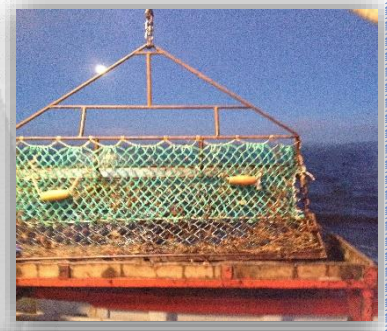
LOUGHS AGENCY

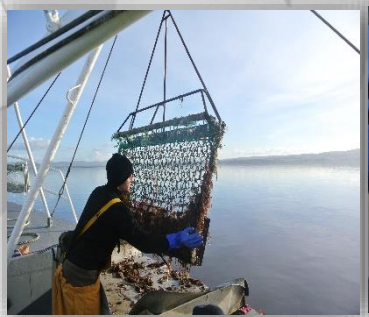
FOYLE, CARLINGFORD AND IRISH LIGHTS COMMISSION

Pre-Fishery Stock Assessment
Lough Foyle Native Oyster Fishery

Summary Report

Autumn 2017





Aquaculture & Shellfisheries

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1. Executive Summary

A pre-fishery stock assessment was conducted on oyster beds in Lough Foyle during autumn 2017.

The results of this survey are in keeping with the results of the post-season survey with the population skewed towards larger size classes and continued evidence of the dominance of the cohort of oysters that settled in Lough Foyle in late summer 2014.

The harvestable biomass of oysters on all oyster beds is estimated to be 315 tonnes (Figure 1). Landings from the fishery in the 2016/17 season amounted to just over 185 tonnes. The total biomass of oysters on these beds has improved relative to the spring situation thanks largely to a very good growing season in 2017. There was no evidence of a widespread spatfall in 2017.

It is recommended that the fishery does not remove the total harvestable biomass in the 2017/18 season. This will help to prevent the loss of an effective spawning stock for the 2018 spawning period and help retain sufficient stock to support a sustainable fishery for 2018/19.

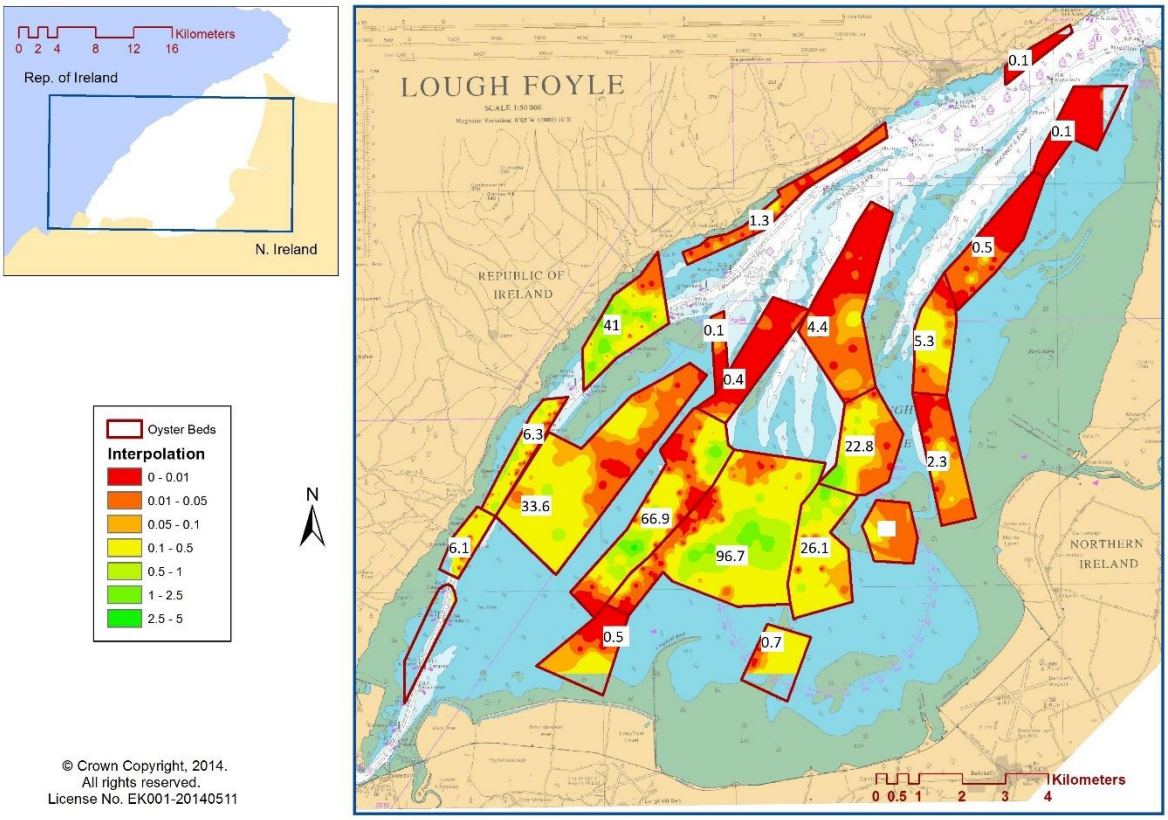

Figure 1 Harvestable Biomass (tonnes) Foyle oyster beds autumn 2017

2. Introduction

A pre-fishery survey of the native oyster beds in Lough Foyle took place in August and September 2017. This survey was conducted by Agency staff on board a local fishing vessel.

3. Methods

A dredge survey was carried out in Lough Foyle using a local fishing vessel. Scientific staff from the Loughs Agency assessed the population distribution and abundance by analysing dredge contents from each sample location (figure 2A-B). Oyster density is calculated by dividing the area dredged (m^2) by the total number of oysters after adjusting for dredge efficiency (25%) and any sub-sampling. Dredge efficiency has been taken from the work done in Lough Foyle during the Baseline Survey of Shellfish Resources conducted by Cefas in 2006. Oyster density is interpolated across the oyster beds using a six point Inverse Distance Weighting (IDW) method and this allows a biomass figure to be calculated based on the area (m^2) of the oyster bed within each density category. This follows the approach of similar work in Irish oyster fishery stock assessments conducted by the Marine Institute. The average weight of the oysters on each bed is used to factor up to an overall biomass based on mean density within each bed. Any fresh dead oysters are recorded as a measure of recent mortality, these exhibit no fouling on the inner surface of the shell valves. Oyster spat (<30mm) presence or absence was recorded at each sample point as was total numbers of spat per dredge sample.

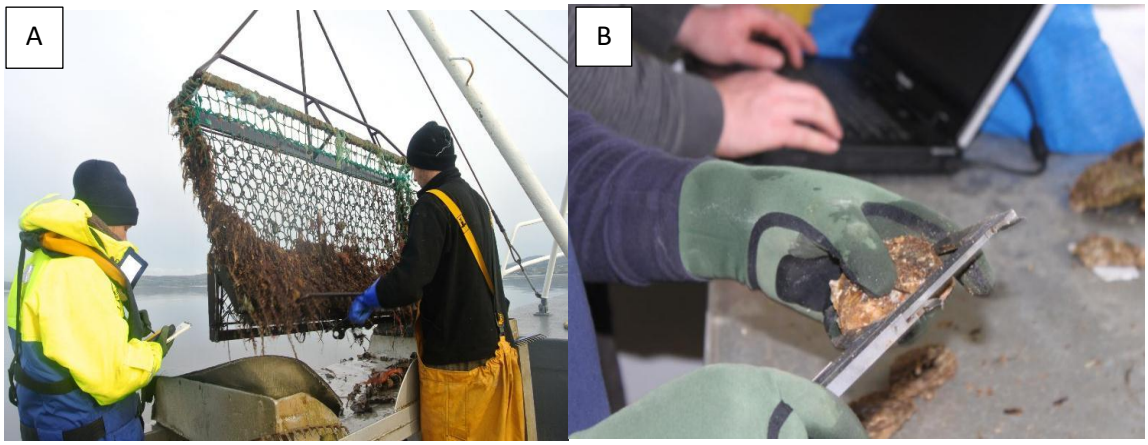

Figure 2 Methods used during survey: (A) Analysing and recording dredge contents. (B) Oysters are measured for length frequency analysis

4. Oyster Density

Oyster density was calculated for each of the sample stations (figure 3). The mean density for all beds is 0.2 oysters/m^2. This figure is in keeping with results from previous years (figure 4). The maximum density recorded was 3 oysters/ m^2 which was observed on the Middle Bed. 15% of the sampled stations had an oyster density of over 1 oyster/m^2, this is represented by the green areas in Figure 3.

Oyster density recorded from each dredge tow has been represented as point data and then interpolated using a 6 point IDW methodology. The interpolation has been performed only in areas of the oyster beds that were surveyed and have point data present. A barrier feature has been placed within the interpolation between the oyster beds in or to the north of the navigation channel and all beds on the east of the navigation channel to help replicate the impacts of a natural barrier (a sandbank) between the beds in this area.

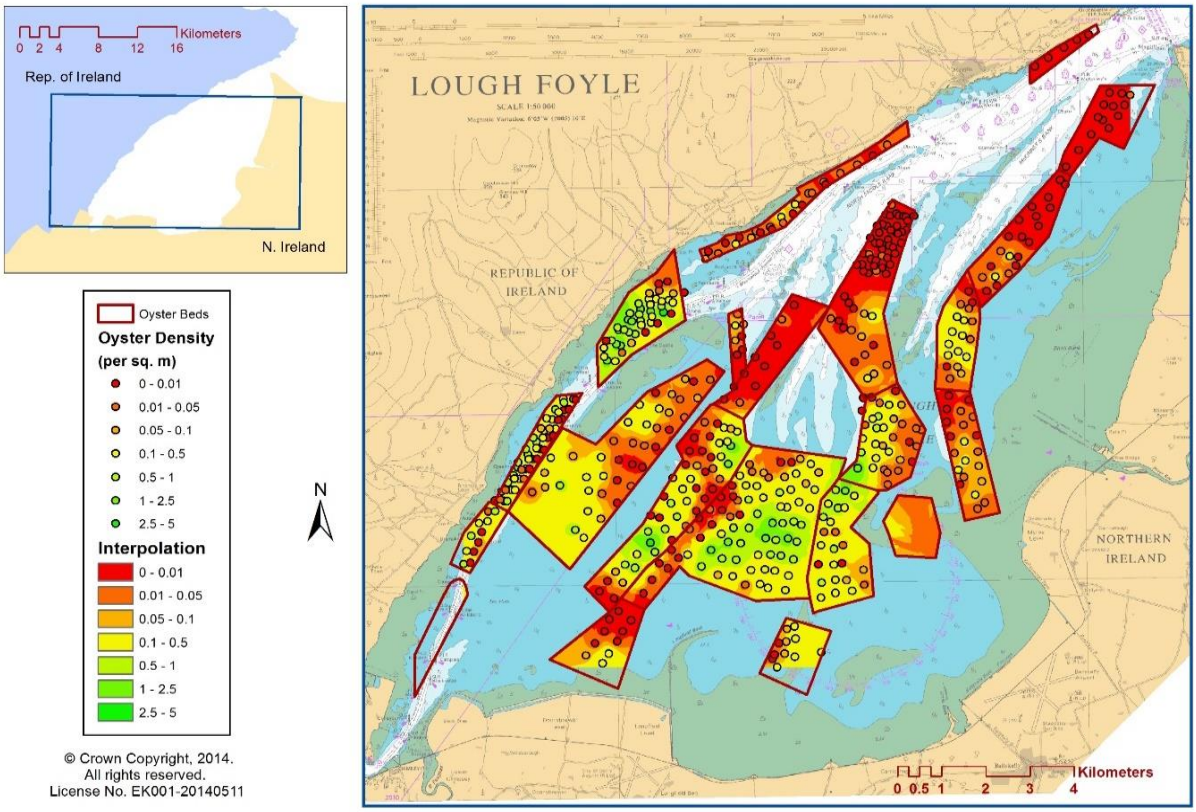

Figure 3 Interpolated oyster density Lough Foyle Autumn 2017

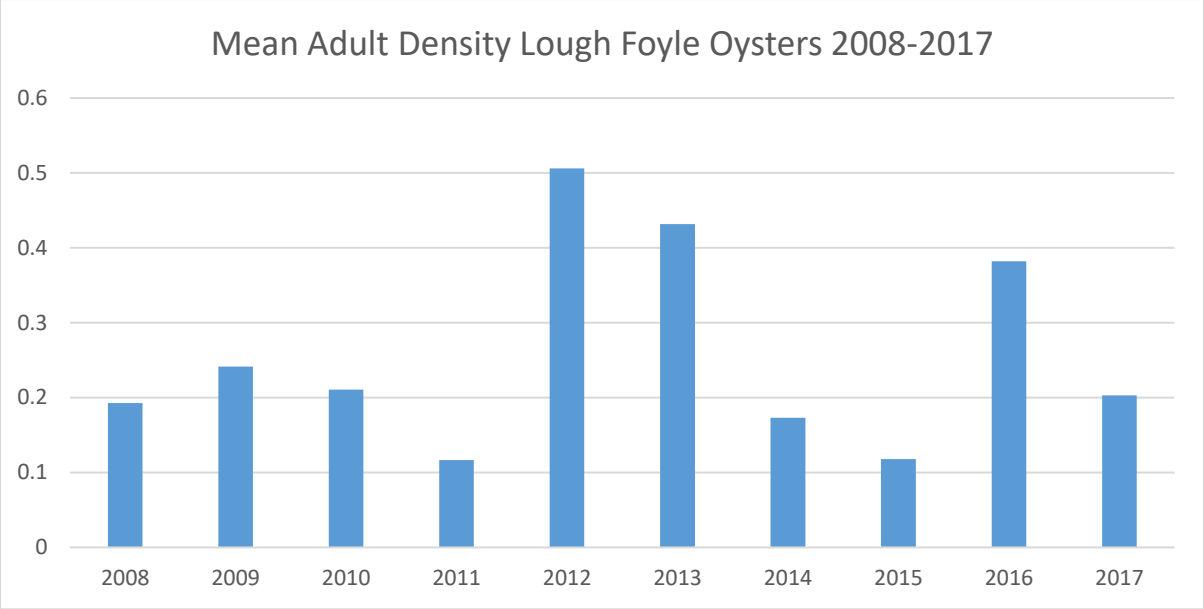

Figure 4 Mean Density Lough Foyle 2008-2017

5. Biomass Estimate

The estimated total oyster population biomass is 684 tonnes (table 1). This is an increase from the estimated biomass of 615 tonnes in autumn 2016. Total stock biomass above 80mm is currently estimated to be 315 tonnes. This is the highest estimated fishable biomass figure on record and bodes well for a productive fishery for the coming season.

