Preliminary advice to PNA on a response to COVID-19

Report prepared for the
Parties to the Nauru Agreement

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About MRAG Asia Pacific

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

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1 Background

The COVID-19 (hereafter 'COVID') pandemic emerged in Wuhan, China in December 2019, and has since spread rapidly internationally. As of 28 April 2020, more than 3.1 million cases of COVID-19 have been reported in 210 countries and territories, resulting in more than 217,970 deaths[1]. Restrictions to control the spread of the virus have resulted in massive disruption to the normal way of life for most citizens across the globe and the most severe and sudden contraction of economic activity since the Great Depression[2].

The emergence of the COVID pandemic poses significant challenges for Pacific Island countries, including the PNA. Most importantly, the pandemic represents a grave health risk to their people given the fragile state of health care systems and the high proportion of people in vulnerable health categories. Against this background, Party governments have taken early and precautionary action to protect public health, including effective closure of borders to international travel, restrictions on the use of air and sea ports and the introduction of strict quarantine arrangements. At the time of writing, many PNA Parties remain some of the very few countries in the world without confirmed COVID cases.

On the other hand, COVID also presents considerable economic challenges for Parties, with measures to control the spread of the virus disrupting domestic economic activity and threatening to undermine national revenue streams which will be required for Parties to support communities during and post-crisis.

In particular, as the 'majority owner' of the world's largest tuna fishery, revenue from fishing is a key source of economic activity for both Government and the private sector, with fishing access fees representing around 70% of Government revenue for some Parties. To that end, Parties have a strong interest in maintaining a productive and well-managed fishing sector throughout the COVID pandemic. Nevertheless, some measures appropriately introduced to protect community health have created operational challenges for the tuna industry which risk reducing the economic benefit received by Parties, as well creating difficulties in maintaining some management arrangements (100% observer coverage in the PS fishery; requirement for in port transhipment). To that end, approaches taken to the management of the tuna fishery will mean balancing the risks to human health against the risks to Party economies and the management of the tuna fishery. This will be a key challenge for Party governments throughout the course of the pandemic.

At the same time, the COVID pandemic has resulted in major disruptions to global seafood supply chains, including those based on tuna harvested in the WCPO. Given the importance of tuna revenue to national economies, these dynamics have important implications for Parties and may influence how the Parties position themselves as the pandemic evolves.

To assist in navigating these impacts, the PNA Office contracted MRAG AP to undertake a rapid strategic study on the impacts of COVID-19 on the WCPO tuna supply chain.

The objectives broadly were to provide preliminary advice on:

a) Impacts of COVID-19 on PNA tuna fisheries and economic returns from those fisheries;

[1] https://www.worldometers.info/coronavirus/

[2] https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression/

b) The expected scope of PNA responses to COVID-19 in the short term; and

c) Advice on how PNA might respond to COVID-19 in the medium to longer term.

The terms of reference are included at Annex A.

This report is structured in two parts:

- The first section looks at changes in fishery and market dynamics in the period January to April 2020, as the pandemic took hold. Data and information were drawn from PNA FIMS, interviews with industry participants throughout the supply chain (see Annex B for persons contacted) and other publicly available sources;
- The second section examines the short and long term implications for Parties and sets out preliminary advice on issues Parties may wish to consider from a policy and management perspective.

The focus of the report is on the purse seine fishery, although information on the longline fishery is include where available.

2 Changes in fishery/market dynamics

2.1 Fishing effort

- FIMS data show purse seine fishing effort declined slightly in February '20 against the period November '19 to January '20, but has since recovered in March-April '20 (Figure 1). Indications are that total effort (EEZ + territorial seas + archipelagic waters) increased at a faster rate than effort solely in EEZs. Preliminary data on levels of effort and the intensity of fishing effort (measured as the number of fishing days recorded per calendar day) in April '20 are the highest in the 2019-20 period, although may be influenced by non-fishing days yet to be processed. It is likely that COVID-related restrictions such as port closures may have influenced fishing effort of individual vessels over the Feb- April period, although it seems clear restrictions have not resulted in a widespread decline in fishing effort.

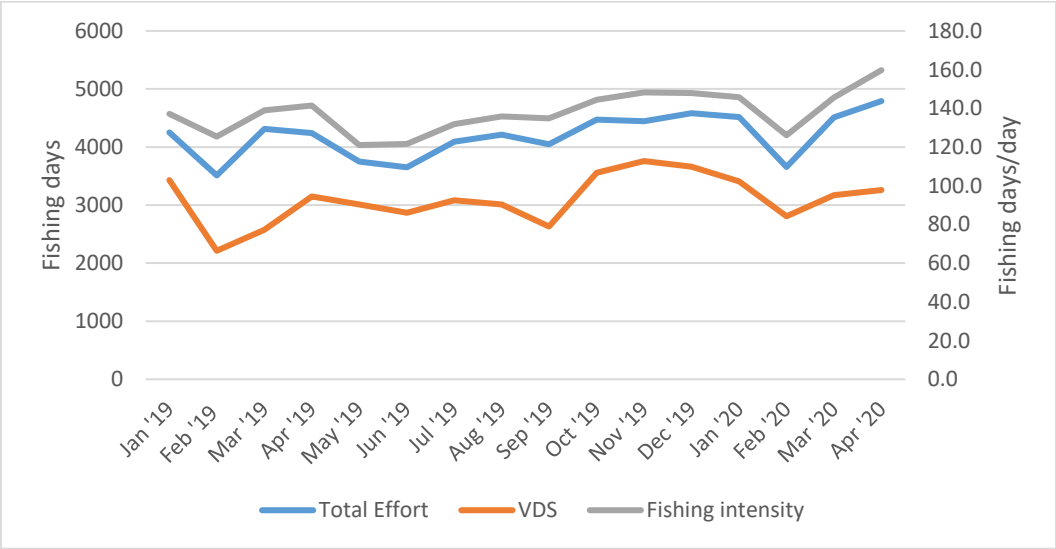

Figure 1: Total fishing days (blue line) and 'fishing intensity' (grey line) across all zones (all Parties, all zones – EEZ, TS, AZ – including high seas), Jan 2020 to April 2020. The number of VDS days recorded in EEZs is also shown (orange line). 'Fishing intensity' is a measure of how many fishing days are recorded for each calendar day.

- The intensity of fishing effort in March '20 (when port closures and quarantine restrictions were increasingly coming into place) was roughly similar to equivalent periods in March '18/19 (Figure 2). Overall fishing intensity in March '20 was around 6.5% higher than the average for March '18/19. FSM, TV and KI showed higher fishing intensity in zone (68%, 68% and 12% respectively), with intensity lower in the high seas (14%), TK and also marginally in PNG. There is limited evidence from the data to indicate any of the variations are COVID-related to date.

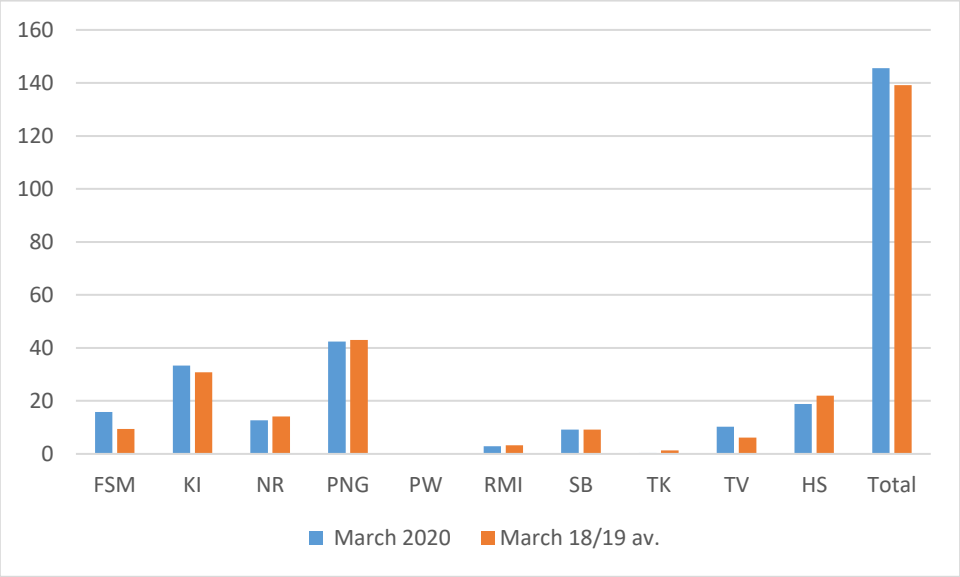

Figure 2: Intensity of fishing effort by zone, March '20 vs March 18/19 average.

- Discussions with industry on the implications of COVID on effort levels have been broadly consistent with the FIMS data. Few interviewees thought that COVID had had a substantial impact on effort levels to date (notwithstanding some impacts at the individual boat level with port closures, observer repatriation, etc), but that operational difficulties associated with at sea transhipment, inability to change crews and undertake routine maintenance, quarantine periods before entering port etc over the coming months will have an impact on effort. The most plausible explanation offered for the rise in effort in March/April was low catch rates – i.e. vessels were staying at sea longer to fill up.

2.2 Catch

- **FIMS data on total PS catch across all Parties** (EEZ+TS+AZ) **and the high seas throughout the January to April period show no obvious impacts from COVID restrictions at this stage** (Figure 3). Total catch broadly increased slightly across the Feb/Mar period as increasing quarantine restrictions came into force across the region, then declined slightly from mid-March into April. The decline in catch does not appear to be correlated with any COVID-related impact on effort (given effort went up in March/April) and is consistent with industry advice indicating poor catch rates in recent weeks.

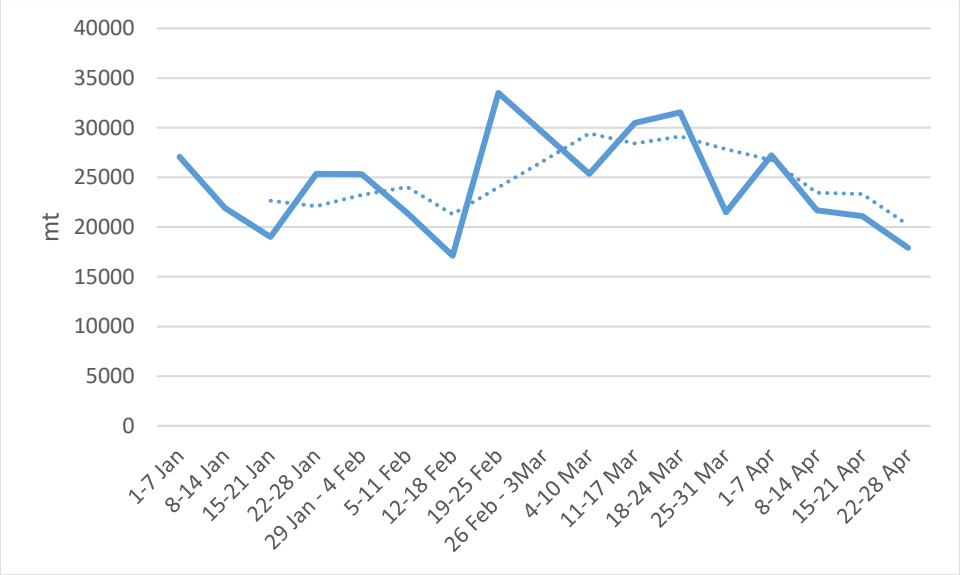

Figure 3: Weekly total PS catch across all Parties (all zones) and the high seas, 1 January 2020 to 28th April 2020. (Blue line = total catch; dashed blue line = 3 week moving average catch)

- Within the overall catch, **there were substantial changes in the distribution of catch amongst the Parties over the January – April period** (Figure 4). Again, **there is limited evidence to suggest these were COVID-related**. The proportion of overall catch taken in the Solomon Is declined from 43% in the first week of January to 0% from mid-March onwards despite Solomon Is ports remaining largely open to transhipping. By contrast, the proportion of catch in PNG grew during the March period, despite increasing controls over access to ports (although it's possible some of the increased catch in PNG may be driven by COVID-related restrictions effectively limiting domestic and LBF vessels to PNG waters).

