



Solent Oyster Fishery

2017 STOCK REPORT

17TH – 24TH JULY 2017

Introduction

The 2017 stock assessment of the native oyster population for the Solent fishery was undertaken over 5 days between the 17th and 24th of July. The survey was carried out using the chartered fishing vessel, 'Angelle Marie' (length 11m, engine 158kW) based in Portsmouth Harbour. The survey was undertaken by Southern IFCA officers with the assistance of students from the University of Southampton as well as researchers from the Blue Marine Solent Oyster Restoration Project, the Hampshire Wildlife Trust, and Langstone Harbour Board. This report details the findings of Southern IFCA's fourth year of the annual stock assessment which was previously carried out by CEFAS and discontinued in 2011. 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. 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. In addition to this, the data in this report will be presented as catch per unit effort as well as oyster density to provide a measure relatable to what catch rates might look like as well as what the density of oyster on the ground might look like so consideration can be made towards the implications for stock recovery.

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 a standard fixed grid of stations that had been previously developed on surveys carried out by CEFAS and previous Southern IFCA surveys, with the addition of several new sites including the inside and outside of the Hamble river, the Itchen river, Yarmouth, Pennington, more sites in Portsmouth and Langstone Harbour and the Sturbridge shoal. These stations were chosen based on advice on fishing practices given by the skipper of the vessel, Southern IFCA sightings and consultation with industry. Compared to the previous Southern IFCA surveys, this year there were also more sites in the Western Solent.

Post survey the catch of 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.

This was also completed for historic data, 2014-2016, to enable comparison between years.

Once grouped into these size classes, calculations based on the distance (m), speed (m/s) and time (s) for each dredge was calculated and used to produce catch per unit of effort data and an estimate of oyster density. The units used for this were oysters per metre of dredge per hour (Oysters/m/h) and oysters per m² occurring on the seabed. This is to provide a measure which is comparable to the effort fishermen might put on the stock and the estimated densities of oysters on the ground. The data used in this report takes into account both positive and negative hauls, where the previous surveys only considered positive hauls, although the oyster density is provided both for an average of the entire bed and as an average of only the hauls finding oysters so as to provide an understanding of the status of the bed and the likely density in the pockets in which they are found. The assessment of density on the ground takes into account an estimation of dredge efficiency, varying reports suggest that dredge efficiency could be between 3-32%. Due to the time of year the survey

is undertaken and the low returns, the efficiency has been estimated at the lower end of the scale at 5% to ensure that oyster density on the ground is not underestimated.

Tow Locations

Figure 1 depicts the tow locations for the survey. Coverage is increased significantly on previous surveys made possible by the use of only one dredge. The number of tows within Southampton Water was limited slightly on planned, but some level of coverage was achieved. Similarly bad weather when surveying Lepe meant that stations had to be slightly reduced.