The total stock biomass is high relative to previous years (figure 5) and this is likely due to good growth in the younger cohort of oysters that settled in late summer 2014 and the carryover of stock from 2011/2012 settlements as a result of the reduced fishing activity since 2014. These oysters have now attained a length of around 60-90mm. Mean weight was higher than previous years with a mean of 60g for all oysters sampled during the survey (n=1386).

The previous biomass estimates have correlated well with the observed landings in the fishery (figure 6). Note that on this graph the survey estimate is that of the pre-season (autumn) survey and the landings figure is taken from logbook returns made by fishermen on a continuous basis throughout the season. On one occasion (2013/14) the stock assessment was not completed on all beds prior to the commencement of the fishery and the landings made prior to the survey being completed were separated for the comparison.

Table 1 Oyster biomass per oyster bed in Lough Foyle Autumn 2017

Bed name	Area (ha)	Mean Length (mm)	Bed Total (t)	Total (t) >80mm
Barney's Bank	200	85.0	0.13	0.10
Black Ghee	236	79	4.68	2.34
Drumskellan	91	81.5	12.38	6.19
Flat Ground	970	80.18	205.92	96.78
Great Bank	827	81.6	60.04	33.62
McGhee	167	77	7.48	0.75
Middle North	228	85.5	0.66	0.49
Middle South	531	79.2	133.98	66.99
Moville	250	75	1.17	0.58
Peak	208	82	10.64	5.32
Perch	276	78	107.98	41.03
Quigley's Pt	141	75.8	20.62	6.39
Redcastle	164	83	2.71	1.36
Sandy Ridge	474	86.7	6.28	4.40
Shooting Range	215	74	5.75	0.57
Southside North	288	79.1	47.63	22.86
Southside South	319	79.3	56.73	26.10
Total	**5584**	**80.1**	**684.78**	**315.88**

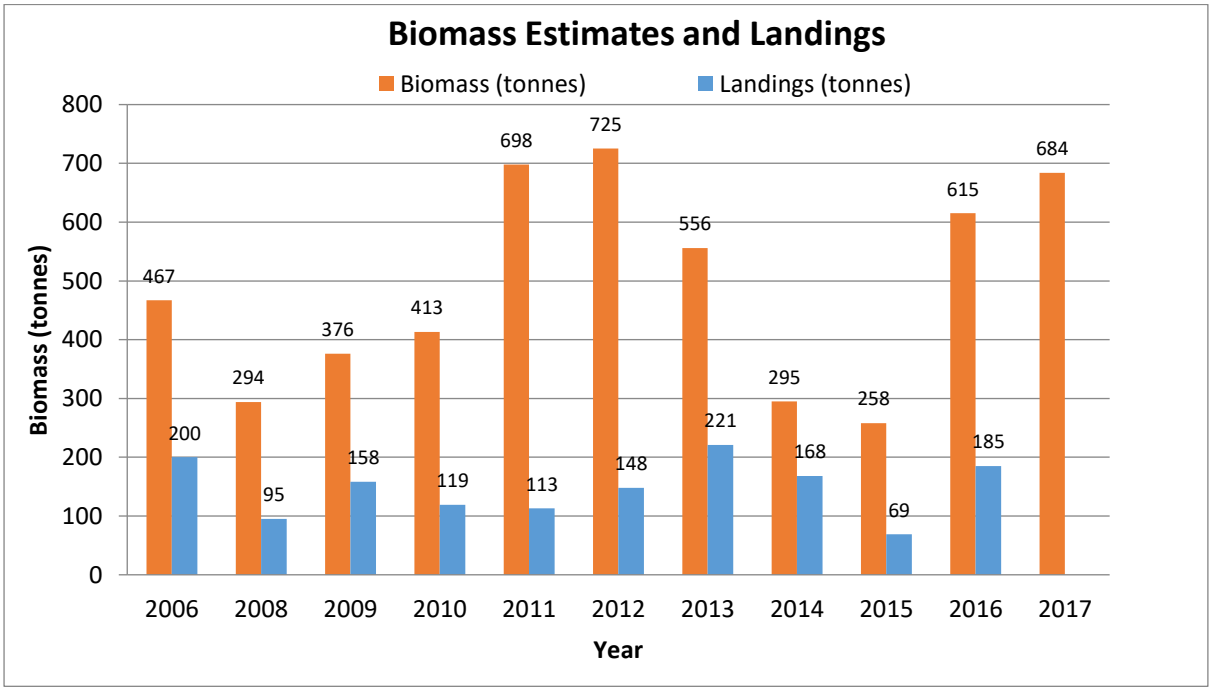

Figure 5 Historic Biomass and Landings Lough Foyle

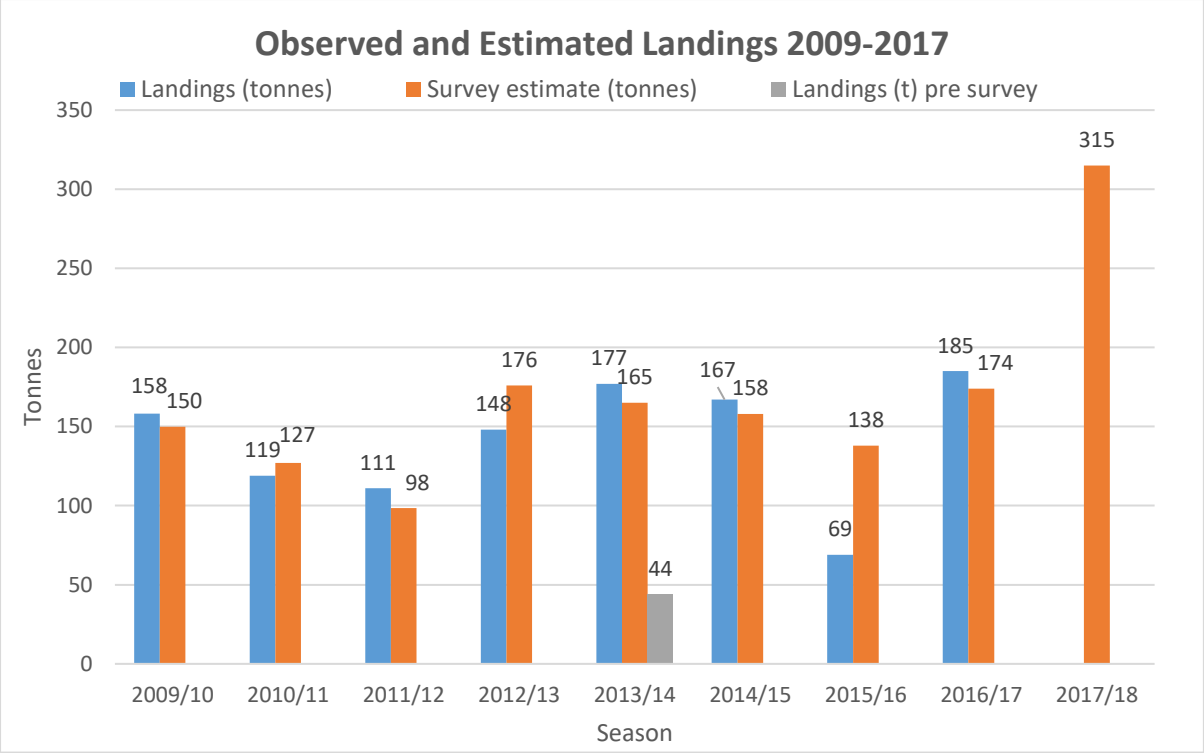

Figure 6 Observed and Estimated Landings from Lough Foyle

6. Spatfall

Oyster spawning and larval survival is thought to be heavily dependent on good environmental conditions throughout the spring and summer and the threshold water temperature values being exceeded for a minimum period of time, usually 16^0C for 2-4 weeks. If these conditions do not occur it is expected that spawning will be limited to a small percentage of the stock on each bed and the numbers of juveniles will be minimal. Spawning is also limited by oyster density and proximity of each individual oyster to another has an impact on fertilisation success. Removal of oysters during the fishing season reduces the oyster density.

Poor spawning and settlement was observed in the 2013 and 2015 spawning seasons and no widespread spatfall was observed in 2016. Spat settlement appears to have taken place on the highest density beds in 2017 with 11.9% of the stations sampled having spat present (figure 7 and 8).

Mean spat density was 0.018 spat/m^2 which is much lower than previous years in which widespread heavy spatfall was observed (figure 9). The number of sampled stations with spat present has increased by 50% from 2016, however this was less than that observed in years with widespread spatfall when 50% or more than the stations had spat present.