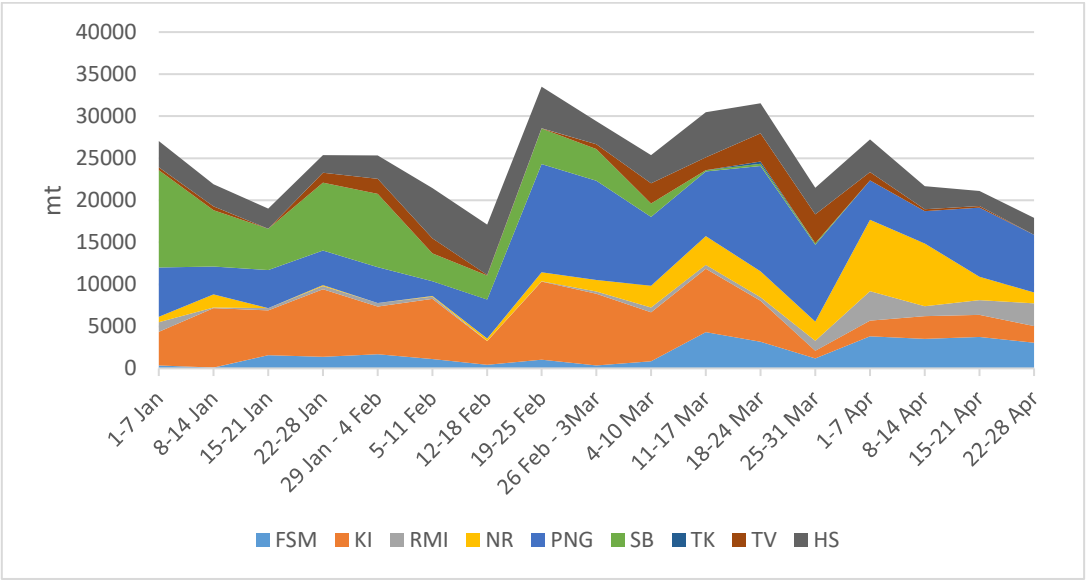

Figure 4: Trends in weekly PS catch, 1 January 2020 to 28th April, 2020.

2.3 Catch rates

- Discussions with industry indicated that catch rates in 2020 are down on the comparable period in 2019, with most operators rating catch rates only poor to fair.

- FIMS data confirm that catch rates (total mt/day; all zones) have been low over recent months, with **average catch rates for the January – April 2020 period around 30% lower than the same period in 2019** (Figure 5). Nevertheless, this appears to be a continuation of a declining trend since mid-2019 with limited evidence to date that COVID-related restrictions have impacted catch rates. While catches rates have declined, the intensity of fishing effort (fishing days/calendar day) has increased, presumably as vessels take longer to fill up.

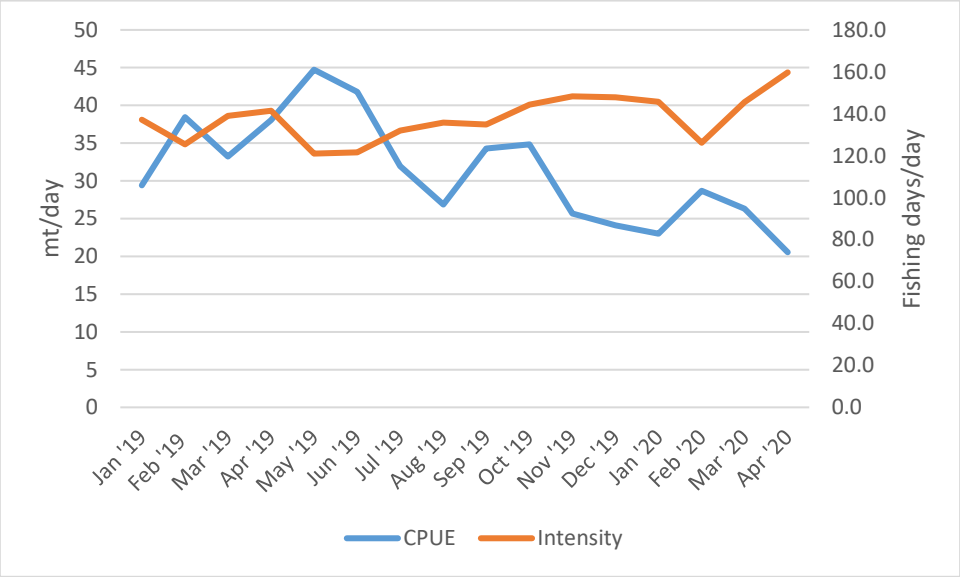

Figure 5: Catch rate (mt/day, all species; LHS) and fishing intensity (VDS days/day; RHS), January 2019 to April 2020.

2.4 Distribution of fishing effort

- Although there have been changes in the distribution of fishing effort in the early part of 2020, discussions with industry indicate that few if any of these are COVID-related – **vessels are largely still 'fishing where the fish are'** within the context of available access arrangements. Nevertheless, one interviewee said their vessels were beginning to factor in ease of transhipment into calculations.

- FIMS data indicate changes in the distribution of effort, but no strong overall trend (Figure 6 and Figure 7). Effort in the Solomon Is, Kiribati and the High Seas declined as a proportion of total effort between January and April 2020, with effort increasing particularly in FSM, Nauru and RMI. The proportion of overall effort in PNG remained stable. April figures may be impacted somewhat by delays in processing NFDs by some Parties.

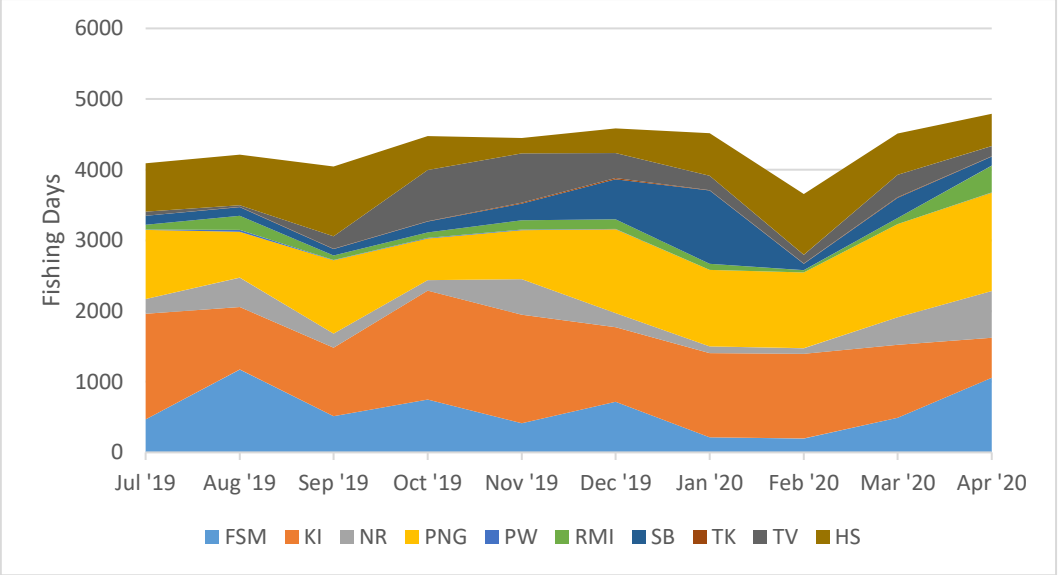

Figure 6: Spatial distribution of effort across Parties, July '19 to April '20.

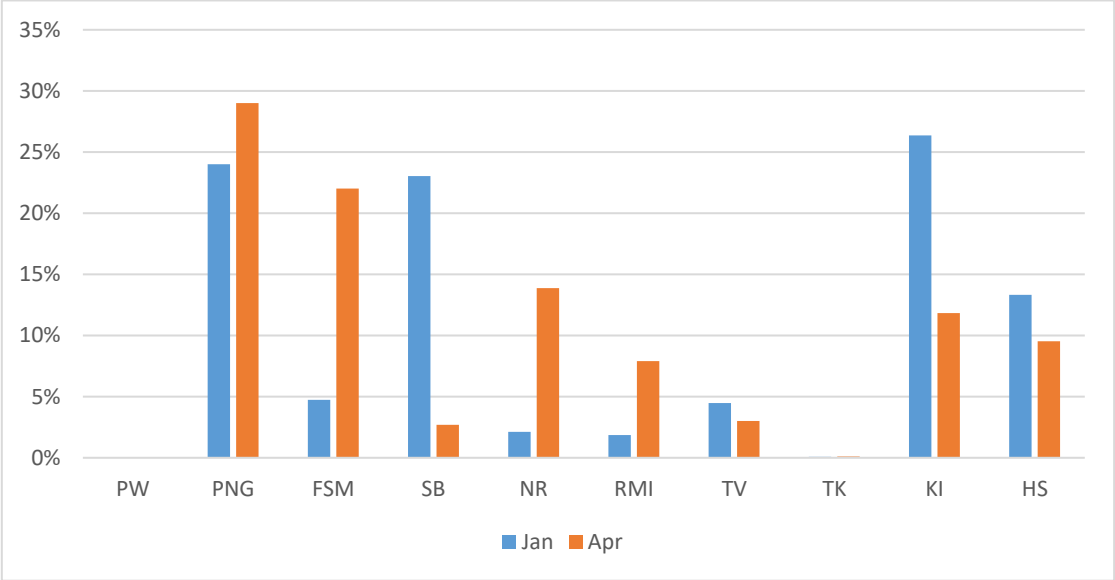

Figure 7: Proportion of fishing effort in each zone, Jan 2020 vs April 2020. Zones are arranged roughly west to east.

- As with catch, **there appears to be no evidence for a contraction of fishing effort around open ports**. Solomon Is ports remain open for example, but the proportion of effort substantially declined between January and April. PNG ports imposed increasing levels of restrictions throughout March, but the proportion of effort has remained stable. Similarly, Nauru's proportion of effort increased despite the absence of a recognised transhipping port.

2.5 Transhipment volume and location

- **Transhipment volumes declined from mid-2019 to February '20, but increased slightly in March/April '20** despite increasing port restrictions (Figure 8). Average metric tonnes of fish transhipped per day across the PNA region do not appear to have been impacted to date by COVID restrictions.

