Southern IFCA Survey Report

Solent Scallop Survey 2024

1. Introduction

As part of Southern IFCA's management of bivalve species in the Solent, surveys are carried out across the King scallop fishing season to better understand the extent and nature of the Solent King scallop fishery. In 2024, in order to provide further data on the stocks at the mid-season point, an additional survey was added mid-season (Jan/Feb) to complement the pre-season (Sept) and post-season (Apr) surveys.

These surveys aim to provide an understanding of the distribution of the King Scallop (*Pecten maximus*) (hereafter referred to as 'scallop') and to collect information on the population structure of the scallops found within the Solent.

The outcomes of the 2024 surveys enable Southern IFCA to monitor population trends before, during, and after the fishing season (1st November to 31st March), and contribute to the timeseries dataset that began in 2021. This data contributes to the evidence base used to inform management of the fishery through the Solent Dredge Permit Byelaw and enables Southern IFCA to ensure that the Solent bivalve fisheries are managed sustainably.

2. Methodology

- Sites for the Solent Scallop survey were defined in 2021 in consultation with local fishers. All 19 of these sites were sampled during each survey, which occurred over 3 days in February (Winter, Mid-the 23/24 season), April (Spring, Post the 23/24 season), and September (Autumn, Pre the 24/25 season).
- Southern IFCA chartered a local, commercial fishing vessel for each survey period to carry out the sampling using a single N-Viro style dredge (Figure 1) towed from the stern of the vessel.

Figure 1: An N-Viro Dredge

- At each site three 4-minute tows were performed, with the skipper identifying the appropriate direction and speed of the tows based on conditions.
- The contents of the dredge were brought inboard, emptied, and sorted, with any scallops put aside for measuring.
- Officers then measured each scallop to the nearest mm in two dimensions, the width (longest axis) and the height (from the hinge to the outer shell edge).
- The catch for each tow was split into over 110mm (the Minimum Conservation Reference Size in ICES VIId) and under 110mm. Both groups of scallops were then weighed.

- On completion of the measurements the scallops were returned to the same area from which they were sampled.
- A map displaying the location of each sampling area within the Solent and the position of tows undertaken during the 2024 surveys is shown in Figure 2.

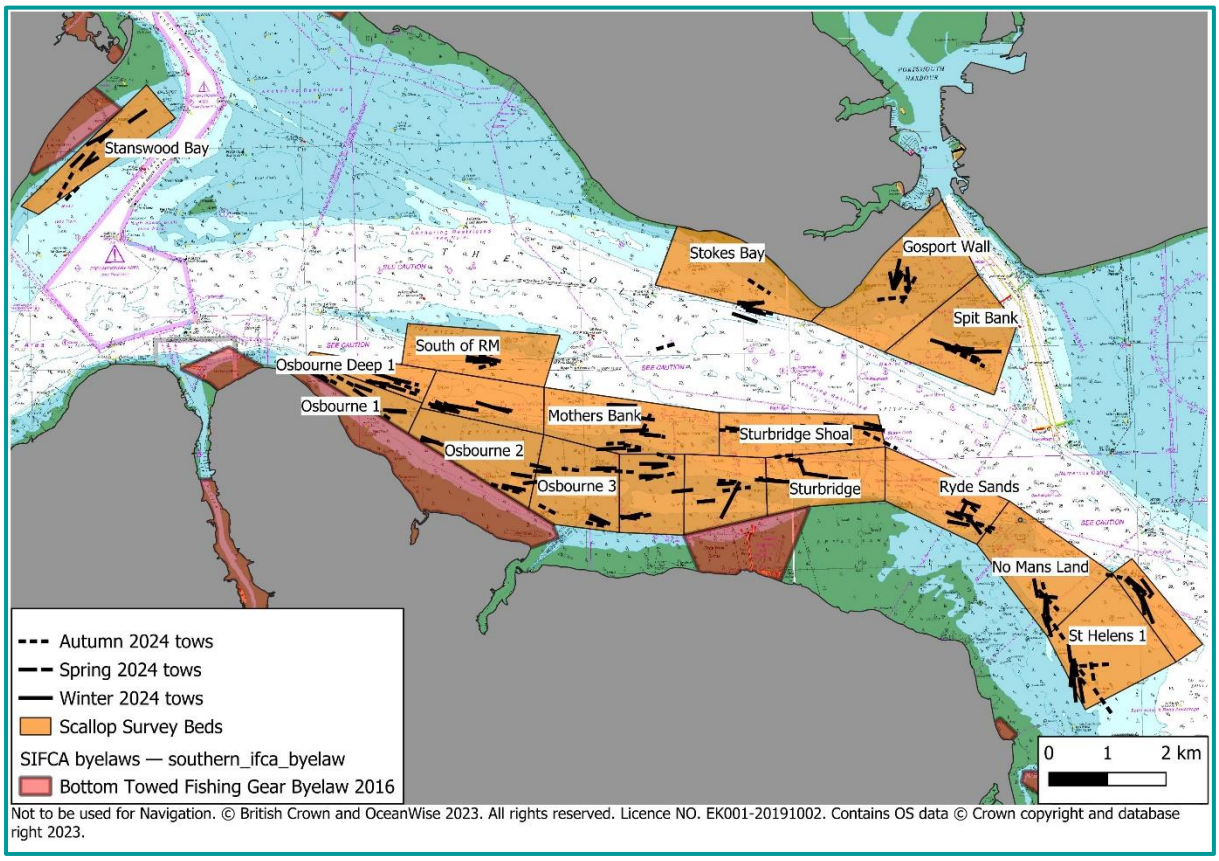

Figure 2: Location of the 19 sampling sites for the Solent scallop fishery, and the position of tows undertaken within these sites during 2024.

3. Results

Across the 19 sites, 1,152 scallops were sampled in Winter 2024, 882 were sampled in Spring 2024, and 1,741 were sampled in Autumn 2024.

3.1 Catch Per Unit Effort (CPUE)

The weight data collected was transformed to provide a value for Catch Per Unit Effort (CPUE), defined as kg of scallops per metre of dredge per hour (kg/m/hr). CPUE was calculated for total weight of scallops, weight of scallops over the Minimum Conservation Reference Size (MCRS), and weight of scallops under the MCRS.

It should be noted that the dredging method is inherently size selective due to the need for commercial vessels to maximise retention of scallops over MCRS and minimise catches (and secondary sorting requirements) of scallops under MCRS. As such the data for CPUE under MCRS will not be representative of this size class as it cannot be guaranteed that all scallops under MCRS have been sampled. However, comparisons can be made between sites and over time to look for changes, in the knowledge that the sampling method is consistent and there is no statistical difference in the catch between dredges used from different vessels.

3.1.1 CPUE between Sites for the 2024 Surveys

In this section, CPUE data for the total sampled population, the sampled population over MCRS, and the sampled population under MCRS is compared between sites for the 2024 surveys.

Winter 2024

- A Kruskal-Wallis test found statistically significant differences between sites for Total CPUE ($p < 0.01$), CPUE Over MCRS ($p < 0.05$), and CPUE Under MCRS ($p < 0.01$), however Dunns' post-hoc analyses found no statistically significant differences between the sites indicating that the variance in the data within sites is greater than the variance between sites.
- For Total population sampled, the site with the greatest average CPUE was St Helens 2 (122.92 kg/m/hr), while the site with the lowest average total CPUE was South of Ryde Middle (7.29 kg/m/hr) (Figure 3).
- For Over MCRS population sampled, the site with the greatest average CPUE was St Helens 2 (91.25 kg/m/hr), while the site with the lowest average CPUE was South of Ryde Middle (4.58 kg/m/hr) (Figure 4).
- For Under MCRS population sampled, the site with the greatest average CPUE was Osbourne 4 (52.81 kg/m/hr), while the site with the lowest average CPUE was Stanswood (2.08 kg/m/hr) (Figure 5).

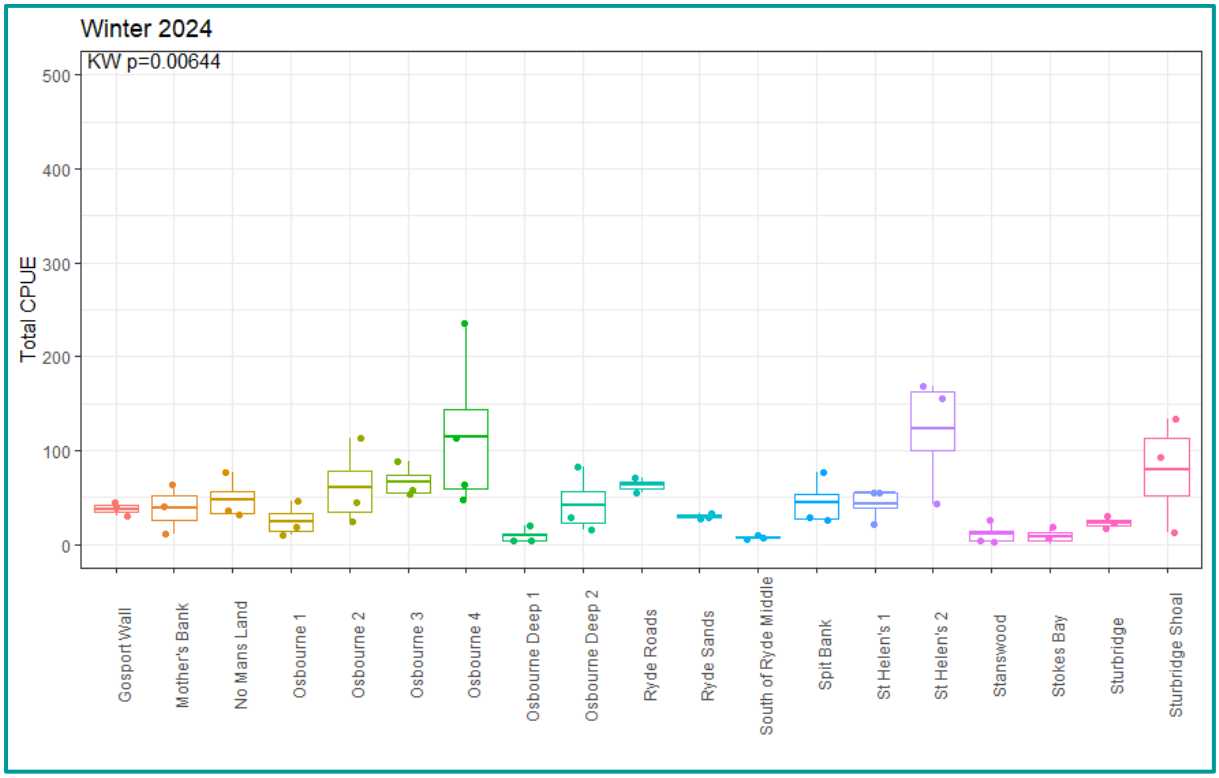

Figure 3: Catch per Unit Effort (kg/m/hr) of the Total population of sampled scallops for each site surveyed in Winter 2024.