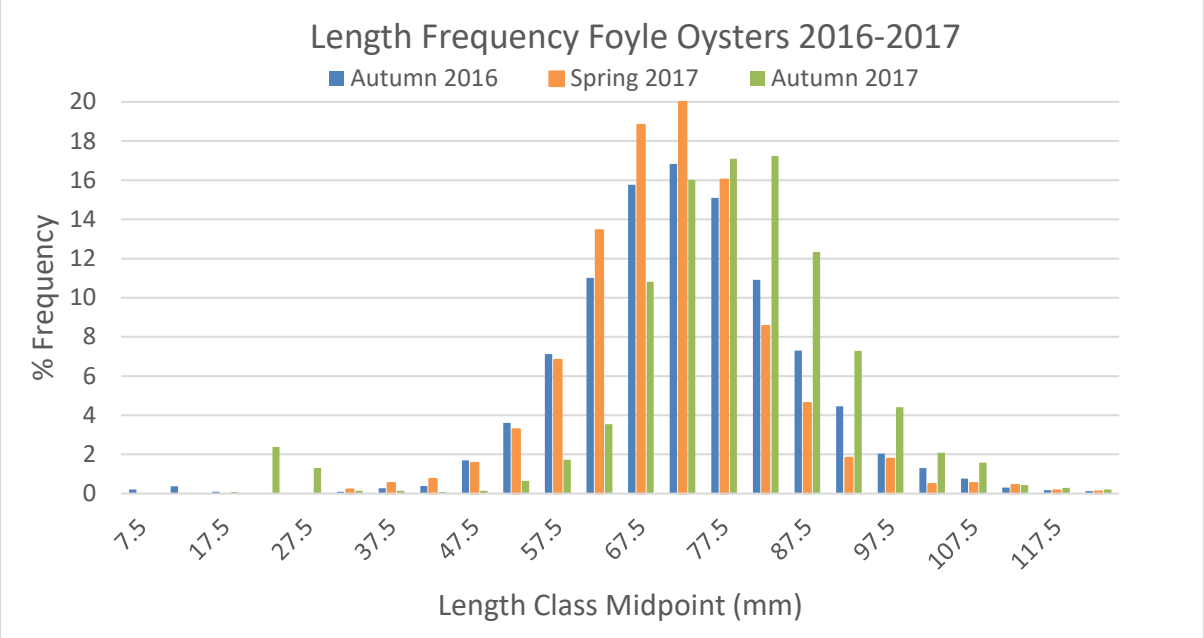

Figure 7 Length Frequency of oysters in Lough Foyle 2016-2017

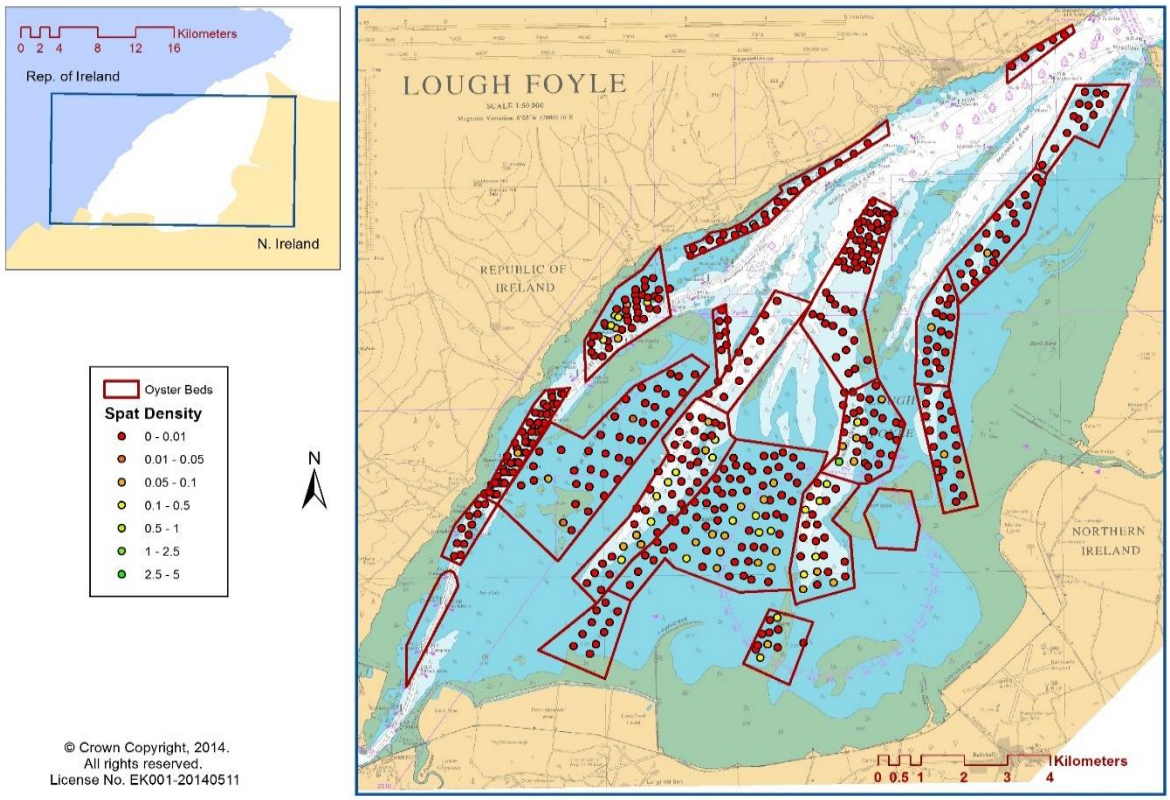

Figure 8 Oyster Spat Density in Lough Foyle Autumn 2017

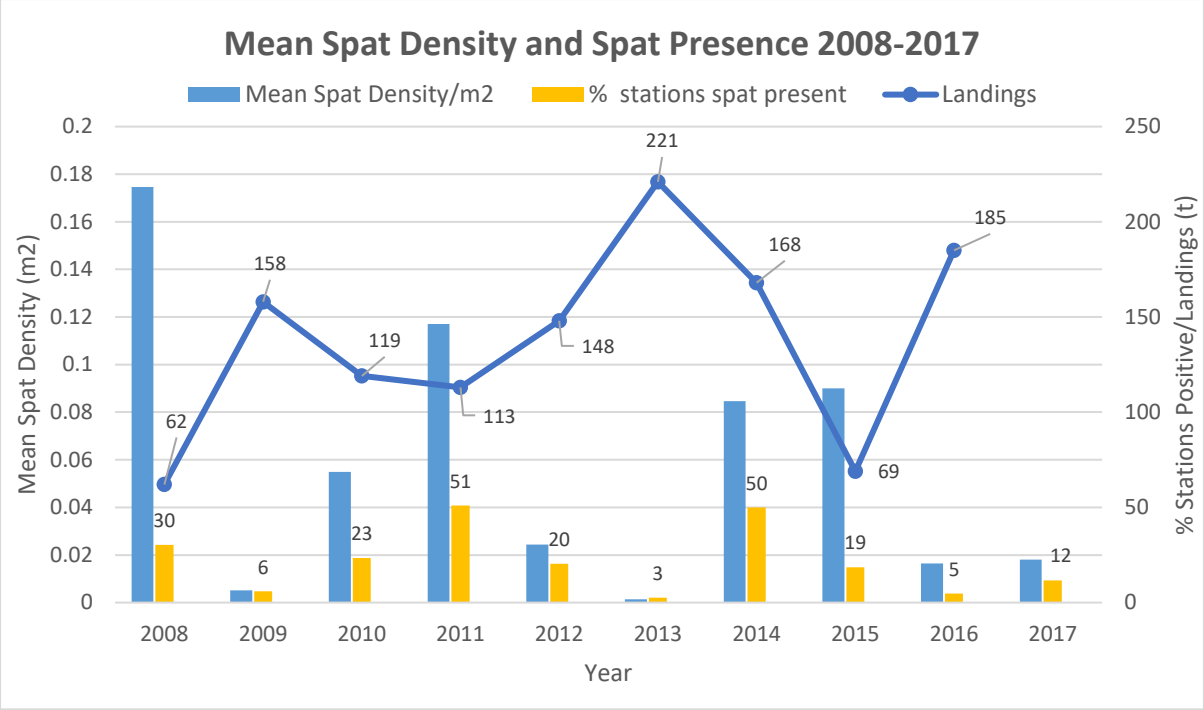

Figure 9 Historic Spat Density and Presence Lough Foyle

7. Mortality Levels

There was very limited evidence of recent mortality on the oyster beds (figure 10). Mortality was recorded in 11.9% of the samples taken and the majority of these appeared to be due to natural causes. The latest *Bonamia* test results show infection rates of between 0-30% on the beds and this may result in elevated mortality levels if the intensity of the infection is high.

Historic data on mortality show the gradual reduction in mortality levels since the first major reported incident in 2011 (figure 11). It may be prudent to continue to monitor this situation closely if the total biomass of the stock increases and if mean densities on the oyster beds increase due to natural recruitment or through any stocking or enhancement programmes in the future.

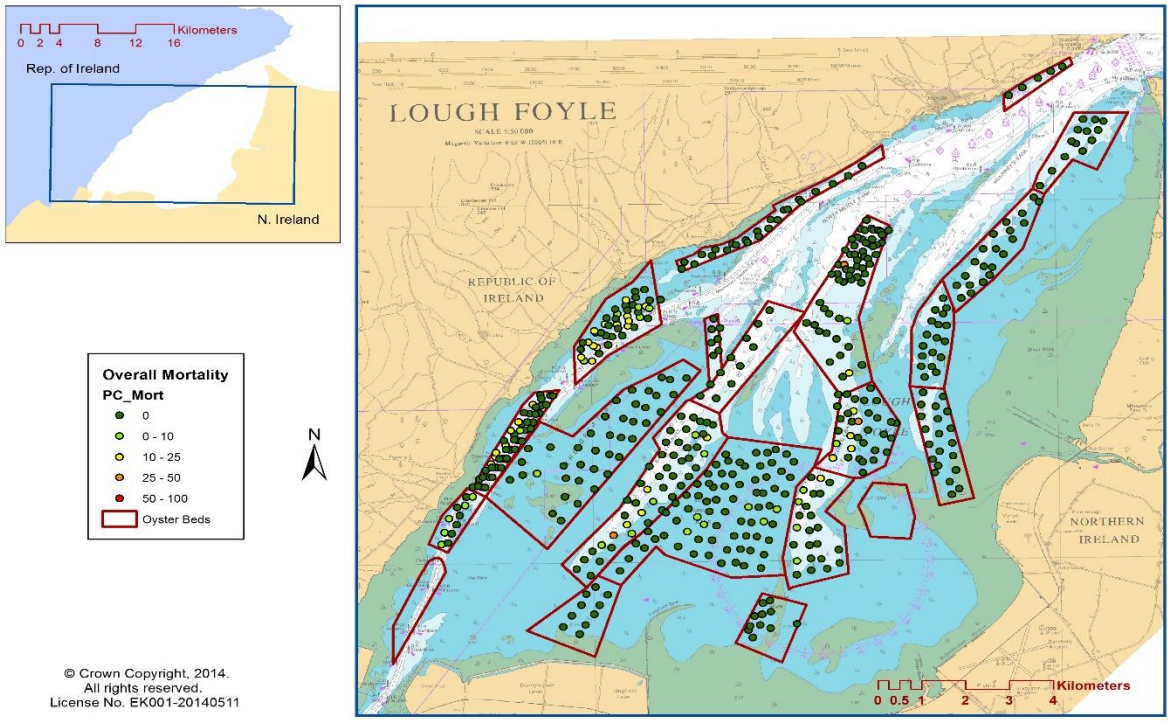

Figure 10 Overall mortality recorded in Lough Foyle Autumn 2017

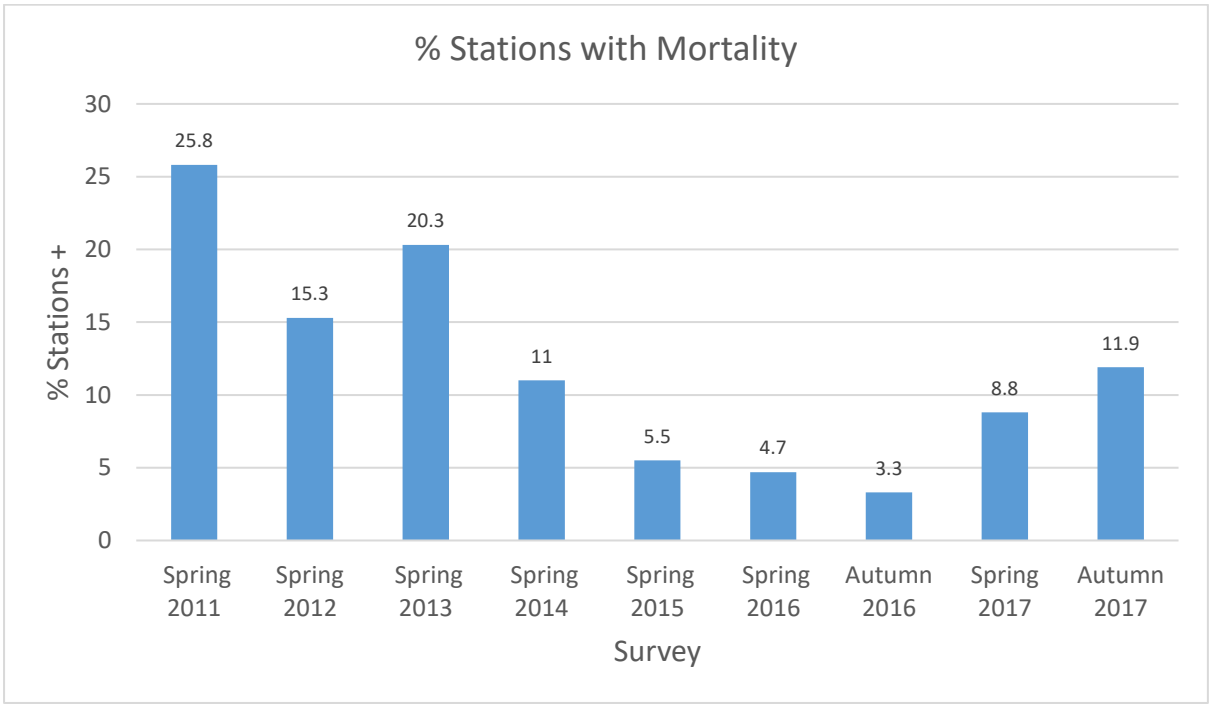

Figure 11 Historic Mortality levels Lough Foyle

8. Population Structure

The length frequency of the oyster population shows that the proportion of larger size classes has increased since the 2007 stock survey. The 2007 results show there was poor representation of oysters 75mm and above in the population. In the years since the regulation of the fishery in 2008 there has been greater evidence of larger oysters within the population (see figure 12).

The larger oysters are an important resource within the population. These make up the majority of the spawning stock biomass. Although oysters as small as 35mm are capable of spawning, the larger oysters are capable of producing large quantities of larvae for the fishery, and are therefore of great importance. If there is a higher percentage of large oysters present in the population along with suitable environmental conditions there is a greater chance of spawning success. The overall sampled population consists of 83% above 71mm. Figure 12 highlights the bias towards larger length classes as a result of poor recruitment in 2015 and 2016.

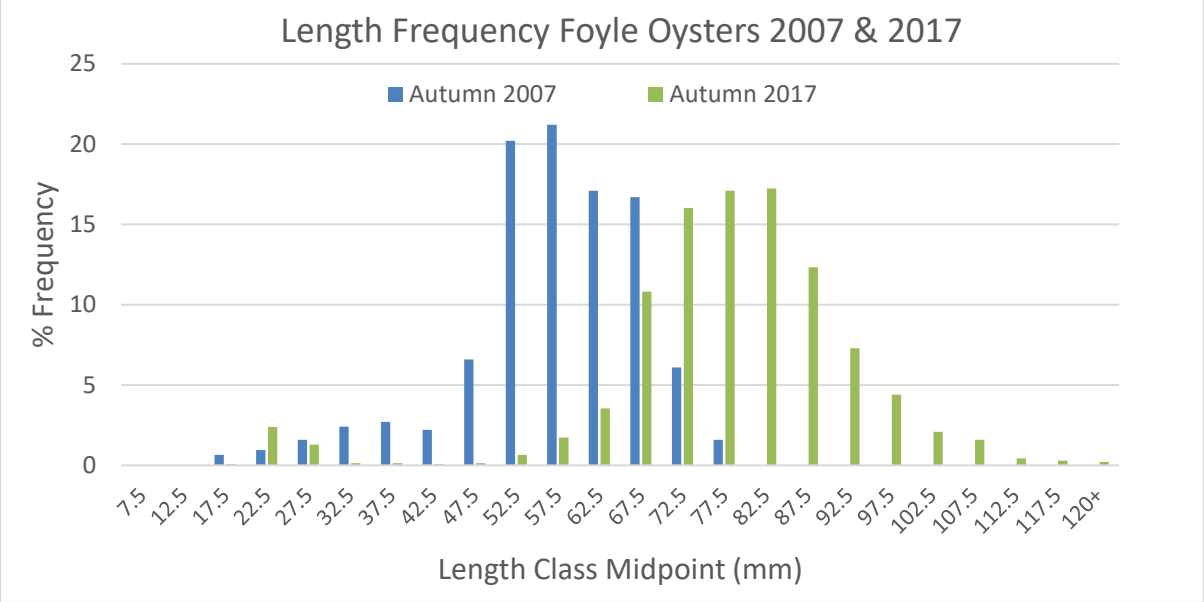

Figure 12 Length Frequency of Lough Foyle oysters 2007 & 2017

The cumulative length frequency (figure 13) shows the gradual growth in smaller size oysters with a shift of the line to the right in all the length classes as a result of good growing conditions and the absence of fishing removal of larger length classes since December 2016.