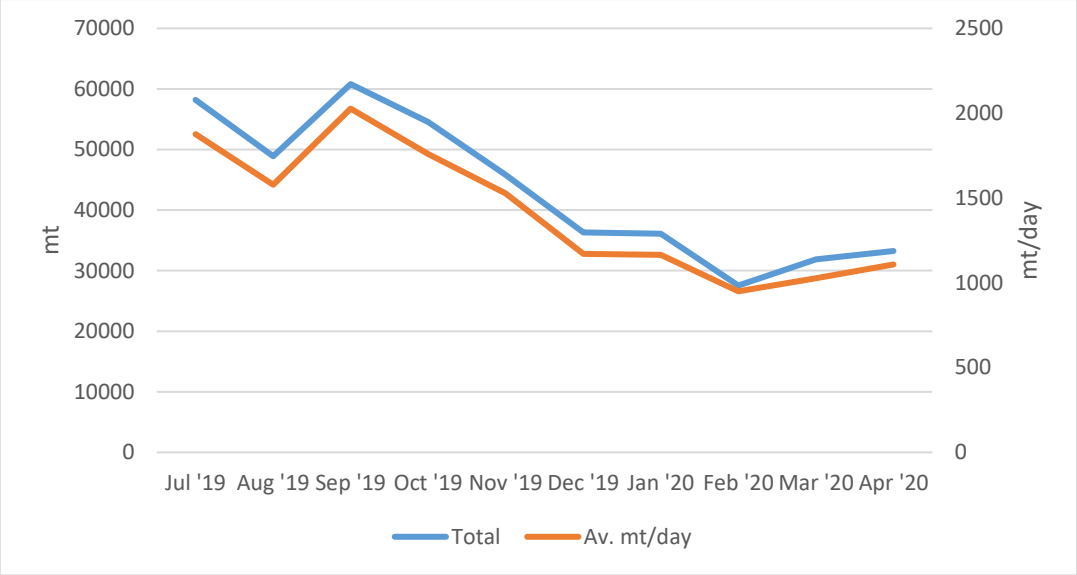

Figure 8: Total volume (LHS) and average metric tonnes/day (RHS) of purse seine tuna transhipped in PNA ports, July 2019 to April 2020.

- Within the broader declining trend, **port closures and restrictions appear to have had a substantial impact on the distribution of transhipment, particularly in April** (Figure 9). Large declines in volume were evident in KI, PNG, TV in April, each of which introduced either prohibitions or other strict measures. By contrast, FSM, and to a lesser extent RMI, appear to have been the beneficiaries of policies to leave ports open (with conditions).

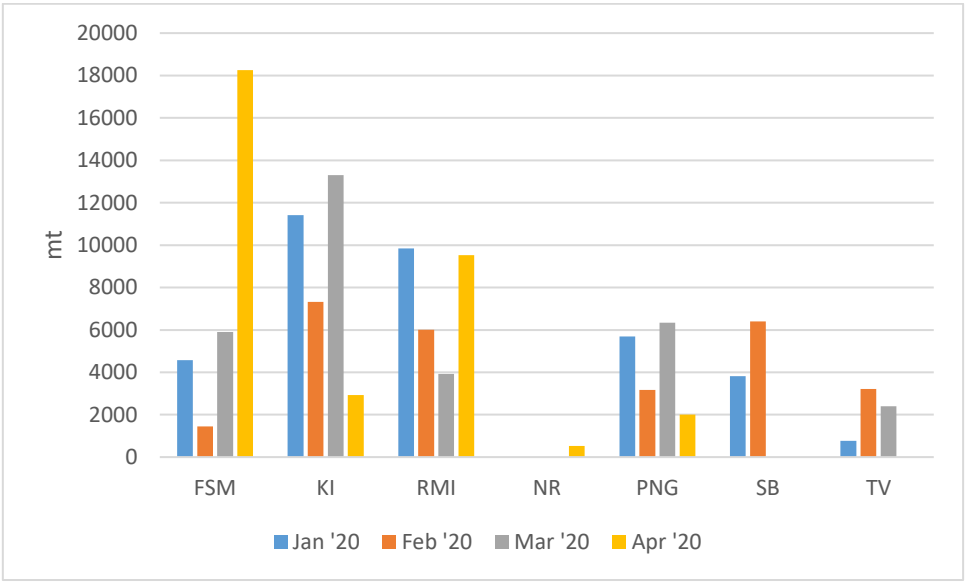

Figure 9: Total volume of purse seine fish transhipped by Party and month, Jan – Apr 2020.

2.6 Market demand

2.6.1 Purse seine

- **All retail and brand interviewees reported experiencing strong retail sales for shelf-stable tuna through the February/March period, largely driven by 'panic buying'**. During the most intense period, one brand reported selling three months' inventory in two weeks. In the US, sales of shelf stable tuna nearly quadrupled from early February to mid-March (Figure 10).

Interestingly, Bumble Bee reported that ~70% of canned tuna buyers in the panic buying period were new to the category (representing a key opportunity for the company and sector arising from COVID[3]).

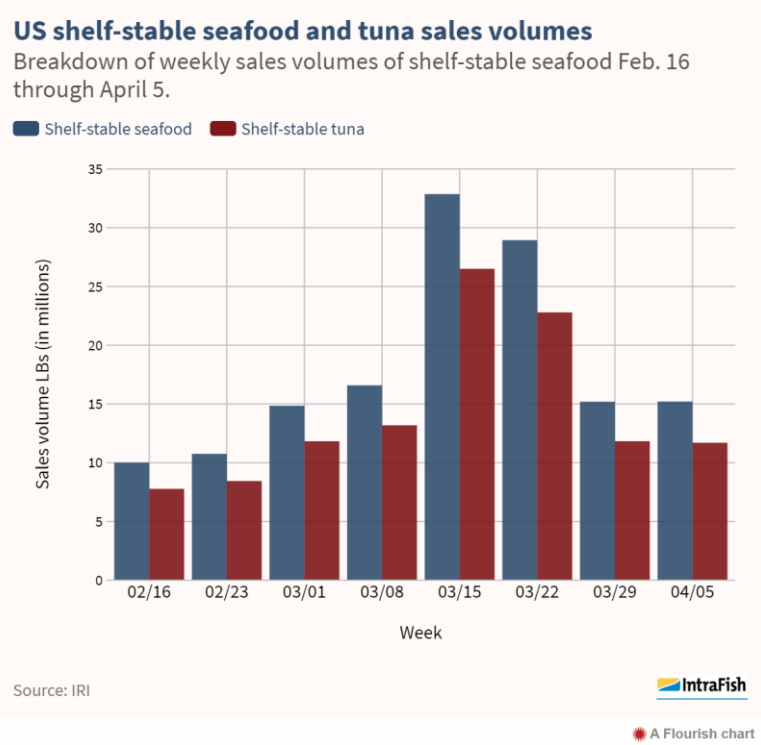

Figure 10: US shelf-stable seafood and tuna sales volumes, February 16 to April 5. (Source: Intrafish)

- Sales of shelf-stable tuna have since fallen from the peak (as one interviewee noted "once your pantry is stocked, it's stocked"), although where sales will end up is uncertain and influenced to some extent by the duration of the pandemic. **Most retailers interviewed thought that sales would 'normalise' to a large extent, but perhaps remain 5-10% higher than pre-COVID levels for the period in which access to restaurants was restricted**.

- For brand owners and retailers, the initial period of panic buying resulted in a substantial demand shock. Many burned through inventories that had been built up based on cheap fish prices in the back half of 2019. The net result is the pipeline for new orders is now reportedly full – many brands are placing orders to restock panic bought fish. The supply concern amongst some is a 2nd wave of panic buying – they could satisfy demand for the 1st wave based on existing inventories, but a 2nd wave would be harder.

- In contrast to retail, **demand for foodservice or industrial pack tuna (used for restaurants, school canteens, etc) collapsed almost entirely** as increasing restrictions took hold. Although the proportion of overall production going into the foodservice sector pre-COVID is unclear (one report suggested around 35-40% of Ecuadorian production goes to foodservice), one interviewee advised that overall market demand was only up marginally after the decline in foodservice was taken off the increase in retail. The general view has been the collapse of foodservice demand has served to moderate Bangkok price for SKJ (i.e.

[3] https://www.intrafish.com/processing/bumble-bee-ceo-canned-tuna-supply-shock-is-reshaping-our-supply-chain/2-1-792451

increases in demand for canned tuna haven't resulted in increased SKJ price in Bangkok because demand for foodservice has collapsed).

2.6.2 Longline

- **Discussions with fishing companies and associations with exposure to fresh and frozen sashimi markets have been almost universally pessimistic**.

- Japanese companies advised that since the onset of COVID in January, restaurants, izakayas (Japanese taverns) and sushi bars in Japan have seen significant declines in the number of customers, which has led to declines in demand and price for sashimi tuna. Declining consumer demand has caused slower turnover of stock in cold storages, with carrier vessels forced to wait longer at port until cold storage becomes available. Companies report that slower turnover of cold storages has become a serious issue since the spread of COVID-19. Some companies advised that operators of fishing vessels have been required to bear additional charges by carrier companies to compensate for waiting time, although the mechanism was not clear.

- Chinese companies reported that deeper frozen longline products from Chinese fleet are mainly exported to Japanese market, although smaller amounts are sold domestically and on EU and US markets. However, since March 2020 there has been limited demand in the Japanese market given cold storages in both China and Japan are at capacity. One Chinese LL company reported having large sales contracts with a Japanese buyer for sashimi grade BET/YFT and ALB cancelled. Chinese companies advise that the situation is likely to get worse over the coming months, with many facing difficult decisions about whether to keep operating. Blockages in the supply chain will mean that companies are unable to move tuna off vessels, resulting in cash flow problems. But vessels returning home port (or other ports) also face challenges with restrictions on the entry of foreign vessels or crew.

- Korean companies also advise that demand for sashimi tuna has largely disappeared. Buyers cannot travel to Korea to check the quality of tuna due to travel ban. Moreover, landings in Japanese ports have been delayed because of blockages in cold storage. They noted that boat owners could 'easily' go bankrupt if capacity to sell catches isn't returned shortly.

- One company which operates a large fleet of LL vessels (half fresh vessels, half frozen) noted that the fresh fish operation had been impacted the most. Markets and logistics networks in Honolulu and the mainland US had been hit hard, meaning demand had reduced to near zero. Demand has since crept back up in the US, but perhaps to only 30-40% of what it was. Buyers are also asking for extended payment terms. Demand for frozen product was mixed. Higher quality BET/YFT cuts are typically sold through the foodservice/restaurant sector where demand has been hit hard. Cheaper cuts are sold through the supermarket sector where sales had been relatively strong (although not enough to compensate for declines in the higher end frozen and fresh operations). The company also advised that some expenses are up, with air freight volumes down and airlines charging higher fees for freight. Fuel costs are down, although nowhere near enough to offset other impacts to the business.

2.7 Fish price

2.7.1 Purse seine

- The general consensus amongst interviewees was that plants in south east Asia had been fortunate to date, with limited or no downtime as a result of COVID. Coupled with strong global demand for canned fish, this kept the **Bangkok SKJ price around $1500** in April (Figure 11).