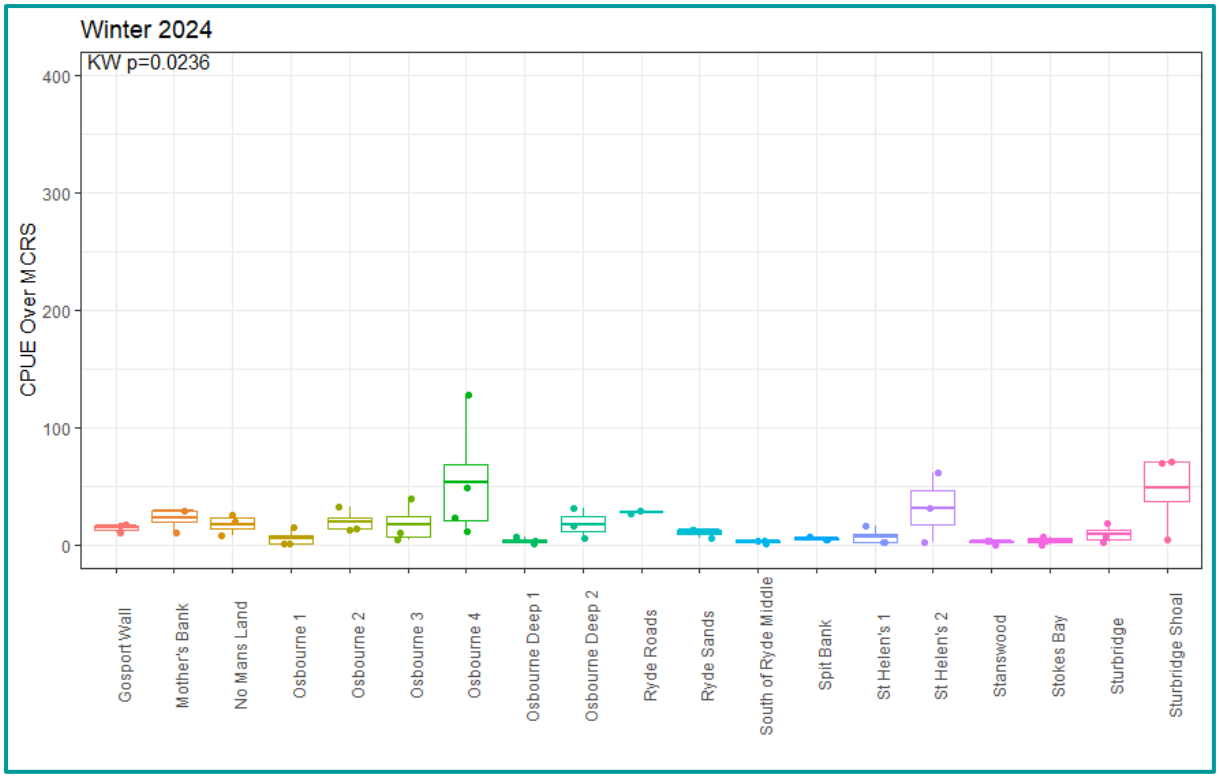

Figure 4: Catch per Unit Effort (kg/m/hr) for the sampled population of scallops Over the Minimum Conservation Reference Size for each site surveyed in Winter 2024.

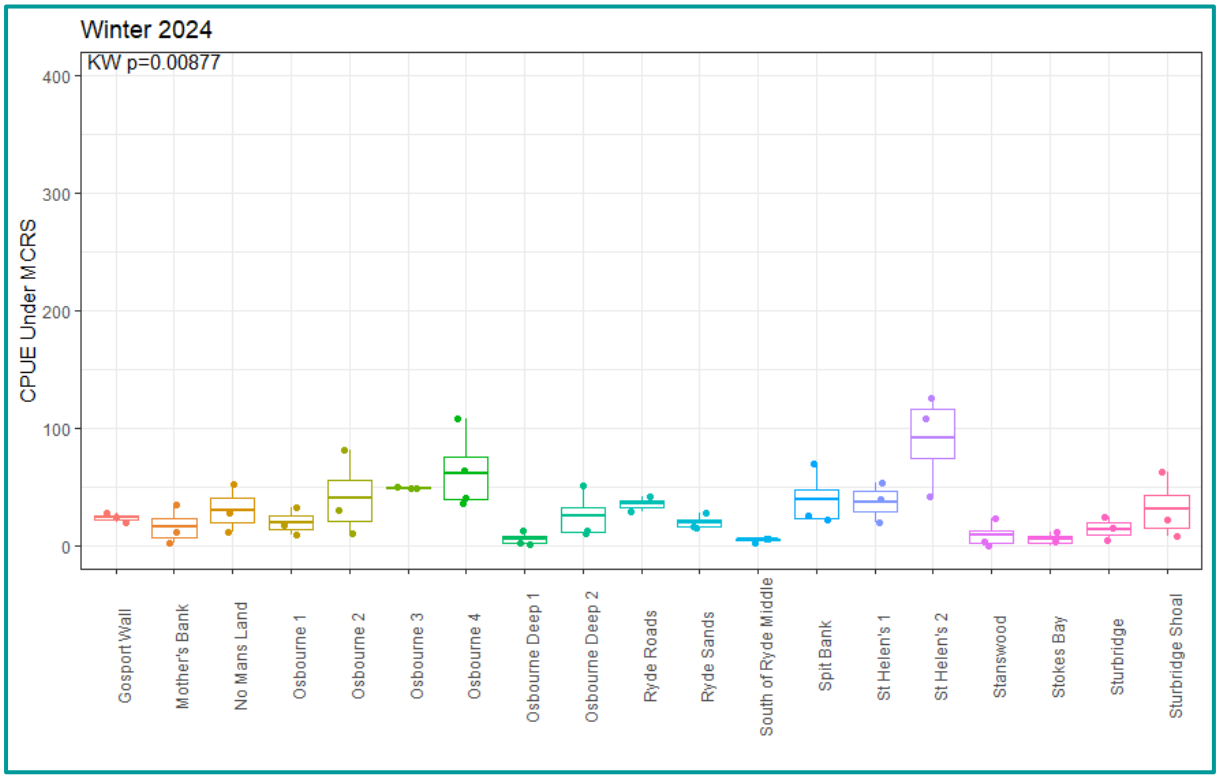

Figure 5: Catch per Unit Effort (kg/m/hr) for the sampled population of scallops Under the Minimum Conservation Reference Size for each site surveyed in Winter 2024.

Spring 2024

- A Kruskal-Wallis test found statistically significant differences between sites for Total CPUE ($p < 0.01$), CPUE Over MCRS ($p < 0.01$), and CPUE Under MCRS ($p < 0.01$), however Dunns' post-hoc analyses found no statistically significant differences between the sites indicating that the variance in the data within sites is greater than the variance between sites.
- For Total population sampled, the site with the greatest average CPUE was Sturbridge (95.93 kg/m/hr), while the site with the lowest average CPUE was South of Ryde Middle (3.90 kg/m/hr) (Figure 6).
- For Over MCRS population sampled, the site with the greatest average CPUE was Sturbridge (42.57 kg/m/hr), while the site with the lowest average CPUE was South of Ryde Middle (3.13 kg/m/hr) (Figure 7).
- For Under MCRS population sampled, the site with the greatest average CPUE was Sturbridge (53.35 kg/m/hr), while the site with the lowest average CPUE was Stanswood (0.00 kg/m/hr) (Figure 8).

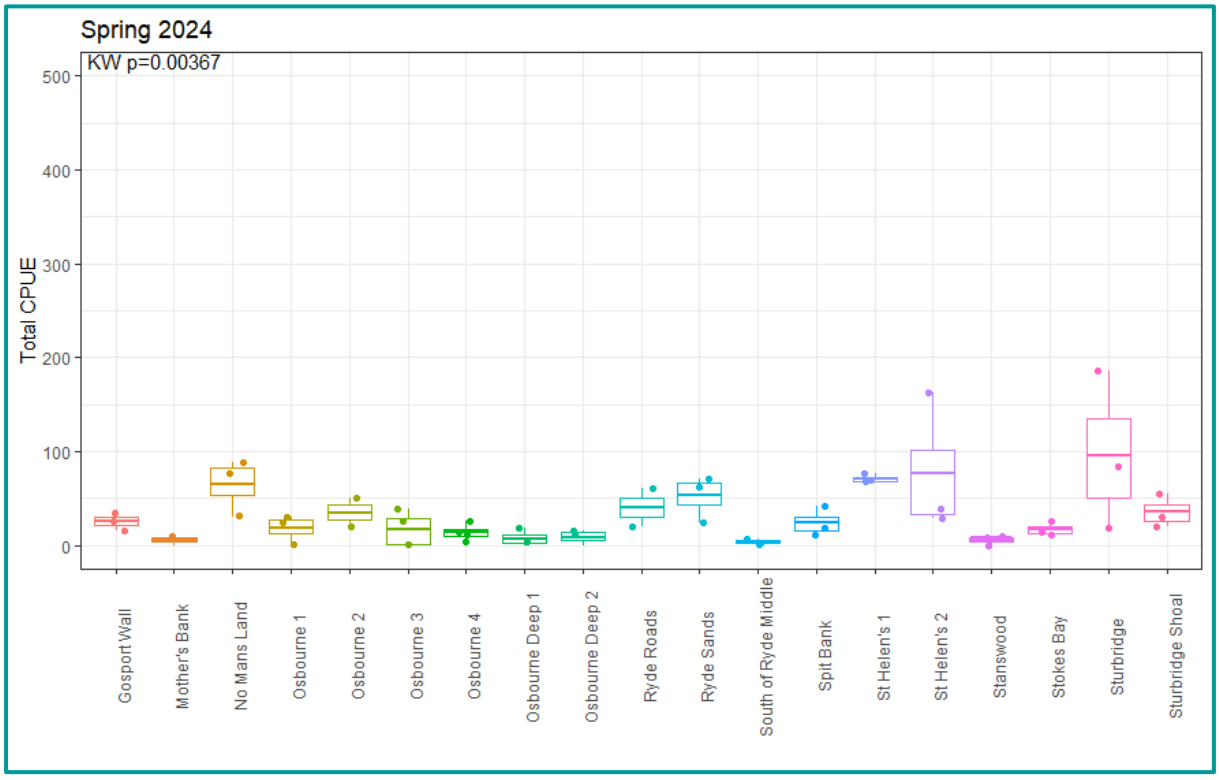

Figure 6: Catch per Unit Effort (kg/m/hr) of the Total population of sampled scallops for each site surveyed in Spring 2024.

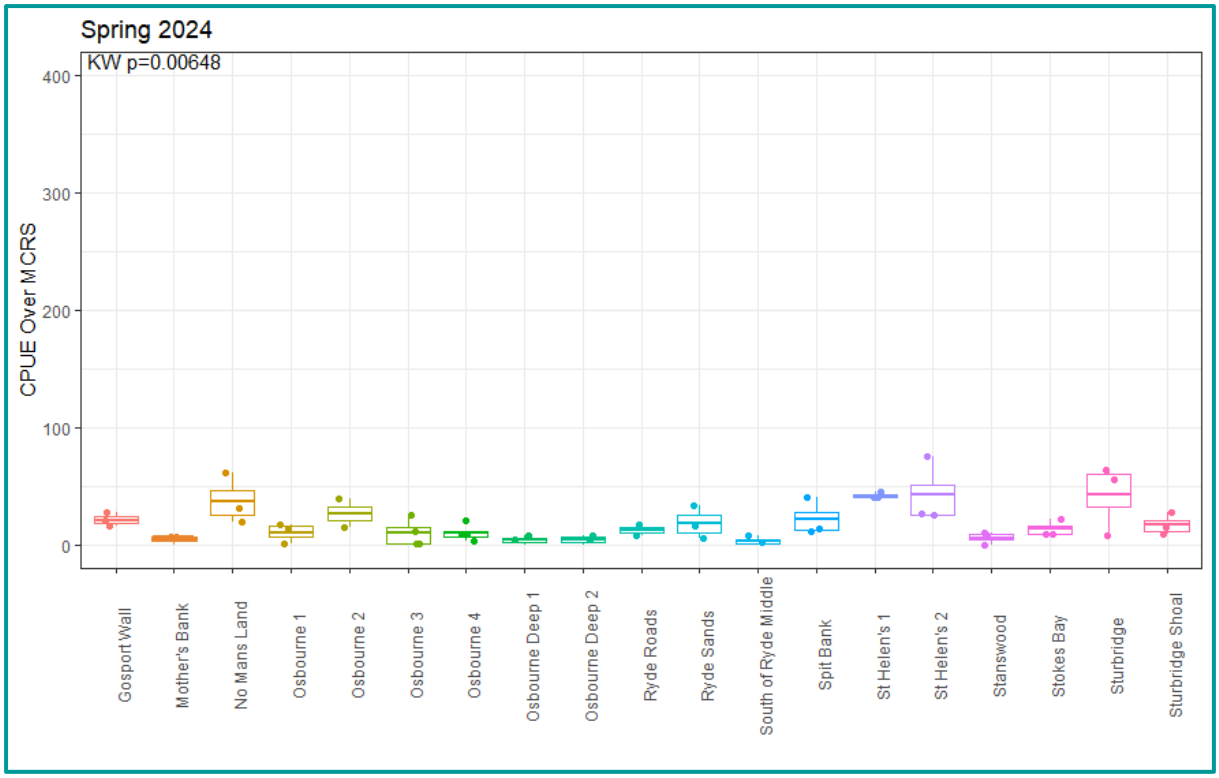

Figure 7: Catch per Unit Effort (kg/m/hr) for the sampled population of scallops Over the Minimum Conservation Reference Size for each site surveyed in Spring 2024.