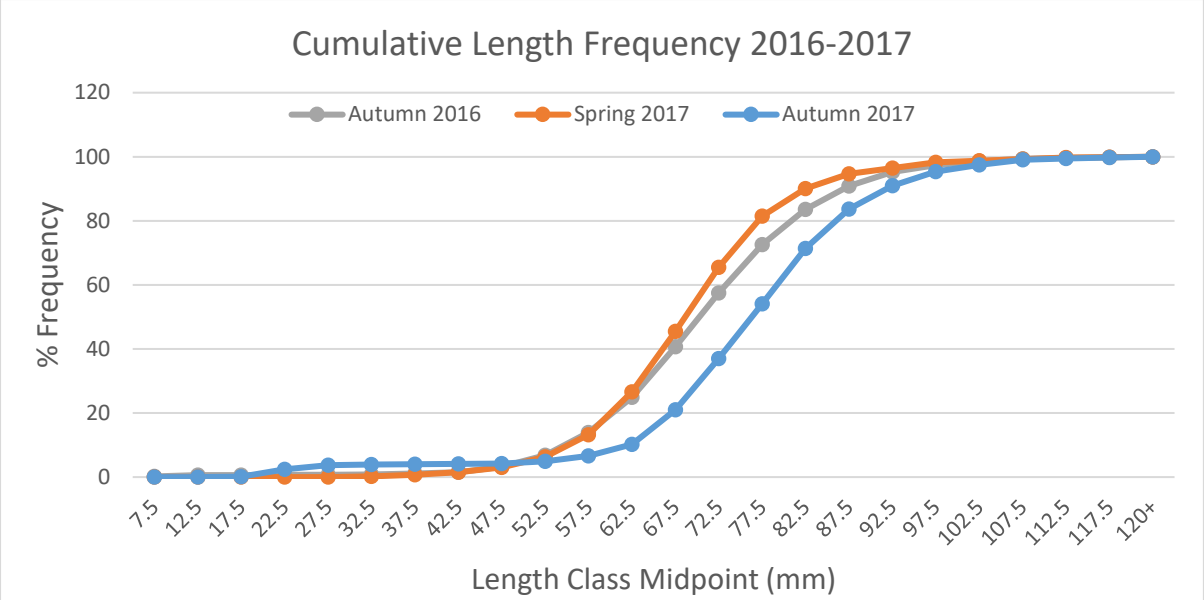

Figure 13 Cumulative Frequency across all oyster beds in Lough Foyle 2016-2017

The pie chart in figure 14 shows a bias towards larger size classes within the stock as a result of limited recruitment of juveniles into the stock in the 2015 and 2016 spawning seasons. This is likely to lead to a reduction in the fishable stock size in the 2019/20 and 2020/21 seasons.

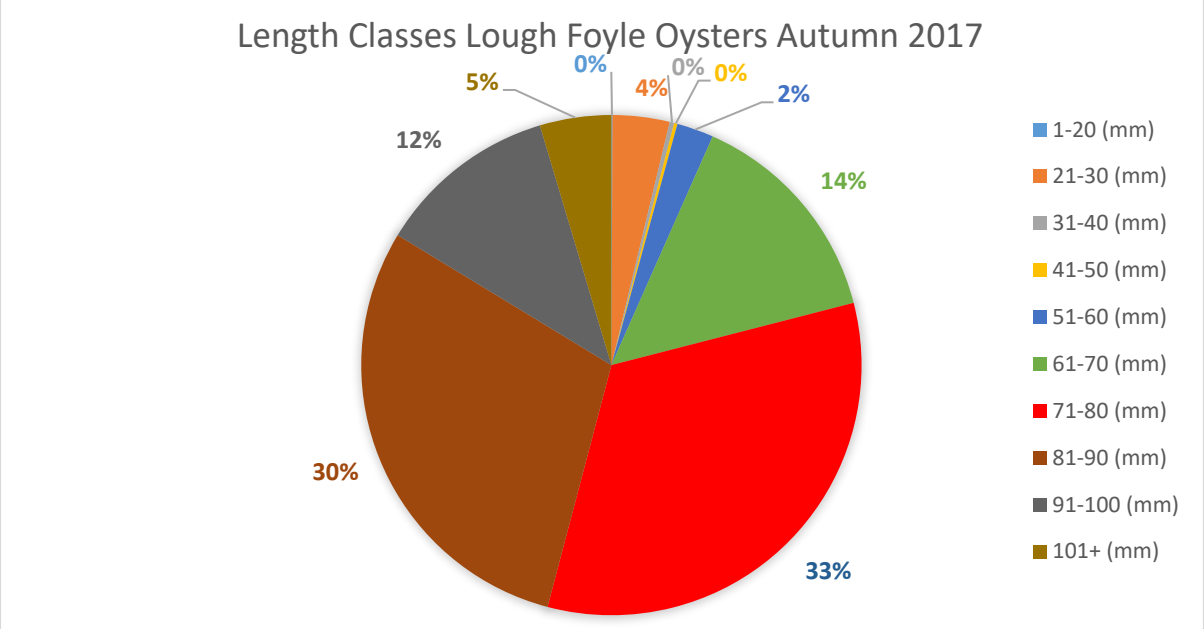

Figure 14 Length classes on oyster beds Lough Foyle 2017

Figure 15 illustrates the percentage of each length class on the oyster beds in Lough Foyle. This chart highlights the differences between beds in terms of the health of their stock structure. The beds which consistently produce commercially important quantities of oysters (Middle Bed, Perch, Flat Ground) have good representation of length classes from 61mm-101mm+.

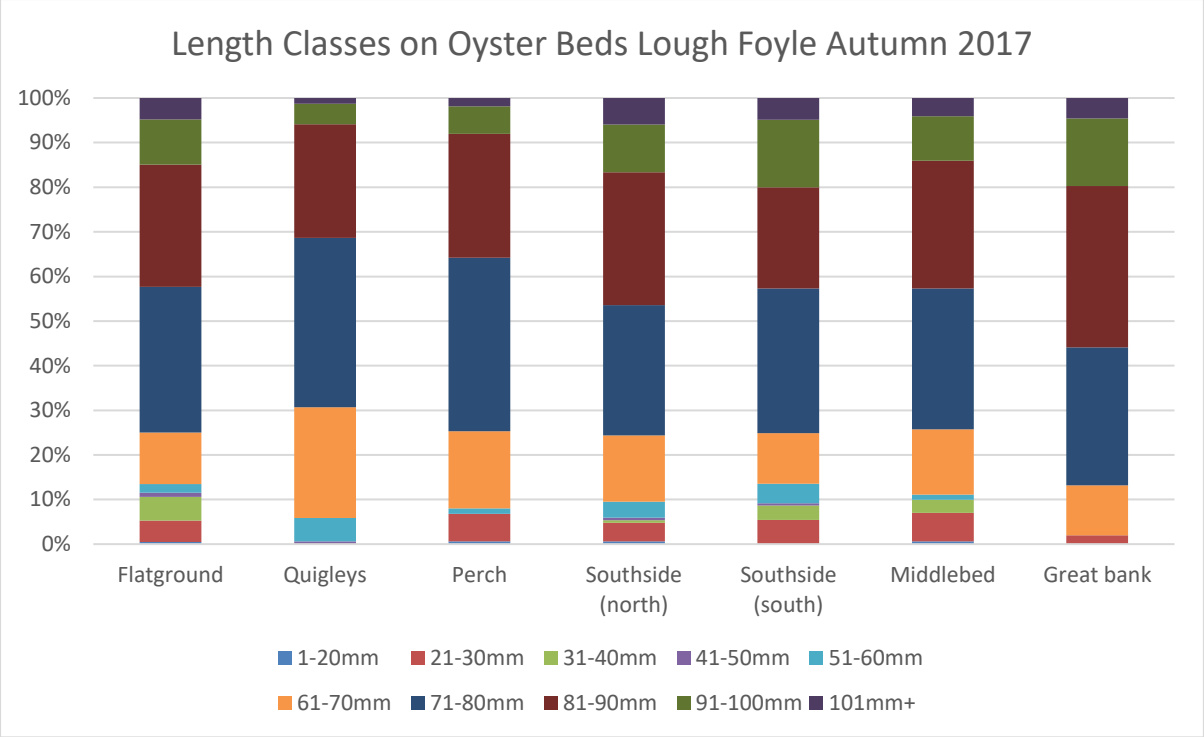

Figure 15 Size class on each bed in Lough Foyle Autumn 2017

9. Oyster Bed Review

9.1 The Perch

Table 2 Summary Information: The Perch

Bed Name	**Perch**
Area (h)	276
Total Biomass (t)	107.9
Biomass (t) >80mm	41

The Perch is one of the 5 main commercially fished oyster beds with the highest density in Lough Foyle and it covers an area of 276 hectares. The overall biomass estimated for this bed is 107.9 tonnes, 41 tonnes of that figure is currently above market size of 80mm and is available to the fishery. 19.2 tonnes of oysters were landed from this bed during the 2016/17 fishing season. The length frequency for the Perch shows there is a notably higher percentage of 80mm+ oysters recorded during the autumn 2017 survey than the autumn 2016 survey; this shows the growth progression during 2017. There was only a small percentage of oysters <30mm recorded during the survey due to a relatively unsuccessful spawning season (Figure 16).

