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A SECOND LOOK: ALFONSINO FISHING IN THE SIOFA AREA TO 2024 AND ITS MANAGEMENT

Southern Indian Ocean Deepsea Fishers Association (SIODFA)

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Abstract	<p>The F.T. <i>Will Watch</i> has targeted alfonsino in the SIOFA Area since 1999 using the same fishing method and gear configuration and many of the same crew. An analysis of the history of the past catch and fishing effort was presented at SC09 (2024) to identify if it informs on the status of the alfonsino resource. The record showed a complex history that reflects market/demand in the fishery, the complex behaviour of alfonsino and the varying effects of oceanographic variability on its catchability. We concluded that for this fishery the best method to assess relative alfonsino resource abundance was the annual average catch per tow of this vessel. The oceanographic environment and nature of fishing activities of all the vessels in the fishery should be considered as part of the annual management process. In this regard, the fishing success in 2024 would have been affected by the earlier withdrawal from the fishery of the F.T. <i>Nikko Maru No. 1</i> for all of 2024 and the entry into the fishery of the F.T. <i>Klondyke 139</i>.</p> <p>It is concluded that a continuation of the SIOFA alfonsino fishery at the levels of fishing effort as prosecuted in 2024 would be appropriately precautionary,</p>

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A SECOND CLOSER LOOK: THE SIOFA ALFONSINO FISHERY UNTIL 2024 AND ITS MANAGEMENT

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SUMMARY

2025 marks the 26th year that the F.T. *Will Watch* has operated in the SIOFA alfonsino fishery using the same fishing methods and gear configuration. This continues the opportunity to examine the history of its past catch and fishing effort and the status of the alfonsino resource. The *Will Watch's* fishing history reflects market/demand, the behaviour of alfonsino, the attraction of other species (e.g. orange roughy) and the effects of oceanographic variability on alfonsino³ availability and vulnerability. In 2024, we concluded that for the Southwest Indian Ocean alfonsino fishery the best index of assessment is the average annual catch per tow. This report builds on our 2024 report⁴ by extending the data record that is analysed to include fishing results from 2024.

1. INTRODUCTION

Various papers have referred to the fishing methods used in the SIOFA alfonsino fishery (e.g. SIOFA Secretariat 2025) and their biology and population dynamics, e.g., Brandão & Butterworth (2020), Brandão, Butterworth & Johnston (2020). The analysis of these latter authors used a GLM describing the catch and effort of trawlers operating in the SIOFA trawl fishery during the era that started in 1999. This paper focuses on a simple measure to describe a complex situation using the catch and effort data of the F.T. *Will Watch*.

Historically, this fishery was far more complex with many flags operating many vessels that targeted various deepwater species. In 2024 there were three flags and just three vessels; the F.T. *Tomi Maru No. 58* (TAFCO, Japan), the *Klondyke 139* (Akia Fisheries, Mauritius) and the F.T. *Will Watch* (United Fame Industries, Cook Islands). *Tomi Maru 58* and *Klondyke* target exclusively alfonsino with pelagic trawl nets, *Will Watch* fishes for orange roughy in June/July and targets alfonsino with a mid-water net for the rest of the year. Approximately two

³ The alfonsino referred to in this document is *Beryx splendens*: [WoRMS - World Register of Marine Species - *Beryx splendens* Lowe, 1834](#)

⁴ Shotton, R. & C. Heaphy 2024. A Closer Look: The SIOFA Alfonsino Fishery and its Management. 9th Annual Meeting of the Scientific Committee (SC9). Bangkok, Thailand, 18–27 March 2024. SC-09-INFO-29. Southern Indian Ocean Deepsea Fishers Association (SIODFA). 11pp. <https://siofa.org/system/files/sc_restricted_docs/SC-09-INFO-29-SIODFA-Mgmt-SIOFA-ALF-Fishery_restricted.pdf>

years ago the Tomi Maru 58 trialled aimed trawling in the Will Watch style but it was decided to return to using a 'Gloria' pelagic trawl. Thus, care should be taken in interpretation of catch results of this vessel during this period to avoid error from confounding different gear types.