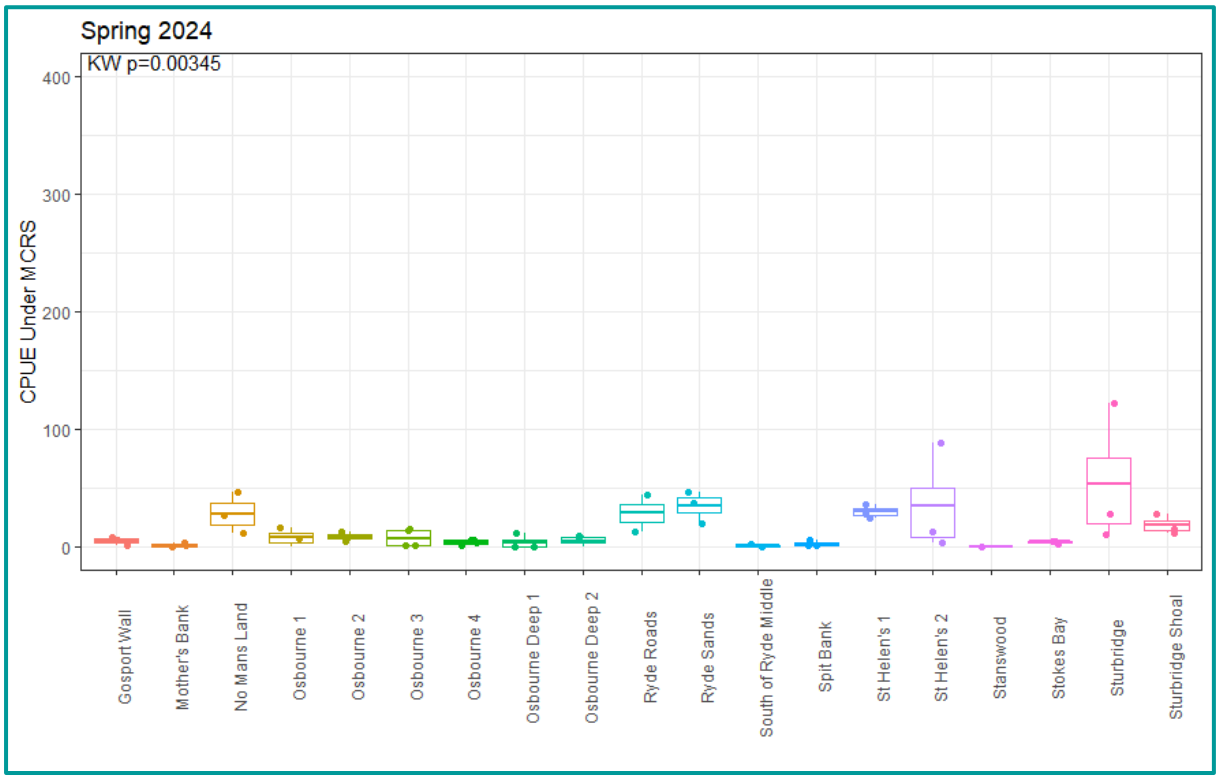

Figure 8: Catch per Unit Effort (kg/m/hr) for the sampled population of scallops Under the Minimum Conservation Reference Size for each site surveyed in Spring 2024.

Autumn 2024

- A Kruskal-Wallis test found statistically significant differences between sites for Total CPUE ($p < 0.01$), CPUE Over MCRS ($p < 0.01$), and CPUE Under MCRS ($p < 0.01$), however Dunns' post-hoc analyses found no statistically significant differences between the sites indicating that the variance in the data within sites is greater than the variance between sites.
- For Total population sampled, the site with the greatest average CPUE was No Mans Land (392.96 kg/m/hr), while the site with the lowest average CPUE was Stanswood (4.46 kg/m/hr) (Figure 9).
- For Over MCRS population sampled, the site with the greatest average CPUE was Osbourne 2 (182.67 kg/m/hr), while the site with the lowest average CPUE was Stanswood (3.98 kg/m/hr) (Figure 10).
- For Under MCRS population sampled, the site with the greatest average CPUE was No Mans Land (232.26 kg/m/hr), while the site with the lowest average CPUE was Osbourne Deep 1 (0.40 kg/m/hr) (Figure 11).

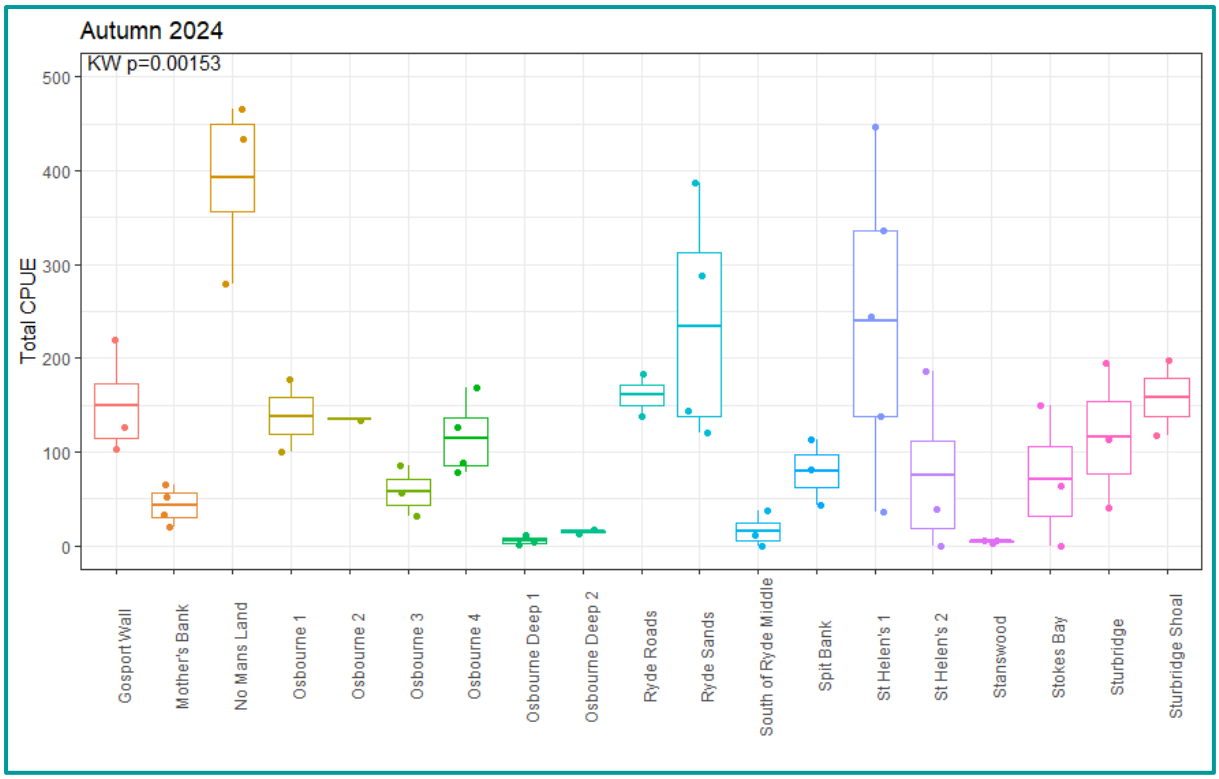

Figure 9: Catch per Unit Effort (kg/m/hr) of the Total population of sampled scallops for each site surveyed in Autumn 2024.

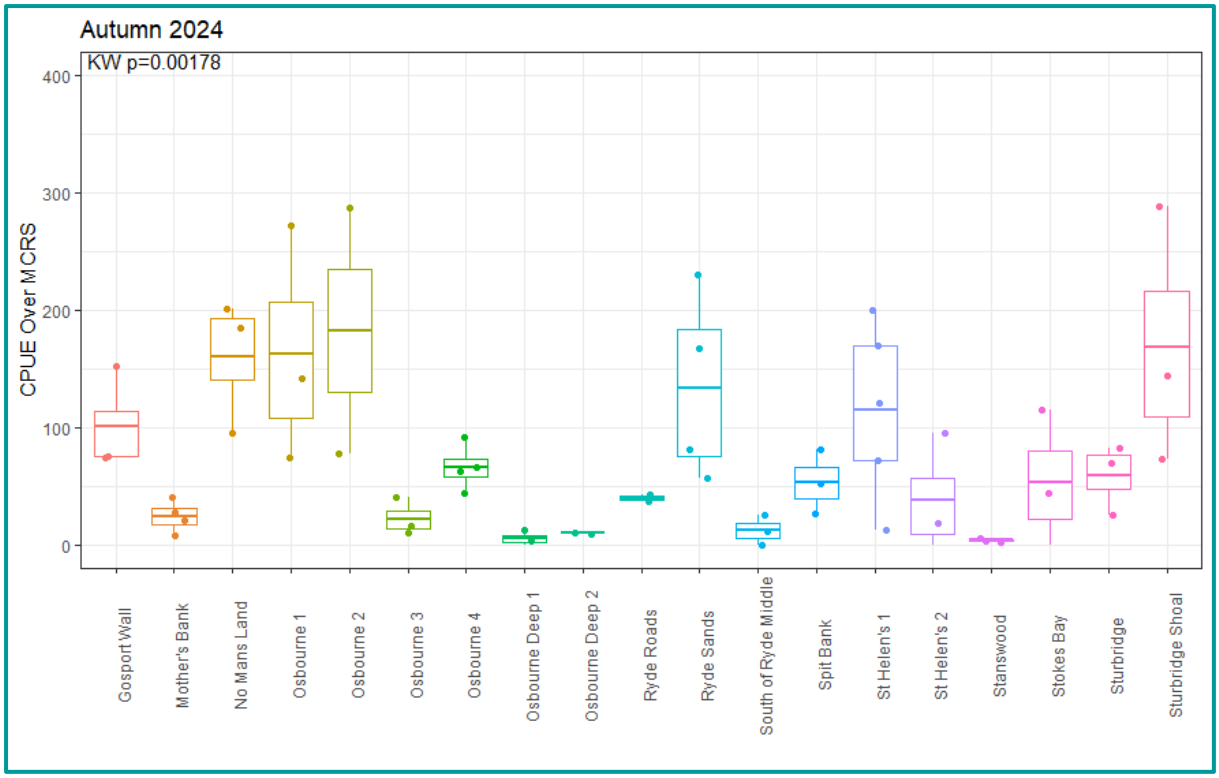

Figure 10: Catch per Unit Effort (kg/m/hr) for the sampled population of scallops Over the Minimum Conservation Reference Size for each site surveyed in Autumn 2024.