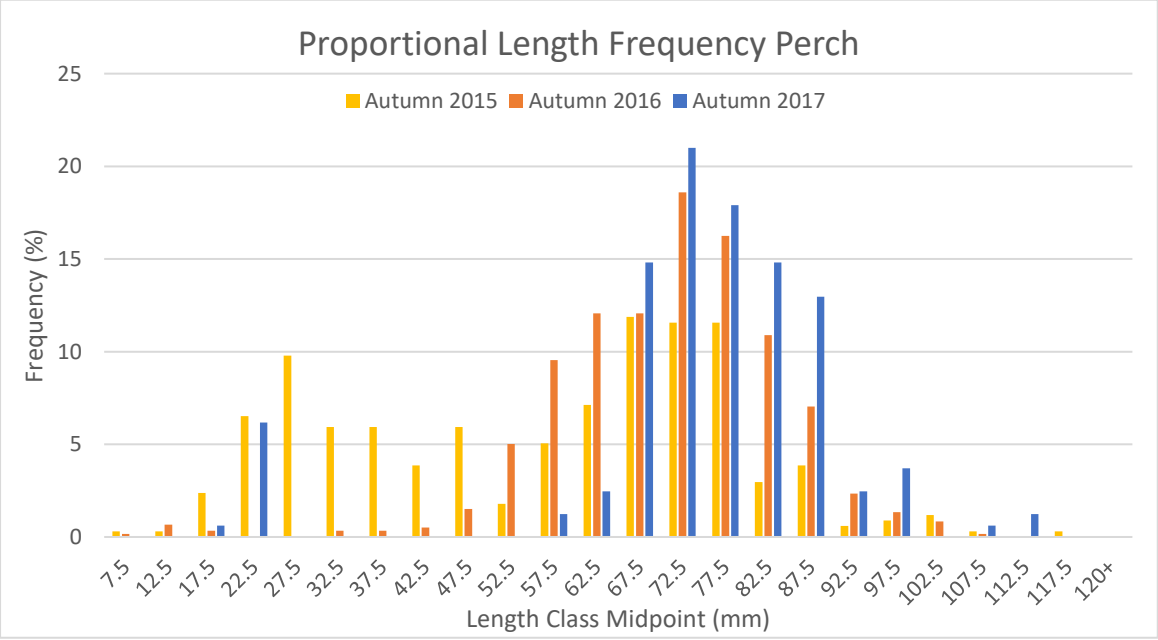

Figure 16 Proportional Length Frequency The Perch 2015-17

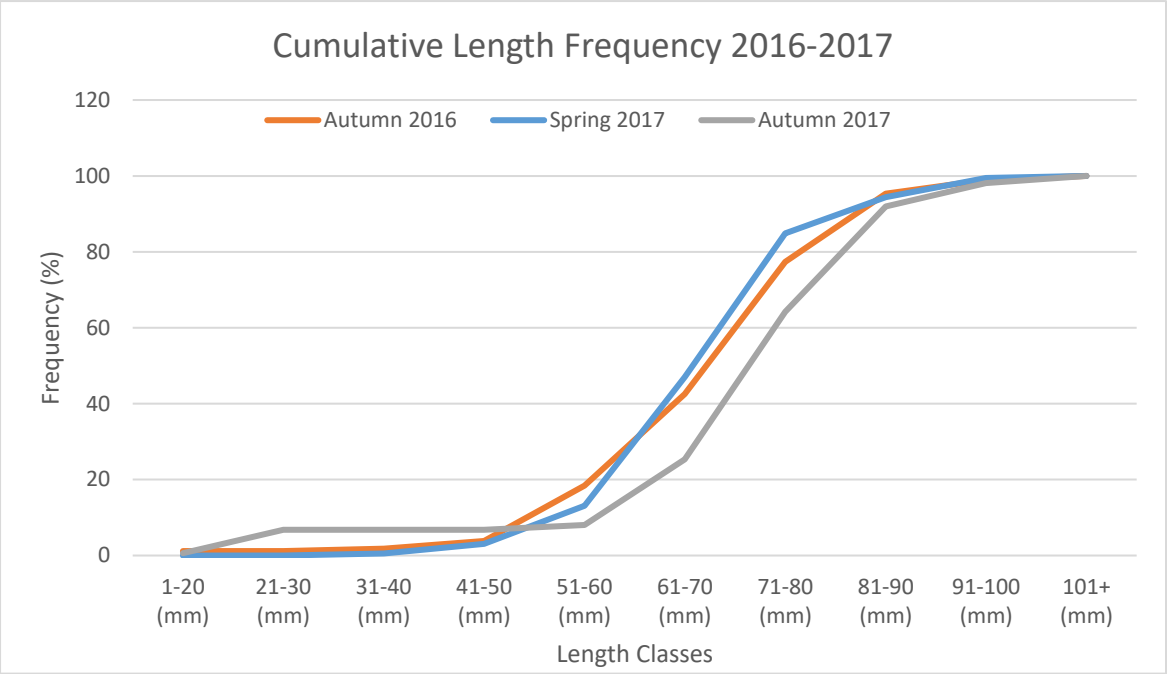

Figure 17 Cumulative Frequency: The Perch 2016-2017

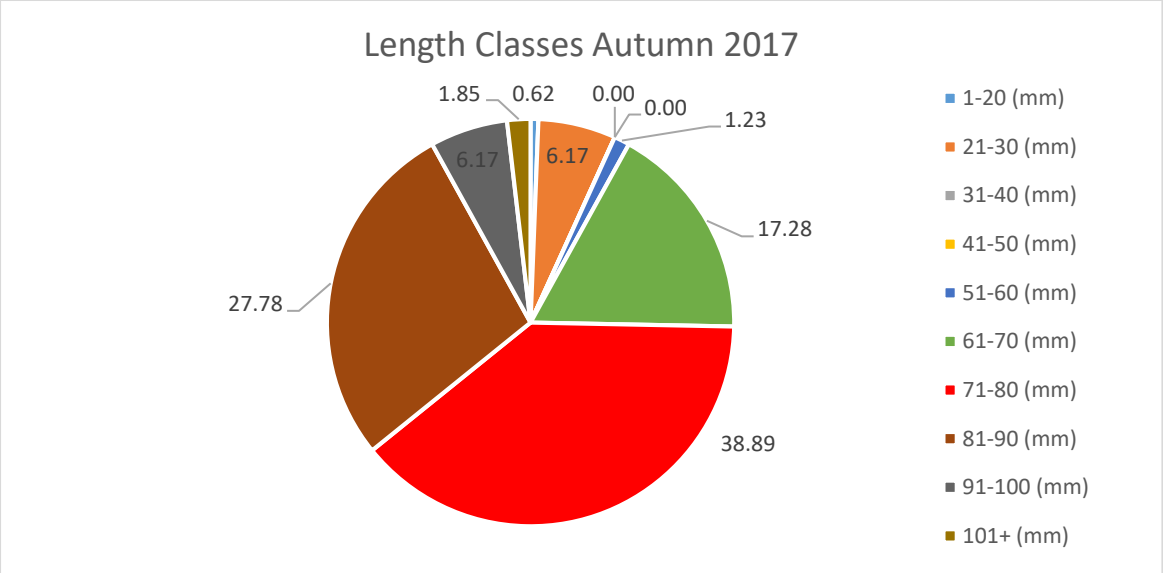

Figure 18 Percentage of length classes: The Perch 2017

9.2 The Flat Ground

Table 3 Summary Information: The Flat Ground

Bed Name	**Flat Ground**
Area (h)	970
Total Biomass (t)	205.9
Biomass (t) >80mm	96.78

The Flat Ground covers an area of 970 hectares. Total stock biomass for this bed is estimated to be 205.9 tonnes. 96.7 tonnes is above market size therefore harvestable biomass. 34 tonnes of oysters were landed from the Flat Ground during the 2016/17 season.

The length frequency (figure 19) shows evidence of limited spatfall (<30mm) was recorded during the survey. The growth progression of the 2014 spat is observed in the data with an increase from an average of 12.5mm to an average of 35mm in autumn 2015 with another increase again to over 67mm in autumn 2016. This cohort is now recruiting into the fishery at 80mm+. In keeping with the overall length frequencies there is good representation of older age classes which would not have been recorded in the stock assessments during the period 2007-2010.

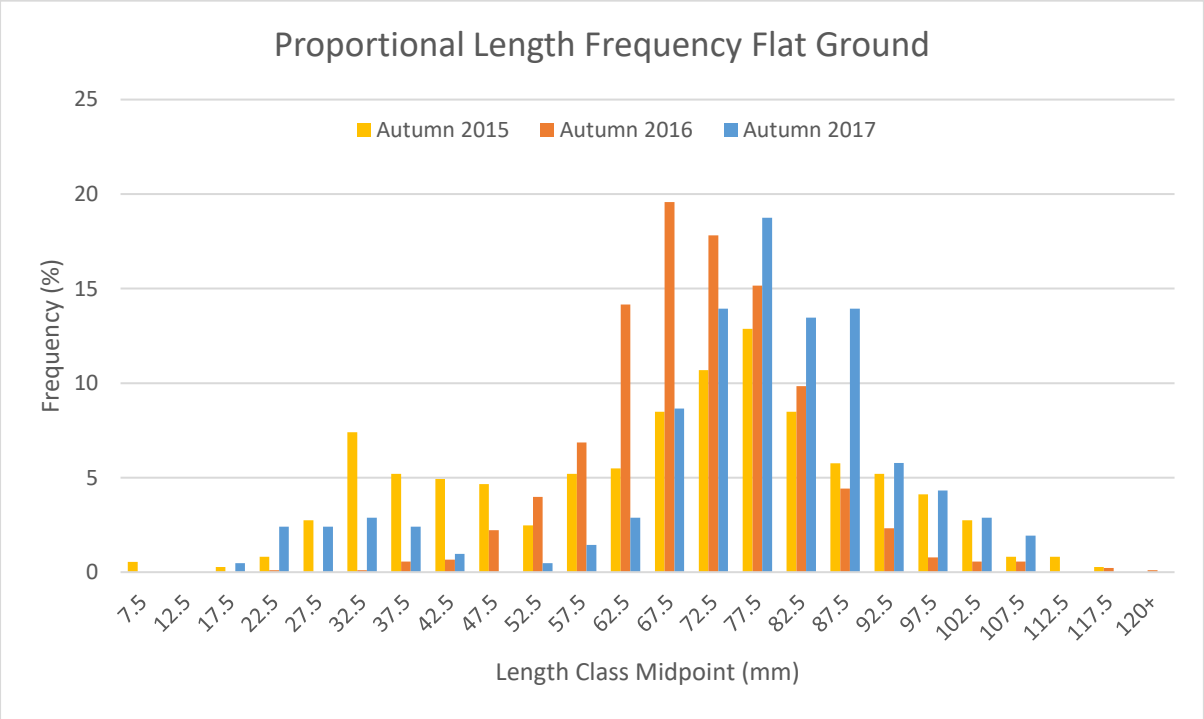

Figure 19 Proportional Length Frequency: Flat Ground 2015-17

The cumulative frequency (Figure 20) for the stock on the Flat Ground shows the growth in the smallest length classes since the spring survey with the majority of the population now above 70mm on this bed.

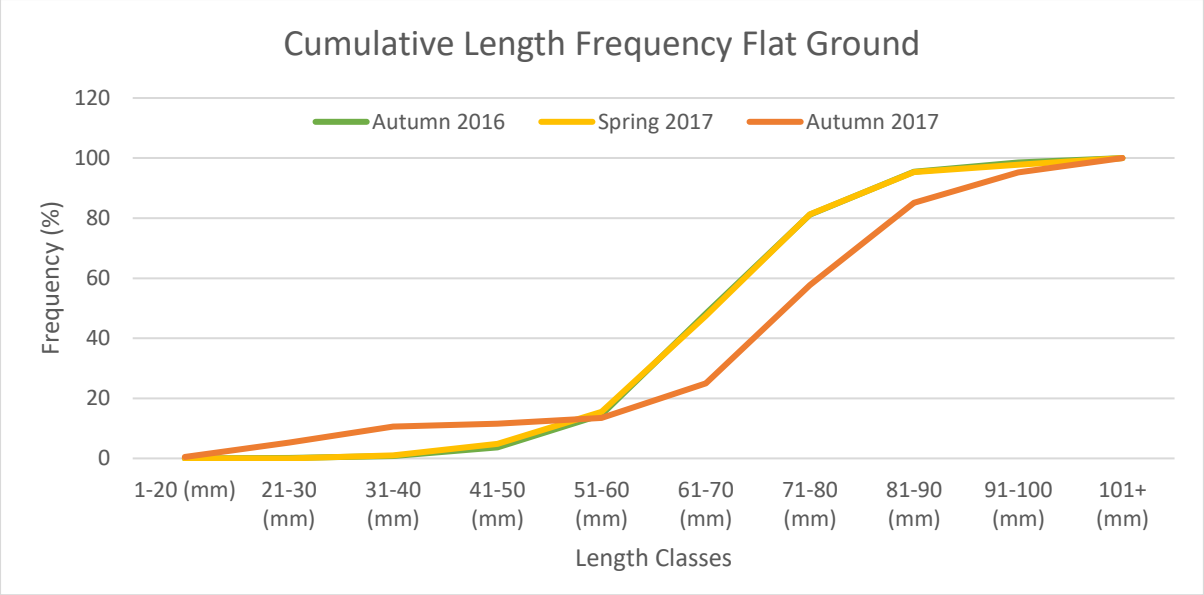

Figure 20 Cumulative Frequency: Flat Ground 2016-2017

The pie chart (Figure 21) also draws attention to the fact that the smaller size classes are not represented on this bed and the vast majority of the population on the bed is more than 70mm in size.

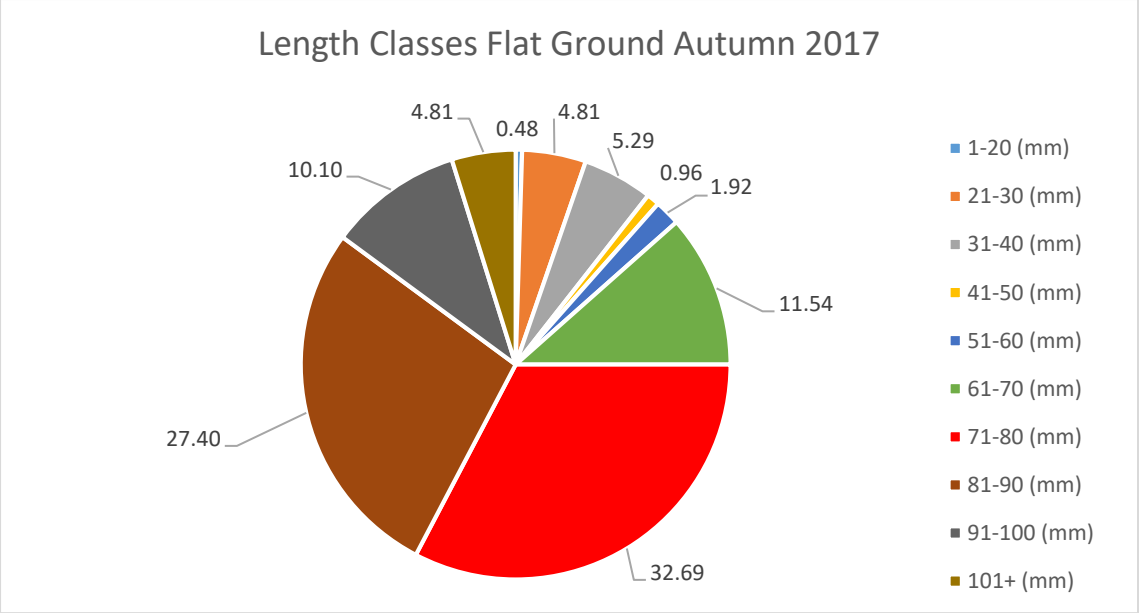

Figure 21 Percentage of each length class: Flat Ground 2016

9.3 Quigley's Point

Table 4 Summary Information: Quigley's Point

Bed Name	**Quigley's Point**
Area (h)	141
Total Biomass (t)	20.6
Biomass (t) >80mm	6.3

Quigley's point covers an area of 141 hectares. The total biomass has been estimated to be 20.6 tonnes on this bed with 6.3 tonnes above the market size of 80mm. 14.2 tonnes were landed from Quigley's bed during the fishing season of 2016/17.

The length frequency for Quigley's Point (figure 22) shows limited evidence of any spatfall on the bed. The cohort that settled in 2014 has now attained a size of 80mm+ on average.