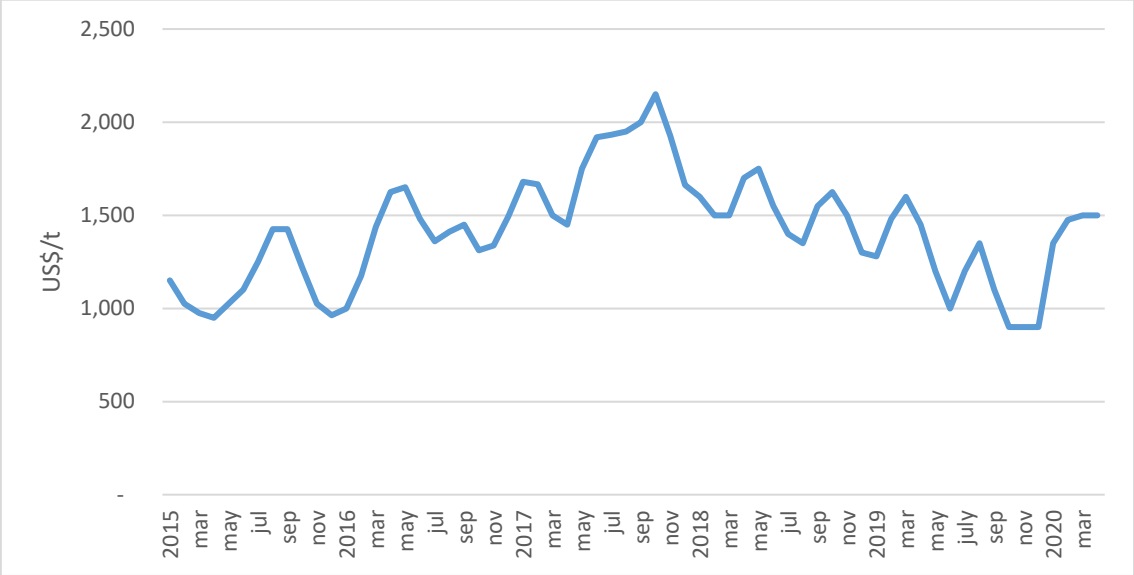

Figure 11: Bangkok skipjack price, January 2015 to April 2020.

- However, other centres haven't been as lucky with factories in Ecuador, China, Europe and Mauritius all suffering temporary closures or production cuts (e.g. in many cases due to the need for increased physical distancing in plants; in China's case, travel restrictions imposed around the lunar new year holiday meant that processing plant staff from inland areas couldn't return to canneries, which are mainly based in coastal areas). The result is that plants are using less tuna, cold storage space is getting full and price has fallen accordingly. In Ecuador's case, this has been exacerbated by strong recent catches in the EPO. While fish prices across the world are usually in relative parity, in April Bangkok was at $1500 while Ecuador and Seychelles are at $1200 and $1300 respectively.

- The common view amongst traders/canners is that, 'one way or another', the prices will converge. One interviewee noted that "*because it is highly unlikely that all important tuna processing hubs will be COVID free and able to maximize their outputs over the next several months, I would imagine that price will probably be meeting somewhere between USD1300-1500*".

- A number of interviewees made the point that the WCPO supply chain is generally longer than those from other ocean basins and therefore perhaps slightly less exposed to COVID-related price shocks. In particular, the involvement of traders and carriers offered greater flexibility in the destination of fish, such that fish could potentially be redirected to other processing locations if there was a COVID problem in one country.

- Anecdotal information indicates that prices for May have been set around $1400 in Bangkok and $1100 in Ecuador (the latter being influenced by the combination of COVID-related production downturns and strong catches in the EPO).

2.7.2 Longline

- Market reports indicate that the wholesale price and volume of tuna sold through Toyosu market in April 2020 declined substantially on the same period in 2019, but varied by species and product form. Sales of frozen BET were down 56% on 2019, with price falling by 16%. Sales of fresh BET were down 93%, with price down 36%[4].

- Chinese companies reported that the price of ULT sashimi grade 40 kg BET has decreased from ¥1300 in 2017 to ¥650 Japanese yen in March 2020. They note there is no demand for sashimi grade ALB.

- Korean companies advised that, as of March, sashimi price in Japan had declined more than 25% compared to the same period in 2019.

2.8 Fuel prices

- **The main 'silver lining' for fishing and carrier vessels associated with COVID has been the drop in fuel prices**. In December 2019, Brent crude price averaged $67 per barrel - $10 higher than December of the previous year. However, in January, oil prices began to fall in response to COVID-related reductions in global demand. Then in March, OPEC+ failed to reach an agreement on production cuts which resulted in the two largest oil producers - Russia and Saudi Arabia - flooding the market with cheap oil. Combined with the COVID-related reduction in demand and shortages of global storage facilities[5], this sent oil prices to historic lows (Figure 12 and Figure 13).

[4] https://www.seafoodsource.com/news/supply-trade/toyosu-sales-figures-reveal-crippling-effect-of-covid-19-on-japan-s-seafood-market

[5] See for example, https://www.abc.net.au/news/2020-04-26/why-australian-government-crude-oil-purchase-teaches-economics/12185546; on April 20, future for West Texas Intermediate crude fell below zero for the first time ever – because production is costly to stop and storage capacity was full, oil producers were, in effect, paying people to take it off their hands (e.g. https://www.ft.com/content/88997d67-bf69-409e-8155-911fc1f2fd6f).

Figure 12: Singapore Marine Gasoil (MGO) price (red line) and the global 20 ports average MGO price (grey line), January 2108 to April 15, 2020 (Source: https://shipandbunker.com/prices/apac/sea/sg-sin-singapore#MGO)[6]

Figure 13: Singapore MGO price, Jan 2010 – Apr 2020. April 2020 price is as at 16th April. Prices are unadjusted for inflation. (Source: https://shipandbunker.com/prices/apac/sea/sg-sin-singapore#MGO)

- Fuel is the highest variable cost for purse seiners typically accounting for around 30 - 50% of total costs. For longliners, fuel accounts for around 30-40% of total costs.
- **Although SKJ price normally closely linked to fuel price, the unique circumstances around COVID** (very strong demand for canned fish; very weak demand for oil) **have resulted in a temporary 'uncoupling' of these indices** (Figure 14). It hasn't yet reached the stage of being the largest difference between SKJ price and fuel, but it's close and (at least at the time of writing) continuing to trend upwards (Figure 15). All other things being equal, this would create good conditions for profitability amongst the purse seine fleet (although with lower catch rates in 2020 and restrictions due to COVID, all other things are not equal).

[6] Note that as of 29th April, Singapore MGO price has fallen further to $213/mt.

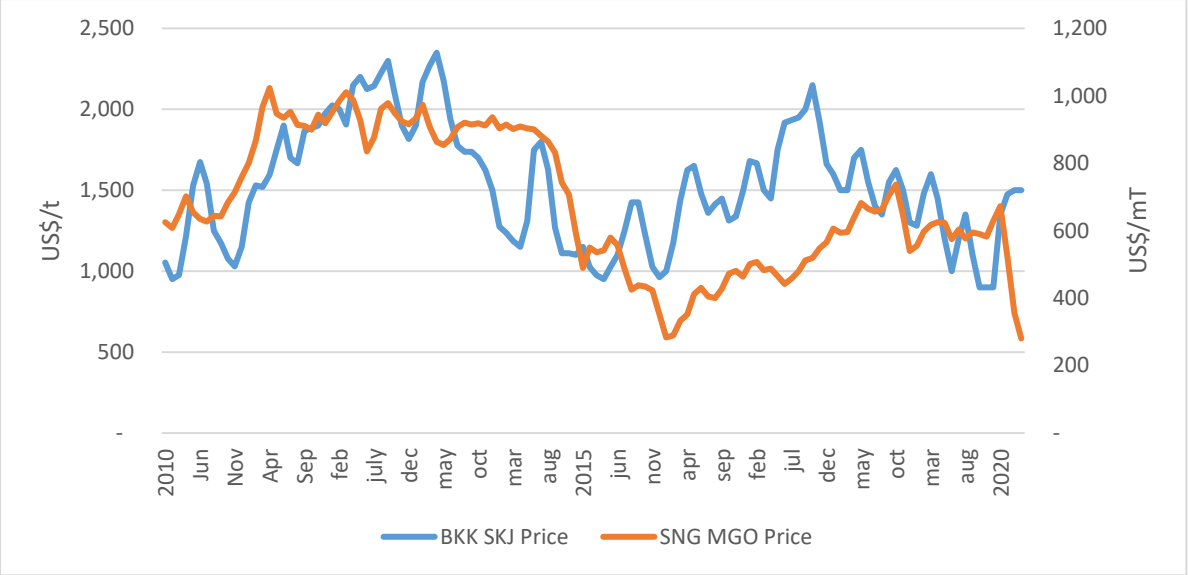

Figure 14: Skipjack price in Bangkok vs Singapore MGO price, Jan 2010 to April 2020. Blue line = BKK market report price SKF – 4-7.5lbs (source: https://investor.thaiunion.com/raw_material.html). Orange line = Singapore MGO price (source: as above). Singapore MGO price for April 2020 is the average price to April 17. BKK market price for April 2020 is based on advice from traders.

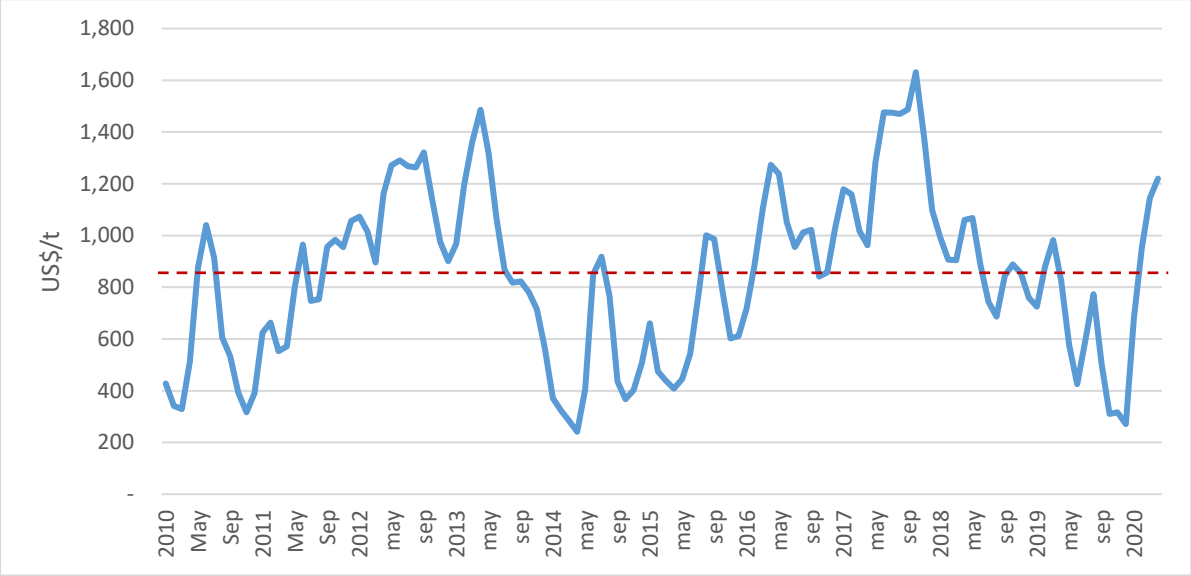

Figure 15: Difference between BKK SKJ market price and Singapore MGO price. Larger differences create better conditions for vessel profitability, all other things being equal. The red line is the average difference between BKK SKJ market price and Singapore MGO price, Jan 2010 to Apr 2020. The red dashed line is the average price difference between Jan 2010 and April 2020.