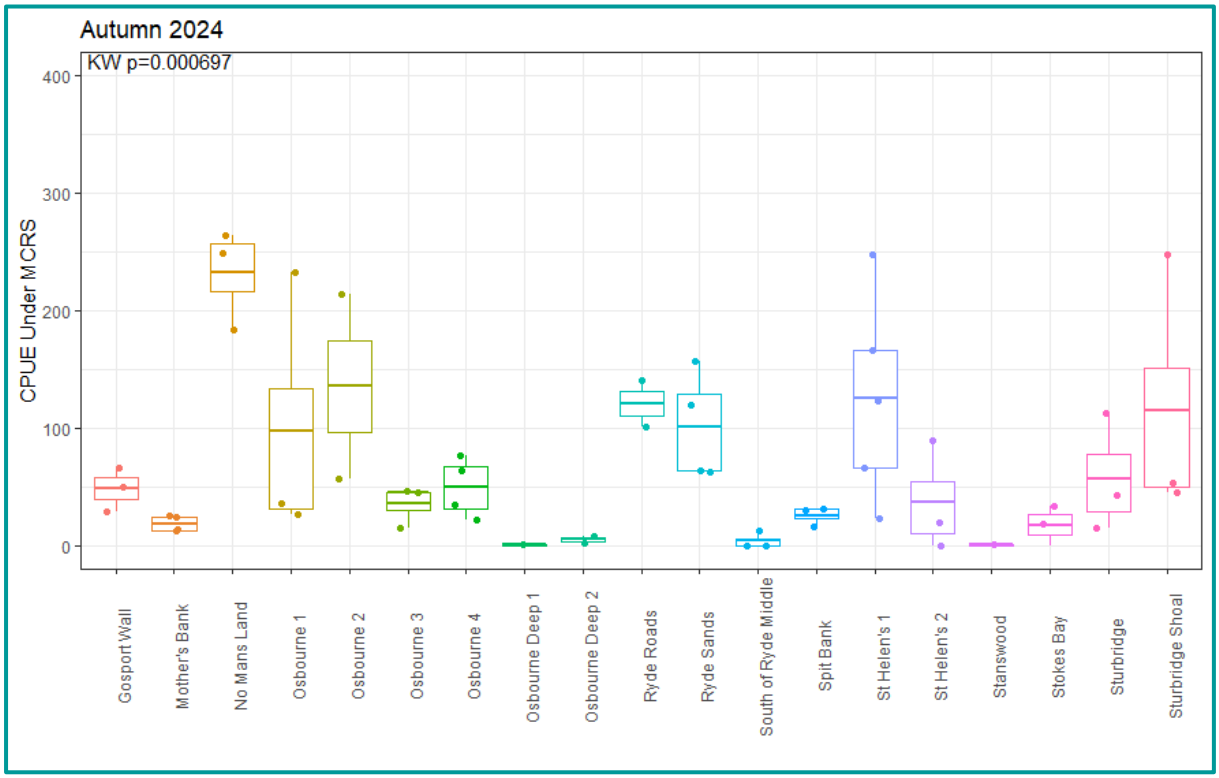

Figure 11: Catch per Unit Effort (kg/m/hr) for the sampled population of scallops Under the Minimum Conservation Reference Size for each site surveyed in Autumn 2024.

3.1.2 Comparing CPUE Between Surveys

Combining data for all the sites in each of the surveys, comparisons were made between surveys for Total CPUE, CPUE Over MCRS, and CPUE Under MCRS using Kruskal-Wallis and post-hoc Dunn's test. Trends in CPUE are highlighted for key timeframes:

- When the fishing season was active (Autumn 23 to Spring 24 surveys),
- When the fishery was closed (Spring 24 to Autumn 24 surveys),
- Comparisons between the spring and autumn surveys in 2023 and 2024.

Total CPUE (Figure 12)

- A statistically significant decrease in mean CPUE was seen during the 23/24 fishing season (Autumn 23 to Spring 24) from 110.00 kg/m/hr to 32.00 kg/m/hr ($p < 0.01$).
- A statistically significant increase in mean CPUE was seen when the fishery was closed (Spring 24 to Autumn 24) from 32.00 kg/m/hr to 141.00 kg/m/hr ($p < 0.01$).
- A statistically significant decrease in mean CPUE was seen from the Spring 2023 survey (84.70 kg/m/hr) to the Spring 2024 survey (32.00 kg/m/hr) ($p < 0.01$).
- The mean CPUE increased from Autumn 2023 (110.00 kg/m/hr) to Autumn 2024 (142.00 kg/m/hr) but was not significant.

CPUE Over MCRS (Figure 13)

- A statistically significant decrease in mean CPUE was seen during the 23/24 fishing season (Autumn 23 to Spring 24) from 77.40 kg/m/hr to 18.00 kg/m/hr ($p < 0.01$).
- A statistically significant increase in mean CPUE was seen when the fishery was closed (Spring 24 to Autumn 24) from 18.00 kg/m/hr to 75.60 kg/m/hr ($p < 0.01$).
- A statistically significant decrease in mean CPUE was seen from the Spring 2023 survey (30.10 kg/m/hr) to the Spring 2024 survey (18.00 kg/m/hr) ($p < 0.05$).
- The mean CPUE decreased from Autumn 2023 (77.40 kg/m/hr) to Autumn 2024 (75.60 kg/m/hr) but was not significant.

CPUE Under MCRS (Figure 14)

- A statistically significant decrease in mean CPUE was seen during the 23/24 fishing season (Autumn 23 to Spring24) from 32.40 kg/m/hr to 14.10 kg/m/hr ($p < 0.01$).
- A statistically significant increase in mean CPUE was seen when the fishery was closed (Spring 24 to Autumn 24) from 14.10 kg/m/hr to 65.10 kg/m/hr ($p < 0.01$).
- A statistically significant decrease in mean CPUE was seen from the Spring 2023 survey (54.60 kg/m/hr) to the Spring 2024 survey (14.10 kg/m/hr) ($p < 0.01$).
- A statistically significant increase in mean CPUE was seen from the Autumn 2023 survey (32.40 kg/m/hr) to the Autumn 2024 survey (65.10 kg/m/hr) ($p < 0.05$).

Additional Significant Results

The following significant results were also observed:

- For Total CPUE, a statistically significant decrease in mean CPUE was seen between the Autumn 23 (110.00 kg/m/hr) and Winter 24 (47.10 kg/m/hr) surveys ($p < 0.01$) (Figure 12). This was also seen for mean CPUE Over MCRS (77.40 kg/m/hr to 17.20 kg/m/hr) (Figure 13).
- For CPUE Under MCRS, a statistically significant decrease in mean CPUE was seen between the Winter 24 (29.90 kg/m/hr) and Spring 24 (14.10 kg/m/hr) surveys ($p < 0.01$).

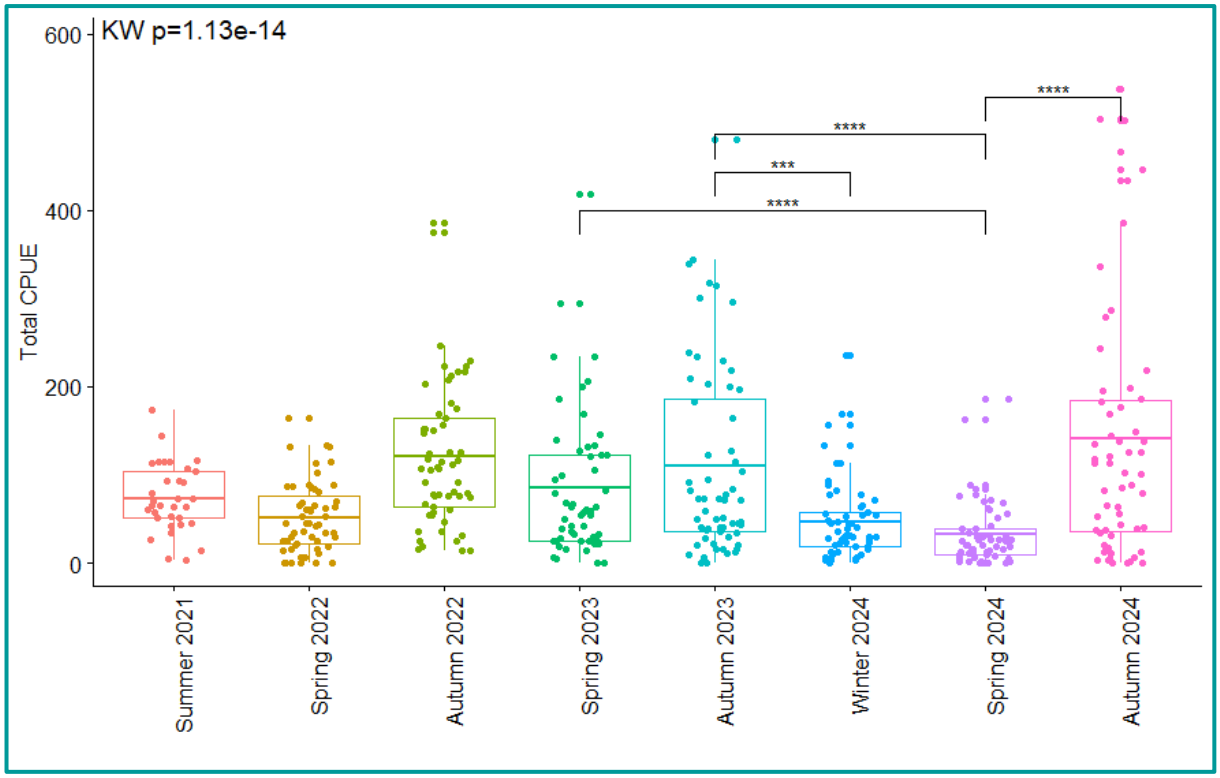

Figure 12: Catch per Unit Effort (kg/m/hr) for the total population of sampled scallops in all surveys undertaken since 2021. Brackets indicate the presence of statistically significant differences between surveys as determined by Dunn's post-hoc analysis (* = $p < 0.05$, ***= $p < 0.001$, **** = $p < 0.0001$).

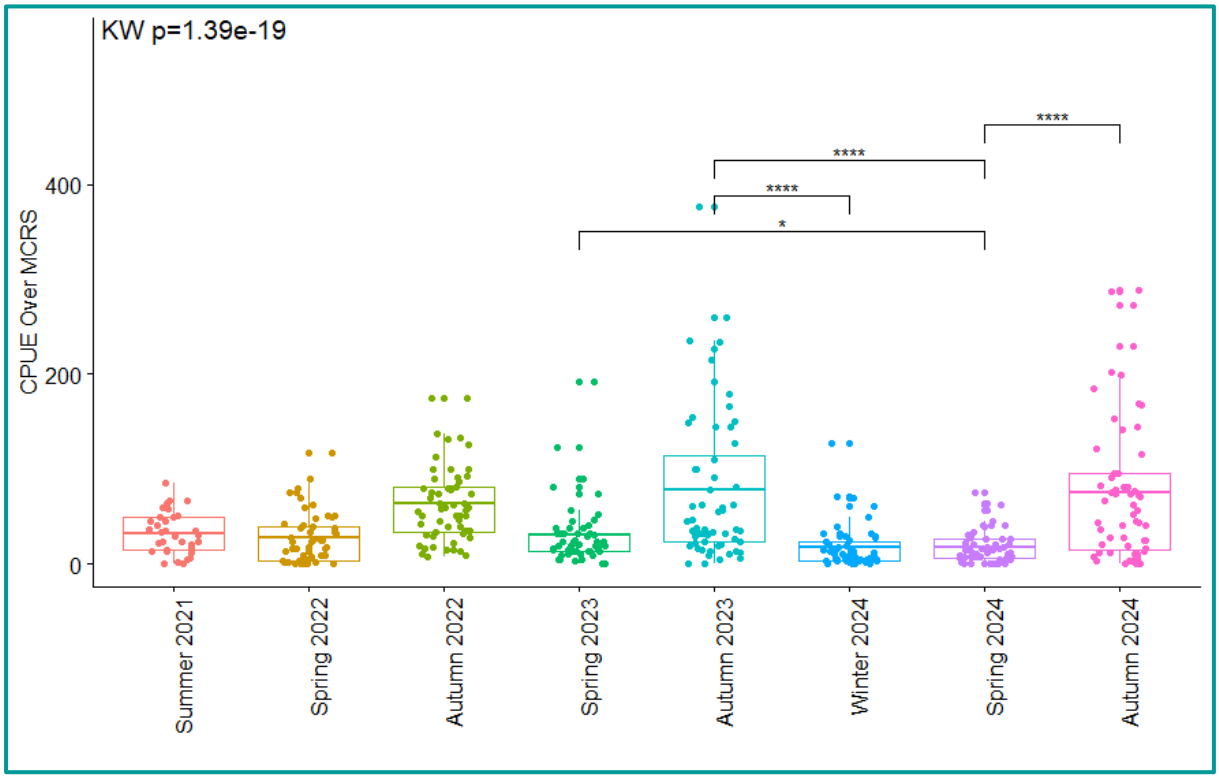

Figure 13: Catch per Unit Effort (kg/m/hr) for sampled scallops Over the Minimum Conservation Reference Size from all surveys undertaken since 2021. Brackets indicate the presence of statistically significant differences between surveys as determined by Dunn's post-hoc test (* = $p < 0.01$, **** = $p < 0.0001$).**