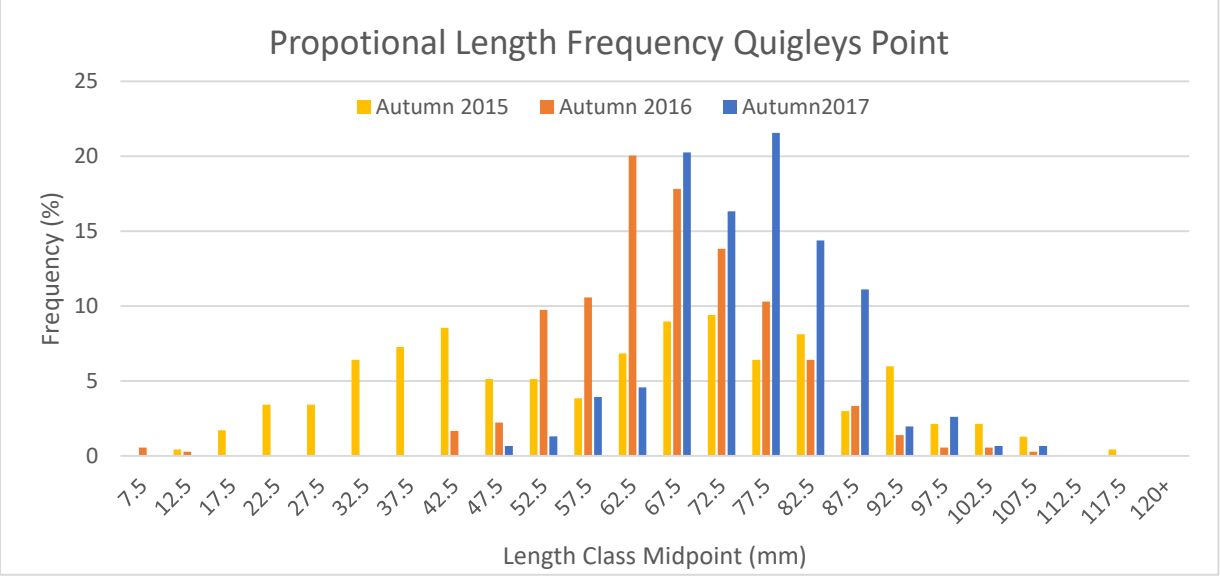

Figure 22 Proportional Length Frequency Quigley's Point 2015-17

The cumulative frequency (Figure 23) again highlights the reduction in the proportion of the stock in the smaller size classes on this bed.

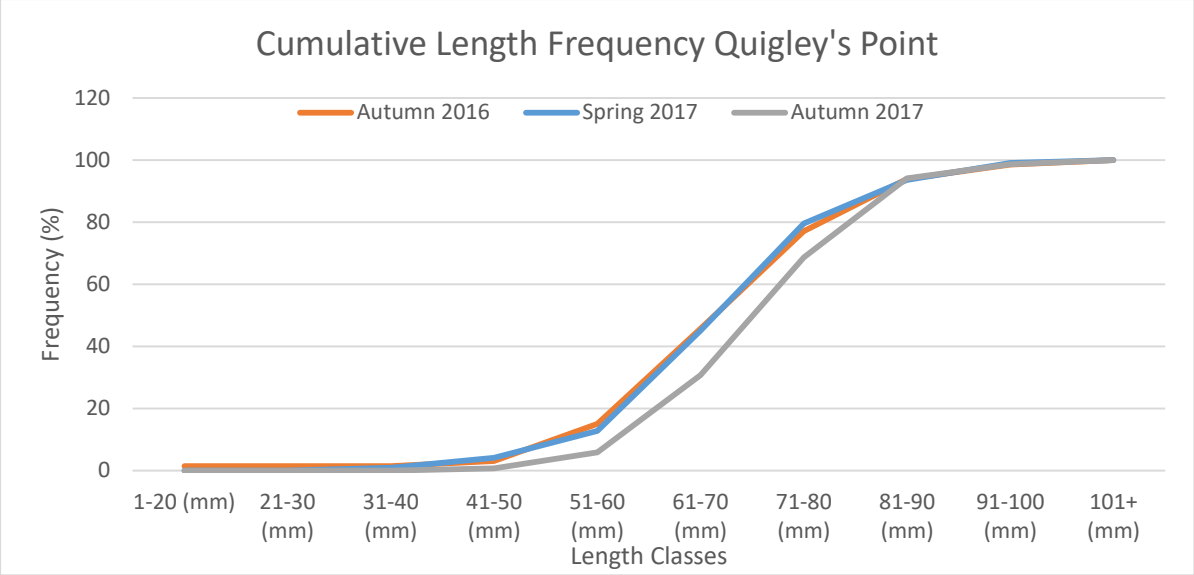

Figure 23 Cumulative Frequency: Quigley's point 2016-2017

Figure 24 shows the proportion of each length class on the bed. It is clear that smaller size classes are missing from this bed as is the case on many other beds in 2017. The market sized stock makes up 31% of the total population.

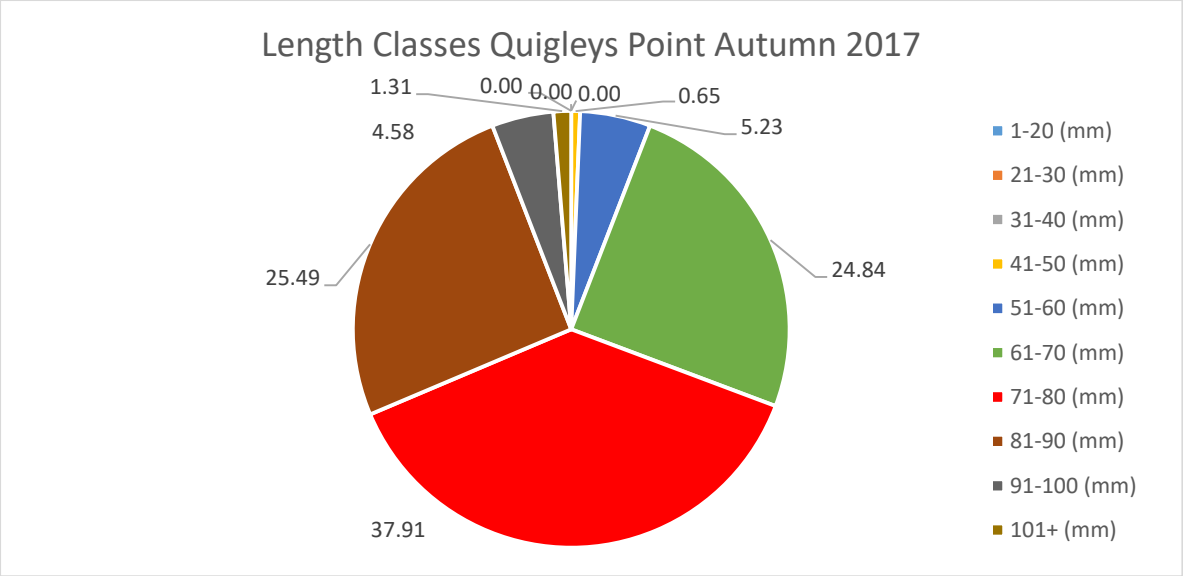

Figure 24 Percentage of length classes: Quigley's Point 2017

9.4 Middle Bed South

Table 5 Summary Information: Middle Bed South

Bed Name	**Middle Bed South**
Area (h)	531
Total Biomass (t)	133.9
Biomass (t) >80mm	66.9

The south section of the Middle Bed covers an area of 531 hectares. There is an estimated total biomass of 133.9 tonnes on this bed and 66.9 tonnes of that figure is of market size.

The length frequency for the Middle Bed South (figure 25) shows that the majority of oysters on this bed are now over 50mm indicating poor juvenile recruitment in 2015 and 2016. There is some limited evidence of a spatfall in 2017 with a proportion of the stock in the 20-30mm size classes.

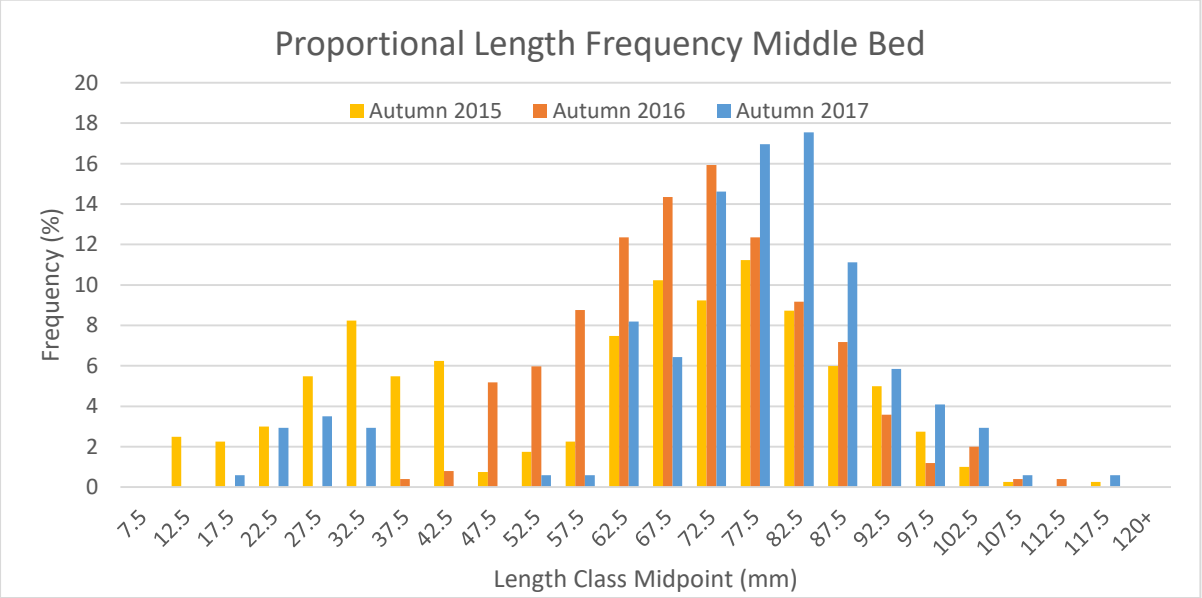

Figure 25 Proportional Length Frequency Middle bed 2015-17

The cumulative frequency (Figure 26) shows an increase in the proportion of larger length classes since the spring 2016 survey. This movement reflects the good growing conditions observed in 2017.

The pie chart (Figure 27) shows evidence of a skew towards larger age classes once again with over 40% of the stock above the market size of 80mm.

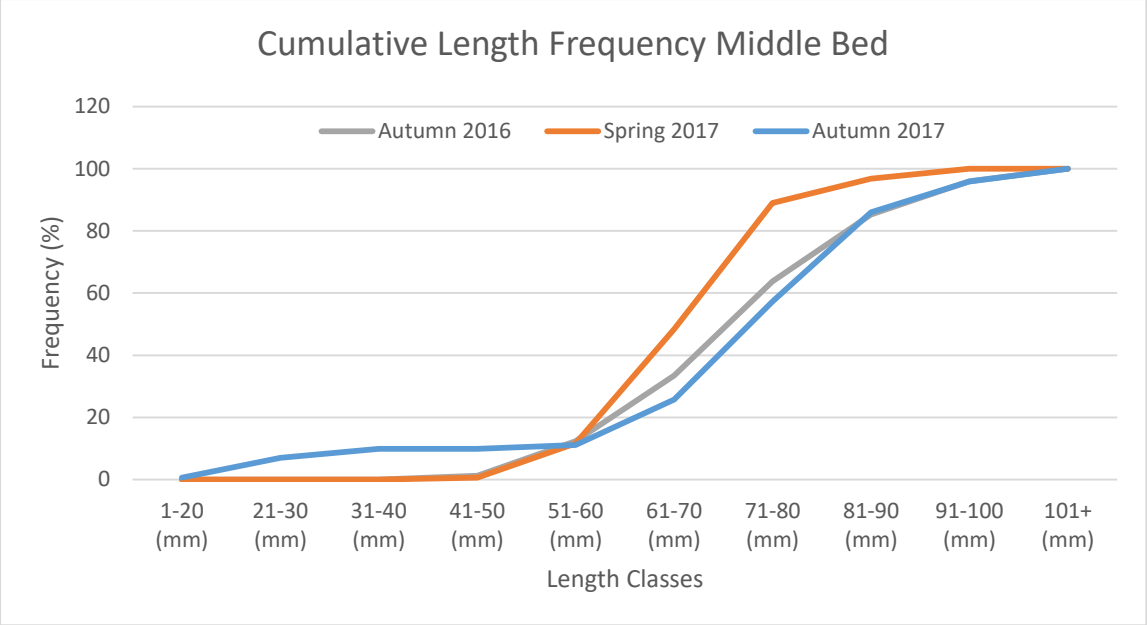

Figure 26 Cumulative Frequency Middle Bed 2016-2017

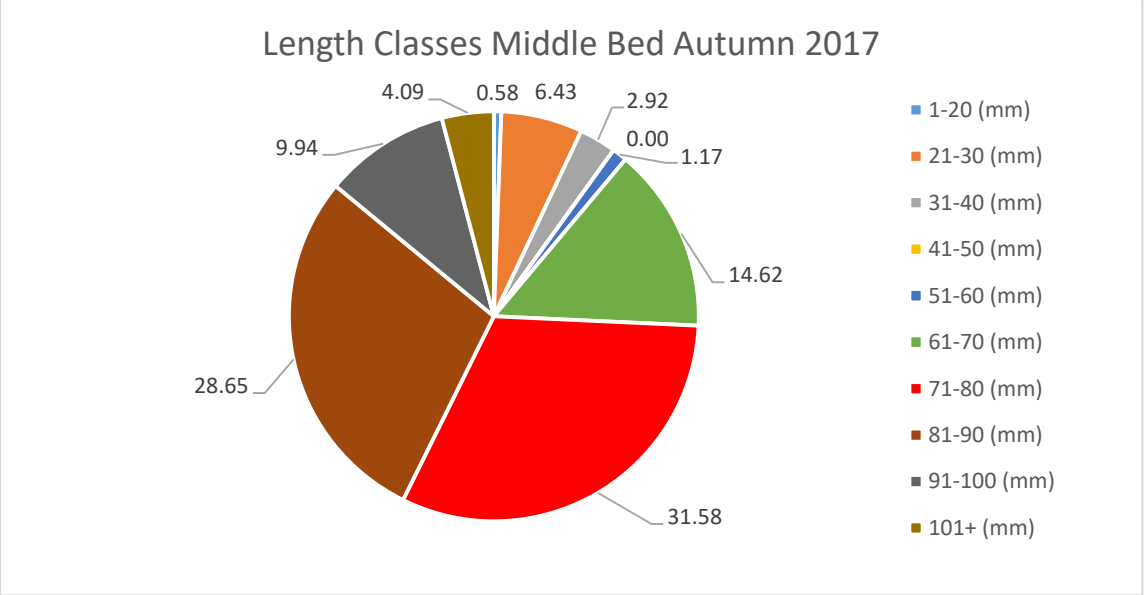

Figure 27 Percentage of length classes Middle Bed 2017

9.5 Southside North

Table 6 Summary Information: Southside North

Bed Name	**Southside North**
Area (h)	288
Total Biomass (t)	47.6
Biomass (t) >80mm	22.8

The North area of the Southside bed covers an area of 288 hectares. The overall biomass on this bed is estimated to be 47.6 tonnes, 22.8 tonnes of this figure represent oysters over 80mm in length.

