

South Pacific Albacore – Allocation and Management Procedure Workshop, SPA8

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Economic Conditions in Southern Longline Fishery of WCPO

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Introduction and overview

The Economic conditions index illustrate the prevailing economic environment of the Southern Longline Fishery overtime based on the economic indicators of fish prices, fuel costs (as a proxy for fishing expenses), and catch rates in a given year against its long-term average over the period 2005 – 2024. Values from the index that are less than 100 suggests the fishery is experiencing below average (2005 – 2024) performance while values above 100 suggest better than average or favourable economic conditions in any particular year. While favourable economic conditions may be indicative of the ability of the fishery to generate returns, they do not indicate which parties, e.g. vessel owners or coastal states, these profits accrue to. The area evaluated is situated south of 10 degrees south in the Western and Central Pacific Fisheries Commission – Convention Area (WCPFC-CA), excluding the waters of Indonesia, Philippines, and Vietnam.

Recent years of 2022 and 2023 show the economic index to be below its long-term average due to low fish prices (drop in real fish prices of Alb and Yellowfin) although with slightly higher catch rates which is likely to be driven by relative low effort levels seen since 2021. The recent 2024 year saw a slight improvement in the economic index attributed to lower fuel costs than previously and fish prices around it's long term average (2005 – 2024), however given catch rates were provisional at the time of writing, interpretation of the index in 2024 year is also considered preliminary at this stage.

Overall, the economic conditions in the Southern Longline Fishery have shown long-term decline, with lower peaks and deeper troughs largely driven by fluctuating catch rates. This underscores the need for proactive management controls to constrain effort and stabilise catch levels and rates, especially during years of favourable economic conditions, ensuring sustainable and stable fishery performance over time.

Fish prices

The fish price component of the economics index is a weighted composite index of the annual real USD (adjusted for inflation) fish prices series of Thai imports for albacore, Japanese imports from Oceania for fresh bigeye and yellowfin (Figure 1; Figure 2; Figure 3). The composite fish price index provides a measure to see how fish prices change over time for the fishery (Figure 4).

While real albacore prices have fluctuated overtime, the general trend is relatively stable and reached US\$2,638/ mt in 2024. In contrast, real USD fish prices for fresh bigeye and yellowfin imports into Japan followed a similar steady trend until 2014. The trend in recent years for bigeye real prices remained slightly stable at around US\$11,791/ mt in 2024, whilst real yellowfin prices have declined considerably since 2020 from its long-term average (due to the Covid-19 impact on the fresh market) reaching US\$7,099/ mt in 2024.

