



# Solent Oyster Fishery

2018 STOCK SURVEY REPORT

23RD – 31ST JULY 2018

## Introduction

The 2018 stock assessment of the native oyster (*Ostrea edulis*) populations for the Solent fishery was undertaken over 7 days between the 23<sup>rd</sup> and 31<sup>st</sup> of July. The survey was carried out using the chartered fishing vessel 'Angelle Marie' (length 11m, engine 158kW), based in Portsmouth Harbour. This report details the findings of Southern IFCA's 5<sup>th</sup> year of the annual stock assessment which was previously carried out by CEFAS (Palmer and Firmin, 2011) and discontinued in 2011. The survey was taken up again in 2014 to inform management of the native oyster fishery, deemed necessary as a result of a decline in catch rates. This report was produced with the assistance of University of Southampton student Sophie Minns. This year's assessment uses many of the historic sites established by the CEFAS survey as well as the addition of a number of new sites, this was made possible by funding provided by the Blue Marine Foundation. The methodology has also been adapted from the CEFAS surveys to use a ladder dredge, rather than a Baird dredge, as this better represents the equipment used by the fishing industry.

## Methodology

The survey was undertaken using a ladder dredge towed for distances of approximately 100 - 200 metres depending on the ground. The sampling was carried out using grid of stations that had been previously developed on surveys carried out by CEFAS (CEFAS, 2011) as well as sites in Portsmouth and Langstone Harbours, Southampton Water and on new beds in the Solent where industry have identified an interest. These stations were chosen based on advice on fishing practices given by the skipper of the vessel and further consultation with industry. For each tow the start and end locations are recorded, as well as the start and end time to allow for analysis of effort and to calibrate against variations in tow length. The oysters were measured, and the catches of sizeable oysters are weighed. Assessments are also made of the substrate, notable other species and presence of pests/predators.

Post survey, the catch of native oysters was divided into two size groups.

1. 70mm and over: 70mm represents the minimum landing size (MLS) for oysters established in 1992.
2. Below 70mm: All oysters caught below the MLS that would not be legally harvested, including spat, were put in this group.

Although the two size groups are considered for this survey, it is worth noting that the survey is not designed to target small/juvenile oysters as a result of the gear used, some small, just below 70mm are retained and very small oysters attached to substrate, however, due to the mesh size, certain size classes will be excluded.

Once grouped into these size classes, calculations based on the distance (m), speed (m/s) and time (s) for each dredge were applied and used to produce catch per unit of effort data. This year, as oysters over 70mm were weight as well, one of the units provided is the weight of oysters caught per metre of dredge per hour (kg/m/h) as well as the individuals per metre of dredge per hour (over/under 70mm) which feeds into the Solent time series. This is to provide a measure which is comparable to the effort fishermen might put on the stock (kg/m/hour) as well as feed into the previous time series (individuals/m/hour) to start to develop an idea of trends. The data used in this report takes into account both positive and negative hauls (hauls where oysters were and were not caught, where the previous surveys only considered positive hauls. As assessment of positive hauls is provided, mainly as a method

of highlighting the actual extent of oysters across the bed, as in many areas oysters are often found in pockets as opposed to spread across the entire bed.

## Survey Area

Figure 1 depicts the areas sampled during the survey. Coverage was increased significantly on previous surveys, made possible by the use of only one dredge and additional funding provided by the Blue Marine foundation. These new areas were based on historic activity and consultation with industry.

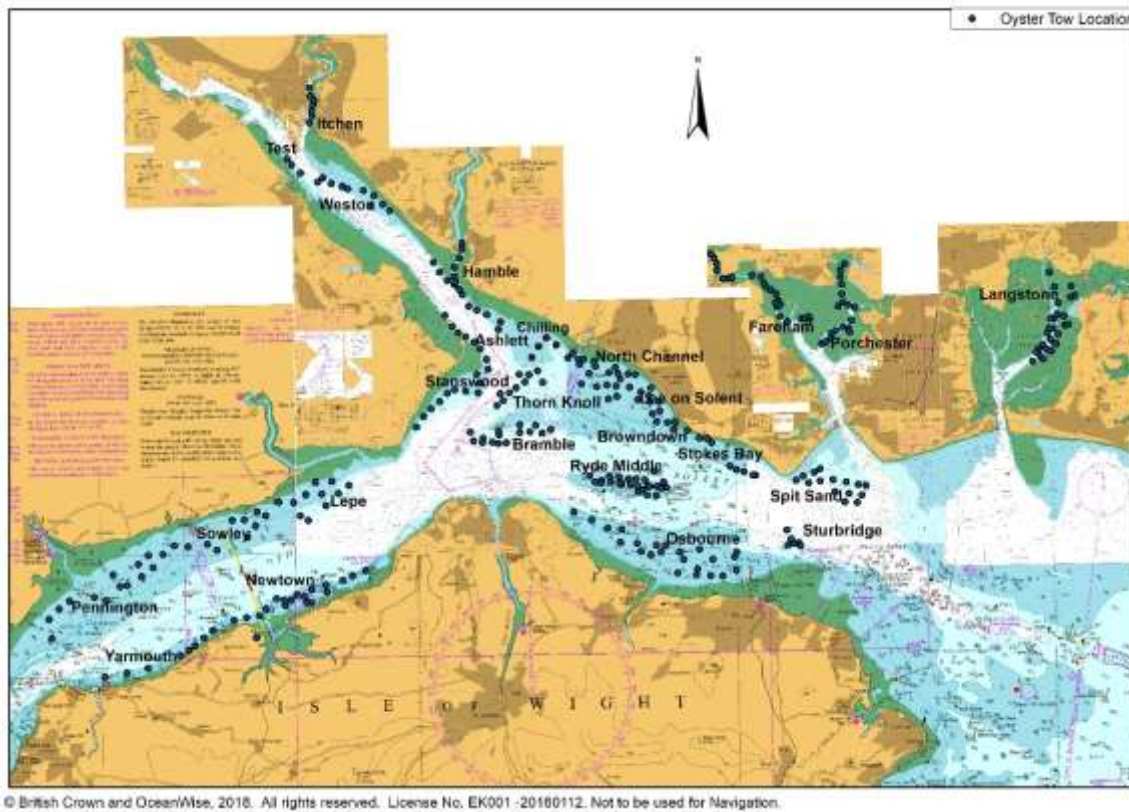


Figure 1 – Locations of tows across the Solent undertaken in the 2018 Solent oyster stock survey.