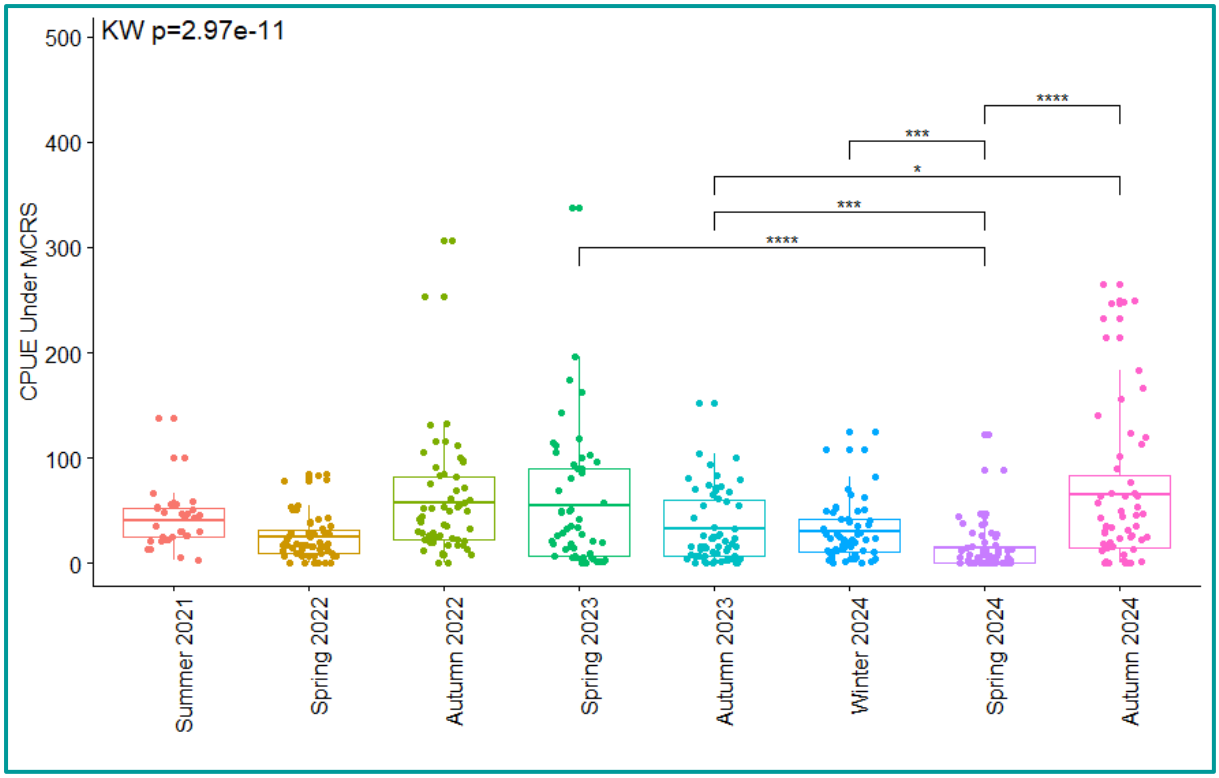

Figure 14: Catch per Unit Effort (kg/m/hr) for sampled scallops Under the Minimum Conservation Reference Size in all surveys undertaken since 2021. Brackets indicate the presence of statistically significant differences between surveys as determined by Dunn's post-hoc test (* = $p < 0.05$, ***= $p < 0.001$, **** = $p < 0.0001$).

3.1.3 Comparing CPUE for Each Site Between Surveys

For the same key timeframes, comparisons were also made between the individual sampling sites for Total CPUE, CPUE Over MCRS and CPUE Under MCRS. A summary of the change to CPUE at sites between surveys undertaken in 2023 and 2024 for these key periods is provided in Table 1.

Table 1: A summary of the trends in CPUE change for individual sites between surveys for key timeframes; during the fishery closed period (2023 and 2024) during the fishing season (23/24) and between spring and autumn surveys for 23-24.

		Total Sample	Over MCRS	Under MCRS
No. of sites where CPUE increased during the closed season (Spr – Aut of same year)	2023	11 sites	14 sites 3 significant	4 sites
	2024	16 sites 4 significant	17 sites 4 significant	18 sites 3 significant
No. of sites where CPUE decreased during the closed season (Spr – Aut of the same year)	2023	7 sites	4 sites	14 sites 1 significant
	2024	3 sites	2 sites	1 site

		Total Sample	Over MCRS	Under MCRS
No. of sites where CPUE increased during the 23/24 fishing season (Aut 23 – Spr 24)		1 site	1 site	3 sites
No. of sites where CPUE decreased during the 23/24 fishing season (Aut 23 – Spr 24)		18 sites 3 significant	18 sites 4 significant	16 sites 1 significant
Spring 2023 – Spring 2024	Increase	2 sites	6 sites	4 sites
	Decrease	16 sites 3 significant	12 sites	14 sites 5 significant
Autumn 2023 – Autumn 2024	Increase	11 sites	8 sites	14 sites 1 significant
	Decrease	9 sites 1 significant	11 sites 1 significant	5 sites

Graphs displaying trends in CPUE at each site throughout the timeseries can be found in Annex 1 for all three sampled groups, with significant results indicated with brackets.

3.2 Size Frequency

An analysis of width data from the three surveys undertaken in 2024 gave the following results:

- A visual analysis of the size frequency data for all 2024 surveys shows that the Winter 24 survey had a wider range of width measurements for scallops than either the Spring or Autumn surveys (Figure 15).
- Comparing the average width of scallops (mm) between all the 2024 surveys using a Kruskal-Wallis test showed that there was a significant effect of survey on width ($p < 0.01$), with a statistically significant decrease found for the Autumn 24 survey (105mm) in comparison to Spring 24 survey (108mm) ($p < 0.01$).
    - This is different from the previous closed season, when a statistically significant increase in mean width of the sampled population was found from the Spring 23 survey (104mm) to the Autumn 23 survey (109mm) ($p < 0.01$).
- A statistically significant decrease in mean width of the sampled population was found between the Autumn 23 (109mm) and Spring 24 (108mm) surveys.
- The results show that the greatest width of scallop sampled in 2024 was 145mm in the Winter survey (Figure 15).

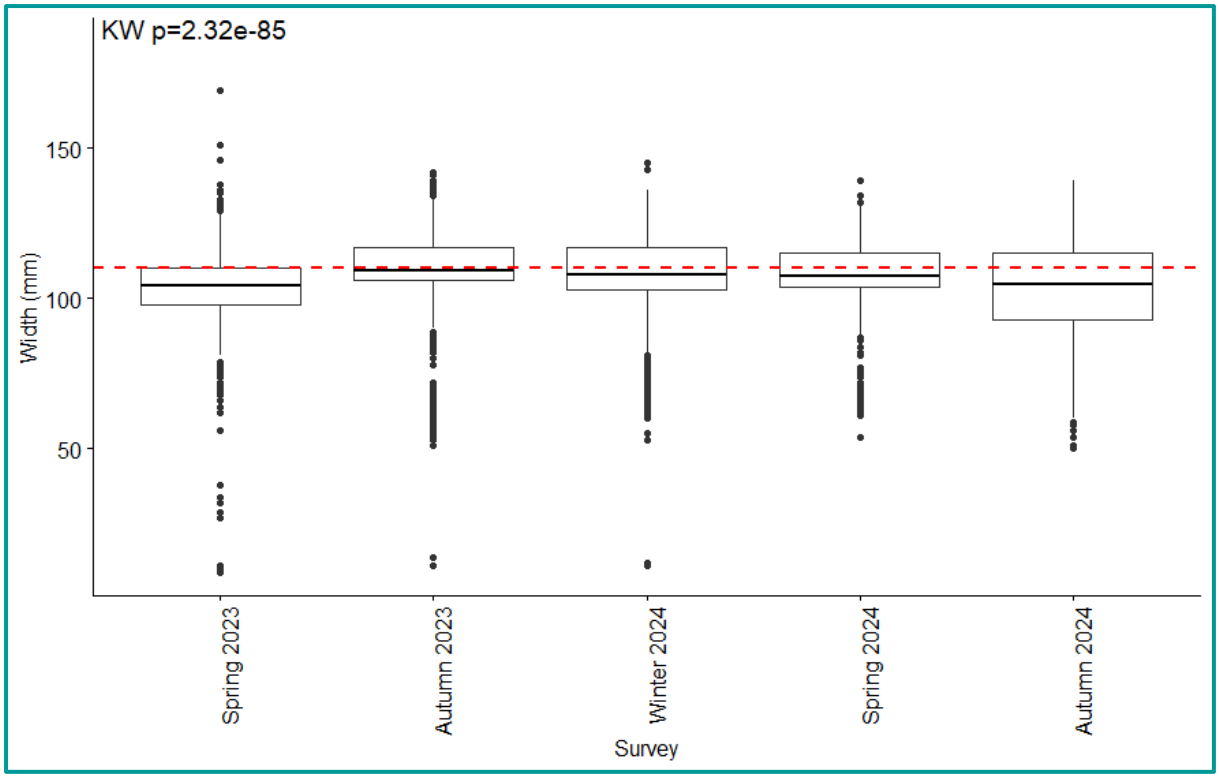

Figure 15: Comparison of the widths of scallops (mm) measured during the Winter, Spring, and Autumn 2024 surveys and the Spring and Autumn 2023 surveys. The thick black line shows the median width (mm), the red dotted line represents the Minimum Conservation Reference Size of King scallops in ICES area VIId (110mm).

3.2.1 Descriptive Analysis of Size Frequency

Winter 2024 (Figure 16)

Eleven of the nineteen sites sampled for the Winter 2024 survey have peaks in their size frequency distribution for a class above the MCRS (<110mm). Of the remaining sites, 6 have distribution peaks in the 105 – 110mm size class.

The distributions for Osbourne 2, Osbourne 3, Osbourne 4, Ryde Roads, and St Helens 2 also display smaller secondary peaks around the 60 – 65mm class.

Spring 2024 (Figure 17)

Ten of the nineteen sites sampled for the Spring 2024 survey have peaks in their size frequency distribution for a class above the MCRS (<110mm). Of the remaining sites, 8 have distribution peaks in the 105 – 110mm size class.

The distributions for Ryde Roads, Ryde Sands, St Helens 1, and St Helens 2 also display smaller secondary peaks around the 60 – 65mm class.