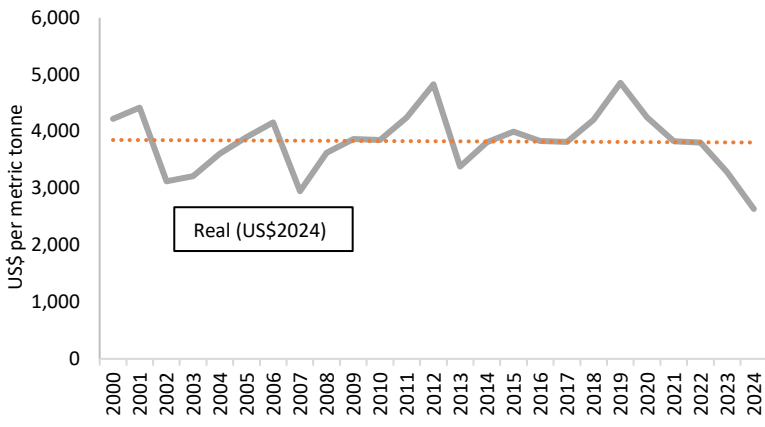


Figure 1: USD real prices of imports of albacore into Thailand

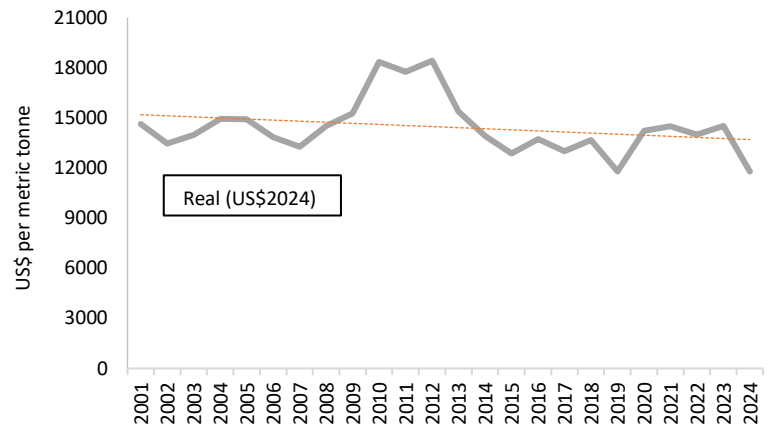


Figure 2: USD real prices for Japanese bigeye imports from Oceania

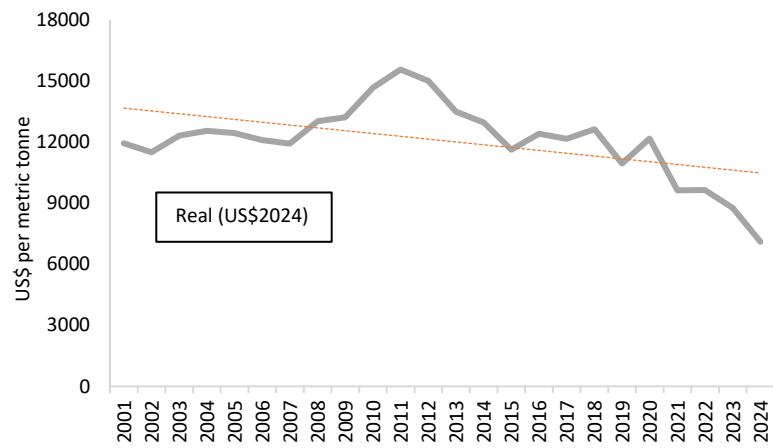


Figure 3: USD real prices of Japanese yellowfin imports from Oceania

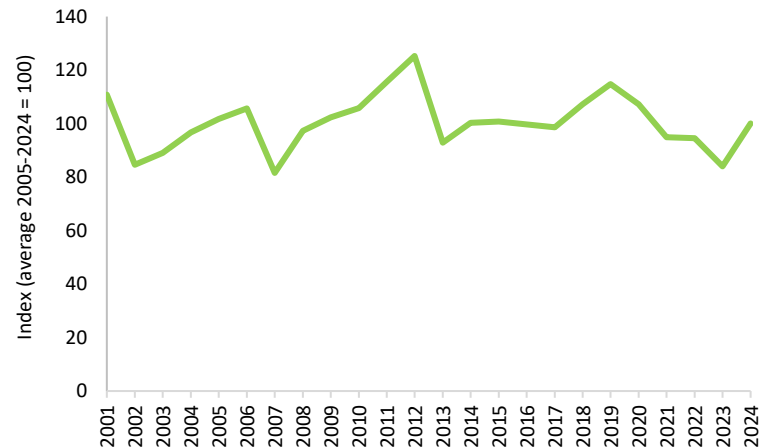


Figure 4: Composite Price Index for the Southern Longline Fishery

Costs

The fishing cost component of the economic index is based solely on fuel costs as a proxy for fishing expenses. Access and license fees are not included in the fishing cost component as the economic conditions index is intended to monitor the ability of the fishery to generate economic returns, whereas access fees reflect a transfer from operators to coastal states rather than an economic cost.

Given fuel is the single most important operational cost across fleets, it is subject to the most fluctuation over time and subsequently the biggest driver in change of fishing cost over time. Changes in other non-fuel operational costs can also affect fishing operations considerably (e.g. bait costs in longline fisheries), but given limited cost data available in the region to assess the degree of variation in these non-fuel operating costs, it is assumed in this study that other real fishing costs (aside from fuel) remain constant in real terms or subject to less variability.

For assessing fuel cost trends, the price of Singapore Marine Diesel Oil (MDO) is a good indicator of the fuel expenses incurred by purse seine and longline vessel operators in the region (Figure 5). The fishing cost component of the economic index uses information on proportion of fuel cost relative to total production cost (obtained from several sources) to develop a constant factor that represents non-fuel costs (assumed to remain constant in real terms over time) and combined with the Singapore MDO real USD price index series to determine a total real cost index (Figure 6).