The fishery is predominantly undertaken in the Western Indian Ocean areas of the Southwest Indian Ridge and the Walters Shoal region. The Will Watch makes a single (summer) trip to the 90-East region, though since the contraction of alfonsino fishing effort this now tends to occur every two years.

Normal alfonsino fishing operations involve skippers moving between underwater topological features (UTFs) over which alfonsino aggregate to feed – fishing and vessel activity cause the alfonsino to disperse so the skipper is always considering his next move and that of the alfonsino. The choice of next fishing ground is based on experience and ambient conditions; the steam between the Southwest Indian Ridge and Walters Shoal takes over 24 hours so is a decision not made lightly. The decision to shift regions is regularly based on oceanic weather conditions – moving from the path of storms. At other times operational factors indicate the best time to change fishing region – catching a large bag (which can take up to a day to process) may trigger the move, just as visiting a string of 'vacant' UTFs in one region can send the vessel to the other.

The F.T. *Will Watch* remains the only vessel active from the start of the alfonsino fishery. There has been continuity of bridge officers, and fishing tactics have remained essentially unchanged. The vessel fishes the whole of the Southern Indian Ocean responding to alfonsino availability which, like the subtropical climate, can be highly variable in the short term but has been consistent over the 26 year history of the fishery. For these reasons SIOFA contends that this single vessel CPUE is the most accurate and efficient cost-effective measure of alfonsino abundance.

2. ALTERNATIVE MEASURE OF FISHING SUCCESS

2.1 Annual Catch Data

The *Will Watch* maintains a complete record of its fishing events: time and date of tows, depth, location and catch tonnage. The two data sets (revised tow-by-tow estimates and daily production) are reported to the Ministry of Marine Resources, Cook Islands.

The data recording protocol on the *Will Watch* is as follows.

- i. The catch weight of a tow is visually estimated by the bridge officer, this measure allows fishing event-based analysis but is not used for catch reporting. The factory manager contributes to the estimate with the relative volumes and species makeup in each haul as it is processed by the factory. At the end of each day the skipper aligns the haul estimates with the actual catch volumes.
- ii. In the factory, the catch is processed into frozen-at-sea (FAS) products and every package is weighed into inventory as product weight (pwt). The greenweight (gwt) is calculated through the application of a vessel-specific conversion factor⁵ for each product form (whole, dressed, fillet, etc.) to provide the measured amount of resource that is reported to the MMR, Cook Islands and then to SIOFA.
- iii. The accuracy of the tow-by-tow catch estimate tends to be consistent within each fishing trip ($\pm 10\%$). There is unavoidably some variability between fishing trips as a result of different factory managers and crew and vessel officers.

⁵ Conversion factors are calculated empirically by the Cook Islands regulator. They are checked regularly by the fishery observer.

- iv. For the present analysis a final adjustment is made by the resource manager ashore by applying a correction factor on a trip-by-trip basis. The ratio of the total estimate is divided by the total reported green-weight. This correction factor is then applied back to the tow log for each shot.

The total catch from each trip is landed in Port Louis, Mauritius and verified by a licensed fish receiver. In this document, the time series of data used is from 2010 to the present. Here, the figures show catch data that have been standardized to a time series mean for reasons of commercial sensitivity.

Figure 1 shows the annual alfonsino catch by the *Will Watch* for 2010 – 2024, these are the years for which the haul-by-haul catch estimates can be verified by Cook Islands reporting and observation. The largest catch in the time series was in 2023, the lowest in 2022. The average magnitude of year-on-year change through the time series is 48%.