The length frequency (figure 28) shows limited evidence of any settlement in 2017 with a very small proportion of the stock less than 30mm. The spatfall from 2014 has now progressed into the 80-90mm age classes.

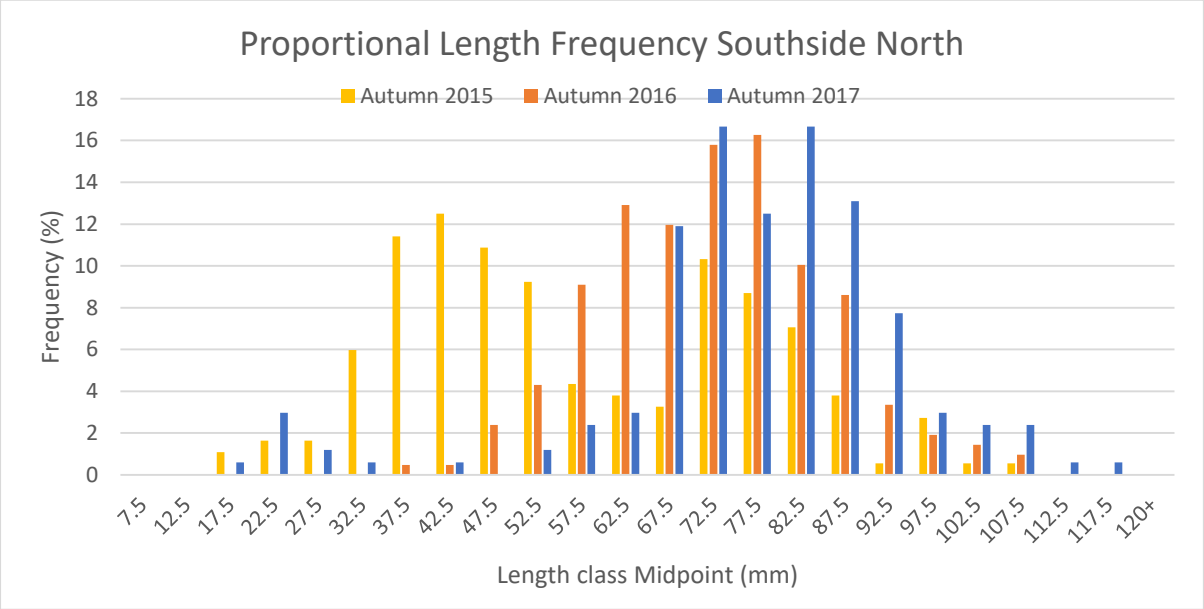

Figure 28 Proportional Length Frequency Southside (N) 2015-17

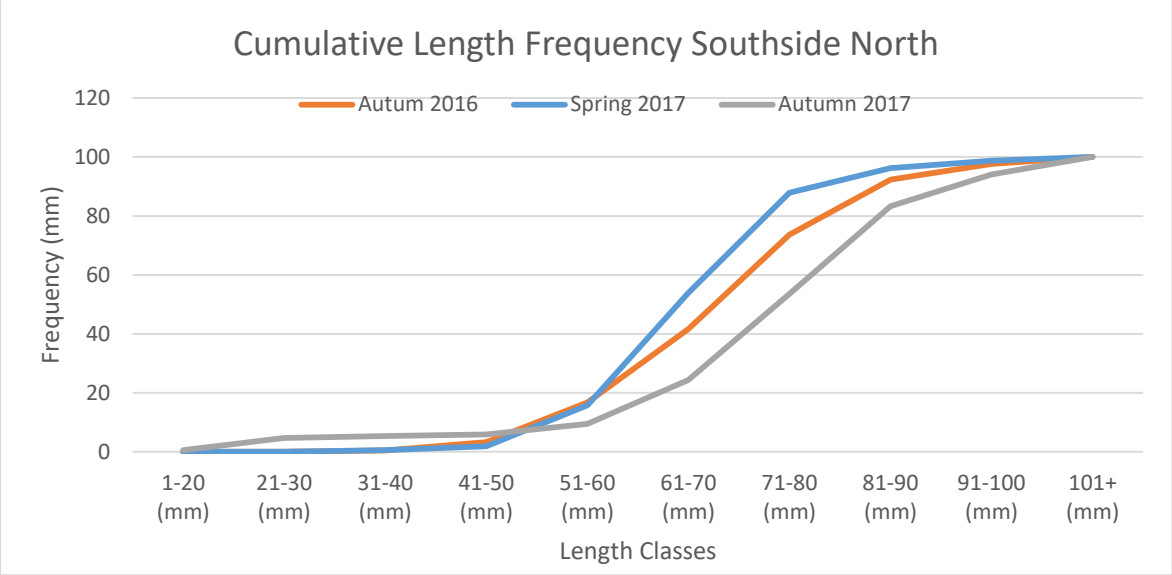

Figure 29 Cumulative Frequency Southside (N) 2016-2017

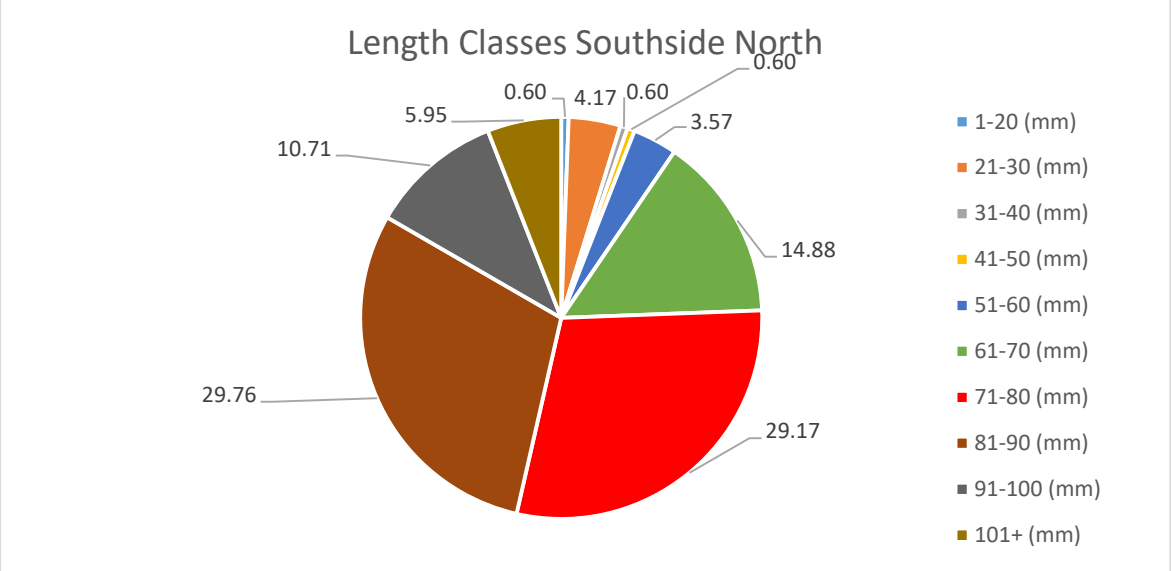

Figure 30 Percentage of length classes: Southside (N) Autumn 2017

9.6 Southside South

Bed Name	**Southside South**
Area (h)	319
Total Biomass (t)	45.7
Biomass (t) >80mm	26.1

The south section of the Southside bed covers 319.0 hectares in total. The overall biomass of oysters calculated during the autumn 2017 survey is 45.7 tonnes and 26.1 tonnes of this figure is currently above 80mm therefore available to the fishery for the 2017/18 season.

Again, like the length frequency for the northern section of the Southside there was limited evidence of spat (<30mm) recorded for this survey. The stock on this bed is skewed towards the larger size classes with the majority above 75mm in length.