In presenting the cost index, an important caveat to note during the Covid-19 period is that there were significant changes in non-fuel costs including for example shipping, air freight, and imported equipment that all affected costs of operations. These impacts from Covid-19 are not reflected in the cost index produced and as such, the fishing cost component in the economic index may have been underestimated because it is based mainly on fuel. Therefore, caution is advised when analysing the economic index figure for years 2020 and 2021 (shaded as green below in Figure 6 and Figure 9).

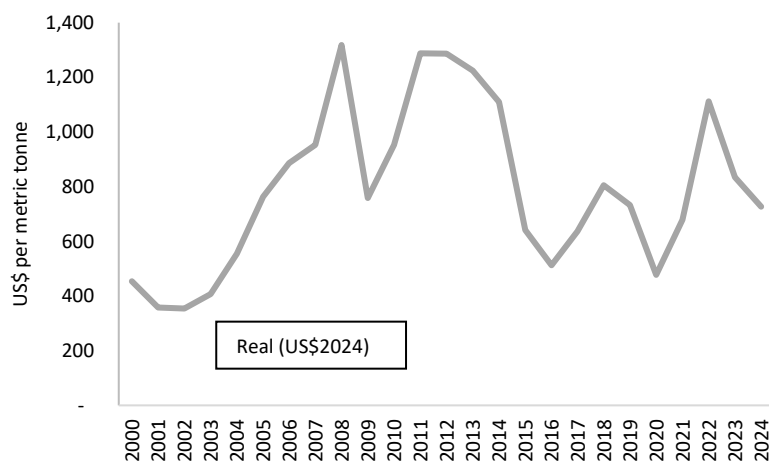


Figure 5: USD real price series of Singapore Marine Diesel Oil (MDO)



Figure 6: Fishing Cost Index for Southern Longline Fishery

Catch Rates

The catch rate component of the economic conditions index is based on the catch per unit of effort (CPUE) across all major tuna species (albacore, bigeye, yellowfin) and bill fish species in the fishery, measured in terms of kilograms caught per hundred hooks set. The full breakdown of species contribution to the CPUE index is shown in Figure 7. Note, at the time of writing the 2024 CPUE data from SPC is provisional and will likely be revised later in the 2025 year.

Total catch rates for each species in a year are compiled into catch rate index to see how total annual catch rates change over time relative to its long-term average (2005 – 2024) in the SLL fishery (Figure 8). Peak periods of total catch rates are seen in years 2009 and 2017 but at lower associated levels including the low catch rate periods in years 2012 and 2021. Overall, catch rates appear to exhibit cyclical behaviour since the 2000s but the lower peaks and deeper troughs, and the slower recovery from the troughs have resulted in average catch rates declining over time. This is reflected by the 5-year running average on a downward trend (Figure 7).