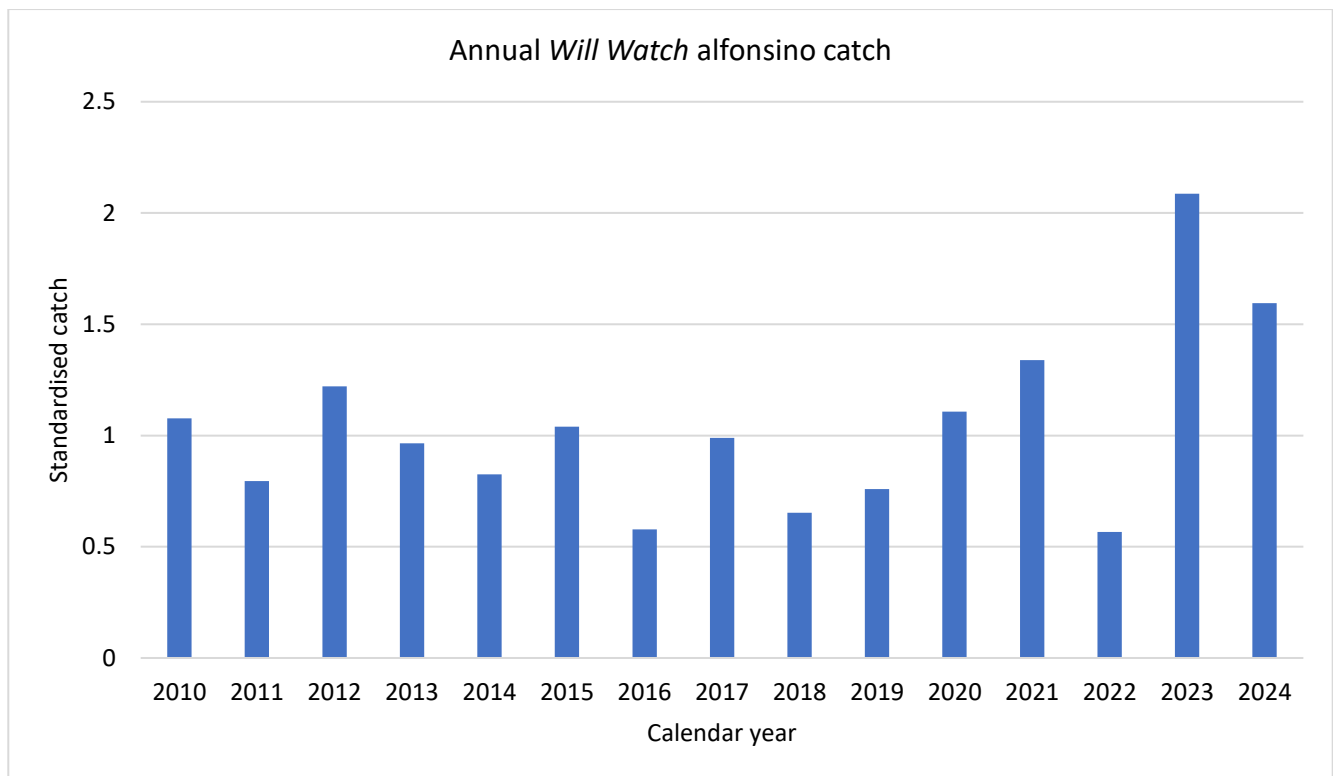


Figure 1: Will Watch annual catch, 2010-2024. Values standardized to the mean of the time series.

2.2 Effort Data

The measure of effort used here is a ‘tow’, or ‘shot’, irrespective of the time that was involved in the tow. Figure 2 shows how the annual number of tows targeting alfonsino has varied since 2010. All tows are included in this analysis, including zero tows, which in this fishery would be accurately called “misses” as the Will Watch does not shoot the net unless they have identified an aggregation of alfonsino with the sounders. Fishing in this manner is called aimed trawling and is fundamentally different to ground fishing or pelagic trawling operations where catch per unit time or distance may reflect local abundance.

Prior to 2021,⁶ Will Watch alfonsino targeted fishing effort, at depended (inversely) on the level of effort directed at orange roughy. Maintenance periods and fishing voyage timings revolved around the vessel being on the grounds at the start of the roughy spawning period in June. In some years the roughy aggregations were available for a longer period so Will Watch would do two voyages with this focus (noted “or” in figure 2). Scheduled maintenance for this vessel typically takes 6 weeks from the fishing schedule and is currently at 3-yearly intervals (“m” in figure 2). Calendar year 2022 is an outlier in both catch and effort as the vessel was forced to take several months off fishing for a maintenance port-call in New Zealand, a result of COVID interruptions.

