Live Wrasse Fishery

Monitoring and Control Report 2023

A fishery for live Wrasse to supply Scottish salmon farms was developed in the Southern IFCA District in 2015. Wrasse are purchased as a natural pesticide, to remove sea lice from salmon cages. The species removed from the district include Ballan (*Labris bergylta*), Corkwing (*Symphodus melops*), Goldsinny (*Ctenolabrus rupestris*), Rock Cook (*Centrolabrus exoletus*) and Baillon Wrasse (*Symphodus bailloni*). Target species have shifted between Ballan and mixed species or only mixed species throughout the years. The fishery has been managed with a Monitoring and Control Plan (MCP) and Fishery Guidance Measures alongside the Minimum Conservation Reference Size Byelaw since its implementation in 2021.

Monitoring and Control

The Fishery Guidance Measures were developed with industry in 2017 to address concerns surrounding the sustainability of the fishery and Wrasse populations. The first draft of the MCP was completed and implemented in 2018 and introduces trigger levels for a series of variables which are monitored during the season. The guidance includes a series of no potting and no take zones, pot limits and a closed season for effort limitation (Figure 1).

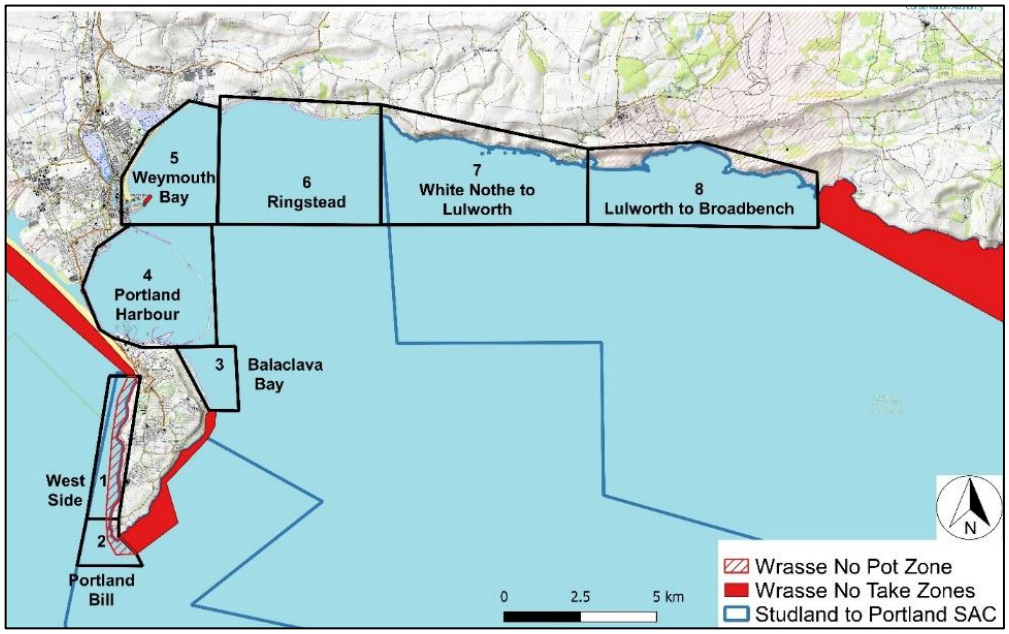

Figure 1 *The Wrasse fishing areas provided to participants in the Dorset Wrasse Fishery including no potting zones and no take zone.*

The monitoring and control plan and Wrasse fishery guidance can be viewed on the Southern IFCA website at www.southern-ifca.gov.uk/district-live-wrasse.

Since 2018, further measures have been developed such as a statutory minimum conservation reference size (MCRS) for all previously mentioned species' aside from Baillon Wrasse. A voluntary maximum size is also employed through the guidance to protect the male constituents as protogynous hermaphrodites. As the Wrasse mature, they turn from female to male. Employing a maximum size ensures that all sexually mature males remain in the ecosystem and are able to reproduce.

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Monitoring and Control Report 2023

2023 Season Summary

Wrasse fishers and Southern IFCA met pre-season to discuss the outcomes of the 2022 HRA review that occurred as a result of triggering MCP Variable 1 in 2022. This provided a platform to discuss and reiterate current management and the importance of cooperation with regards to catch returns and data submission. Fewer fishers engaged in the fishery than in previous years (reduced from 10 to 5) based on the requirements of the buyers operating in the fishery.