- The common view is that the SKJ price and fuel price lines will inexorably converge again – the question is how long it will take? Under normal circumstances, it might happen relatively quickly, but the circumstances around the current pandemic are unique.
- Most observers predict a gradual recovery in oil price as production slows and demand comes back online. The US Energy Information Administration (EIA) forecasts Brent crude oil prices will average $33/b in 2020, roughly half the price of 2019 ($64/b)[7]. The EIA expects

[7] https://www.eia.gov/outlooks/steo/pdf/steo_full.pdf

prices will rise from $23/b during the second quarter of 2020 to $30/b during the second half of the year, before increasing to an average of $46/b in 2021 (Figure 16). The International Monetary Fund's World Economic Outlook for 2020[8], which uses futures markets to forecast based on simple averages of UK Brent, Dubai Fateh, and West Texas Intermediate crude oil price, predicts a more modest recovery, with average price rising from $35.61/b in 2020 to $37.87 in 2021. Nevertheless, modelling shows the actual price is likely to be highly sensitive to the alternative trajectories in evolution of the pandemic.

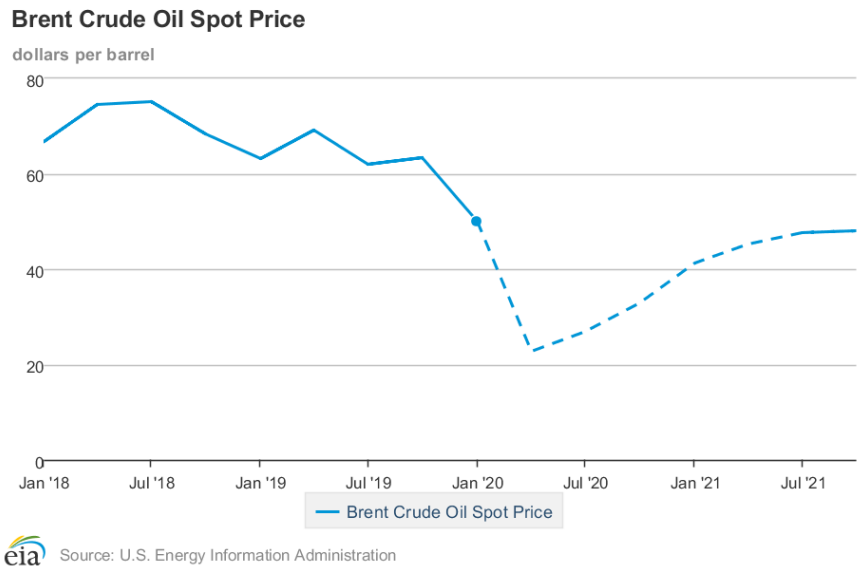

Figure 16: Short term oil price prediction (source: US Energy Information Administration[9])

- If widespread restrictions remain in place globally (reducing oil demand and placing upward pressure on demand for canned tuna), we may see a prolonged divergence of SKJ and oil prices. If restrictions are eased in the larger economies (particularly the US, EU and China) and market countries, we may see a 'normalisation' of the lines relatively quickly.

2.9 Risks to the broader supply chain

2.9.1 COVID impacts on processors

- **The key risk to the broader supply chain nominated by most interviewees was SE Asian canneries (particularly in Bangkok/Thailand) going down with COVID outbreaks.** A sustained and widespread drop in production would lead to cold stores filling up and prices falling. The extent of the impacts would depend on the nature and duration of the impact (all canneries affected? only a small number? short term? longer term?) as well as the capacity of alternative processors (Philippines, Indonesia, Vietnam, Korea, China, Ecuador) to take up the slack. At the PNA end, a sustained drop in processor demand and price would lead to weaker profitability in the harvesting sector, with potentially lower levels of fishing

[8] https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020

[9] https://www.eia.gov/outlooks/steo/data/browser/#/?v=8&f=Q&s=&start=201801&end=202104&map=&linechart=~BREPUUS&ctype=linechart&maptype=0&id=

effort (some boats tying up) and weaker demand for VDS days (and/or higher levels of effort in the high seas). One processor noted "*the PNA cannot afford to see Bangkok reducing its processing tonnage because that will set off a lot of unpleasant situation, ie. slow carrier turnaround, lower fish price, reduced activities at PNA transhipment ports, less fishing activities, and less VDS revenue*." The same processor noted that reduced production in Philippine and Vietnam is "more manageable" because they are less dependent on supply from the WCPO.

- Notwithstanding the general view that disruption to Thai processors represents the key risk to the supply chain, a number of people made the point that the WCPO was perhaps slightly less exposed to disruptions in single locations that other ocean basins given the longer supply chain with traders/carriers and greater flexibility to move fish around when there is a problem in one country.

- To date, Thailand has been relatively less affected by COVID than other key processing hubs (e.g. Ecuador, China, Mauritius), with the number of confirmed new cases falling since early April (Figure 17). One processor indicated that the Thai Government had done a "*decent job of keeping the COVID-19 under control which has helped our handling of the issue within our facilities good job in getting things under control*". Nevertheless, testing rates in Thailand remain low relative to other economies (Figure 18).

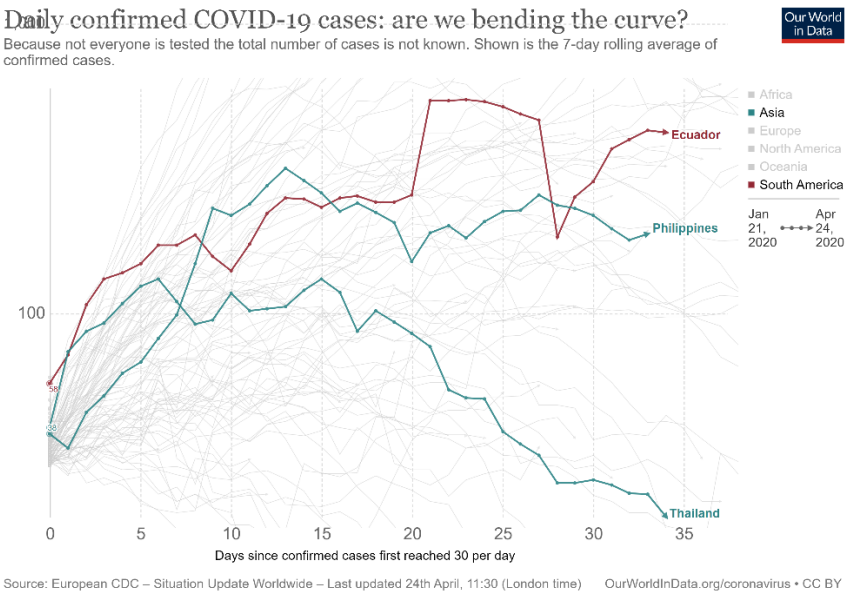

Figure 17: Daily confirmed COVID-19 cases, January 21 to April 24, 2020. Note the scale of the graph is logarithmic. (source: https://ourworldindata.org/grapher/covid-confirmed-daily-cases-epidemiological-trajectory?country=ECU+PHL+THA)

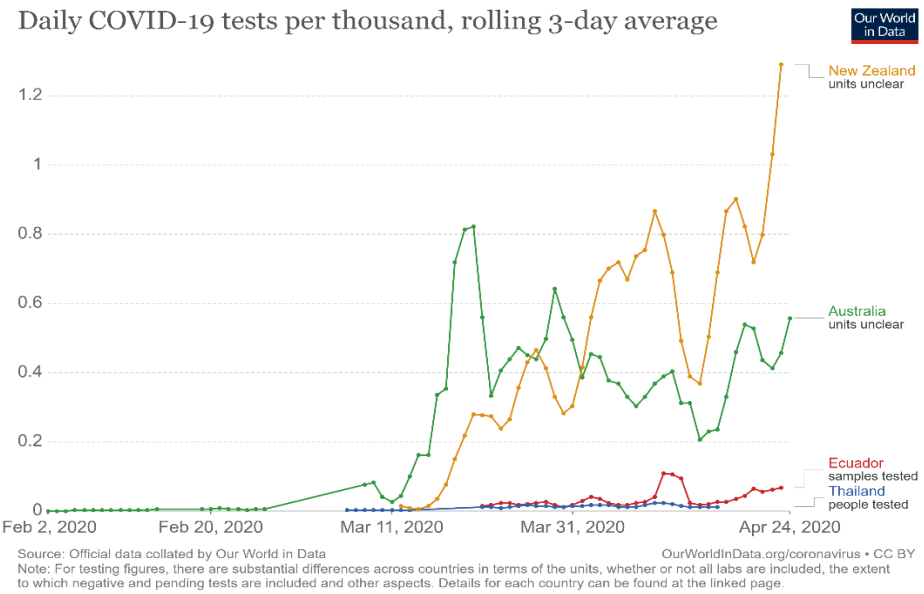

Figure 18: Daily COVID-19 test per thousand people, February 2 to April 24, 2020. Australian and New Zealand testing rates have been included for comparison. (Source: https://ourworldindata.org/grapher/daily-covid-19-tests-per-thousand-rolling-3-day-average?country=ECU+THA+AUS+NZL)

- To manage COVID risks, Thai processors have introduced a number of practical measures within factories. One processor noted that "*(Company name) took the issue very seriously since February. We banned all International travel since mid February and started taking temperature of all workers and staffs daily. We discouraged visitors both foreign and domestic. In the processing line, we tried to expand the work space to accommodate distancing among workers as much as we can. Later on when the spreading became more serious, we banned all travel and asked workers to stay locally. People working in one area cannot cross to another area of the plant. All meetings are conducted on line or by phone even if all participants are in the same plant, and we banned all visitors into the plant area. We also performed a risk assessment of people living in the same household with our staffs and how they commute to work. Those with higher risk are being asked to work from home. In some case, the company subsidizes hotel expenses for staffs who have family members working in hospitals. Now, our staffs are taking alternate week to work from home*."

2.9.2 Other risks

- Other broader risks included:
    - Disruption of the global shipping industry and contraction of shipping volumes leading to difficulties in moving containerised tuna and higher freight costs;
    - Inability to access containers leading to difficulties in processors being able to ship finished goods to market countries. One canner noted that this could lead to cash flow problems, which might ultimately undermine their ability to keep the cannery operating. Nevertheless, while container freight volumes were substantially

constrained in February/March, some interviewees noted this was beginning to ease[10].

- Disruption of offloading at key ports – advice to date is that offloading in Bangkok has been largely unaffected by COVID impacts (despite a curfew), although any form of shutdown is likely to lead to longer turnaround times and higher demurrage costs. Prolonged impacts might see cold store volumes depleted and ultimately production affected;
- Disruption to chains of documentation with Government staff diverted to other COVID-related issues. One interviewee noted "*this is an import/export industry which relies quite a bit on authorities' signatures and movement of documents so there is a concern that everyone involved in each step of the supply chain will need to perform their functions in a timely manner. For example, without the EU Catch Certificate, products cannot go to the EU*."

- One processor nominated the issues around transhipment – and the inability to have boats efficiently offload/undertake maintenance etc – as the key risk to the supply chain.

2.10 Demand for VDS days

- Several of the industry interviewees were asked for their thoughts on likely demand for VDS days in the remainder of 2020. All acknowledged that **predicting demand was extremely difficult in the current circumstances**, particularly given the potential for broader shocks in the supply chain. Nevertheless, putting aside broader scale shocks (e.g. BKK processors going down with COVID), a common factor likely to influence demand was the logistical ease of the fishing/transhipment operation and the extent of downtime. Most interviewees thought that COVID restrictions which made the fishing operation difficult - e.g. delays in transhipping for bad weather, inability to find open ports for repairs/maintenance, having to steam home to change crew, etc – would ultimately lead to a loss of fishing time and a decrease in demand for days. The extent of the decrease would be proportional to the stringency of COVID restrictions. Japanese operators noted that they had not seen a decrease in demand to date, but that a resumption of the observer program before logistics networks were capable of supporting efficient movement might result in a '*significant adverse impact on the demand for days*'.