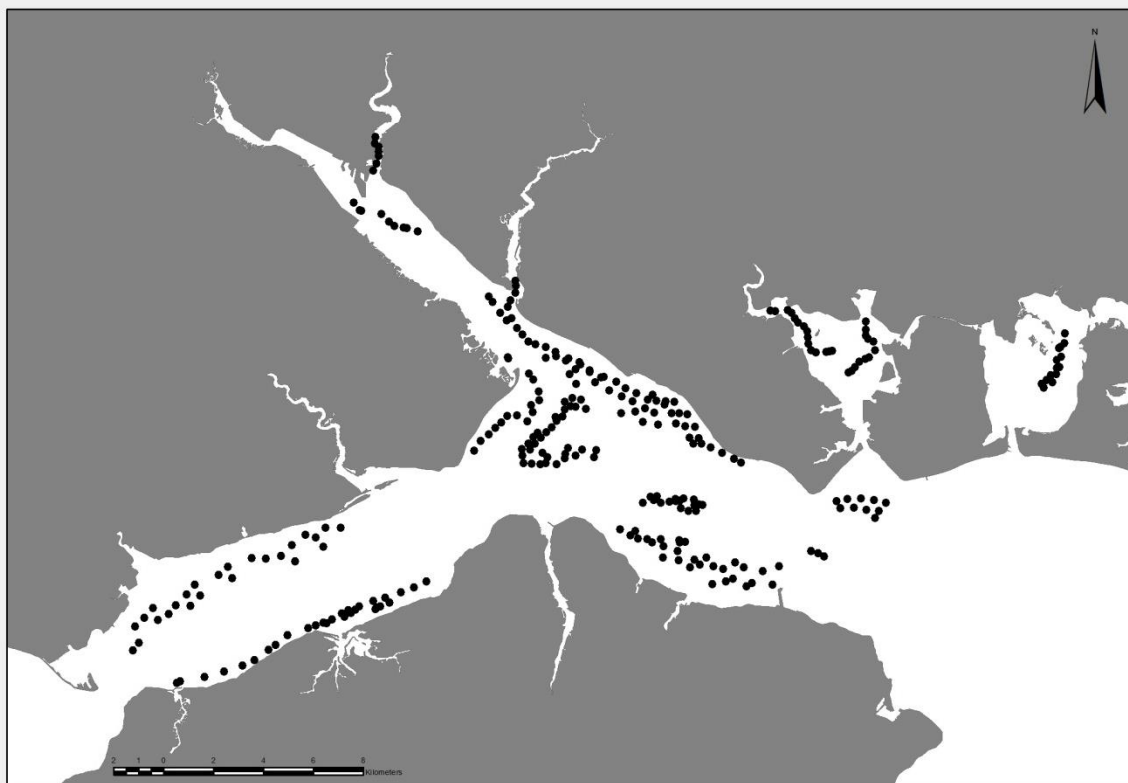


Figure 1 – Locations of tows across the Solent undertaken in the 2017 Solent oyster stock survey

Results

Figure 2 highlights the oysters found based on an average tow length across the survey. This highlights the current nature of the oyster populations, being found on parts of the beds, and rarely across the entire bed.

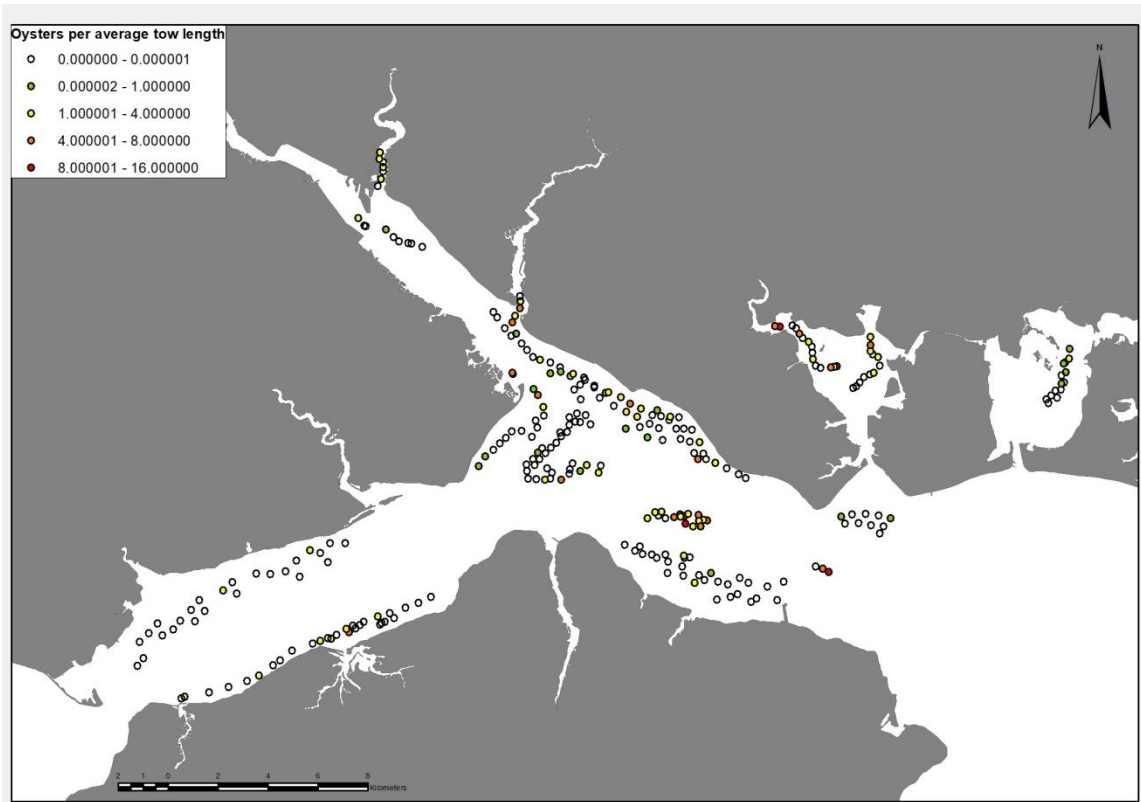


Figure 2 - Oysters per average tow length across each bed

The tables in the Final data appendices give a log of oysters caught, per metre of dredge per hour of fishing caught at each station between 2014-2017 as well as oyster densities both across an entire bed and averaged across the positive tows. For ease of consideration they have been split into the Harbours, Eastern Solent, Western Solent and Southampton Water.