## Results

Figure 2 shows the CPUE (kg/m/hour) for oysters for each tow. This highlights the current nature of the oyster populations, being found on parts of the beds, and rarely across the entire bed. The total number of tows for the survey was 330. The number of tows in each bed varied based on the size of the bed and local conditions.

The survey achieved tows at all the planned beds, but were limited at some survey sites in Ashlett, Osborne Bay, Calshot Spit, Lepe, Sowley and Pennington, by the presence of weed limiting the effectiveness of the dredge.

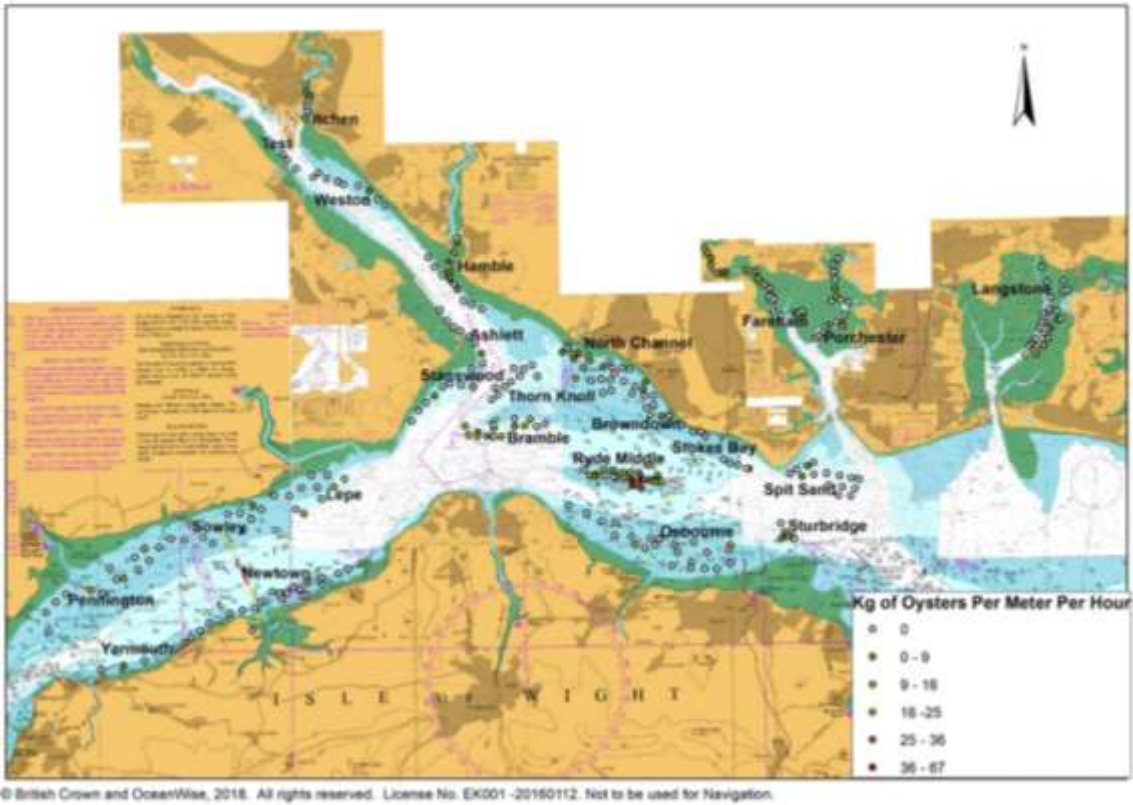


Figure 2 – Kilograms of oysters per meter of dredge per hour of towing across each bed.