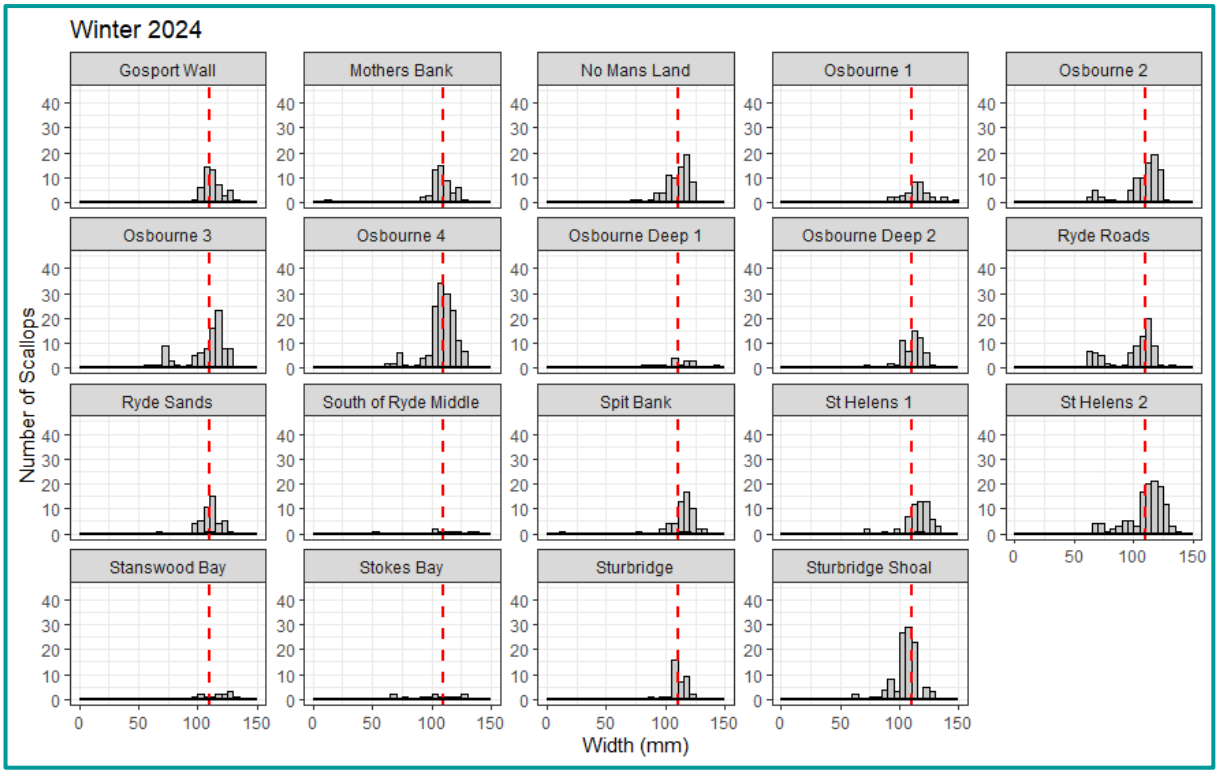

Figure 16: Width of scallops (mm) across all beds sampled in the Winter 2024 survey. The red dashed line represents the Minimum Conservation Reference Size of King scallops in ICES area VIId (110mm).

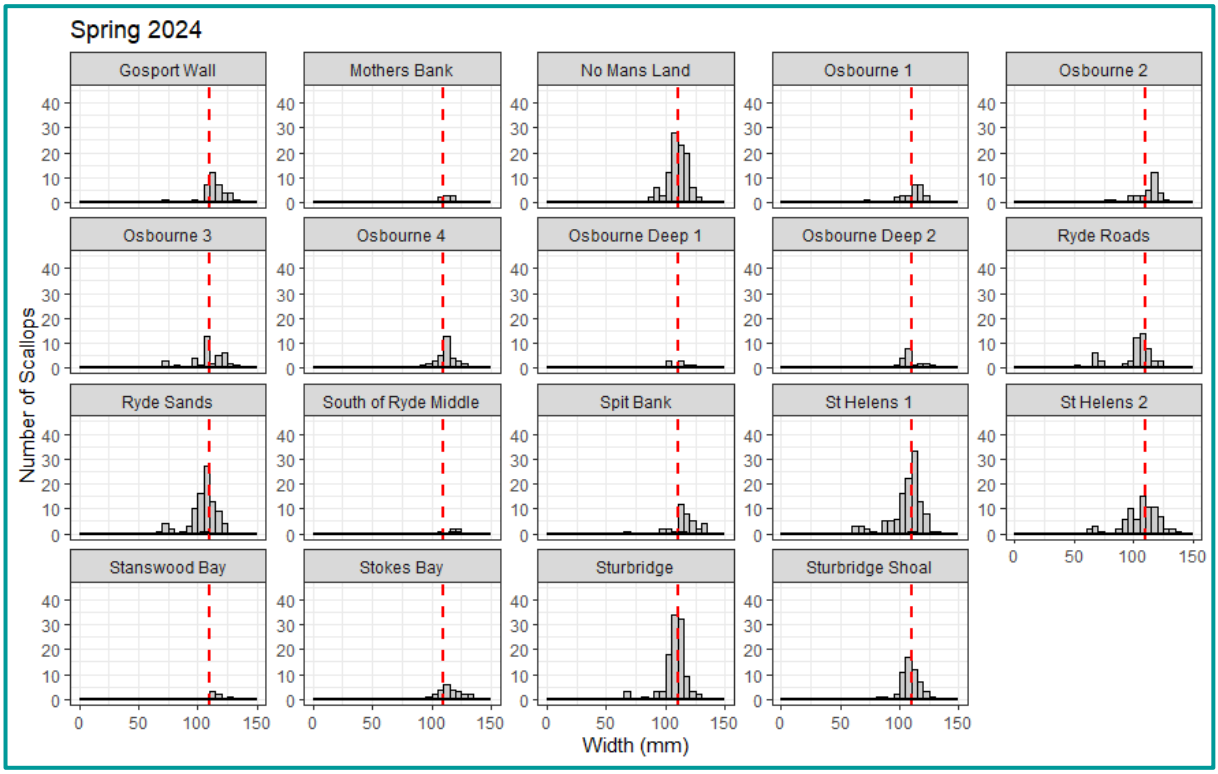

Figure 17: Width of scallops (mm) across all beds sampled in the Spring 2024 survey. The red dashed line represents the Minimum Conservation Reference Size of King scallops in ICES area VIId (110mm).

Autumn 2024 (Figure 18)

Twelve of the nineteen sites sampled for the Autumn 2024 survey have peaks in their size frequency distribution for a class above the MCRS (<110mm). Of the remaining sites, 4 have distribution peaks in the 90 – 95mm class.

No distribution peaks are below 75mm for any of the sites sampled in Autumn 2024.

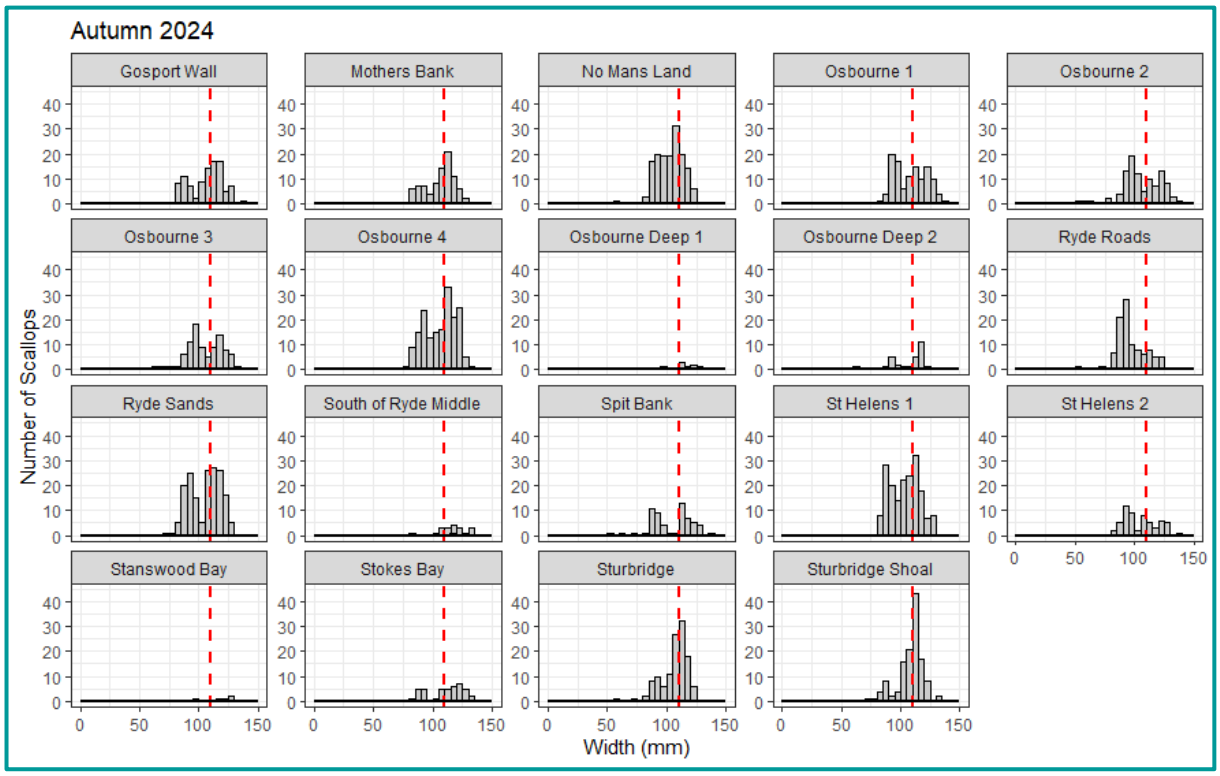

Figure 18: Width of scallops (mm) across all beds sampled in the Autumn 2024 survey. The red dashed line represents the Minimum Conservation Reference Size of King scallops in ICES area VIId (110mm).

4. Catch Data

As the Solent Dredge Permit renews in November of each year, catch is recorded in a season from November to October of the following year. The only year where October was open to fishing following a closed season was in 2022.

The total kg of King Scallop caught across all vessels during the 23/24 season was 560.9 tonne, an increase from the 22/23 season at 153.3 tonne, and from the 21/22 season at 297.8 tonne.

During the 23/24 fishing season, the average weight of scallop caught each month was 7.2 tonne per vessel. This was an increase from both the 22/23 season (2.1 tonne per vessel) and the 21/22 season (3.5 tonne per vessel).

During the 23/24 fishing season, the most vessels fished during January (17), and the most catch was taken during the first month (November, 11.7 tonne per vessel) (Figure 19). During the 22/23 season, the most vessels were seen fishing in November (18), when the most catch was also taken (3.4 tonne per vessel). During the 21/22 season, the most vessels during January and October (17), with the most catch taken during October (8.5 tonne per vessel) (Figure 19).