Also included in data Appendix II are charts of the oyster densities for where data exists beyond three years.

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.

When assessing the sites with time series, as in previous years, Ryde Middle is shown to produce the highest returns with an average oyster per metre of dredge per hour of 72.03 in 2017. The only instance across the time series where this has been higher outside of Ryde Middle has been Osbourne Bay in 2014, but this has not been observed in 2015-17 perhaps highlighting small pockets of oysters. Sturbridge was surveyed for the first time in 2017 and highlighted the highest density of oysters caught with 104.24 oysters over 70mm caught per metre of dredge per hour, although it is difficult to judge this against a typical catch based on the lack of previous data.

Considering the oyster density per m² all sites fell well below 1 per m² with the highest density across a bed being the 0.56 observed at Sturbridge shoal. The oyster density per positive haul gives an indication of the density they are found in when they occur, ignoring the hauls in which they are completely absent. With this measure Sturbridge is the highest density again with 0.84 per m² however following this Chilling, Browndown and to a lesser

extent Lee on Solent, Bramble and North Channel show increases from the densities across a bed. This is likely a reflection of a small number of dredges with a higher number of oysters and the rest of the bed not returning oysters. This trend can be observed in the heatmap in Figure 2 showing individual tows with more oysters.

Western Solent

The Western Solent has been surveyed in the past by CEFAS, and to a lesser extent Southern IFCA, but during the oyster surveys since 2010 the number of stations had been reduced as a result of low catch returns. This years survey increased the number of stations, surveying Yarmouth and Pennington again as well as extra stations at Sowley, Lepe and Newtown. Also Stanswood has been surveyed the past two years.

For all sites with a previous time series, as in the past, the catch rates are typically lower than the higher rates seen in certain beds within the Eastern Solent. The highest catch per metre of dredge per hour was observed at Newtown with an average of 15.55 oysters over 70mm. When considering the time series, 2014 showed higher returns than other years with Lepe showing the highest of 113.18 oysters over 70mm per metre of dredge per hour. Considering the new years data, Stanswood showed low returns in 2017, but slightly higher in 2016. The other new bed, Pennington shows returns of no oysters per metre of dredge per hour over 70mm, but did show a low amount of smaller oysters below 70mm.

Considering the densities, these were very low across all the beds, with averages in 2017 of less than 0.1 oysters per m² at all sites. These are understandably higher, when only considering the positive hauls indicating, as elsewhere, a number of hauls with oysters, but most of the bed surveyed showing no oysters.

The Harbours

The sites surveyed for the previous years in Portsmouth and Langstone were revisited. Also included were extra sites in Fareham, Bomb Ketch lake and additional survey points in the Portchester Channel and Langstone Main channel.

The catch data for the Harbours shows a degree of variation across the beds surveyed. Langstone Harbour, for the period of the time series, has shown fairly stable returns with a catch per unit effort of oysters per metre of dredge per hour ranging from 9.19 - 10.68 across the four years surveyed for oysters over 70mm. Considering the new site, Bomb Ketch, a higher number of oysters were found here than at the other sites with a catch of oysters over 70mm per hour per metre of dredge of 69.75, higher than that seen in the harbour time series. Encouragingly, sites in Portsmouth seem to have a consistently higher number of oysters below 70mm, particularly in Fareham, where, unlike sites across the four year time series (excluding Ryde Middle) oysters below 70mm have been observed indicating some level of recruitment.

When looking at the density of oysters on the ground in the harbours, those surveyed in 2017 show that Bomb Ketch had the highest returns across a bed with an average of 0.4 oysters per m². This is comparable to the oyster density found in the positive hauls at Fareham (0.41 per m²). Likely a result of the smaller survey area with returns at all stations, whereas the densities observed at Fareham are focused on smaller areas. Regardless of this, all sites show low densities.