Fishing during the 2023 season consisted of pot fishing only. Rod and line fishing is used to target Ballan Wrasse however due to the feasibility and cost of arranging separate transports for Ballan and mixed species, there was a focus on mixed species only. As a result, fishers who had previously participated in the fishery solely with rod and line did not participate in the 2023 season.

Throughout the 12-week season, Southern IFCA deployed 6 patrols with a specific focus on Wrasse compliance with additional patrols also covering areas where wrasse landings occur. Landings of wrasse generally occurred weekly with a total of 10 landing days through the season. A total of 23 inspections were conducted over the 6 patrols, with each of the participating vessels inspected between 2 and 6 times. During each inspection, 20 of the smallest fish were measured, a total of 5 undersized fish were found across all fishery participants for the whole of the 2023 season.

Fishers are requested to submit monthly catch returns by the 14th of the following month. During the 2023 season, 14 of the expected 15 catch returns were submitted with 4 out of 5 fishers complying with the request to add an additional column part way through the season due to the significant numbers of Baillon Wrasse being observed. Weekly landings data was also received from the buyer within 5 days of the landing day, allowing up to date monitoring of the total landings of Wrasse. This frequent communication allowed Southern IFCA to proactively identify potential patterns in landings and model predicted scenarios for when the landings could reach a certain level in relation to MCP Variable 1 (trigger related to number of wrasses landed). This allowed for targeted communication with fishers and buyers and allowed the request to stop fishing to be communicated in advance of the trigger threshold being reached. The total number of Wrasse landed in the 2023 season equals 38,441. The MCP Variable 1 trigger (41,031 wrasse) was not exceeded, and all fishers ceased fishing when requested to do so. No other triggers under the MCP were exceeded during the 2023 season.

Southern IFCA maintain communication with buyers and fishers throughout the season to work towards effective co-management of the fishery. Fishers and buyers are invested in the fishery and take an active approach to engaging with Southern IFCA.

2023 Data Analysis

Method

Southern IFCA receives count data on the number of Wrasses landed to buyers. The buyer data is used to monitor the removal from the fishery during and at the end of the fishing season.

All fishers voluntarily submit Wrasse Catch Return Forms (CRF) throughout the season which details their daily fishing location, effort and catch. CRF data is used to calculate Landings Per Unit Effort (LPUE) for either ‘pot’ or ‘rod and line’ fishing methods. This data is used to compare fishing effort to the MCP variables.

Generalised Linear Models (GLM), run in the programming software ‘R’, are used to consider which variables (Year, Day of Year or Area Fished) best describe the variation in LPUE.

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Monitoring and Control Report 2023