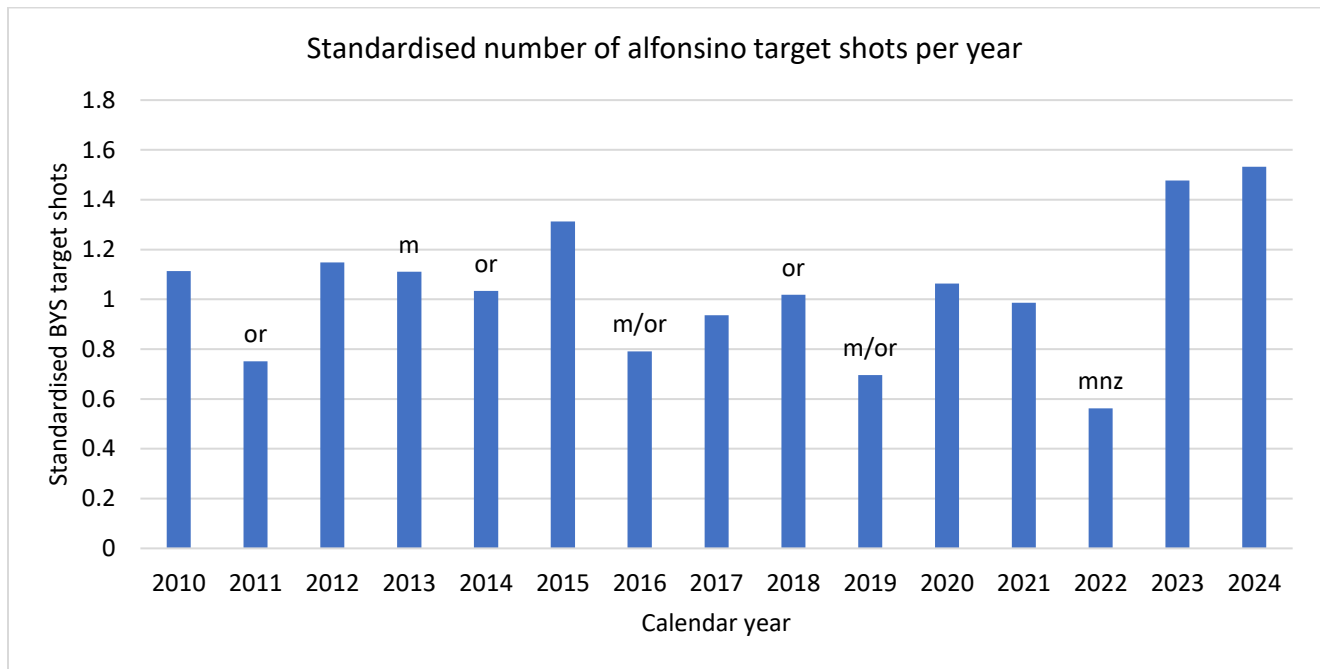


Figure 2: Annual Will Watch alfonsino target fishing shots, standardized to the average over the time series. Annotation over the bars indicates operational interruptions: or – extra roughy trip, m – year with scheduled maintenance period, mnz – maintenance trip to New Zealand (COVID).

2.3 Catch per Tow

Figure 3 shows trends in catch per tow of the Will Watch for 2010 – 2024. The catch is the total alfonsino landed in the calendar year and the number of tows includes all tows that were aimed at alfonsino, in all regions (including 90°-East). The annual catch per tow in the last 5 years appears to fluctuate above the 15 year average without evident trend (Figure 3)

⁶ The COVID pandemic forced changes to the seafood consumption patterns in key markets, which in turn led to a change in the preferred target species for Willwatch to catch.