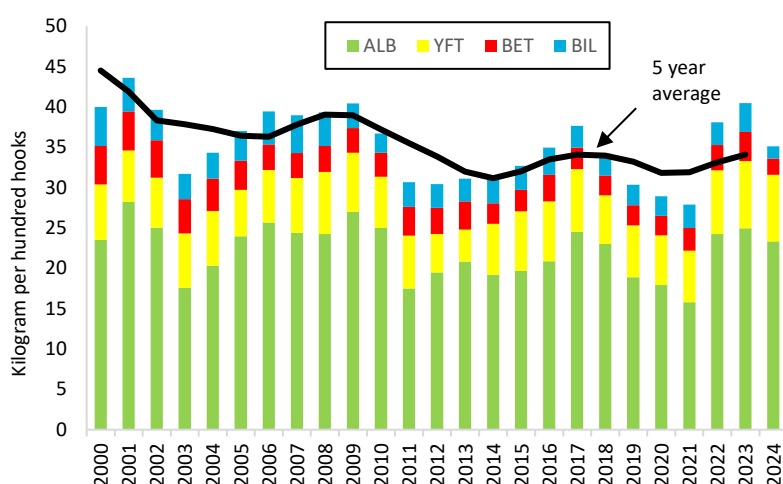


Figure 7: Annual Catch Rate Index by Species

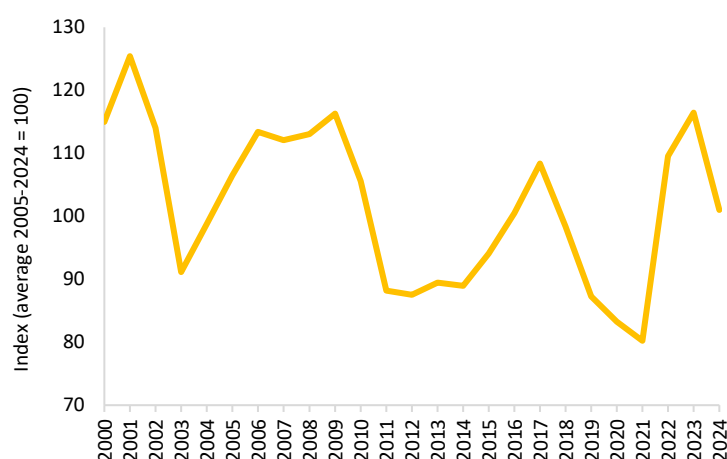


Figure 8: Catch Rate Index for the Southern Longline Fishery

Economic Conditions Index

Historically, the economic conditions index for the Southern longline fishery has fluctuated on a downward trend over the years 2000 to 2013 (Figure 9). Economic conditions slowly improved from 2014 to 2017 with the index reaching above long-term average levels due to declining fuel prices and increasing catch rates with fish prices remaining close to their long-term average.

Despite the favourable economic conditions of fish prices and fuel costs being above their long-term average for years 2018 to 2020, catch rates were on a downward trend till 2021 resulting in the economic index falling well below its long-term average in 2021. Although catch rates started to recover in 2022, following the lowest annual catch in two decades in 2021, the overall economic index remained well below the long-term average. This decline was largely due to a significant increase in Marine Diesel Oil (MDO) prices, exacerbated by the Russia/Ukraine conflict.

Year 2023 saw a slight improvement in the economic index to previously but still remained below the 20-year average primarily driven by low fish prices although with slightly higher catch rates which is likely to be driven by relative low effort levels seen since 2021. The economic index improved slightly in 2024, attributed to lower fuel costs than previously and fish prices around it's long term average, however given catch rates are still provisional at the time of writing, interpretation of the 2024 index year is considered preliminary at this stage.