Fishing Effort and Location

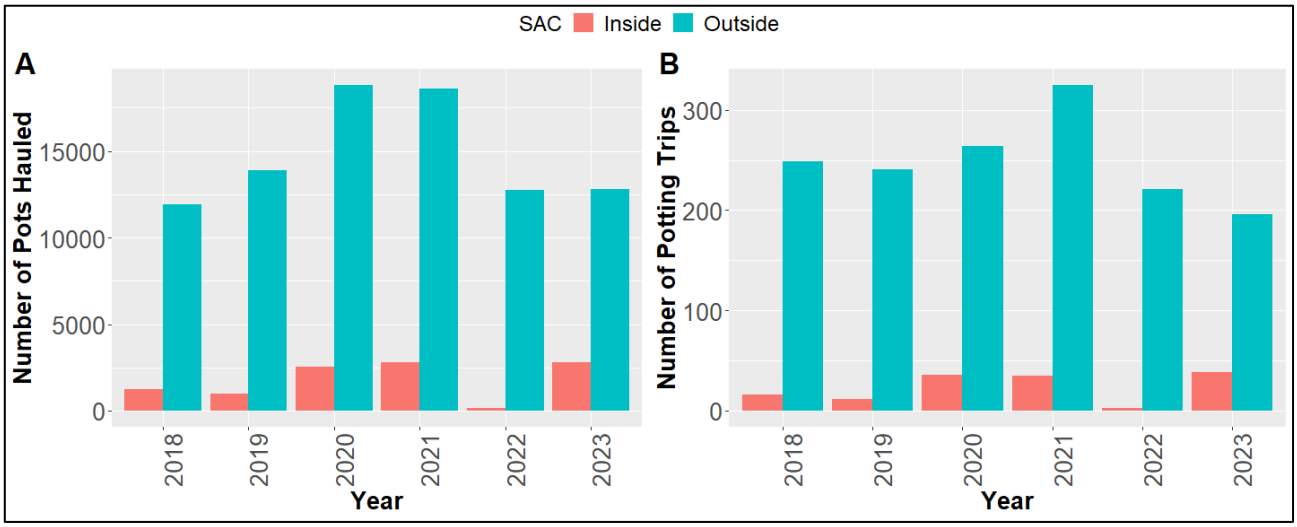

Figure 2 *The pot fishing effort from 2018 to 2023 within and outside of the Studland to Portland SAC.*

Figure 2A and B display the number of pot hauls inside vs outside the SAC (2A) as well as the number of pot fishing trips that occurred inside vs outside the SAC (2B). In 2023, a similar number of pots were hauled outside the SAC as in 2022 and 2018. However, there was an increase in pots hauled within the SAC from 2022 to 2023 as the only vessel that fishes within the SAC was unable to participate for the full 2022 season.

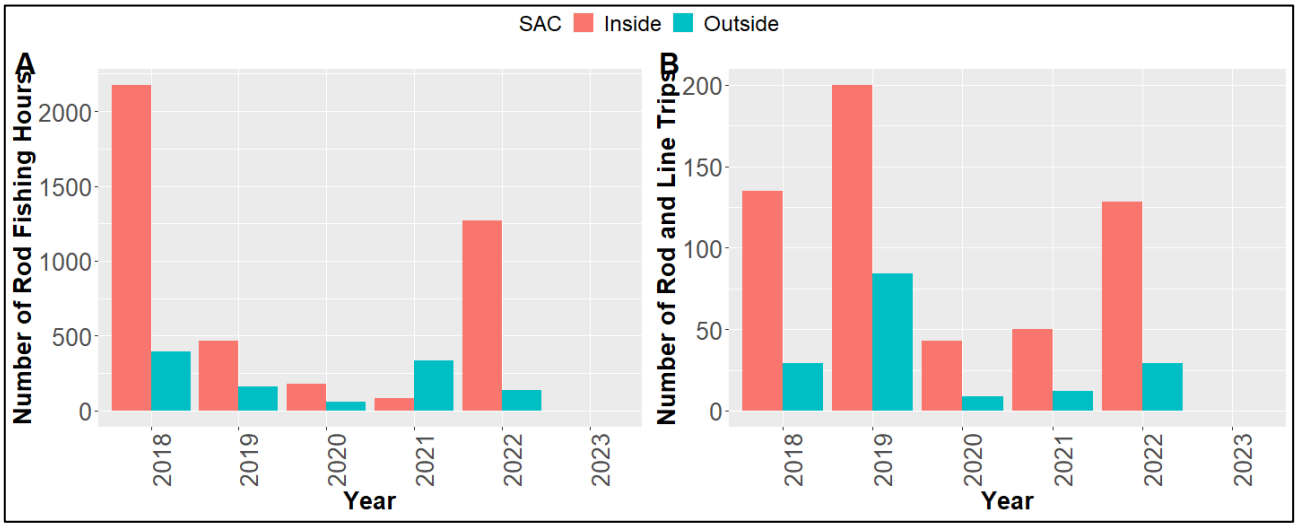

Figure 3 *The rod and line fishing effort from 2018 to 2023 within and outside of the Studland to Portland SAC. No rod and line fishing occurred in 2023.*

Figure 3 displays the trends in rod fishing hours and trips within and outside of the SAC. No rod and line fishing trips occurred in 2023; rod and line fishing is used to target Ballan Wrasse. As the fishery changed from targeting Ballan and mixed species separately to mixed species only, pot fishing was the only method used in 2023.