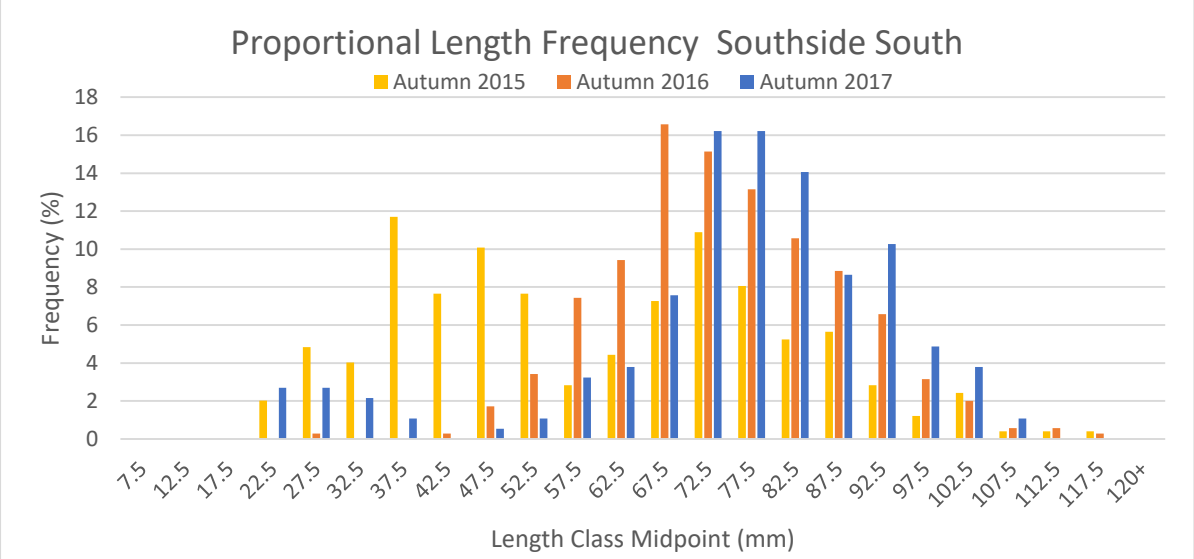

Figure 31 Length Frequency Southside (S) 2015-17

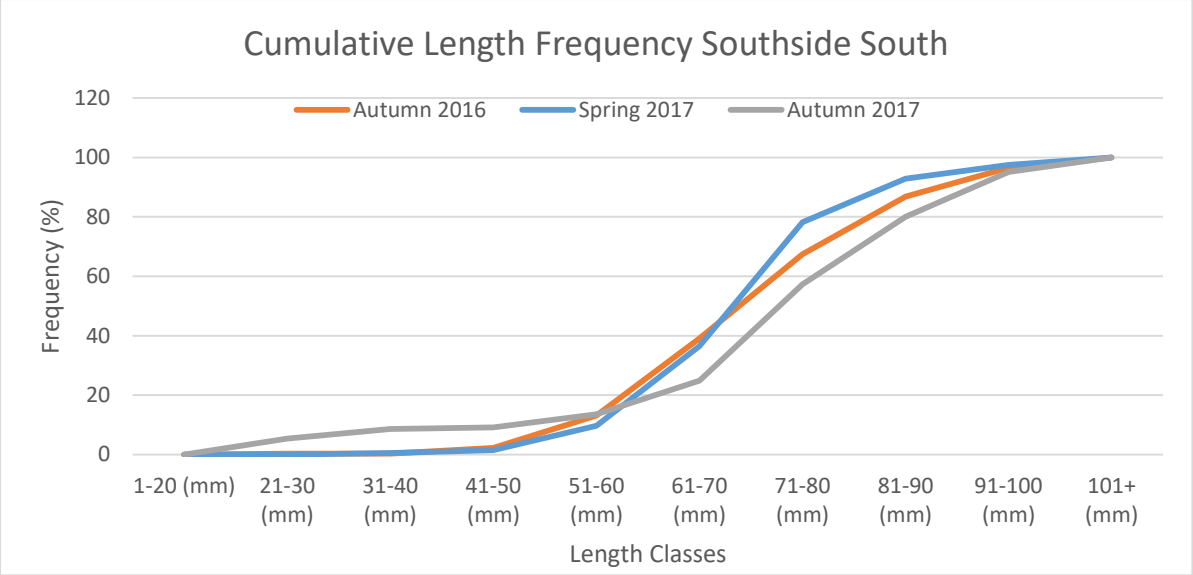

Figure 32 Cumulative Length Frequency Southside (S) 2016-2017

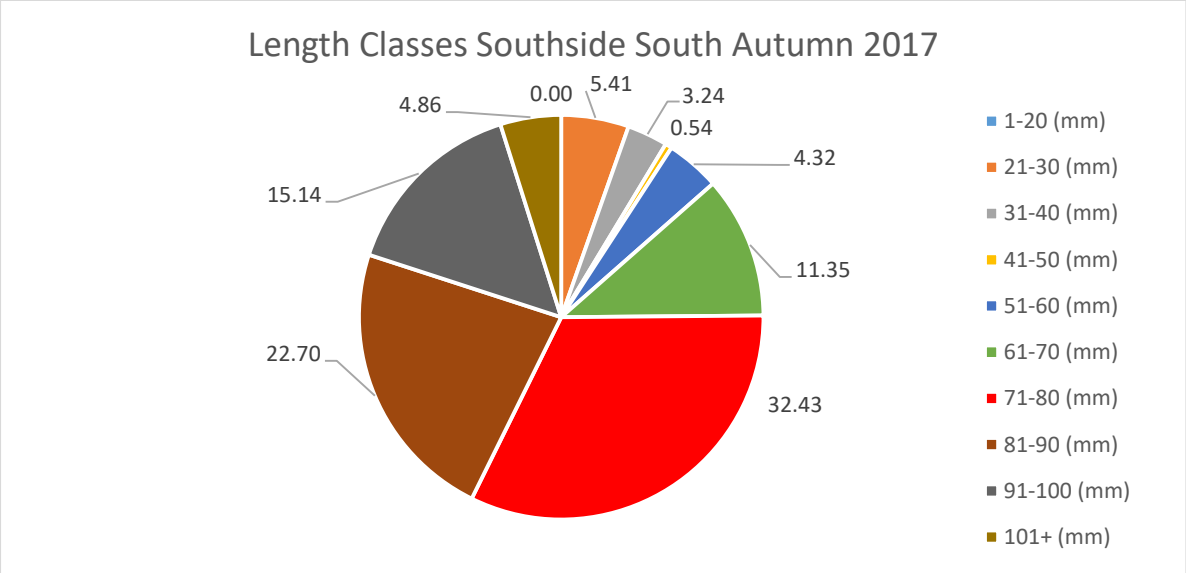

Figure 33 Percentage of length classes: Southside (S) 2017

10. Conclusions

The total biomass estimated for the stock is an increase on the estimates made in spring 2017 and autumn 2016. There has been evidence of a limited spatfall in 2017. The biomass above the minimum landing size of 80mm is estimated to be 315 tonnes. This is the highest fishable stock estimate ever produced for this fishery.

The overall length frequency for the surveyed stock shows the length classes are skewed towards the larger size classes and the majority of the stock is more than 75mm. If a percentage of this stock is left behind and environmental conditions are favourable in summer 2018 there is a greater potential for a successful spawning event and recruitment into the fishery.

It is recommended that the fishery does not remove the total harvestable biomass in the 2017/18 season. This will help to limit the loss of an effective spawning stock for the 2018 spawning period and help to retain enough stock to support a sustainable fishery in 2018/19.

11.Recommendations

Consider partial removal of the harvestable stock biomass to help alleviate pressure on the stock from fishing activity and help sustain an effective spawning broodstock and a viable fishable stock for 2018/19.

Appendix I. Raw data from interpolated density data and biomass estimates

Bed name	Density Class Range	N	Polygon Area (m2)	Mean Weight (g)	No. of Oysters	Total Biomass (t)
Barneys	0 - 0.01000	12	1664112	70	1664	0.12
Barneys	0.01001 - 0.05000	1	13700	70	230	0.02
Barneys	0.05001 - 0.10000	0	0	70	0	0.00
Barneys	0.10001 - 0.50000	0	0	70	0	0.00
Barneys	0.50001 - 1.00000	0	0	70	0	0.00
Barneys	1.00001 - 2.50000	0	0	70	0	0.00
Barneys	2.50001 - 5.00000	0	0	70	0	0.00
Drumskellan	0 - 0.01000	4	18500	64	18	0.00
Drumskellan	0.01001 - 0.05000	1	66100	64	1066	0.07
Drumskellan	0.05001 - 0.10000	0	114548	64	5727	0.37
Drumskellan	0.10001 - 0.50000	3	567945	64	172749	11.06
Drumskellan	0.50001 - 1.00000	3	22600	64	13878	0.89
Drumskellan	1.00001 - 2.50000	0	0	64	0	0.00
Drumskellan	2.50001 - 5.00000	0	0	64	0	0.00
Flat Ground	0 - 0.01000	16	889460	63	889	0.06
Flat Ground	0.01001 - 0.05000	8	1135126	63	32601	2.05
Flat Ground	0.05001 - 0.10000	6	624376	63	40950	2.58
Flat Ground	0.10001 - 0.50000	23	4369718	63	1084481	68.32
Flat Ground	0.50001 - 1.00000	16	2227909	63	1514271	95.40
Flat Ground	1.00001 - 2.50000	6	452388	63	595321	37.51
Flat Ground	2.50001 - 5.00000	0	0	63	0	0.00
Black Ghee	0 - 0.01000	9	759166	58	759	0.04
Black Ghee	0.01001 - 0.05000	14	818275	58	22863	1.33
Black Ghee	0.05001 - 0.10000	3	702034	58	48610	2.82
Black Ghee	0.10001 - 0.50000	4	67200	58	8437	0.49
Black Ghee	0.50001 - 1.00000	0	0	58	0	0.00
Black Ghee	1.00001 - 2.50000	0	0	58	0	0.00
Black Ghee	2.50001 - 5.00000	0	0	58	0	0.00
Great Bank	0 - 0.01000	9	1062683	64.3	4494	0.29
Great Bank	0.01001 - 0.05000	10	1875092	64.3	42344	2.72
Great Bank	0.05001 - 0.10000	8	1354824	64.3	92789	5.97
Great Bank	0.10001 - 0.50000	11	3827792	64.3	705322	45.35
Great Bank	0.50001 - 1.00000	2	136200	64.3	88757	5.71
Great Bank	1.00001 - 2.50000	0	0	64.3	0	0.00
Great Bank	2.50001 - 5.00000	0	0	64.3	0	0.00

Bed name	Density Class Range	N	Polygon Area (m2)	Mean Weight (g)	No. of Oysters	Total Biomass (t)
Middle north	0 - 0.01000	9	2120111	91	2120	0.19
Middle north	0.01001 - 0.05000	2	102044	91	1278	0.12
Middle north	0.05001 - 0.10000	0	41959	91	2098	0.19
Middle north	0.10001 - 0.50000	0	17252	91	1725	0.16
Middle north	0.50001 - 1.00000	0	0	91	0	0.00
Middle north	1.00001 - 2.50000	0	0	91	0	0.00
Middle north	2.50001 - 5.00000	0	0	91	0	0.00
Middle south	0 - 0.01000	19	1052933	59	1053	0.06
Middle south	0.01001 - 0.05000	4	822952	59	25379	1.50
Middle south	0.05001 - 0.10000	5	41959	59	3155	0.19
Middle south	0.10001 - 0.50000	9	4214121	59	1341277	79.14
Middle south	0.50001 - 1.00000	8	864923	59	526158	31.04
Middle south	1.00001 - 2.50000	2	225200	59	326781	19.28
Middle south	2.50001 - 5.00000	1	15600	59	47010	2.77
Moville	0 - 0.01000	16	1752968	55	1753	0.10
Moville	0.01001 - 0.05000	3	637143	55	12549	0.69
Moville	0.05001 - 0.10000	0	86100	55	4305	0.24
Moville	0.10001 - 0.50000	2	19500	55	2600	0.14
Moville	0.50001 - 1.00000	0	0	55	0	0.00
Moville	1.00001 - 2.50000	0	0	55	0	0.00
Moville	2.50001 - 5.00000	0	0	55	0	0.00
Peak	0 - 0.01000	3	309693	50.6	310	0.02
Peak	0.01001 - 0.05000	5	522191	50.6	11089	0.56
Peak	0.05001 - 0.10000	2	379484	50.6	30568	1.55
Peak	0.10001 - 0.50000	8	859393	50.6	168317	8.52
Peak	0.50001 - 1.00000	0	0	50.6	0	0.00
Peak	1.00001 - 2.50000	0	0	50.6	0	0.00
Peak	2.50001 - 5.00000	0	0	50.6	0	0.00
Perch	0 - 0.01000	7	87100	64	87	0.01
Perch	0.01001 - 0.05000	2	283477	64	8391	0.54
Perch	0.05001 - 0.10000	3	131529	64	10585	0.68
Perch	0.10001 - 0.50000	12	898950	64	314589	20.13
Perch	0.50001 - 1.00000	10	965043	64	743828	47.60
Perch	1.00001 - 2.50000	7	382150	64	602893	38.59
Perch	2.50001 - 5.00000	1	2500	64	6838	0.44
Quigley'sPt	0 - 0.01000	14	49822	56.4	50	0.00
Quigley'sPt	0.01001 - 0.05000	5	117678	56.4	2432	0.14
Quigley'sPt	0.05001 - 0.10000	3	227901	56.4	14883	0.84
Quigley'sPt	0.10001 - 0.50000	13	808507	56.4	195772	11.04
Quigley'sPt	0.50001 - 1.00000	12	224419	56.4	150782	8.50

Bed name	Density Class Range	N	Polygon Area (m2)	Mean Weight (g)	No. of Oysters	Total Biomass (t)
Quigley'sPt	1.00001 - 2.50000	1	1600	56.4	1766	0.10
Quigley'sPt	2.50001 - 5.00000	0	0	56.4	0	0.00
Redcastle	0 - 0.01000	9	886669	70.9	887	0.06
Redcastle	0.01001 - 0.05000	8	497605	70.9	12006	0.85
Redcastle	0.05001 - 0.10000	4	152634	70.9	11667	0.83
Redcastle	0.10001 - 0.50000	3	85819	70.9	13731	0.97
Redcastle	0.50001 - 1.00000	0	0	70.9	0	0.00
Redcastle	1.00001 - 2.50000	0	0	70.9	0	0.00
Redcastle	2.50001 - 5.00000	0	0	70.9	0	0.00
Roof Isles	0 - 0.01000	0	0	67.3	0	0.00
Sandy Ridge	0 - 0.01000	46	2853507	77.6	2854	0.22
Sandy Ridge	0.01001 - 0.05000	8	1272659	77.6	28564	2.22
Sandy Ridge	0.05001 - 0.10000	3	541816	77.6	41366	3.21
Sandy Ridge	0.10001 - 0.50000	2	66600	77.6	8208	0.64
Sandy Ridge	0.50001 - 1.00000	0	0	77.6	0	0.00
Sandy Ridge	1.00001 - 2.50000	0	0	77.6	0	0.00
Sandy Ridge	2.50001 - 5.00000	0	0	77.6	0	0.00
Southside N	0 - 0.01000	4	174924	64.4	175	0.01
Southside N	0.01001 - 0.05000	5	906865	64.4	29099	1.87
Southside N	0.05001 - 0.10000	3	436703	64.4	29588	1.91
Southside N	0.10001 - 0.50000	8	1023427	64.4	213406	13.74
Southside N	0.50001 - 1.00000	3	161676	64.4	96845	6.24
Southside N	1.00001 - 2.50000	1	183707	64.4	370502	23.86
Southside N	2.50001 - 5.00000	0	0	64.4	0	0.00
Southside S	0 - 0.01000	2	11100	60.8	11	0.00
Southside S	0.01001 - 0.05000	4	187629	60.8	4229	0.26
Southside S	0.05001 - 0.10000	2	407444	60.8	29172	1.77
Southside S	0.10001 - 0.50000	10	2189815	60.8	547766	33.30
Southside S	0.50001 - 1.00000	5	345114	60.8	273012	16.60
Southside S	1.00001 - 2.50000	1	54704	60.8	78853	4.79
Southside S	2.50001 - 5.00000	0	0	60.8	0	0.00
McGhee Bank	0 - 0.01000	3	66633	60	67	0.00
McGhee Bank	0.01001 - 0.05000	0	81917	60	819	0.05
McGhee Bank	0.05001 - 0.10000	3	171314	60	12683	0.76
McGhee Bank	0.10001 - 0.50000	5	430000	60	111142	6.67
McGhee Bank	0.50001 - 1.00000	0	0	60	0	0.00
McGhee Bank	1.00001 - 2.50000	0	0	60	0	0.00
McGhee Bank	2.50001 - 5.00000	0	0	60	0	0.00
Firing Range	0 - 0.01000	4	826749	50	827	0.04
Firing Range	0.01001 - 0.05000	0	190430	50	1904	0.10

Bed name	Density Class Range	N	Polygon Area (m2)	Mean Weight (g)	No. of Oysters	Total Biomass (t)
Firing Range	0.05001 - 0.10000	1	489739	50	36846	1.84
Firing Range	0.10001 - 0.50000	2	314438	50	75338	3.77
Firing Range	0.50001 - 1.00000	0	0	50	0	0.00
Firing Range	1.00001 - 2.50000	0	0	50	0	0.00
Firing Range	2.50001 - 5.00000	0	0	50	0	0.00