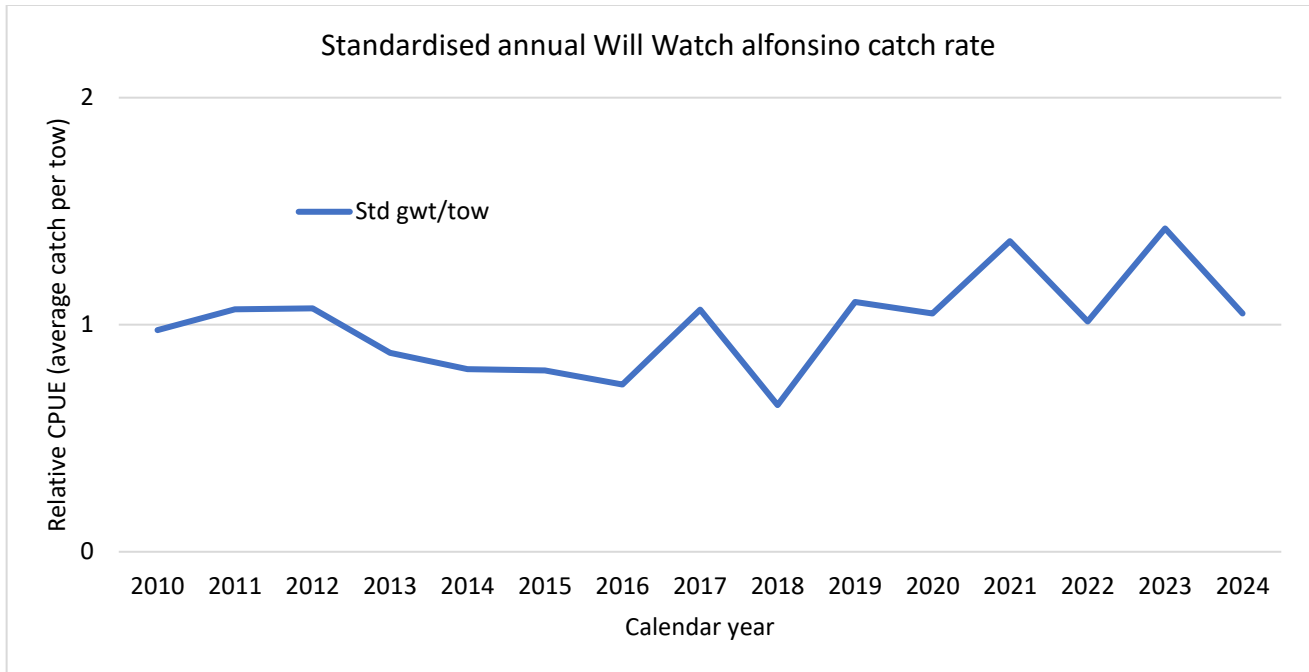


Figure 3: Will Watch annual CPUE 2010 to 2024, values are standardized to the mean of the time series.

2.3 Catch rate by region

The following figures show Will Watch catch and effort in each of the two main fishing regions – Southwest Indian Ocean Ridge and the Walter’s Shoal Region.

Figure 4 shows catch from targeted alfonsino per tow for each of the two areas. It can be seen that fishing is far more consistent through the time series on the Southwest Indian Ridge that it is on Walters Shoal. The first half of the Walters Shoal series is highly variable, and this is reflective of the skippers’ operational preferences – they were previously mostly targeting orange roughy with secondary attention to alfonsino.

Figure 5 shows the vessel location and preferential target species changes over time. Since 2015 there has been a steady increase in targeting alfonsino on Walters. It must be noted that although the skipper will be on the lookout for alfonsino while he is checking fishing spots for orange roughy, this is different to actively fishing for alfonsino. Alfonsino fishing uses a different technique, with a different net, and usually in different locations. Even if aggregations of both species are on the same UTF, alfonsino will be separate from the roughy. Further, they must be fished in different places because the nets need to be deployed on different tow-lines (an alfonsino mid-water net will break if it contacts a rocky ground).