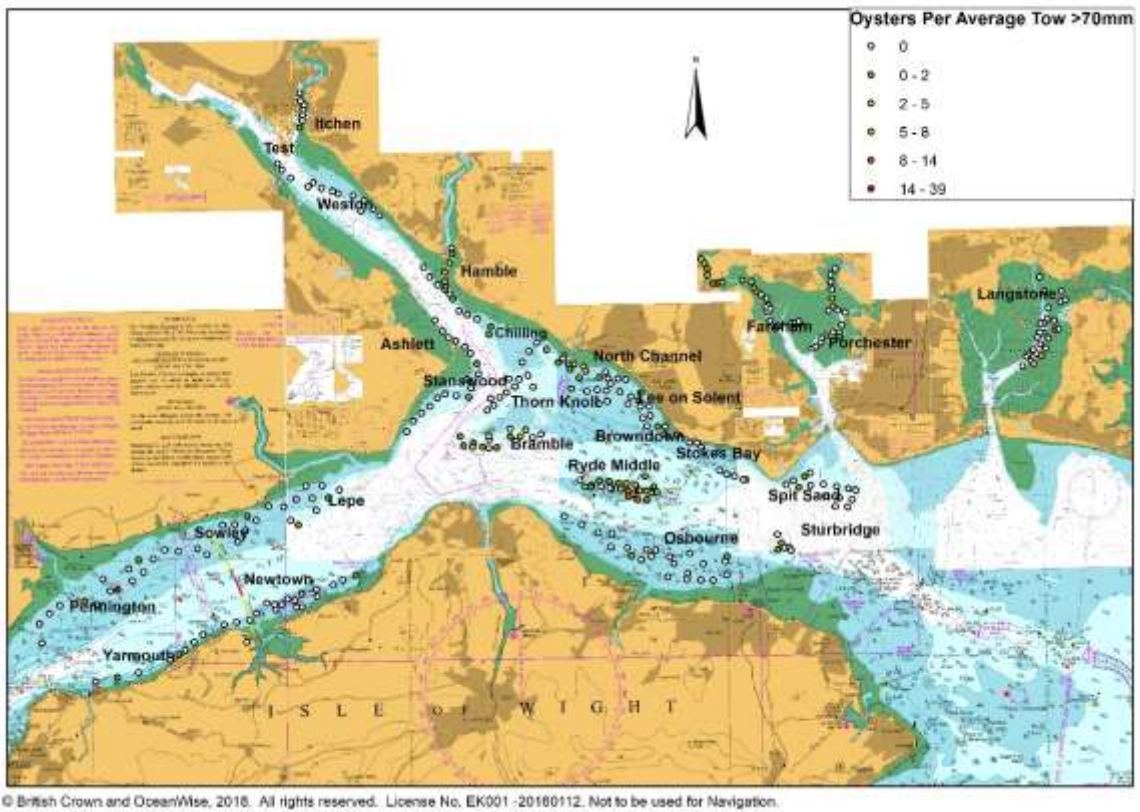


Figure 3 – Oysters above the minimum landing size (MLS) of 70 mm per average tow across each bed.

The tables in data appendix I highlight the CPUE for each bed averaged over the 2018 survey, and the number of oysters per metre of dredge per hour. For ease of consideration, the results have been split into the Harbours, Eastern Solent, Western Solent and Southampton Water. Data appendix 2 highlights the time series of data with results from surveys between 2014 and 2018. The measure used here is individuals per metre of dredge per hour (split into over and under 70mm).

### ***Eastern Solent***

The Eastern Solent contains the most sites that were surveyed for this report. Its sites have historically contained more oysters than those in the Western Solent. This year additional stations were added to provide better coverage of all sites. An additional site was added at Stokes Bay.

As in previous years, Ryde Middle is shown to produce the highest returns with 81.5% of tows being positive and an average weight of oyster per metre of dredge per hour of 18.4 Kg/m/hr. The Eastern end of Ryde Middle showed higher catch rates than the Western end, but the high percentage of positive tows shows that oysters are found across the bed. Compared to previous years, 127.7 individuals per metre of dredge per hour represents the highest catch rate observed at Ryde middle. Elsewhere, other occasional high catch rates were found at North Channel and Bramble, but the higher catches were not consistent across the bed and they averaged out to 6.68 kg/m/hour and 7.01 kg/m/hour.

A low number of oysters were found at Sturbridge, Osborne, Lee on Solent and Browdown with 50% or less positive tows and less than 3 Kg/m/hr. This showed little change on previous years for Osborne, Lee on Solent and Browdown, but a significant decrease on last year at Sturbridge where the catch rate was far higher estimating 121.6 individuals larger than 70mm per metre of dredge per hour, compared to this years 8.4.

### ***Western Solent***

The Western Solent has been surveyed in the past by CEFAS, but during the oyster surveys since 2010 the number of stations had been reduced as a result of low catch returns. This year's survey increased the number of stations, surveying Yarmouth and Pennington in more detail as well as adding extra stations at Sowley, Lepe and Newtown. Also Stanswood has been surveyed the past two years.

For all Western sites, the catch rates were considerably lower than the high rates in Ryde Middle, Bramble and North Channel in the Eastern Solent. The highest oyster weight per metre of dredge per hour was observed at Yarmouth with 3.1 Kg/m/hr with 38% of positive tows. The other Western sites had a majority of negative tows and generally poor catches when oysters were sampled. Some of this could be attributed to the high levels of weed, particularly on the north shore at Pennington, Sowley and Lepe affecting the dredge, but the values are fairly typical of what has been found previously with only occasional catches.

### ***The Harbours***

The sites surveyed for the previous years in Portsmouth and Langstone were revisited. Also included were extra tows in Fareham, Portchester and Langstone, particularly focusing on some of the shallower parts of these areas, following feedback from industry.

Portsmouth Harbour showed similar trends to previous years where Fareham showed higher catches of oysters than Portchester, with an estimated 9.17 kg/oysters/m/hour and

approximately 62.5 oysters per metre of dredge per hour over 70mm. These were the highest figures in the survey outside of Ryde Middle. Comparatively, the weighted CPUE is low when compared to the estimated number of individuals per bed seen elsewhere, this is due to the oysters found at Fareham weighing much less compared to those in the Solent. The fishery at Fareham is more focused than the survey extent, and the majority of the catch and fishery tends to lie in the Northern half of the sample sites. If only the positive results were considered (57.9% of the tows), the catch rate increases to 15.8kg/m/hour. Fareham also showed signs of future generations of oysters present, with a range in size classes indicating reproductive success in this area. Portchester had low catch rates as in previous years, averaging 2.76 kg/m/hour.

Catch rates in Langstone remained low, as in previous years, with an average kg/m/hour of 1.0. New sites were surveyed in Langstone Harbour, which did in places have higher catch rates, but as a result of generally low catch rates for the traditional sites, this had little impact on the bed average.

### ***Southampton Water***

Southampton Water was introduced to the time series in 2017. As in previous years, much of the areas showed low catches, with Ashlett and the Test returning no oysters. Calshot Spit, the Itchen and Weston showed very limited numbers of oysters, all returning below 2.7kg/m/hour. The Hamble returned higher catch rates, particularly in the stations within the mouth of the Hamble, however this is focused around a few tows, and when averaged across the site returns 4.26 kg/m/hour. This is consistent with the previous year's survey, which again showed pockets of higher density oysters around the inner part of the Hamble, with lower catch rates outside, averaging out to a lower amount, but higher than elsewhere in Southampton Water.

## **Summary**

Oyster levels across the Solent remained fairly consistent for the duration of the time series, this year saw largely similar trends to previously, where Ryde Middle had the highest catch rates followed by Fareham. Fareham showed signs of multiple age classes indicating reproductive success. Elsewhere, populations remained fairly stable (with the exception of Sturbridge), with pockets of high density of oysters found at the Hamble and North Channel, but fairly low levels when considered across a site. Elsewhere, populations remained at a low level, broadly consistent with previous years.

## References

Gravestock, V., James, F., and Goulden, M. 2014. Solent Native Oyster (*Ostrea edulis*) Restoration: Literature Review and Feasibility Study. MacAlister, Elliott & Partners.