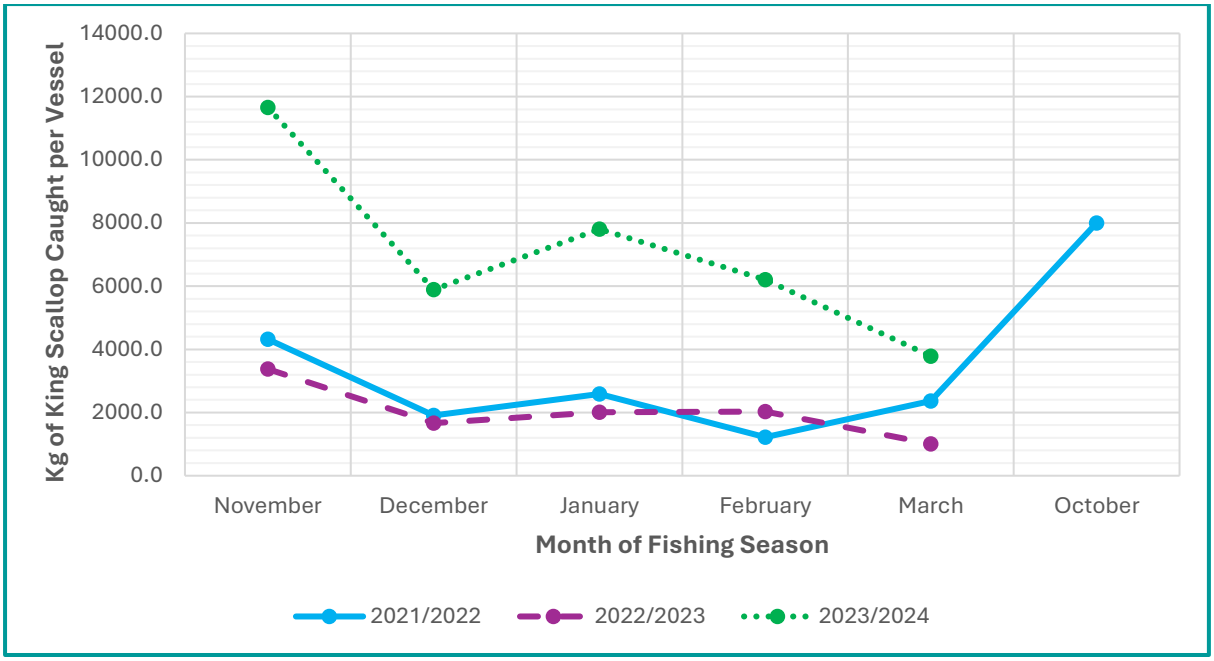

Figure 19: The average Kg of King Scallop caught per vessel during each month of the previous 3 years fishing seasons. Please note that catch levels were not recorded during October 2021 as the SPDB was not yet in place, and were not reported in October 2023 due to a closure of the fishery for that month.

5. Summary

- The Total sampled population, as well as the sampled population when split into Over and Under MCRS, showed a statistically significant decrease in mean CPUE from the Autumn 23 to the Spring 24 survey (23/24 Fishing Season).
- The Total sampled population, as well as the sampled population when split into Over and Under MCRS, showed a statistically significant increase in mean CPUE from the Spring 24 to the Autumn 24 survey (2024 Closed Season).
- The Total sampled population, as well as the sampled population when split into Over and Under MCRS, showed a statistically significant decrease in mean CPUE from the Spring 23 to the Spring 24 survey.
- The sampled population Under MCRS showed a statistically significant increase in mean CPUE from the Autumn 23 to the Autumn 24 survey, the Total CPUE showed an increase which was not significant and the Over MCRS CPUE showed a small decrease of 1.8 kg/m/hr (not significant).

- Mean CPUE for the majority of individual sampling sites increased during the 2024 Closed Season for Total, Over MCRS, and Under MCRS sampled populations (16 sites, 17 sites, & 18 sites respectively).
- This is an increase from the number that saw an increase in mean CPUE during the 2023 Closed Season for Total, Over MCRS and Under MCRS sampled populations (11 sites, 14 sites, & 4 sites respectively).

- Analysis found a statistically significant effect of survey on width, with mean width of the Autumn survey lower than both the Winter 2024 and Spring 2024 surveys.

- The increase in CPUE seen for all sampled populations (Total, Over MCRS, and Under MCRS) during the 2024 closed season and between the Autumn 2023 and Autumn 2024 surveys occurred following the fishing season with the highest landings for King scallop seen within this fishery to date.

6. Discussion

The scallop stock from the 2024 surveys shows a pattern which would be expected based on fishing activity, with an overall decrease in CPUE during the fishing season and then an increase in CPUE during the period when the fishery is closed.

The data from 2024, when looking at the period during which the fishery was closed (Spring 2024 to Autumn 2024), shows an improvement in the stock levels across all sampled populations' CPUE (Total, Over MCRS and Under MCRS) compared to the results seen in 2023. In addition, there has also been an increase in Total CPUE for Autumn 2024 compared to Autumn 2023, with CPUE values in 2024 being more aligned with those seen in 2022. It is recognised that there is a mixed picture when looking at individual sites and not all sites have shown an increase in CPUE during the closed season, however the number of sites where an increase has been seen is greater in 2024 than in 2023 and there is an increased number of sites where this increase is statistically significant (Table 1).

Increases in CPUE for Autumn 24 and during the 2024 closed period for the fishery have been seen despite greatly increased catch levels during the 23/24 season with the highest total quantity and quantity of King scallop per vessel (both overall and monthly through the season) seen for any season to date. This indicates that, at this stage, the increased catch levels have not led to a decline in stock and that the stocks can sustain the commercial fishery.

It is noted that the Under MCRS portion of the stock sampled is subject to the inherent size selectivity of the fishing gear, designed to maximise catches of Over MCRS stock, however the repetition in method used each survey allows for comparisons of this group over time.

It cannot be determined that fishing activity is the only or primary influencing factor on the stock patterns seen from the survey data. It takes time to understand the impact of management intervention (for example increased effort controls introduced for the King scallop fishery in 2023) on stock levels and determine the relevant influencing factors, for example discerning potential influence of management or fishing effort compared to other environmental factors. The results presented in this report add to the timeseries data Southern IFCA are collecting on the Solent Scallop Population, which will provide a greater understanding of the trends of this population. As the timeseries is still in its early stages (3 years of consecutive data collection to date), the data presented provides an overview of the population condition, but further data will be required to fully identify patterns within the stock and the contribution of different potential influencing factors to any patterns seen. It is likely that there are multiple factors influencing the stock pattern, the management of the fishery being one of these.

The continuation of the timing of the survey program, maintaining the mid-season survey for 2025, will enhance understandings of the health of the fishery, providing an opportunity to assess the stock of King scallop during the 24/25 fishing season. In addition, in order to improve understanding of harvesting areas for King scallop in relation to patterns in the stock, an update has been made to the 24/25 monthly catch return form to require finer scale reporting of King scallop catches, moving from the level of a Bivalve Management Area to Sub-Areas within BMA 3 (Eastern Solent) where the majority of fishing for King scallop takes place. This will allow catch

data to be better related to data from the survey, allowing, for example, quantification of information provided by the fishing industry during the 23/24 season suggesting that some of the sites which have shown lower stock levels in the 2024 survey are those which were not fished extensively during the 23/24 season.

During 2025, it is the intention to implement an updated methodology for the Solent Scallop Survey Programme, developed in consideration of key areas for the King scallop fishery in the Solent, engagement with the fishing industry and engagement with Cefas on nationally applied methodologies. The updated methodology aims to provide data on smaller size classes of King scallop by using a Queen scallop dredge alongside the N-Viro dredge used by fishers and to ensure that each year the areas surveyed align with those where harvesting takes place, as for example it is known that there are areas of the Solent which are targeted for King Scallop which are not covered by the current survey methodology. The intention is to increase the robustness of the data collected and thus the timeseries dataset for this species in the Solent to ensure that management of the fishery continues to be based on best available evidence. The data collected under the new methodology also has the potential to be fed into national evidence gathering, for example as part of the implementation of the King Scallop Fisheries Management Plan (FMP).

Annex 1

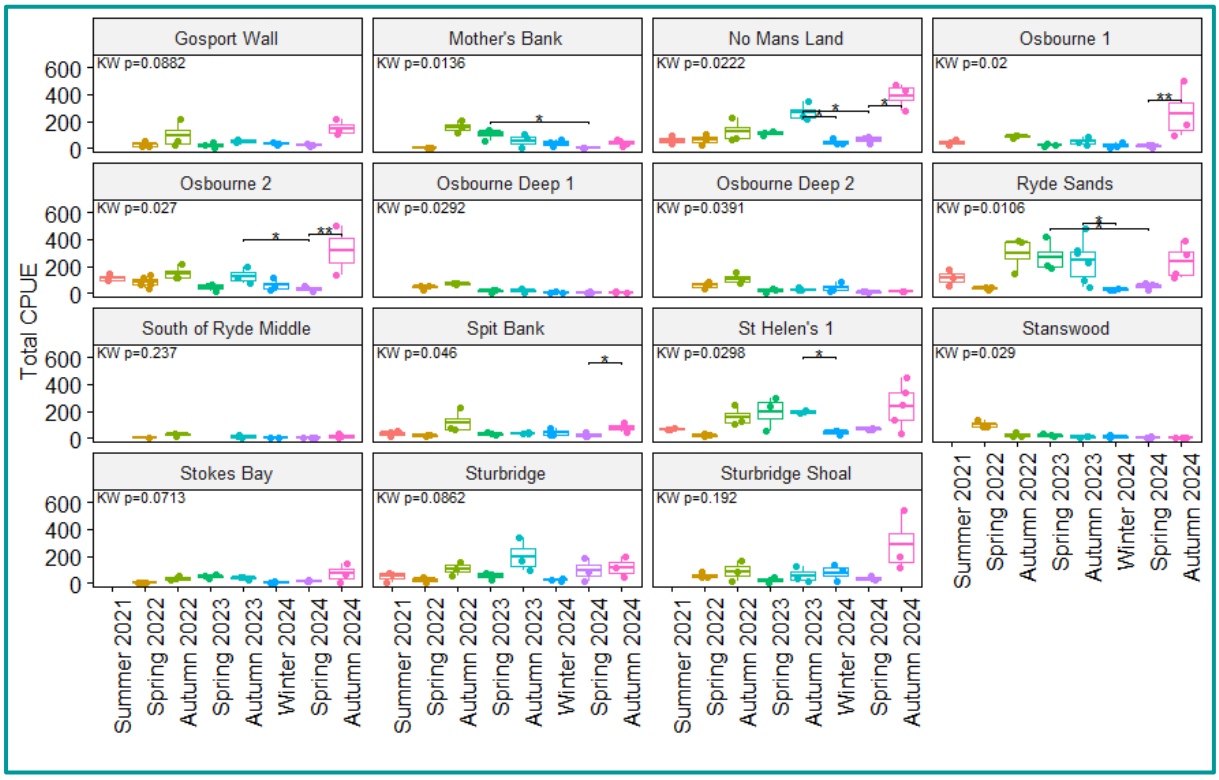

Figure 20: Catch Per Unit Effort (kg/m/hr) of the total population of scallops sampled at sites analysed by a Kruskal-Wallis test for all surveys. The brackets display the statistically significant results between 2023 and 2024 surveys from a post-hoc Dunns analysis (* = $p < 0.05$, ** = $p < 0.01$).