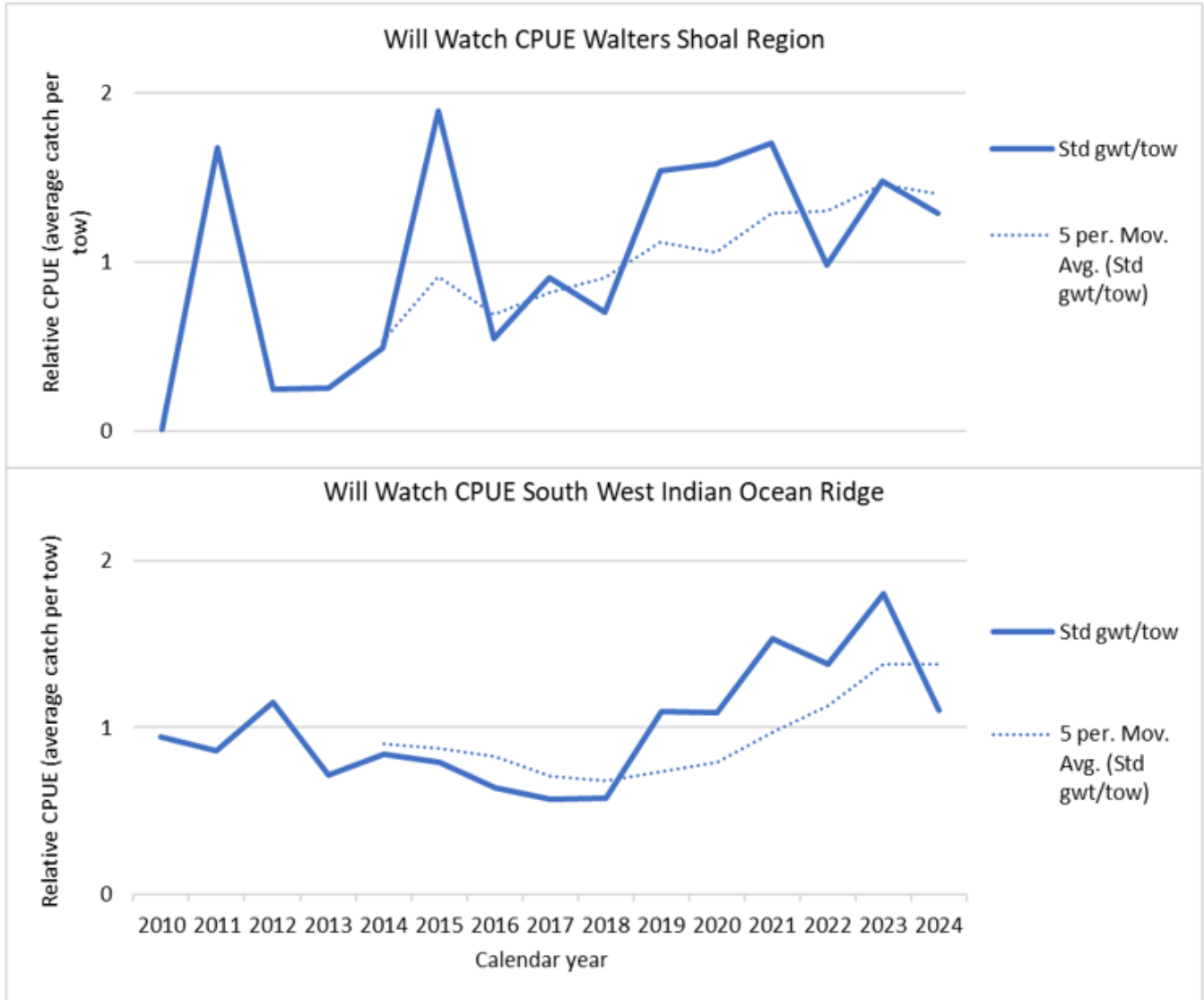


Figure 4: Alfonsino greenweight catch per tow for each major fishing region standardised to the average of the timeseries. Dotted line represents moving average of the 5 preceding years.