Kamphausen, L.M. 2012. The reproductive processes of a wild population of the European flat oyster *Ostrea edulis* in the Solent, UK.

Palmer, D. and C. Firmin (2011). Solent Regulated Fishery Oyster Stock Survey 5 - 8 July 2011. Technical report. Centre for Environment, Fisheries and Aquaculture Science, Lowestoft Laboratory. 19 p.

## Data Appendix I – 2018 survey results

*Table 1 - Percentage of positive tows (where oysters were found) for each site surveyed.*

Site	Number of Tows	Positive Tows (%)
Ashlett	4	0.00
Bomb Ketch	4	75.0
Bramble	15	60.0
Browndown	10	10.0
Calshot spit	4	25.0
Chilling	6	50
Fareham	19	57.9
Hamble	16	37.5
Itchen	9	44.4
Langstone	26	15.4
Lee on Solent	14	21.4
Lepe	12	8.3
Newtown	19	15.8
North Channel	18	44.4
Osborne	23	13.0
Pennington	13	15.4
Portchester	18	27.8
Ryde Middle	27	81.5
Sowley	12	25.0
Spit sand	15	20.0
Stanswood	10	20.0
Stokes Bay	5	0.0
Sturbridge	6	50.0
Test	1	0.0
Thorn Knoll	5	0.0
Weston	11	27.3
Yarmouth	8	37.5



<i>Table 2 – Catch per unit effort data averaged across the beds for all tows.</i>				
<b>Area</b>	Site	Average No. of Oysters per metre dredge per hour $\geq 70\text{mm}$	Average No. of Oysters per metre dredge per hour $< 70\text{mm}$	Average Kg oysters/m/hour
<b>Eastern Solent</b>	Bramble	27.1	5.3	7.0
	Browndown	5.4	0.0	0.8
	Chilling	17.4	6.7	3.8
	Lee on Solent	4.9	0.00	1.4
	North Channel	35.6	0.7	6.7
	Osborne	5.6	1.6	1.3
	Ryde Middle	127.7	10.8	18.4
	Spit sand	4.9	2.0	0.6
	Stokes Bay	0.0	0.0	0.0
	Sturbridge	8.4	14.6	2.6
	Thorn Knoll	0.0	0.0	0.0
<b>Western Solent</b>	Lepe	4.5	0.0	1.9
	Newtown	6.5	1.2	1.8
	Pennington	3.2	0.0	1.2
	Sowley	7.1	0.0	2.7
	Stanswood	3.5	6.7	2.8
	Yarmouth	8.1	5.3	3.1
<b>The Harbours</b>	Bomb Ketch	24.7	27.9	4.2
	Fareham	62.5	52.1	9.2
	Portchester	15.4	10.5	2.8
	Langstone	7.5	4.6	1.0
<b>Southampton Water</b>	Calshot spit	8.3	8.3	1.7
	Hamble	24.5	2.1	4.3
	Itchen	8.4	30.3	2.7
	Ashlett	0.0	0.00	0.0
	Test	0.0	0.0	0.0
	Weston	0.0	16.8	0.0

**Table 3 - Catch per unit effort data averaged across the beds for all tows where oysters were found.**

Area	Site	Average No. of Oysters per metre dredge per hour $\geq 70\text{mm}$ for positive tows	Average No. of Oysters per metre dredge per hour $< 70\text{mm}$ for positive tows	Average Kg oysters/m/hour for positive tows
<b>Eastern Solent</b>	Bramble	45.1	8.9	11.7
	Browndown	53.7	0.0	7.5
	Chilling	34.8	13.5	7.6
	Lee on Solent	22.9	0.0	6.6
	North Channel	80.1	1.6	15.0
	Osborne	43.2	12.1	9.6
	Ryde Middle	156.7	13.3	22.6
	Spit sand	24.9	10.0	3.2
	Sturbridge	16.8	29.3	5.1
<b>Western Solent</b>	Lepe	54.1	0.0	23.0
	Newtown	40.9	7.7	11.5
	Pennington	21.3	0.0	7.5
	Sowley	28.5	0.0	10.9
	Stanswood	17.5	33.6	13.9
	Yarmouth	21.7	14.1	8.4
<b>The Harbours</b>	Bomb Ketch	32.9	37.2	5.6
	Fareham	108.0	89.9	15.8
	Langstone	48.8	30.1	6.5
	Portchester	55.6	37.9	10.0
<b>Southampton Water</b>	Calshot spit	33.3	33.3	6.7
	Hamble	65.2	5.5	11.4
	Itchen	19.0	68.1	6.0
	Weston	0.0	61.6	1.3
	Test	0.0	0.0	0.0