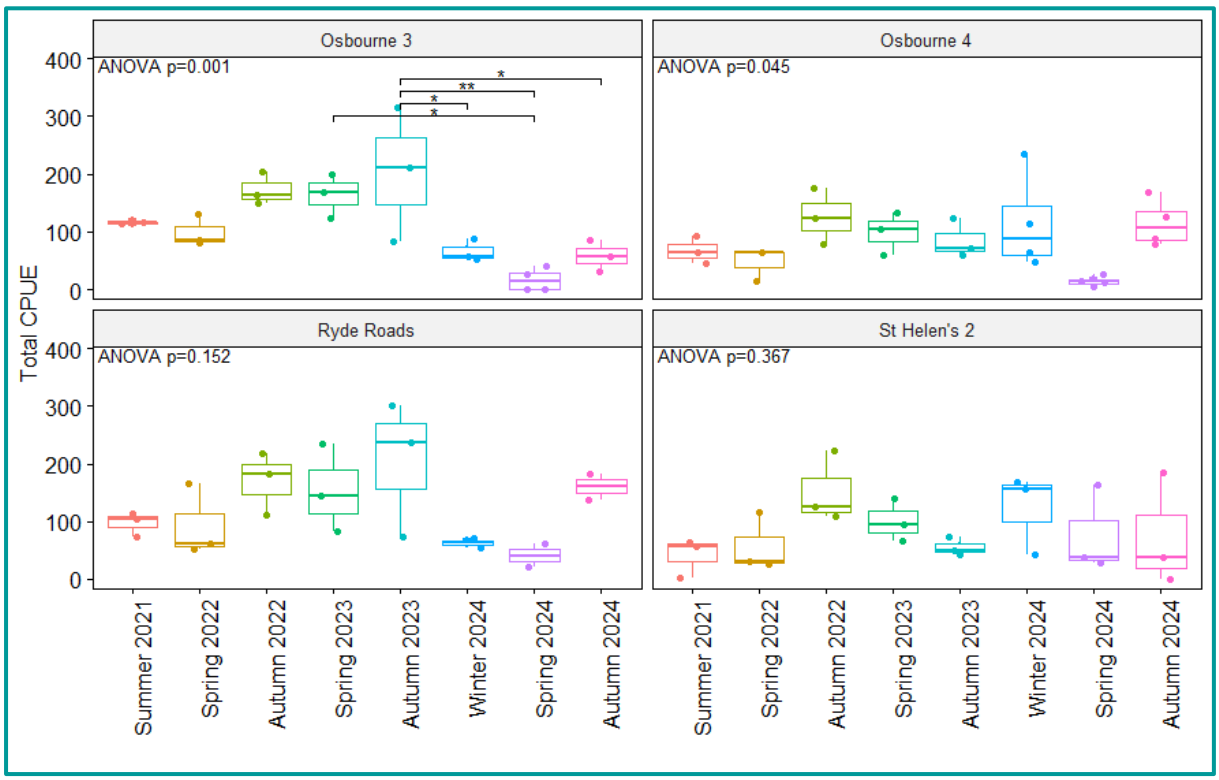

Figure 21: Catch Per Unit Effort (kg/m/hr) of the total population of scallops sampled at sites analysed by ANOVA for all surveys. The brackets display the statistically significant results between 2023 and 2024 surveys from a post-hoc Tukey analysis (* = $p < 0.05$, ** = $p < 0.01$).

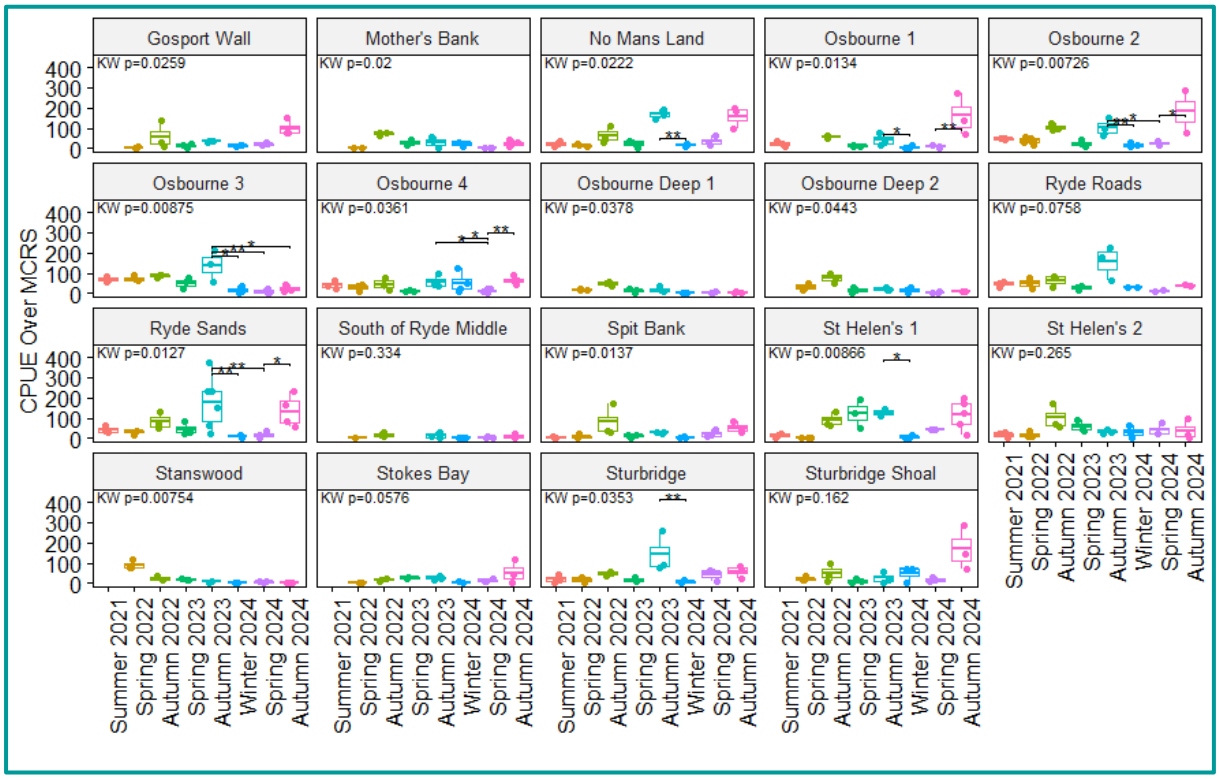

Figure 22: Catch Per Unit Effort (kg/m/hr) of sampled scallops Over the Minimum Conservation Reference Size at sites analysed by a Kruskal-Wallis test for all surveys. The brackets display the statistically significant results between 2023 and 2024 surveys from a post-hoc Dunns analysis (* = $p < 0.05$, ** = $p < 0.01$).

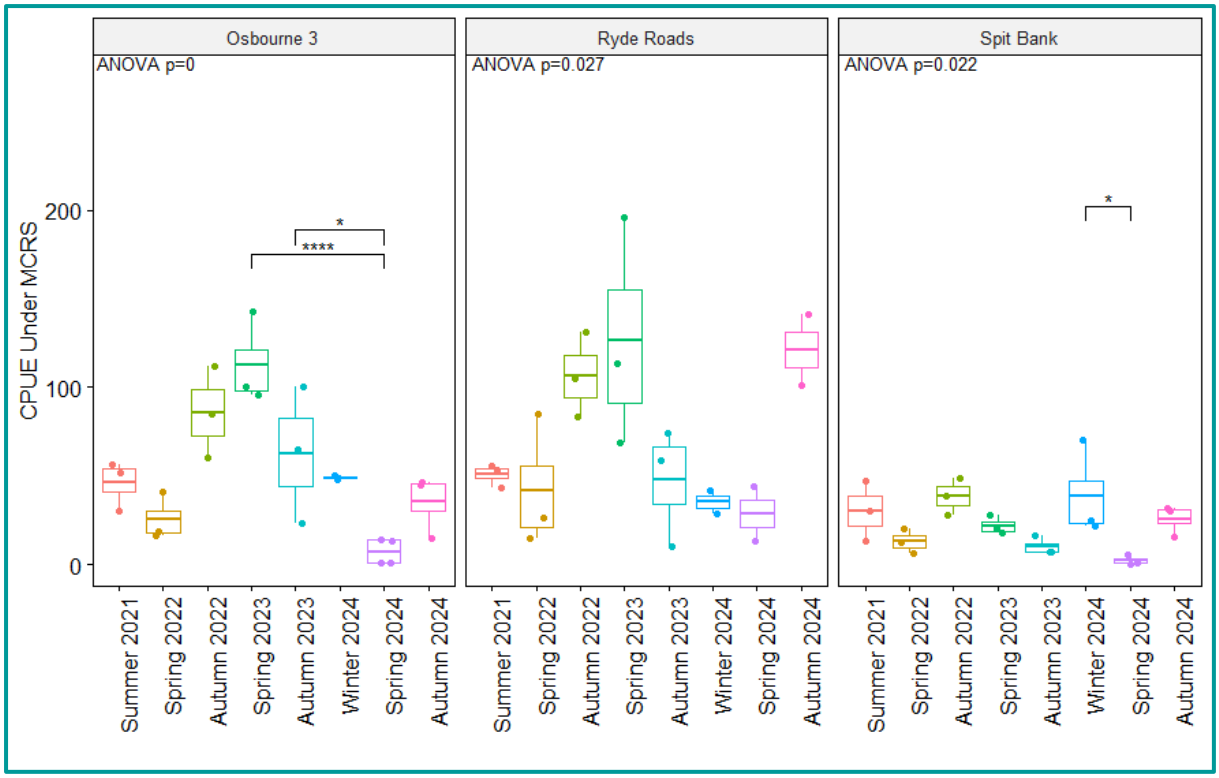

Figure 23: Catch Per Unit Effort (kg/m/hr) of sampled scallops Under the Minimum Conservation Reference Size at sites analysed by a Kruskal-Wallis test for all surveys. The brackets display the statistically significant results between 2023 and 2024 surveys from a post-hoc Dunns analysis (* = $p < 0.05$, ** = $p < 0.01$).

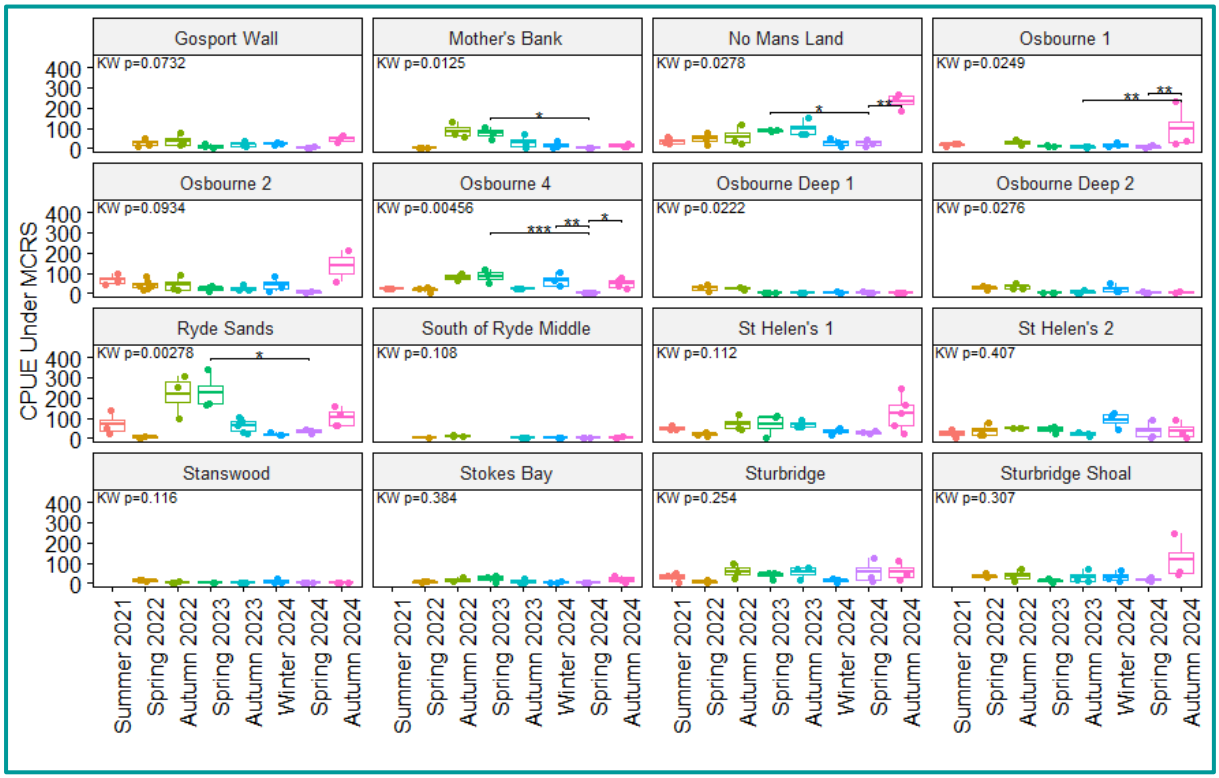

Figure 24: Catch Per Unit Effort (kg/m/hr) of sampled scallops Under the Minimum Conservation Reference Size at sites analysed by an ANOVA for all surveys. The brackets display the results between 2023 and 2024 surveys from a post-hoc Tukey analysis (* = $p < 0.05$, **** = $p < 0.0001$).