- Logistical challenges also need to be seen in the context of broadly lower catches/catch rates in 2020. One interviewee noted that "*our catches for one company … with over 10 vessels is down close to 20% versus last year due to more down time and less catches. Now the vessels are averaging more than 40 day trips. So all the vessel companies are having a tough time with the lower catches and more down time even with the lower fuel costs*." In the context of the logistical challenges facing the industry, they noted that some vessels may combine their logistical changes (crew changes, reprovisioning, net repair etc) with a period of tie up back in home port. They noted that "*some vessels are starting to look into this but they still have unused days so deciding whether the prices might go up later in the year and see when to tie up*".

[10] e.g. https://www.agility.com/insights/COVID19/ocean-freight/

- Most acknowledged that many companies had bought fewer days for 2020 (on the back of low SKJ prices at the end of 2019), with the general approach at that time being to 'wait and see' what happened with prices and the broader state of the fishery. In the current uncertainty, most interviewees thought industry would be cautious about buying days (this year and next), with PNA's approach to dealing with COVID being watched closely.

3 Where to from here for PNA?

3.1 Context – how long does this thing last?

Perhaps the key uncertainty in the development of any coordinated PNA approach is how long the pandemic and associated need for restrictions will last. In general terms, a shorter run pandemic might allow scope for 'heavier' restrictions, whereas those same restrictions in the longer term would begin to seriously undermine Party national budgets (and associated capacity to recover post-COVID) and compromise conservation and management measures.

The difficult reality is that no-one knows how long the pandemic will run. Many/most informed observers think that things will return to 'normal' only after an effective vaccine is widely available and/or effective shorter term treatments have been found. Despite concerted research efforts internationally, most respected specialists indicate a vaccine is unlikely to be available for 12-18 months[11].

International travel and movement of people is likely to be one of the last restrictions to be lifted, at least for those economies with domestic outbreaks under control and the capacity to ride out the short term economic impacts of isolation.

In that context, Parties may wish to begin planning for both short and longer term impacts.

3.2 Shorter term issues

3.2.1 Observers

The inability to source observers was a key challenge for the purse seine fleet in the early days of the COVID crisis, though this has largely been resolved (at least in terms of it being an impediment to fishing) by the Parties' decision to temporarily suspend the 100% observer coverage requirements until 31st May. Given the logistical challenges in moving observers around the region, this was the only pragmatic decision that could be taken and has largely been received well by industry and Governments (albeit NGO groups and others have noted the need for compensatory monitoring measures[12]).

Logistically, observer repatriation remains a substantial challenge that will not be resolved overnight. Many Parties' ports are still effectively closed, while many vessels carrying observers from Parties able to be repatriated are working through the logistics of getting observers home with the least possible disruption to fishing operations. As an example, the PNA Observer Agency (POA) had 72

[11] https://www.theguardian.com/world/2020/apr/06/when-will-coronavirus-vaccine-be-ready; https://www.healthline.com/health-news/heres-exactly-where-were-at-with-vaccines-and-treatments-for-covid-19#Vaccine;

[12] https://ngotunaforum.org/wp-content/uploads/2020/04/Pew-Observer-Letter-with-NGO-Signatures.pdf

observers on active duty at the time of suspension (27th March) – as of 4th May, 15 have been repatriated (or are in transit in their home country) with 57 remaining on active duty.

From a data collection/CMM point of view, the challenges associated with repatriation mean that observer data will continue to be collected for many weeks (possibly months) to come.

While the temporary suspension dealt with the immediate challenges, a number of issues related to the observer program are worth considering moving forward:

- Observer repatriation - While to date most observers have been happy to remain on the vessel and earn income, at some point that will end and observers will request to disembark vessels (or some Parties may insist observers return home). Parties, fishing companies and observer program providers will need to work cooperatively to return observers with the least pragmatic disruption to the fishing operation. Repatriation is a particular challenge for Parties who are not yet accepting the return of observers – these Parties may wish to work through what happens when one or more of these observers requests to disembark the vessel for health, safety or other reasons. International travel restrictions in most ports in the Pacific makes disembarking them in a foreign port very difficult in practice.

  Parties may also wish to consider the financial logistics of supporting observers if they need to be disembarked in a port other than their home port (e.g. for health, safety or compliance reasons). While both the Parties' and WCPFC decisions on the temporary observer suspension are very clear that "*the observer's costs will continue to be met by the vessel operator until such time as the observer is returned to his/her home port*"[13], Parties may wish to consider how this would work in practice – does the vessel company pay for these costs directly (under conditions agreed with the Party), or does the observer program pay for some/all of these costs upfront and make arrangements for reimbursement by the vessel operator? Given the absence of flight routes, disembarking the observer in ports other than their home port may result in the observer being there for weeks, perhaps months.

- Observer income – Observer work is the primary source of employment and income for hundreds of observers and their families across the Parties. Assuming around 45,000 fishing days are undertaken annually, this equates to somewhere around 65,000 observer days at sea (taking into account steaming time etc). While different observer programs pay different rates, assuming an 'all up' rate per sea day of $80/day (including sea day and shore day fees, MSC sea day fees and other expenses), a full year suspension of the observer program would result in lost income of around $5.2m. A three month suspension would result in lost income of $1.3m. Additional income will be lost to debriefers and placement officers, as well as support businesses in the main transhipment ports.

  While the impacts to observers will be dependent on the length of the suspension, and will be moderated somewhat because some observer are likely to remain at sea for quite some time, Parties may wish to consider whether there is a need for any specific assistance to observers, or whether the normal social safety nets in place in each Party are likely to suffice. Parties may also wish to think about whether there is any work observers could usefully do in and around fisheries agencies during the suspension period. In this vein, SPC

[13] WCPFC Circular No.: 2020/24, para 3 (https://www.wcpfc.int/doc/circ-2020-24/commission-decision-response-covid-19-regarding-suspension-requirement-purse-seine).

have contacted PNA to tentatively explore whether observers might be engaged to undertake activities such as port-based biological sampling (where feasible and safe) and collection of artisanal/coastal fisheries data which are currently under-represented.

- Observer (and Pacific Is crew) safety – observer safety is the fundamental consideration of any observer program. Given many observers are likely to remain on vessels for many weeks – and COVID is likely to still be a risk when the temporary suspension is lifted – Parties may wish to consider the types of risk management arrangements they would like vessels carrying observers (and Pacific Island crew) to have in place.

  Parties may also wish to consider what would happen in the event of an outbreak on board a fishing vessel. Parties currently free of COVID may not welcome a COVID-infected vessel into their ports, even under emergency circumstances, and may not be adequately set up to deal with an outbreak in any event. If the vessel is a DWFN flag, they may be able to steam back to their home port, but what if it's a domestic vessel? As many people have observed, floating around the ocean may well be the safest place to be, but nevertheless, Parties may wish to 'game plan' the arrangements necessary to manage and treat an outbreak on a vessel in the region.

  In the same vein, Parties may wish to consider what would happen in the event of an observer or crew emergency (e.g. what safety precautions might countries want to have in place to allow for observers/crew members to be treated?).

- Under what conditions does the suspension end? – this is a key question being faced by Governments around the world in relation to COVID restrictions. In the context of the observer requirement, the decision to suspend included a requirement for a monthly review. Parties may wish to consider the circumstances under which the observer program could be safely and efficiently 'restarted' and developing some broad criteria to assist with the monthly reviews. Key considerations are likely to be that any safety risks to observers on board have been adequately addressed and basic logistics networks necessary to transport people around the Pacific have resumed to some degree. It is worth noting that, even with logistics networks back in place, the types of quarantine arrangements we have in place at the moment are likely to be extremely expensive for vessels (e.g. vessels waiting at sea for 14 days before entering port to pick up an observer; observers being quarantined for 14 days upon entry into a country, etc). Arrangements would be required to make this process more efficient (e.g. some form of COVID testing process for observers pre-departure, with observers testing negative being able to fast-tracked through quarantine arrangements onto vessels). Other suggestions may be a broader COVID testing regime for both observers and crew pre-departure to ensure the safety of both, and arranging for vessels to transit without observers from their (DWFN) home port to a PNA port to embark observers in order to avoid unnecessary international travel and exposure for observers.

- EM to complement observers – In the longer term, Parties may wish to consider the role that e-monitoring data and video footage could play in complementing the role of the human observers onboard the fishing vessels. Although there are a range of practical and technical issues to be worked through, EM would allow some form of monitoring to continue in the event of future major disruptions to observer coverage (as well as deterrence to non-compliance), with observers employed onshore to review EM footage. The results of any early EM trial could be used to help plan the longer term mix of monitoring arrangements in the fishery, and any future integration with other potential

management measures (e.g. catch document schemes, etc). A number of major retailers have written to tRFMOs in the context of the COVID pandemic encouraging them to progress having EM accepted as an alternative monitoring approach[14].

3.2.2 Logistics of fishing/port access

The **next major short term issue is a complex of matters around the logistics of the fishing operation**. **Key issues include capacity to efficiently tranship, exchange crews, undertake basic repairs and maintenance and reprovision**. Each of these are related to large extent to the general issues of port access and international travel. Now that the immediate challenge of sourcing observers has been addressed, these issues are the 'most pressing' for industry and the most immediate operational challenge for Parties to consider.

The main issues are as follows:

- **Transhipment** – port closures and other quarantine arrangements introduced by the Parties have had an impact on the capacity of purse seiners to tranship in port and, in the absence of alternative arrangements, threatened to create serious blockages in the supply chain. To that end, industry has broadly welcomed Parties' designation of areas within their territorial seas to allow transhipment at sea. Nevertheless, all made the point that it is not a 'like for like' swap in terms of efficiency and safety. Some transhipments at sea will inevitably be delayed by bad weather and swell, potentially resulting in backlogs of unloads and longer turnaround times for vessels.

  Vessels operators are also concerned about the safety of their vessels and crew. One interviewee reported "*a couple of incidents already of the vessels colliding due to bad weather*" while another reported "*in the case of PON, FSM – we had a purse vessel collide with the carrier – resulting in significant damage to our vessel - -although its still operational. It was a result of high seas. No one was hurt and I do not know if, or how compensation will be involved – but when even a larger PS vessel goes in contact with a carrier in a rough sea – the PS will always lose"*.

  In addition to the efficiency and safety concerns, transhipment at sea makes crew exchange, repairs and maintenance and reprovisioning very difficult (see below).

- **Crew exchange/technical support** – The inability to exchange crews or fly technicians into Party ports was nominated as a 'looming' problem by almost all industry interviewees. Some thought that a prolonged delay (with crew required to stay on longer than their current contracts) could lead to strikes or social unrest on board, while others were concerned about the market implications and whether some customers would consider this 'forced labour'. Many thought that boats could continue to operate perhaps for a few months, but problems would begin to emerge after that.

  For deck crew, many interviewees thought that some level of exchange could be facilitated through carrier transfers, with crew generally happy to sit on a carrier for a month in transit to the destination port (although one interviewee pointed out that space on carriers is typically fairly limited, so capacity for exchange may be quite limited in practice).