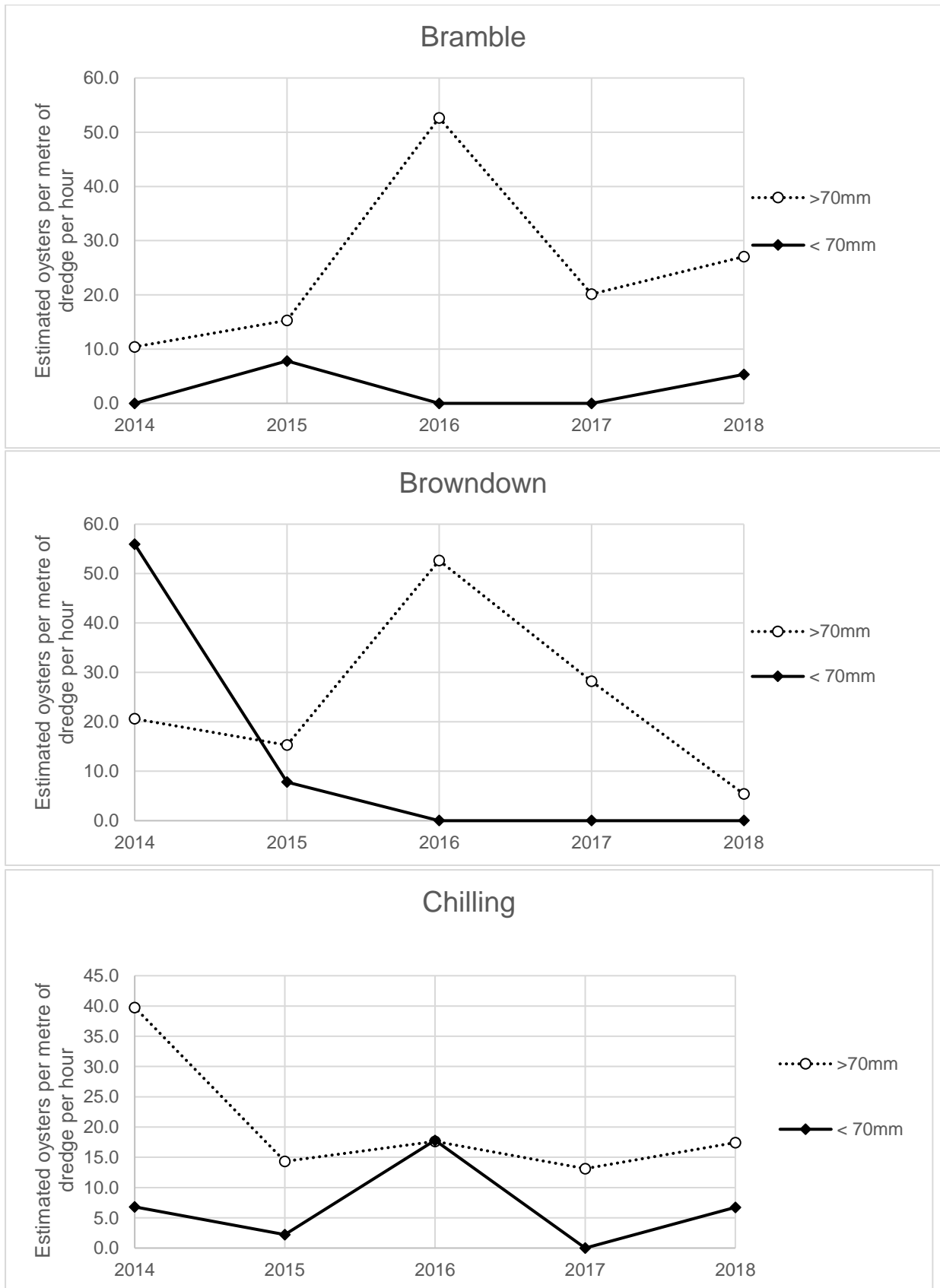
**Data Appendix II – Time Series Data 2014 - 2018**

<b>Table 4 – Time series data from Solent Survey 2014 - 2018</b>			
<b>Eastern Solent</b>			
<b>Site</b>	<b>Year</b>	<b>Average of No Oyster per metre dredge per hour &gt;70mm</b>	<b>Average of No Oyster per metre dredge per hour &lt;70mm</b>
Bramble Bank	2018	27.1	5.3
Bramble Bank	2017	20.1	0.0
Bramble Bank	2016	52.6	0.0
Bramble Bank	2015	15.3	7.8
Bramble Bank	2014	10.4	0.0
Browndown	2018	5.4	0.0
Browndown	2017	28.2	0.0
Browndown	2016	52.6	0.0
Browndown	2015	15.3	7.8
Browndown	2014	20.6	55.9
Chilling	2018	17.4	6.7
Chilling	2017	13.1	0.0
Chilling	2016	17.6	17.8
Chilling	2015	14.3	2.2
Chilling	2014	39.8	6.8
Lee-on-the-Solent	2018	4.9	0.0
Lee-on-the-Solent	2017	8.9	0.0
Lee-on-the-Solent	2016	11.0	0.0
Lee-on-the-Solent	2015	74.6	0.0
Lee-on-the-Solent	2014	20.3	0.0
North Channel	2018	35.6	0.7
North Channel	2017	19.8	4.3
North Channel	2016	85.1	0.0
North Channel	2015	45.9	5.7
North Channel	2014	35.0	31.9
Osborne	2018	5.6	1.6
Osborne	2017	2.9	0.0
Osborne	2016	9.2	0.0
Osborne	2014	109.6	34.6
Ryde Middle	2018	127.7	10.8
Ryde Middle	2017	68.5	16.9
Ryde Middle	2016	104.9	5.0
Ryde Middle	2015	66.7	19.9
Ryde Middle	2014	85.9	19.1