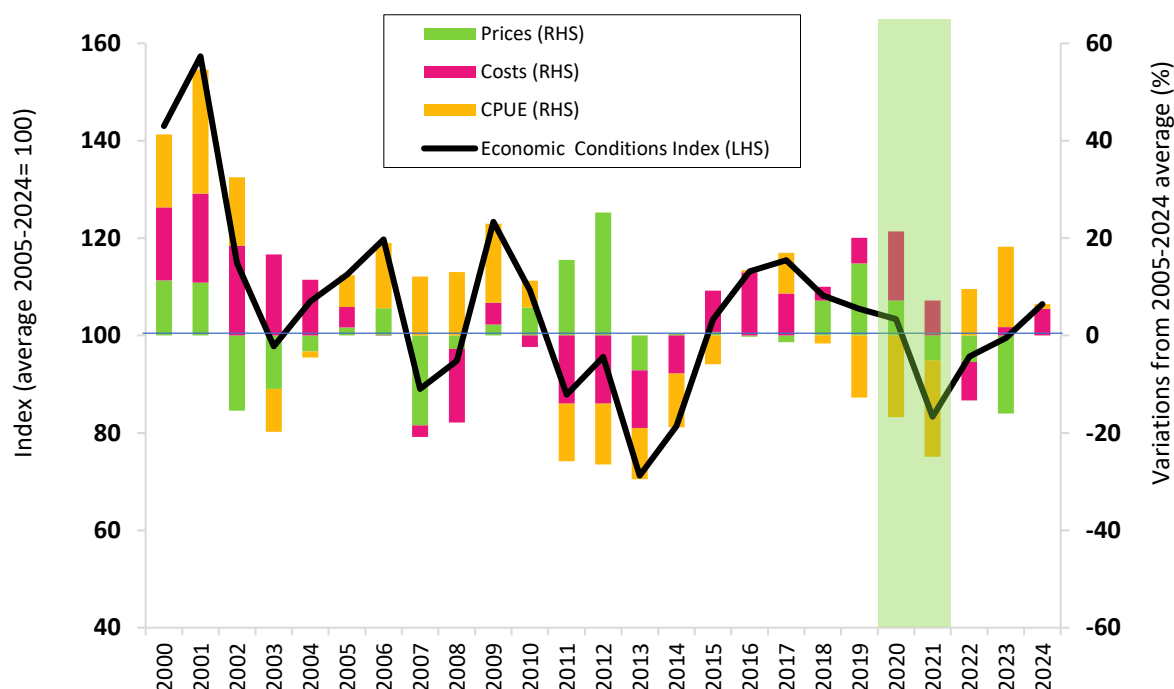


Figure 9: Economic Conditions Index for the Southern Longline Fishery (LHS) and variance of component indices against average (2005 – 2024) conditions

Key takeaways

Economic conditions in the longline fisheries are heavily impacted by catch rates and fishing cost. While fuel costs are one of the primary drivers of profitability, higher prices can incentivize increased fishing effort activity, even throughout the periods of decreasing catch rates and lower the level at which catch rates make it unviable for a vessel to remain in the fishery. Periods of favourable economic conditions of high fish prices and lower fuel costs will continue to incentivise increasing fishing effort to capitalise on these favourable economic conditions (Figure 10), until catch rates become unviable again for vessels to remain the fishery, resulting in the cyclical pattern observed in the Southern Longline Fishery.

Overall, economic conditions in the Southern Longline Fishery have shown long-term decline, with lower peaks and deeper troughs largely driven by a similar pattern in fluctuating catch rates. This highlights the need for management limits to constrain effort and stabilise catch levels and rates, particularly during years of favourable economic conditions (high fish prices and low fuel costs), ensuring sustainable and stable fishery performance over time.

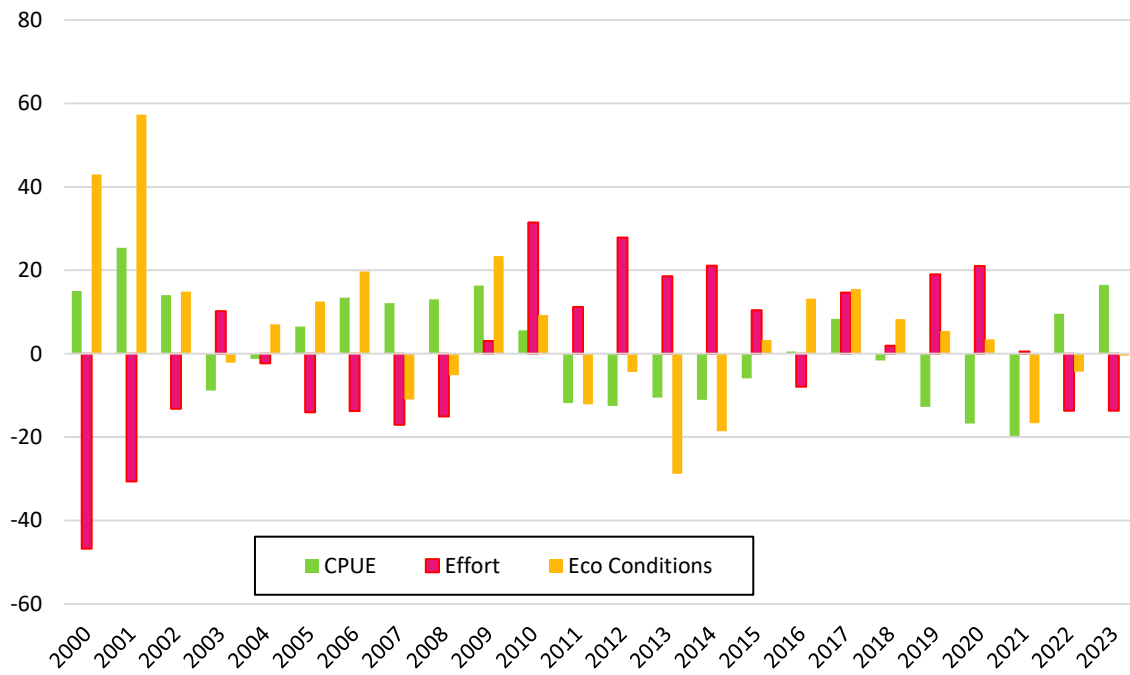


Figure 10: Southern Longline Economic Conditions: Catch Rates vs Effort