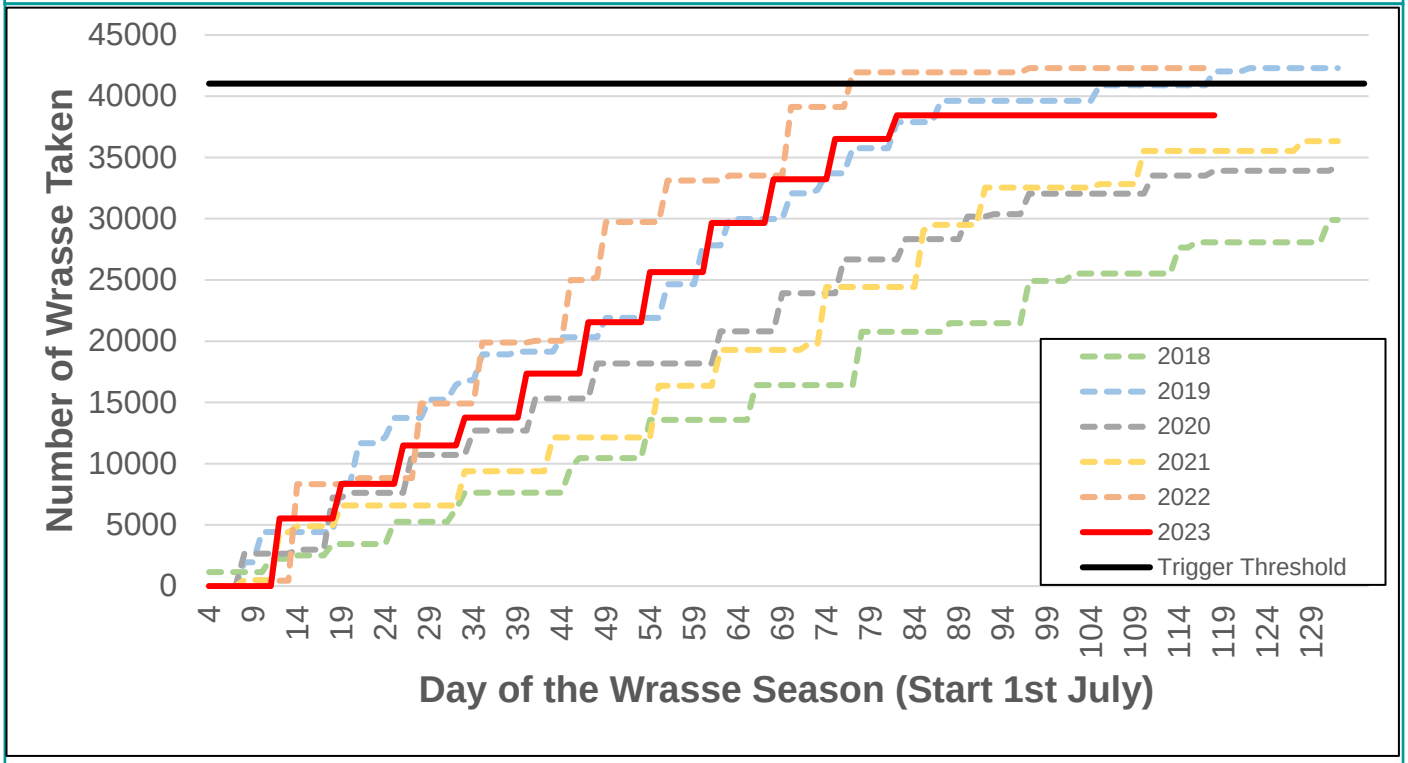

Figure 3 *The number of Wrasse landed each year from 2018 to 2023. The solid black line displays the 25% increase in Wrasse landings from the 2018 baseline (MCP Variable 1 trigger). The solid red line displays the trend in Wrasse landings during the 2023 season. The trigger threshold was not reached during the 2023 season.*

Figure 4 displays the trends in landings throughout each season as per records provided by buyers. The black line displays the trigger level for MCP Variable 1. MCP Variable 1 was exceeded in 2019 and 2022, following which a review of the HRA for the fishery was undertaken. The solid red line displays the landings for 2023, landings remained under the trigger value and the fishery ceased at a catch level of 38,441.

Landings Per Unit Effort

Landings per unit effort were subject to a generalised linear model (GLM) analysis. In previous years, the categories have been split into ballan per pot and mixed species excluding ballan per pot. Due to the addition of a separate column for Baillon midway through the season, confidence in the identification of each species is relatively low for 2023, therefore Total Wrasse per pot has been analysed. The following figures show the variables that best explain the variation in $LPUE_{pot}$ and the corresponding significance levels for each variable.