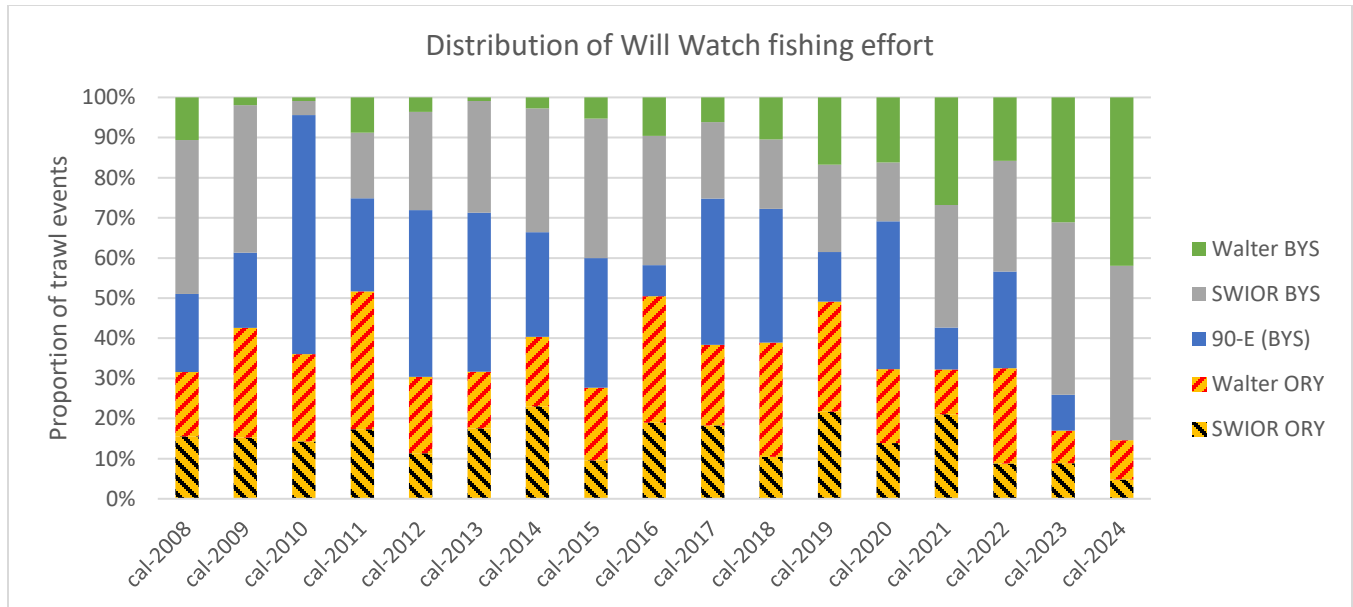


Figure 5: Will Watch fishing effort by region (Walters Shoal or Southwest Indian Ridge) and target species – alfonsino (BYS) or orange roughy (ORY). The metric for effort is the number of tows in a calendar year including zero-catch tows.

3. DISCUSSION

The findings suggest that Southern Indian Ocean alfonsino is not overfished and that there is no indication that overfishing is occurring.

The Will Watch alfonsino catch rate data shows a flat to increasing trend over the timeseries. This is evident in both the annual average catch per tow over the whole ocean and at the principal regional fishing areas of Walters and the Southwest Indian Ridge.

The catch rate timeseries shows a trend of increasing interannual variability. We note that the primary cause of variability in fishing success is from weather and water temperature changes affecting alfonsino availability and vulnerability to capture. South Indian Ocean climate in 2023 was characterised by colder water temperatures and fewer storms to avoid – consequently this was a great year for catching alfonsino. We suggest that the increased interannual variability of CPUE in recent years is due to the removal of competing factors so that when conditions are right for fishing alfonsino, they are able to better capitalise. These competing factors included other vessels in the fishery and high market demand for orange roughy.

We posit that the average annual catch per tow of alfonsino is an easy and cost-effective proxy of abundance. In particular using the Will Watch data is:

- Assumption free – standardisation is built in.
- Derived from a single vessel and thus free from error introduced by compounding data from different vessel, gear types, fishing methods, and other vessel effects.

A key limitation of this approach, common to all aimed trawl fisheries, is that to accurately reflect fishing effort we must consider zero-catch tows. Without including these in the analysis, and only counting trawls that hit, we

move away from the relationship between effort and abundance. This could lead to measuring hyperstability. Consequently, when we include zero-catch tows in a single vessel fishery we are measuring two variables – alfonsino abundance and how hard it is to find them and net them on any given day.