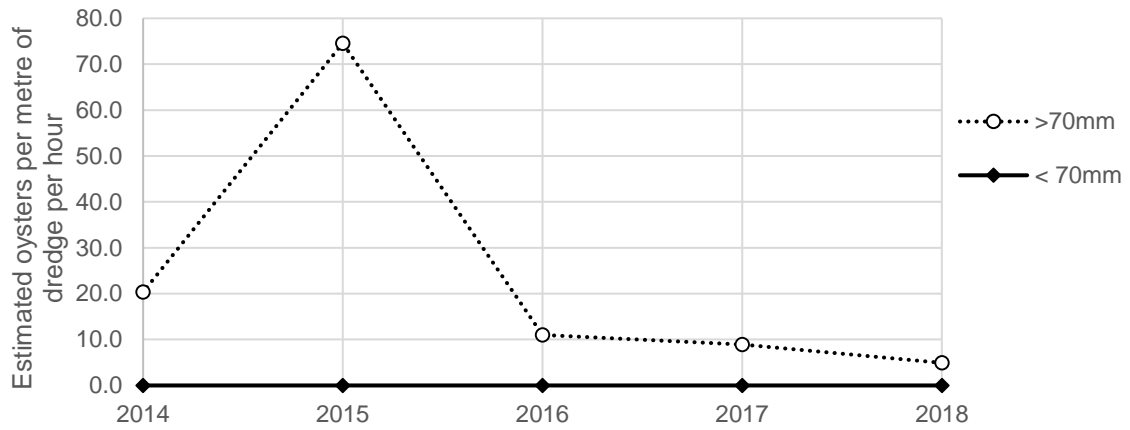
Spit Sand	2018	5.0	2.0
Spit Sand	2017	4.4	0.0
Spit Sand	2016	3.2	0.0
Spit Sand	2015	4.2	4.2
Spit Sand	2014	14.4	0.0
Stokes Bay	2018	0.0	0.0
Sturbridge	2018	8.4	14.6
Sturbridge	2017	121.6	28.8
Thorn Knoll	2018	0.0	0.0
Thorn Knoll	2017	1.8	0.0
Thorn Knoll	2016	0.0	0.0
Thorn Knoll	2015	8.5	0.0
Thorn Knoll	2014	0.0	0.0
<b>The Harbours</b>			
Site	Year	Average of No Oyster per metre dredge per hour >70mm	Average of No Oyster per metre dredge per hour <70mm
Bomb Ketch	2018	24.7	27.9
Bomb Ketch	2017	70.7	27.3
Fareham	2018	62.5	52.1
Fareham	2017	24.5	4.0
Fareham	2016	25.0	59.4
Fareham	2015	21.1	26.9
Fareham	2014	77.9	50.9
Portchester	2018	15.4	10.5
Portchester	2017	23.1	4.6
Portchester	2016	21.8	0.0
Portchester	2015	4.9	0.0
Portchester	2014	22.1	16.2
Langstone	2018	7.5	4.6
Langstone	2017	9.6	2.2
Langstone	2016	11.2	12.0
Langstone	2015	12.5	0.0
Langstone	2014	10.7	16.8
<b>The Western Solent</b>			
Site	Year	Average of No Oyster per metre dredge per hour >70mm	Average of No Oyster per metre dredge per hour <70mm
Lepe	2018	4.5	0.0
Lepe	2017	4.2	0.0
Lepe	2016	16.8	0.0
Lepe	2015	14.9	0.0
Lepe	2014	48.2	0.0
Newtown	2018	6.5	1.2
Newtown	2017	18.1	1.6
Newtown	2016	0.0	0.0

Newtown	2015	9.8	0.0
Newtown	2014	51.4	7.3
Sowley	2018	7.1	0.0
Sowley	2017	0.0	0.0
Sowley	2016	0.0	0.0
Sowley	2014	13.0	0.0
Pennington	2018	15.4	0.0
Pennington	2017	0.0	4.1
Yarmouth	2018	8.1	5.3
Yarmouth	2017	6.8	0.0
<b>Southampton Water</b>			
<b>Site</b>	<b>Year</b>	<b>Average of No Oyster per metre dredge per hour &gt;70mm</b>	<b>Average of No Oyster per metre dredge per hour &lt;70mm</b>
Ashlett	2018	0.0	0.0
Calshot spit	2018	8.3	8.3
Calshot spit	2017	29.4	11.5
Hamble	2018	24.4	2.1
Hamble	2017	30.7	3.5
The Itchen	2018	8.4	30.3
The Itchen	2017	15.5	4.0
Stanswood	2018	3.5	6.7
Stanswood	2017	4.4	0.0
Test	2018	0.0	0.0
Weston	2018	0.0	16.8

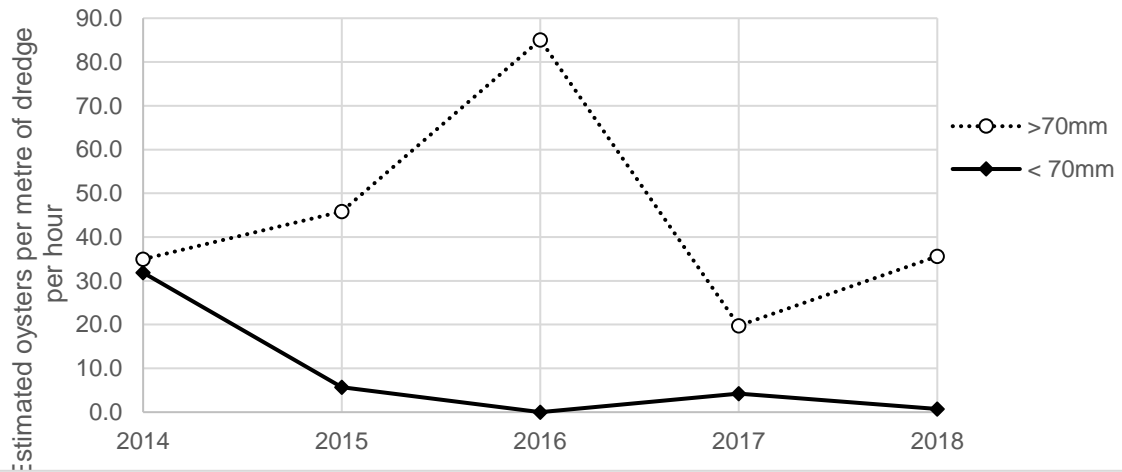
**Figures 1-9** – Eastern Solent CPUE data, averaged across each bed per year showing Estimated oysters per metre of dredge per hour split into > and < 70mm.