The predicted effects Total $LPUE_{pot}$ for 2023 is the highest Total $LPUE_{pot}$ of the fishery between 2018 – 2023 (1.97 fish per pot), 2023 was significantly higher than 2020 and 2021 but not 2022 (figure 5A).

Total $LPUE_{pot}$ is highest in areas 4&5 (Portland Harbour and Weymouth Bay) followed by area 3 (Balaclava Bay), all areas outside of the SAC (figure 5B). It is important to note that areas 1 and 2 are voluntary no potting zones, hence the low number of data points.

For the first time, in 2023, month was introduced as a variable and displayed peaks in Total $LPUE_{pot}$ in August (figure 5C).

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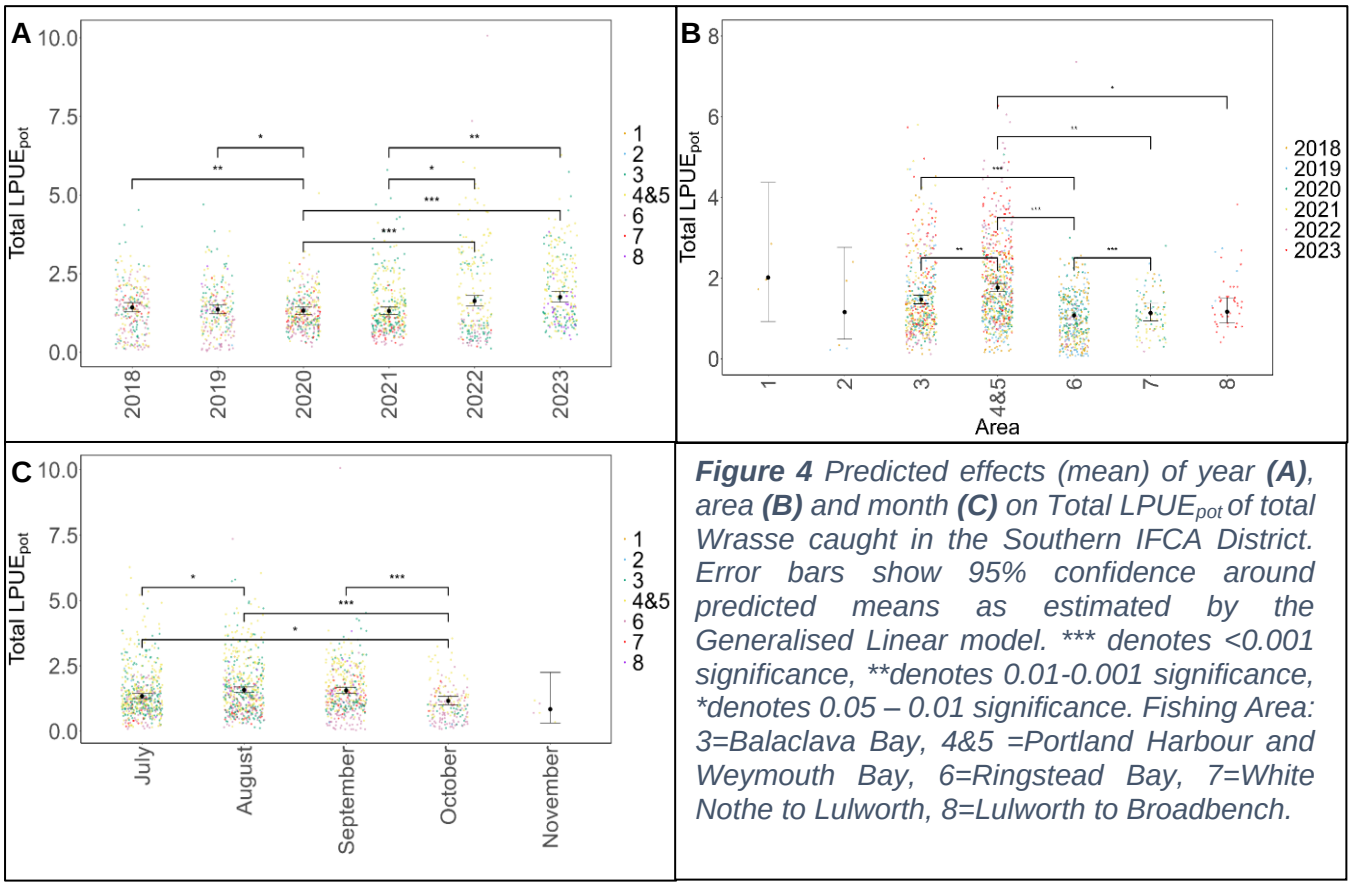