[14] https://www.sustainablefish.org/News/Walmart-Major-Retailers-Call-for-Governments-to-Ensure-Sustainably-Produced-Tuna-during-COVID-19

However, skippers, other senior officers and technicians are not going to want to spend a month on a carrier in transit. In the absence of some way of allowing these officers into Parties, most interviewees thought the most practical option was for vessels to return to their home ports to exchange crew. Many would also take the opportunity to reprovision and undertake basic repairs and maintenance.

One bunkering company said they had stopped all involvement in crew exchange since the emergence of COVID (too much risk to their operation).

Apart from the loss of revenue to support businesses within Parties, the net result from vessels needing to return home to exchange crew would be lost fishing time and potentially lower VDS day demand. One interviewee estimated the steam from Majuro to Qingdao was 10-12 days, so close to a month off fishing grounds for Asian-based vessels taking into account turnaround time. As discussed above, if catch rates remained low and operational conditions difficult, some vessels may combine crew exchange trips with a period of tie up back in home port.

Separate to the constraints around crew exchange in Party waters, industry have reported problems sourcing foreign crews given COVID travel restrictions. For example, the Japanese fleet reported a particular problem with sourcing crew from countries including Indonesia and Kiribati due to quarantine and travel restrictions imposed by the Japanese government and crew members' home governments. One interviewee reported that "*in some cases, fishing vessels had to stay at port for a decent time period due to delays in arrival of foreign crew members. If the current situation on COVID-19 is prolonged, it will cause further cost increases for securing foreign crew members, including their hotel and travel expenses. Some operators are seriously worried that their vessels would be forced to suspend their fishing operation due to a lack of crew members*." Anecdotal information suggests that a number of other vessels are tied up in Asian ports awaiting foreign crew.

- **Repairs and maintenance** – the capacity to undertake basic repairs and maintenance adjacent to the fishing grounds is an essential component of running an efficient fishing operation, particularly in the case of distant water vessels. Part of this means being able to fly in specialist technicians to undertake repairs on the vessels itself, while part of it means accessing onshore facilities such as net yards. One interviewee reported having a few of their vessels break nets due to strong currents in recent weeks with the vessels needing somewhere to dock for repair – given the closure of many ports/facilities, they reported that "*all these problems will take longer to fix*".

  In the absence of efficient local options for repair and maintenance, vessels may be forced back to their home ports for basic repairs (or alternative distant water ports) losing fishing time. If those ports have confirmed cases of COVID, this may have implications for being able to re-enter some Party ports.

- **Reprovisioning** – Many provisions including salt may be arranged through traders/carrier companies although there may still be difficulties obtaining some items that they would have ordinarily sourced from Party ports (e.g. fresh fruit and vegetables). Given the competition with locals for fresh fruit and vegetables, some may see this as a benefit, but there will likely be an economic impact on local providers and on fishing effort if delays in provisioning mean extra downtime.

Having set out the issues, the question is what to do about them. It seems likely that, collectively, the impacts of these logistical issues if prolonged will have an impact on fishing effort (although at this stage it's not clear how much, and the impacts do not appear to be evident in the overall effort figures to date). For those fleets/companies who purchased fewer days at the start of the year, logistical difficulties may ultimately influence demand for VDS days for the remainder of 2020.

Industry's general request is that ports remain open to the maximum extent possible. All have been appreciative of the Parties' decision to designate transhipment areas within their territorial seas, although they made the point that it doesn't assist with the challenges around crew exchange, repairs and maintenance and reprovisioning. To their credit, most/all interviewees have understood Parties' decision to take a precautionary approach in dealing with COVID health risks to their people and they are keen to explore with Parties whether practical arrangements exist to allow for some (higher) level of port access, while at the same time maintaining a very low risk approach to COVID generally.

While decisions around port access are for each Party in the context of their own national response to COVID, there are two measures that Parties may wish to undertake collectively:

- Coordination of medical advice/risk assessment – given the importance of fisheries to national economies, Parties may consider coordinating specific high level, specialist medical advice/risk assessment on the issues around port access by fishing and carrier vessels. The intent would be to provide Parties with specialist advice on the specific risks involved in fisheries (to the extent this has not happened already), with a view to producing a practical set of guidelines around managing the risks around port access (i.e. within the context of Parties' very low risk approach to COVID, what activities are possible, and under what conditions?). Clearly any collective review would need to add value to (and be complementary to) risk assessment/medical advisory processes happening within each Party. The risk assessment may be able to draw on similar assessments/guidance undertaken for other shipping sectors.

  Depending on the nature of the advisory panel, it may also be able to provide advice on managing the risk of COVID outbreaks on fishing vessels in the Pacific and potentially act as a 'standing committee' to assist vessels manage incidents. Reports from Ecuador indicated that six EPO purse seiners are currently in quarantine in Manta with 30% of fishers on three of the vessels testing positive for COVID[15]. One interviewee noted that US factory vessels fishing in Alaskan waters had formed a similar group of medical specialists to provide practical advice to vessels on how to avoid COVID and treat issues as they arise. To date, industry advise that relatively few specific measures have been taken to manage the risks of COVID on board, other than screening of symptoms pre-boarding and encouraging crew to practice good hygiene (although some companies are looking at COVID testing before crew before deployment). A reference group might also be asked to consider arrangements necessary to allow for safe re-entry of observers on fishing vessels after the temporary suspension is lifted as well as necessary measures to allow for safe physical inspection of vessels by compliance officers.

- Establishment of an industry 'reference group' – each of the industry interviewees contacted for the study expressed a keen interest in working cooperatively with Parties to manage the

[15] Atuna

practical impacts of the COVID crisis. There is a high level recognition amongst all sectors of that the interests of industry and Parties in maintaining a productive fishing sector are broadly aligned. A reference group could be used as a sounding board to seek input on the key operational challenges being faced by industry, to provide up to date information on the state of the fishery and to work through practical solutions to any logistical challenges (with Parties having the ultimate say on if, and how, any solutions were implemented).

Parties may also wish to consider requesting regular updates on key issues and indicators – a monthly 'COVID dashboard' – to assist in monitoring progress and planning responses (e.g. catch, effort, CPUE, transhipment volumes, number of observers remaining on vessels, fish price, key developments, etc). These updates could include regular runs of the PNA purse seine economic model to track rents in the fishery.

Other suggestions raised by industry and others include:

- Strictly controlled customs/quarantine areas around net yards and other key onshore facilities to allow for safe routine maintenance, and potentially for offloading to containers;
- Arranging for crew transhipment in 'open' ports such as Guam, or using helicopters to transport crew from airports in PNA ports direct to vessels without exiting the airport jurisdiction;
- Examining whether some uninhabited atolls with good entry channels could be designated as transhipment areas. Some of these are reportedly used by cruise ships at the moment. Clearly, the environmental and safety risks of any such arrangement would need to be considered;
- Upgrading the tracking of carriers and bunker vessels in FIMS to track meetings of vessels at sea;
- Some interviewees reported that bilateral agreements with some Parties include a prohibition on transferring crew and goods at sea – they suggested easing some of these restrictions on a case by case basis may be helpful;
- Establishing some form of COVID testing regime for essential technicians/crew to allow them to fly into key transhipment ports (this would obviously only work in places with operating air routes).

Advice from industry and fuel companies is that the logistics of bunkering have been largely unaffected by COVID to date.

3.2.3 Impacts on CMMs

At the higher level, the COVID-related impacts on CMMs should be seen in the context of the status of stocks and the broader state of the management of the fishery, all of which is relatively healthy. Each of the main tuna stocks remain above the level capable of producing maximum sustainable yield (MSY) and the broader framework of measures to control entry and effort and monitor catches in the fishery (FFA Regional Register, VDS Register, PS VDS, LL VDS, LL catch limits, VMS, requirements for catch reporting, etc) remains in place. At the same time industry is unlikely to change its basic operation over the short-medium term, leading to changes in catch composition, catch rates etc. The net result is that the fishery is unlikely to be markedly affected by short-term adjustments to management and the PNA's strong investment in science and management over decades has, in effect, bought itself flexibility to introduce short-term measures to protect its people without risking the wider health of the fishery.

Indeed, from a conservation point of view, COVID-related declines in demand/price for the most vulnerable of the main tuna species (BET) may lead to a period of lower catches and effort in the WCPO longline fishery, which may have a positive impact on the stock overall.

Nevertheless, any measure temporarily suspended/relaxed by Parties (or simply unable to be undertaken due to COVID-related restrictions – e.g. pre-fishing inspections) will have implications for the management system which Parties may wish to consider. The main changes in the management/monitoring framework to date have been (i) the temporary suspension of the 100% observer coverage requirement in the purse seine fishery, (ii) the relaxation of the requirement for in-port transhipment (and the designation of at sea transhipment areas) and (iii) the inability to undertake some forms of physical vessel inspection. The implications of each of these is discussed below:

- Observer coverage in the PS fishery – observers play a wide-ranging and important role in both scientific and compliance functions on purse seine vessels. The main management measures likely to be impacted by the temporary suspension include monitoring of the FAD closure, catch retention, non-fishing days, bycatch monitoring, species of special interest (SSI) interactions, logbook validation, general compliance and catch sampling.

  For general catch sampling/logbook validation, SPC are best placed to advise on the data/timeseries implications from a temporary suspension of observer coverage and should be involved in any approaches developed. SPC's preliminary advice on the main implications of a period without observer coverage from a data collection point of view is:

  - A need to 'interpolate' estimates of species composition for 2020 based on historical information. This should be OK if the operation of the fishery doesn't change, though the implications of any management change (e.g. pre-dawn set ban) would need to be considered;
  - Biological sampling (including size data for assessments) would be significantly affected. This might be supplemented by port sampling at unloading, if COVID conditions allow;
  - Bycatch modelling would be affected.

  SPC have also noted that the suspension impacts tag seeding programs that support work on stock assessment and climate change projection.

  For the FAD closure, Parties may wish to consider alternative measures required to encourage and monitor compliance including, for example, a prohibition on pre-dawn sets.

  Parties may also wish to explore whether there is value in attempting to fast track WCPFC efforts to source catch data from canneries (which is currently provided by some canneries on a voluntary basis) to assist with verifying logbook reporting (at least at the trip level). This may be of value if all out-turn data can be sourced and traceability challenges of partial unloads can be addressed.

  For non-fishing days, Parties have already agreed to increase rates of VMS polling, as well as strengthen requirements around manual reporting. In the very near term, many vessels may be required to steam long distances to repatriate observers. NFDs claimed for that purpose can be verified with observers.

Parties may also wish to explore with SPC whether the unique circumstances we find ourselves in over the next few weeks/months – where some vessels will have observers and some won't – offers the opportunity to test the compliance/behavioural impacts of having observers on board.

- In port transhipment – the main implication for Parties who've closed ports to transhipment is the inability to undertake normal port State compliance measures as well as monitor transhipments and undertake port sampling. The lack of transhipment monitoring may have some implications, although detailed monitoring of transhipment volume and species composition in the purse seine fishery is generally not widespread. Much of the transhipment data held by SPC is reliant on volumes and species compositions reported in vessel logbooks and Mate's Receipts submitted by carriers. To that end, the shift to at sea transhipment may not have much immediate impact on catch monitoring. The implications for port sampling data should be discussed with SPC. The implications for port State inspections are dealt with below.