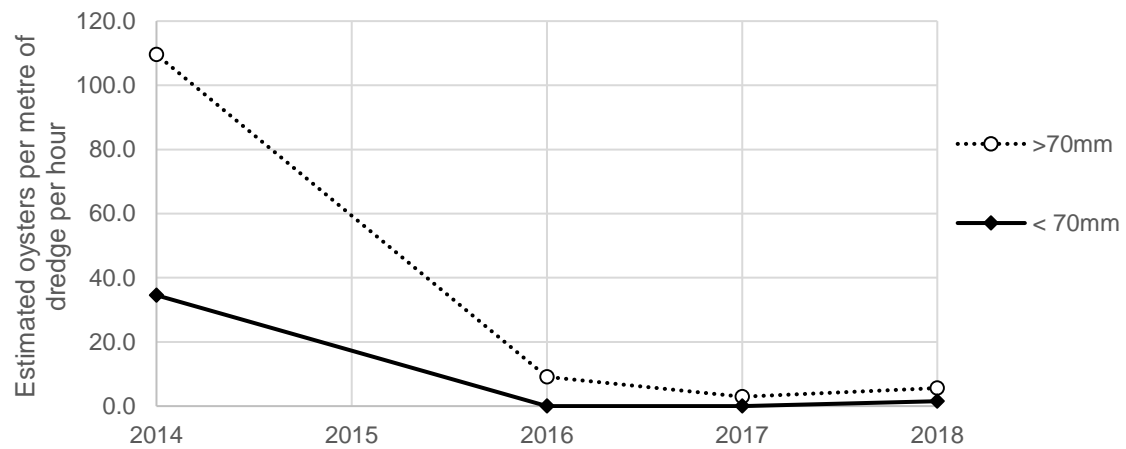
### Lee-on-the-Solent

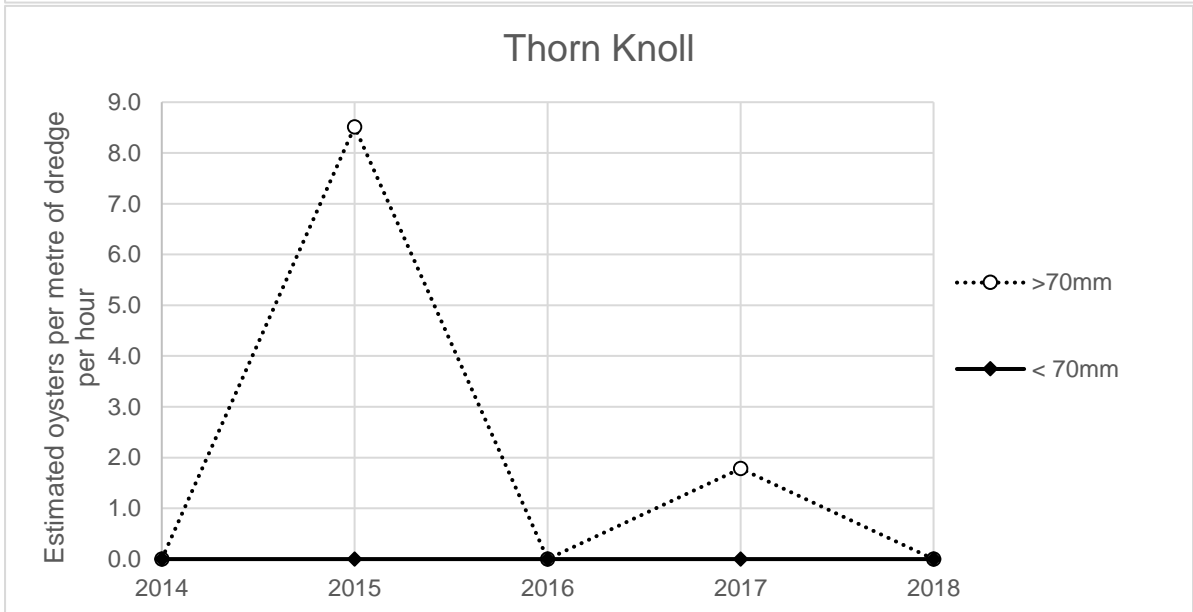
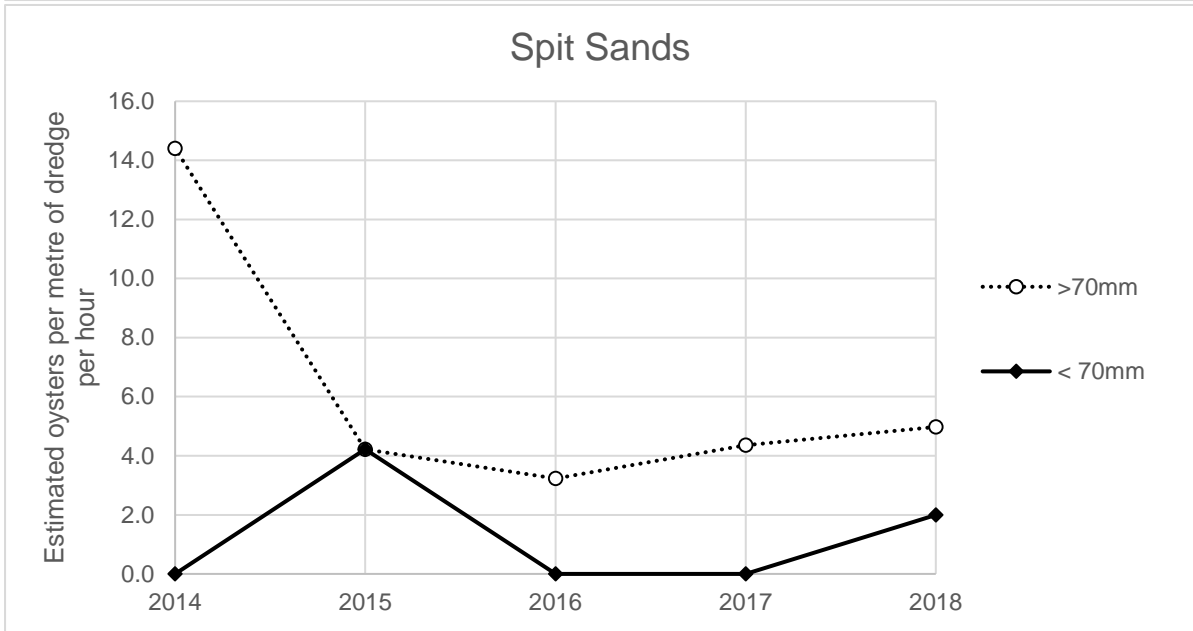
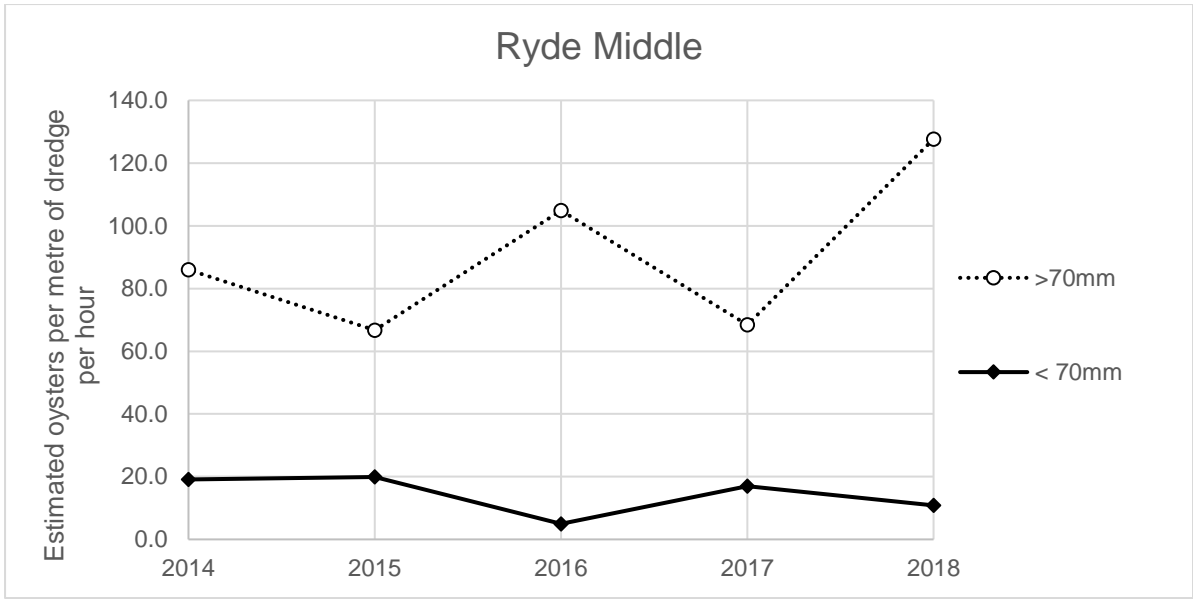