Southampton Water

For Southampton water all sites were new to the time series in 2016, with only one previous survey undertaken in October of 2016. This makes comparison slightly difficult due to the seasonal differences, particularly issues around weed levels and the implications on dredge efficiency.

The highest returns in 2017 were observed in the Inner Hamble showing a catch per unit effort of 66.75 oysters per metre of dredge per hour. Lower levels of oyster under 70mm were observed elsewhere, but some level of smaller oyster were observed at the Inner Hamble, Outer Hamble, Southampton Water West, the Itchen and Calshot.

Densities were typically low, but highest at the inner Hamble showing densities of 0.26 per m^2 over the entire bed and 0.32 over the positive hauls. Even at these levels, indications suggest a low oyster population.

Conclusions

As found with previous surveys, although there are the occasional tows with higher density oysters, particularly in Ryde Middle, Fareham, Lee on Solent, Browndown, Chilling and Bramble Bank, and in the new sites Sturbridge, Bomb Ketch and the Inner Hamble there were certain areas where there are higher densities of oysters present as indicated in the heat map. However when considered across the entire beds, the oyster densities were low per m^2 . Even considering these parts of beds where oysters are present all densities were below 1 oyster per m^2 with Sturbridge and Chilling showing slightly higher 0.84 and 0.5 oysters per m^2 over the positive dredges, indicating either smaller beds (Sturbridge) or pockets of higher density tows (Chilling). In all instances these densities could be considered low and concerning considering the native oyster is a broadcast spawner requiring some degree of proximity to encourage successful reproduction.

Also concerning is the low levels of smaller oysters suggesting a lack of recruitment of future year classes, although this is difficult to completely classify based on the mesh size likely to exclude some of the smaller oysters. However it would be expected that some within the smaller age classes would be retained. An exception to this could possibly be Ryde middle and parts of Portsmouth Harbour where higher level of smaller oysters have been observed throughout the four years of monitoring, indicating some level of recruitment, but these levels are still fairly low. A lack of a significant future year class would indicate, based on the life span of the native oyster that significant recovery over the next five years is unlikely, especially considering the low level of brood stock on the ground indicated by the density estimations.

This new methodology for many of the sites is in its first year, and at most only goes back to 2014. As this time series grows it will become more valuable as a method for determining the current stock level but also of tracking any stock recovery. The more years that are added to it the more value the survey will have as a time series.

Data Appendix I

Annex I - Data tables from the Solent Native oyster survey 2017, including survey data from 2014 - 2016 also using the Solent ladder dredge.

Eastern Solent					
Year	Shellfish Bed	Average Oysters per m of dredge per hour >70mm	Average Oysters per m of dredge per hour <70mm	Oysters per m ² entire bed	Oysters per m ² positive hauls
2017	Bramble	17.27	0.00	0.06	0.17
2016	Bramble	9.20	0.00	0.04	0.11
2015	Bramble	36.47	0.00	0.12	0.14
2014	Bramble	8.94	0.00	0.03	0.15
2017	Browndown	24.18	0.00	0.08	0.31
2016	Browndown	45.13	0.00	0.11	0.23
2015	Browndown	13.11	6.70	0.07	0.11
2014	Browndown	17.66	47.94	0.18	0.30
2017	Chilling	11.25	0.00	0.04	0.50
2016	Chilling	15.12	15.26	0.09	0.16
2015	Chilling	12.27	1.91	0.05	0.11
2014	Chilling	34.09	5.82	0.11	0.34
2017	Lee-On-Solent	7.09	0.00	0.03	0.13
2016	Lee-On-Solent	9.46	0.00	0.04	0.21
2015	Lee-On-Solent	19.28	0.00	0.06	0.12
2014	Lee-On-Solent	14.95	0.00	0.06	0.18
2017	North Channel	16.94	3.64	0.07	0.17
2016	North Channel	72.92	0.00	0.19	0.45
2015	North Channel	39.32	4.91	0.11	0.74
2014	North Channel	29.97	27.32	0.17	0.67
2017	Osbourne Bay	2.52	0.00	0.01	0.09
2016	Osbourne Bay	7.85	0.00	0.03	0.20
2014	Osbourne Bay	93.93	29.62	0.31	0.55
2017	Ryde Middle Ryde	72.03	14.51	0.33	0.37
2016	Ryde Middle Ryde	89.92	4.26	0.32	0.39
2015	Ryde	57.19	17.06	0.29	0.35