- Inspections – travel restrictions, port closures and general concerns around person-to-person spread of COVID have limited Parties' capacity to undertake physical inspection of fishing vessels, including pre-fishing inspections and port State inspections. One WCPFC CCM (China) has also written to the Commission requesting measures be developed to "*reduce the frequency of close contact between the fishing vessels and outside personnel*" including a possible postponement or suspension of high seas boarding and inspection. In the absence of a capacity for physical inspection, Parties may wish to consider which forms of inspection may be undertaken electronically (e.g. vessel document review) as well as coordinating with flag States on issues such as pre-fishing inspections. Given the pandemic may not resolve itself in the short term, and Parties may wish to retain the capacity to undertake at sea boarding and inspection (whether in Party waters or the high seas) for compliance and deterrence purposes, Parties may wish to consider the circumstances under which it would allow its officers to board fishing vessels (both to minimise the risk of its officers contracting COVID and introducing COVID to the vessel) and develop practical guidelines accordingly.

In addition to the implications from management changes already made, COVID-related changes in market dynamics may have implications for some CMMs. For example:

- Albacore CMMs – the collapse in demand and price for sashimi grade tuna and the relative buoyancy of the canning ALB price may provide incentives for some LL vessels to shift from the tropical BET/YFT fishery into the southern or northern ALB fisheries. One interviewee we spoke with indicated that this wasn't likely to be a practical option for their vessels, although given the disparity between the relative health of each market Parties may wish to track tends in catch, effort and vessel participation on both albacore stocks. Initial anecdotal information indicates at least some level of effort shift into the ALB fishery;

- Shark finning (CMM 10-07)– the impact of COVID on the market for shark fins is unknown, but likely to be negative. Nevertheless, given the economic pressures on the tropical LL sector in particular, there may be some incentive to maximise profits from catch, particularly if inspection regimes are constrained; and

- Port State Measures (CMM 17-02) – as discussed above, COVID may have implications for capacity to undertake port State inspections of foreign vessels, although in practice port entry restrictions may mean the number of foreign vessels entering ports is reduced.

A broader implication from COVID might be on the capacity of WCPFC to progress key items on its work program in the short term (e.g. development of HCRs for key stocks, review of the transhipment). While CCMs have cooperated positively on the immediate challenges of observer and transhipment in recent weeks, the inability to meet in person and general diversion of attention elsewhere might mean it's difficult to make progress on some of the bigger issues. Consistent with the context above, this is unlikely to result in any great risk to the stock in the short term, although it may have implications for things like the WCPO MSC certifications which are conditional on progress around some of these issues.

3.3 Longer term issues

Given the uncertainties around the timing of COVID and how the pandemic is likely to evolve, predicting longer term impacts, and in particular 'plotting a pathway out', is both very challenging and perhaps premature at this stage.

In practice, the crisis is likely to 'evolve' rather than 'end', at least until an effective vaccine/treatment is widely available. In that context, the key will be to have systems in place to receive regular high quality information on the state of the fishery and the performance of management measures, as well as decision making systems capable of responding nimbly to new information.

Notwithstanding that, there are a number of areas Parties may wish to keep an eye on:

Reorganisation of industry – will it happen and what does it mean?

Although the overwhelming impact of COVID has been economic contraction, the impact on individual businesses and sectors has been patchy. Businesses well-adapted to providing services in the 'post-COVID environment' have done well (think Zoom conferencing), while 'COVID-exposed' sectors have been hit hard.

Sectors of the economy exposed to COVID downturns are likely to undergo re-organisation, and the tuna sector is not immune. Some businesses under stress are likely to fail, or be absorbed through corporate consolidation and M&As, while others with the capacity to do so are likely to invest in means to insulate themselves against similar shocks in future (e.g. strengthening cold storage capacity, increasing automation where possible). At this stage, it is probably too early to predict impacts in the tuna sector, although initial evidence suggests it will be the longline sector hardest hit and under most pressure to restructure. Impacts are likely to be felt hardest by specialist longline businesses with no diversified (less affected) revenue streams to offset impacts. Widespread impacts in the tropical longline sector may affect flexibility around management options available in the purse seine sector.

Impacts in the purse seine/canning sector are likely to reflect however the complex 'catch rate/fish price/fuel price/logistics/processing production/consumer demand' equation ultimately plays out. While the outcome is uncertain (and will undoubtedly be influenced by however long the pandemic drags on), there are implications for Parties. In the context of the VDS market, a less profitable sector with a less efficient supply chain ultimately means fewer rents are able to generated. By contrast, a stronger supply chain reorganised around more efficient operators/operations (and

potentially retaining some of the 'new' customers generated through initial panic buying), might result in scope for greater rents and opportunities. Similarly, changes in the wider sector will mean a different mix of competitors/collaborators for domestic tuna businesses. Either way, Parties will have a keen interest in the dynamics.

Geopolitics

By any objective measure, the PNA and in particular the VDS, has been a tremendous success story. Through a robust management framework and strong regional cooperation, Parties have increased rents generated from the purse seine from around $50-60m pre-VDS to around $500m in 2019. For some Parties, fishing access rights now represent upwards of 70% of Government revenue.

Depending on how long the pandemic persists, national budgets and economies all over the world, but particularly in developing countries, will be under pressure. It's not yet clear how the major aid donors will respond – some may be under domestic pressure to cut aid budgets, whereas for others the crisis may be seen as an opportunity to build new relationships and cement others. The Pacific has been fertile territory for geopolitical manoeuvring in recent years and Parties will want to ensure that any development in this space serve to strengthen, and not undermine, Party solidarity in the context of fisheries.

Changed logistics routes in the Pacific

Some of the businesses hardest hit by the COVID pandemic have been airlines and other international logistics providers (e.g. shipping services). Substantial changes in established logistics routes in the Pacific (e.g. airlines failing/reducing routes) will impact the capacity of business to operate efficiently and has implications for some CMMs (e.g. ability to move observers around the region). The inclusion of Parties in any travel 'bubbles' in the short to medium term may also influence the ease of business in the region.

Increasing market focus on social accountability

The trend towards an increasing focus on crew and worker welfare in the seafood sector has been underway in major markets for some time now, but the impacts of COVID will likely only heighten market interest in how those on the 'front line' of seafood production are cared for. Parties may wish to follow these developments and consider how the best position the fisheries in PNA waters, as well as their own domestic industries, to meet social accountability requirements.

Annex 1: Terms of Reference

TERMS OF REFERENCE FOR PRELIMINARY ADVICE TO PNA ON RESPONSE TO COVID-19

BACKGROUND

1. COVID-19 creates huge challenges for PNA Members at national, sub-regional and regional levels. Parties are in the process of addressing those challenges with the objectives of:
   a) Protecting the health and wellbeing of their peoples;
   b) Protecting, in particular, the health and wellbeing of observers, inspectors, crew and others engaged in regional tuna fisheries;
   c) Maintaining the effective operations of the tuna fisheries in PNA waters and the economic benefits that flow to the Parties from those fisheries;
   d) Maintaining the contribution of the regional tuna fisheries to global food securities,

   while not undermining the effectiveness of the conservation and management of regional tuna resources and the fisheries that depend on them.

2. Parties have requested advice from the PNAO on developing a more strategic response by PNA to the COVID-19 pandemic. Parties have specifically requested advice on the extent to which quarantine requirements might reduce fishing opportunities for vessels, and on a strategy for recovering from the current situation. During the PNA skype group informal discussions on 6 April 2020, there was support for seeking independent advice on the development of a more strategic approach to responding to COVID-19 by PNA.

OBJECTIVE

3. The objective of the consultancy is to assist PNA to develop a more strategic response to COVID-19, including:
   a) Impacts of COVID-19 on PNA tuna fisheries and economic returns from those fisheries;
   b) The expected scope of PNA responses to COVID-19 in the short term; and
   c) Advice on how PNA might respond to COVID-19 in the medium to longer term.

SCOPE OF WORK

4. The scope of the work to be undertaken shall include:
   a) Key changes to fishery and market dynamics expected from COVID-19, including:
      - Changes in the distribution of effort, including any diversion of effort from PNA waters;
      - Impacts on steaming time from port closures, etc.;
      - Impact on market demand and fish price;
      - Impacts on fuel price;
      - Changes in CPUE;
      - Constraints on broader supply chain, including processing;
      - Taking all of the above factors into account, the likely impacts on effort, profitability and demand for VDS days;
      - The pattern of impacts on different sectors of the fisheries;
      - Industry responses.

   b) Key regulatory and operational actions covering those areas which PNA has already considered and taken action, and identification of any additional areas that may need to be addressed in the short term. This shall include:

- Observer requirements;
- Constraints on use of ports and transhipment;
- Changes of crew, reprovisioning and vessel service and repair;
- Operations of support vessels, including carriers and bunkers,

based on a strategic approach to implementing any changes in these areas, and addressing the potential impact of the quality of conservation and management efforts, including potential IUU risks from reducing monitoring and reporting.

c) Opportunities for Parties to offset industry impacts of COVID;

d) Strategies for recovery and operations following the pandemic.

APPROACH

5. The work will be undertaken as a desk study, including extensive consultation with the PNAO, personnel of the Parties, appropriate industry contacts and other appropriate contact persons. This ToR may be shared with those contacted.

6. The work is intended to provide quick concise relevant advice to Parties. The Consultant should identify any areas needing further more detailed consideration.

7. The work will generally cover both purse seine and longline fisheries, with a focus within the time available on the purse seine fishery.

8. The Consultant shall have access to available data from FIMS. The Consultant shall maintain the confidentiality of individual company, vessel and Party information acquired during the work, unless otherwise authorized by the PNAO CEO.

9. The Consultant shall report to the PNAO CEO.

10. The Consultant shall provide:
    a) A draft report for consideration by the PNA Office and the Parties by 30th April, 2020; and
    b) A final report within 7 days of being provided with comments on the draft report by the PNAO CEO.

BUDGET

11. The budget for the work is set out in Schedule B.

DURATION AND TIMING

12. The consultancy will be undertaken within the period 9th April, 2020 to 14th May, 2020.

REPORTING

13. The Consultant will report to PNA Chief Executive Officer or the Consultant's designate.

Annex 2: List of people contacted

Person	Affiliation
Ray Clarke	SOPAC
Max Chou	FCF
Phil Roberts	Trimarine
Hiroshi Nishimura	Itochu
Eiji Ogawa	Itochu
Narin Niruttinanon	Thai Union
Chih Wang	Da Yang
Joe Murphy	LTFV
Benson Deng	LTFV
Liu Xiaobing	On behalf of Chinese companies
Jerry Kramer	Pacific International Inc
Bobby Muller	Pacific International Inc
Takumi Fukuda	Fisheries Agency of Japan (on behalf of Japanese companies)
Chris Hsu	Winson Oil
Ted Po	Century Pacific Food Inc.
Robert Manansala	Century Pacific Food Inc.
Minoru Honda	Japan Far Seas Purse Seine Fishing Association
Hyun-Ai Shin	KOFA
Bong-Jun Choi	KOFA
Somboon Chotiwattanaphan	Chotiwat Manufacturing Co., LTD.
Itchaya Jiaranai	Chotiwat Manufacturing Co., LTD
Stan Crothers	Tokelau
Mike Batty	Tuvalu
Glen Joseph	MIMRA
Manni Kalisperis	Simplot Australia
Guy Hocking	Coles Australia
Elizabeth McCartan	Coles Australia
Chris Reid	FFA