### North Channel



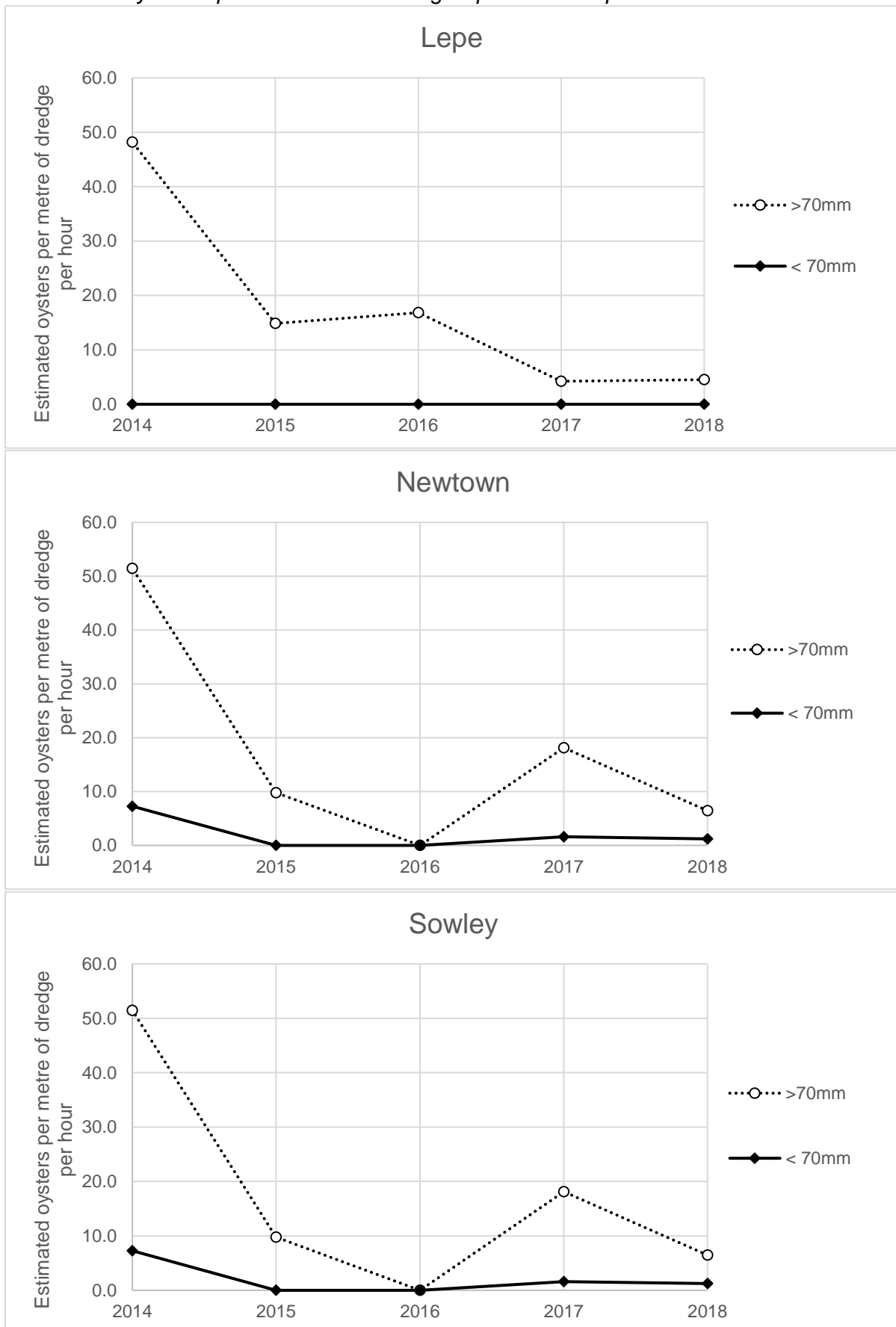
### Osborne







**Figures 10-12** – Western Solent CPUE data, averaged across each bed per year showing Estimated oysters per metre of dredge per hour split into > and < 70mm.



**Figure 13-15** – Portsmouth and Langstone Harbour CPUE data, averaged across each bed per year showing Estimated oysters per metre of dredge per hour split into > and < 70mm.