2014	Middle Ryde Middle	73.66	16.37	0.37	0.50
2017	Spit Sands	3.73	0.00	0.01	0.06
2016	Spit Sands	3.30	0.00	0.01	0.05
2015	Spit Sands	3.62	3.62	0.03	0.20
2014	Spit Sands	12.35	0.00	0.04	0.12
2017	Thorn Knoll	1.53	0.00	0.01	0.08
2016	Thorn Knoll	0.00	0.00	0.00	0.00
2015	Thorn Knoll	7.30	0.00	0.02	0.15
2014	Thorn Knoll	0.00	0.00	0.00	0.00
2017	Sturbridge	104.24	24.69	0.56	0.84

Western Solent					
Year	Shellfish Bed	Average Oysters per m of dredge per hour >70mm	Average Oysters per m of dredge per hour <70mm	Oysters per m ² entire bed	Oysters per m ² positive hauls
2017	Newtown	15.55	1.36	0.06	0.21
2016	Newtown	0.00	0.00	0.00	0.00
2015	Newtown	8.39	0.00	0.03	0.18
2014	Newtown	48.10	6.80	0.17	0.47
2017	Pennington	0.00	3.48	0.01	0.14
2017	Sowley	2.11	0.00	0.01	0.08
2016	Sowley	0.00	0.00	0.00	0.00
2014	Sowley	11.13	0.00	0.05	0.14
2017	Stanswood Bay	3.74	0.00	0.01	0.07
2016	Stanswood Bay	19.91	0.00	0.09	0.13
2017	Yarmouth	5.80	0.00	0.03	0.14
2017	Lepe	4.23	0.00	0.01	0.08
2016	Lepe	14.42	0.00	0.05	0.14
2015	Lepe	12.73	0.00	0.05	0.13
2014	Lepe	113.18	0.00	0.31	0.94

The Harbours					
<i>Year</i>	<i>Shellfish Bed</i>	<i>Average Oysters per m of dredge per hour >70mm</i>	<i>Average Oysters per m of dredge per hour <70mm</i>	<i>Oysters per m² entire bed</i>	<i>Oysters per m² positive hauls</i>
2017	Bomb Ketch	69.75	23.42	0.40	0.40
2017	Fareham	24.04	22.08	0.17	0.41
2016	Fareham	16.93	45.21	0.19	0.37
2015	Fareham	18.13	23.07	0.17	0.35
2014	Fareham	68.89	54.24	0.47	0.54
2017	Portchester	18.00	2.52	0.09	0.25
2016	Portchester	14.01	0.00	0.07	0.13
2015	Portchester	4.20	0.00	0.02	0.16
2014	Portchester	18.91	13.87	0.15	0.34
2017	Langstone	9.87	1.91	0.04	0.09
2016	Langstone	9.73	10.28	0.07	0.22
2015	Langstone	10.68	0.00	0.04	0.11
2014	Langstone	9.19	14.40	0.07	0.20

Southampton Water					
<i>Year</i>	<i>Shellfish Bed</i>	<i>Average Oysters per m of dredge per hour >70mm</i>	<i>Average Oysters per m of dredge per hour <70mm</i>	<i>Oysters per m² entire bed</i>	<i>Oysters per m² positive hauls</i>
2017	Ashlett Creek	28.79	0.00	0.19	0.19
2016	Ashlett Creek	36.54	0.00	0.23	0.23
2017	Inner Hamble	66.75	4.62	0.26	0.32
2016	Inner Hamble	49.20	4.71	0.24	0.26
2017	Outer Hamble	5.83	3.14	0.03	0.08
2016	Outer Hamble	4.19	0.00	0.02	0.08
2017	Southampton Water - East	0.66	0.00	0.00	0.04
2016	Southampton Water - East	0.69	0.00	0.00	0.04
2017	Southampton Water - West	2.76	1.26	0.02	0.06
2016	Southampton Water - West	3.01	3.01	0.03	0.08
2017	Itchen	13.31	3.45	0.07	0.12
2016	Itchen	31.48	14.55	0.20	0.28

2017	Calshot	25.18	9.89	0.15	0.19
2016	Calshot	15.20	0.57	0.07	0.13

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Data Annex II – Figures showing the different beds in the Solent for which there are three or more years of data for the estimated oysters per m². Based on a dredge efficiency of 5%.

