

## Annex D

### Ribble Estuary Cockle Beds: Penfold Channel and South Gut surveys

The science team assessed current stock density and composition on these beds with surveys on 9<sup>th</sup> (2.1m tide) and 10<sup>th</sup> (2.0m tide) November. 56 stations no less than 220m apart were sampled. Due to limitations of tidal range and day light the area of South Penfold was not fully surveyed. Samples were collected using a 'jumbo' and 0.5m square quadrat. All samples, bar one were counted in situ. The total number of cockles, year class and number of undersize cockles were recorded.

Spat (2011 Year Class) were recorded during the survey if observed or found, but values are not definitive for the area as the sampling methodology is suitable for mature cockles only.

### Results

Area	Number of Stations	Average Density of Total Adult Cockle per m <sup>2</sup>	Average Density of Size Cockle per m <sup>2</sup>	Average Percentage Undersize %	
North and South Penfold	n=15	38	17	56	Max 85%
South Gut	n=11	33	25	25	Max 50%
West Penfold	n=30	14	13	26	Max 50%
<b>Total Average</b>	<b>n=56</b>	<b>24</b>	<b>18</b>	<b>34</b>	

Table 1. Average Density and Percentage of undersize cockles found on 3 Ribble Estuary beds.

North and South Penfold have patches of high density cockles, but with a high percentage of undersize. West Penfold area had predominately size cockles but at low densities (14 per m<sup>2</sup>). large numbers of birds were feeding in the West Penfold area and to the south.

South Gut has patches of high density cockle with a high percentage of size in some places.

Spat was observed during the survey and seemed to be more predominant in the North Penfold area. There were some 2009 cockles present; the main year class was 2010.

Cockles from sample Point O6 were returned to the lab to measure length and weight.

	Number	Average Length mm	Length Range mm	Average Weight G	Weight Range g
2009 Oversize	3	33.00	34.73-32.01	12.80	12.3-13.40
2010 Oversize	29	26.57	24.81-28.79	6.91	5.80-9.50
2010 Undersize	71	23.90	20.39-26.20	4.98	3.40-6.30
Spat	12	12.74	7.24-17.81	n/a	n/a

Table 2. Length and Weight measurements of cockles Sampled from Station O6 (North Penfold)

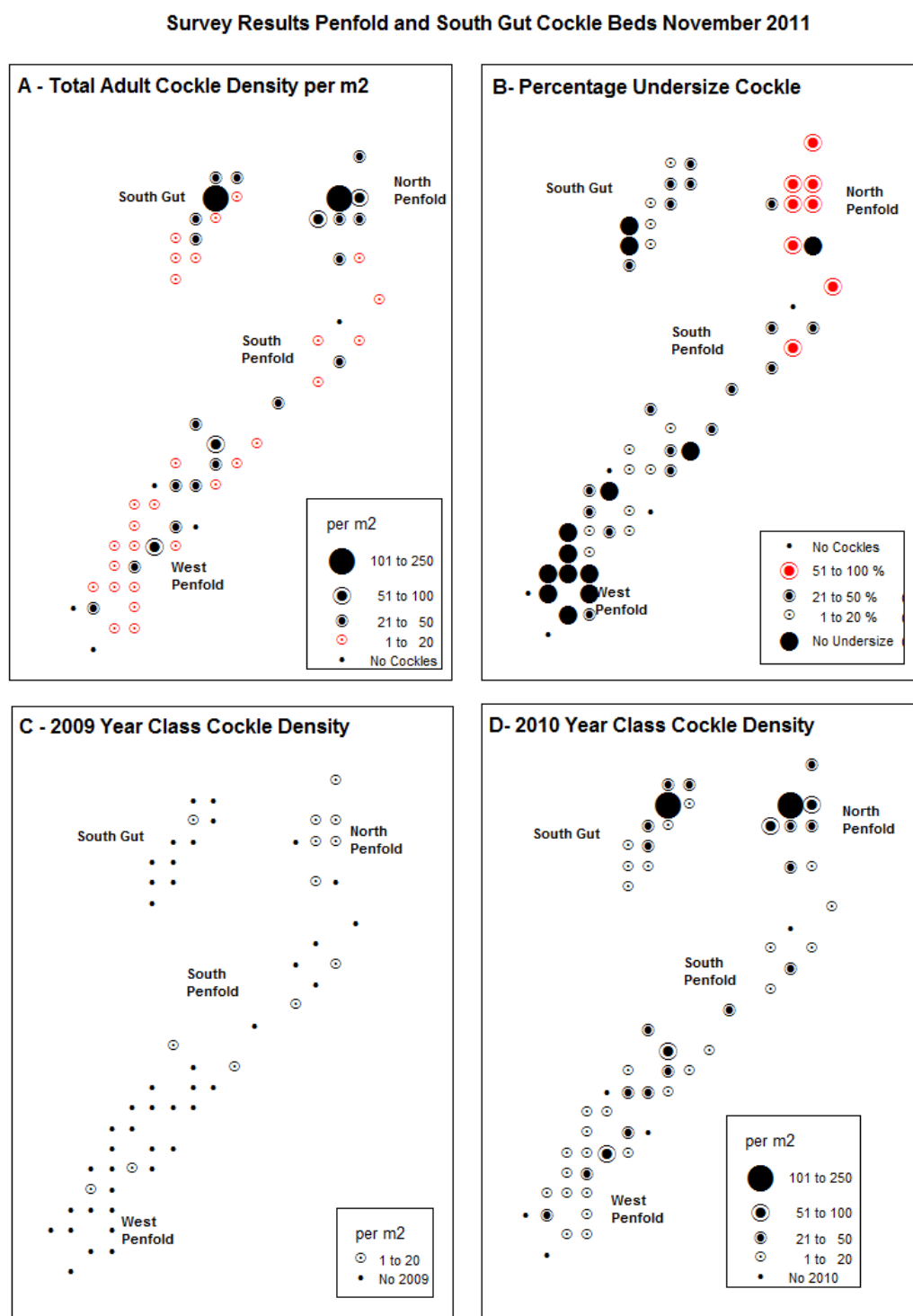


Figure 1. Results from surveyed stations within the Penfold and South Gut Cockle Beds.

*A – total adult cockle per 1m<sup>2</sup>, B – percentage of undersize cockle, C – Number of 2009 Cockle and D – Number of 2010 Cockle*

**Conclusions:** although there are patches of market sized cockle on these beds, they are mostly undersize. In order to protect stocks to encourage a sustainable fishery, these beds should not be fished further in the 2011-12 season.