The usual first response when bridge officers are quizzed about factors affecting recent and anticipated fishing success is summarized as: *weather and water temperature*. To measure the actual relationship between fishing effort and abundance it is critical to understand these factors.

The authors wish to be clear that through this paper we point to the core role of understanding the relationship between fishing operations and the annual climate/weather data. We note that while it is to be expected that climatic changes will affect the spawning, recruitment, and ultimately productivity of alfonsino, this paper passes no comment on these processes.

Do any of the plots shown here provide useful insights, or directions for investigation, as to the provision of management advice? What the various figures shown here emphasize is that catch success must be interpreted in conjunction with other contributing factors. Taking these into account and looking at the trend over multiple years, as befits a relatively long-lived species, may provide the best information available for management.

Further suggestions for future research on this fishery include analysis of:

- Indian Ocean alfonsino reproduction, maturation, spawning, and larval dispersion
- Alfonsino ocean-scale stock structure and connectivity
- Climate change (Indian Ocean Dipole variability and associated weather events) and its effects on deepwater species.

4. LITERATURE CITED

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Appendix: Data grooming

The careful observer may notice that the CPUE graph looks slightly different to that reported to the 2024 Scientific Committee. An error in data was discovered through the process of updating from last year.

This study uses skipper estimated haul-by-haul catch records that is corrected to match the correct amount of alfonsino caught. In the Will Watch company database the conversion factor to get actual greenweight from the product weight was entered incorrectly from 2018. The conversion factor for “dressed” (1.40) was used instead of “HGU” (1.95). Both are a head-and-gutted product but one has a different head-cut resulting in a difference in conversion factor. This oversight was fixed for this 2025 update paper.

No change was made to the actual source data (Will Watch products). It is important to note that the company database used for this analysis is not in anyway linked or associated with the Cook Islands government repository.

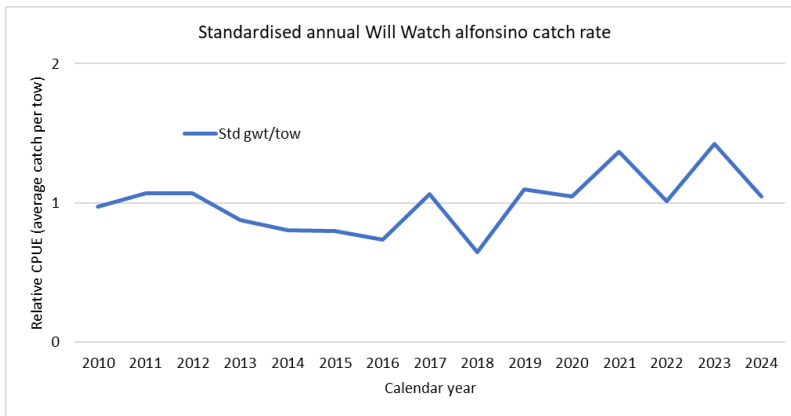
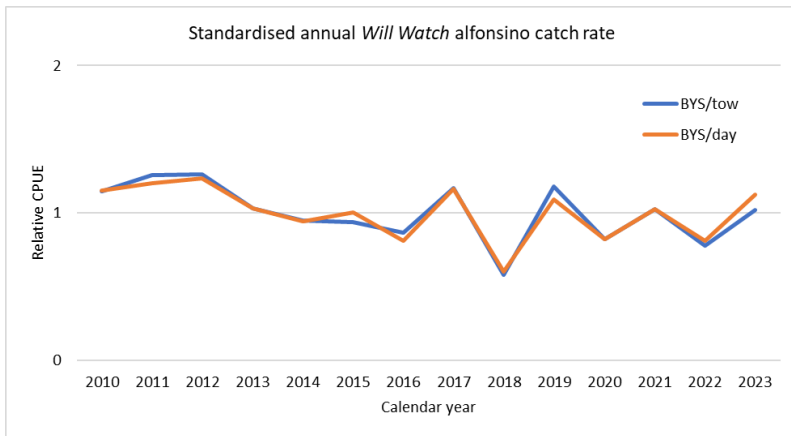


Figure 6: CPUE figure from 2024 (top) and 2025 (bottom)