Figure 4 *Predicted effects (mean) of year* ***(A)****, area* ***(B)*** *and month* ***(C)*** *on Total LPUE$_{pot}$ of total Wrasse caught in the Southern IFCA District. Error bars show 95% confidence around predicted means as estimated by the Generalised Linear model. *** denotes <0.001 significance, **denotes 0.01-0.001 significance, *denotes 0.05 – 0.01 significance. Fishing Area: 3=Balaclava Bay, 4&5 =Portland Harbour and Weymouth Bay, 6=Ringstead Bay, 7=White Nothe to Lulworth, 8=Lulworth to Broadbench.*

Discussion

In previous years, the pot caught Wrasse have been predominantly Corkwing, anecdotally this is not thought to have differed in 2023. However, due to the large number of Baillon Wrasse witnessed in July, fishers were asked to add in a column for Baillon midway through August which affected confidence in species identification.

Due to the lower confidence in identification on catch returns it is difficult to consider the species-specific impacts on the Total LPUE$_{pot}$ in the results above. However, trends in area fished and trends throughout the season do not vary from previous years.

Corkwing Wrasse are more abundant at shallower depths (Henly et al, 2021). Portland Harbour and Weymouth Bay provide a large fishing area (>5.4km^2 each) with depths of less than 10m. Other potential ground within the SAC such as areas 7 and 8, White Nothe to Broadbench have only a narrow band of shallow (<10m) depth. Therefore, it is thought that areas 4&5, Portland Harbour and Weymouth Bay have more area providing more suitable habitat for Corkwing Wrasse which, as the dominant pot fished species, may indicate why Total LPUE$_{pot}$ is highest for these sites.

Similar to previous years, Total LPUE$_{pot}$ rises from July to August before declining. It may be that Ballan Wrasse are responsible for the rise until August, along with other nest building species, Corkwing and Rockcook (Darwall et al.,1992). However, this could also be explained by the relationship of Corkwing LPUE with temperature (Henly et al., 2021). As previously discussed, and observed in previous years, Corkwing account for the majority of pot caught species. As sea temperatures increase throughout July and August, Corkwing may become more active and enter the fishery. Halvorsen et al. (2020) found that CPUE of Corkwing and Ballan Wrasse increased between June and September, before declining in October, similar to the pattern displayed in figure 5C.

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Monitoring and Control Report 2023

Summary

- During the 2023 season, effective communication was maintained between Southern IFCA and fishery participants leading to high levels of compliance with Fishery Guidance and the Monitoring and Control Plan.
- The 2023 Wrasse fishery did not exceed any of the trigger levels for variables defined in the Monitoring and Control Plan.
- A Generalized Linear Model was used to analyse the data submitted by fishers on monthly catch returns. The predicted effects of the Total $LPUE_{pot}$ were best explained by the variables Year, Area Fished and Month.
- Total $LPUE_{pot}$ has increased in 2023, however results were not found to be significantly different to the previous year.
- The majority of Wrasse fishing occurs outside of the Studland to Portland SAC, with the most productive areas also outside of the SAC.
- Southern IFCA will continue to manage the fishery through the use of Wrasse Fishery Guidance, the Monitoring and Control Plan and the Minimum Conservation Reference Size Byelaw.
- In line with the current Habitats Regulations Assessment for the fishery, undertaken prior to the 2023 season, Southern IFCA will continue to keep up to date with any new external evidence which becomes available which may help inform future management of the fishery and associated monitoring.

References

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- Henley, L., Stewart, J. E. and Simpson, S. D. 2021. Drivers and implications of change in an inshore multi-species fishery. *ICES Journal of Marine Science*, 78(5): 1815-1825