Agenda Item B4

By: Rob Dyer, Lead Scientific and Conservation Officer

To: Kent and Essex Inshore Fisheries and Conservation Authority – 30 January 2019

Subject: **EMFF Project: Filling the Knowledge Gap – Whelk Populations**

Classification Unrestricted

Summary:
To provide an update on progress over the first year of the two-year, EMFF-funded whelk research project

Recommendations:
To **NOTE** and **DISCUSS** the report

In January 2018, survey work commenced on the whelk population study funded through EMFF. The intention behind this study was to collect 2 years worth of whelk population data in order to better inform management decisions for the whelk permit fishery within the KEIFCA district.

Monthly samples of whelks have been collected using commercial fishing vessels and KEIFCA vessels. Each sample consists of the complete contents of 5 pots (with no escape gaps), and have been collected from Area 1 (Essex coast) and Area 2 (North Kent Coast). The list of samples collected during 2018 are shown below in Table 1.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Area 1	No sample	✓	✓	✓	No sample	No sample	✓	✓	✓	✓	✓	✓
Area 2	✓	No sample	✓	✓	✓	✓	✓	No sample	✓	✓	✓	✓

Table 1: Samples collected during 2018

KEIFCA staff and interns have been trained in the processing of whelk samples by Dr. Phil Hollyman and Charlotte Colvin of Bangor University. Both have many years of whelk research experience and have provided valuable expertise on this project. Dr. Hollyman has previously worked with KEIFCA to determine size at age and size at maturity of whelks from within the district, and presented this work to the authority in 2018.

The processing of each whelk involves the collection of the following data:

- Shell length (maximum length of shell)
- Shell width (minimum width of shell)
- Total weight (including shell)
- Body weight (whelk tissue minus shell)
- Gonad weight (weight of gonad tissue)
- Foot weight (weight of edible whelk tissue)
- Gender
- % Maturity (assessed visually)
- Penis length

From this data it is possible to track changes in the whelk population over the course of the project. For example, changes in sexual maturity can be tracked through a visual assessment of maturity, or via the calculation of gonadosomatic index (the weight of the gonad as a proportion of the total body weight). Foot weight can be used to calculate a meat yield (foot weight as a proportion of the total weight) to see annual trends.

During processing, minimum width measurements allow data to be separated into two categories: Sizeable and Undersized. For the purposes of this project 'Sizeable' means a minimum width of 25mm or more (in order to comply with KEIFCA Whelk Fishery Permit Byelaw technical requirements), while undersized represents whelks with a minimum width of 24.9mm or less (whelks which would pass through a 25mm riddle).

To date over 3500 whelks have been processed from Areas 1 and 2. Numbers of whelks from each sample are shown in Table 2 below. This is presented visually in Figure 1. Processing of whelks from Area 2 (North Kent) has been prioritised during staffing turnover. As a result, currently data for January-July is available for Area 2, while only January-April data is available for Area 1. However, staff and intern availability should see progress on whelk processing from both sites.

		Total Whelks	Sizeable	Undersize
Jan '18	Area 1	0	0	0
	Area 2	596	360	236
Feb '18	Area 1	303	116	187
	Area 2	0	0	0
Mar '18	Area 1	171	165	6
	Area 2	545	346	199
Apr '18	Area 1	142	134	8
	Area 2	576	389	187
May '18	Area 1	0	0	0
	Area 2	466	416	50
Jun '18	Area 1	0	0	0
	Area 2	231	190	41
Jul '18	Area 1			
	Area 2	202	180	22

Table 2: Whelks processed as of Jan 2019

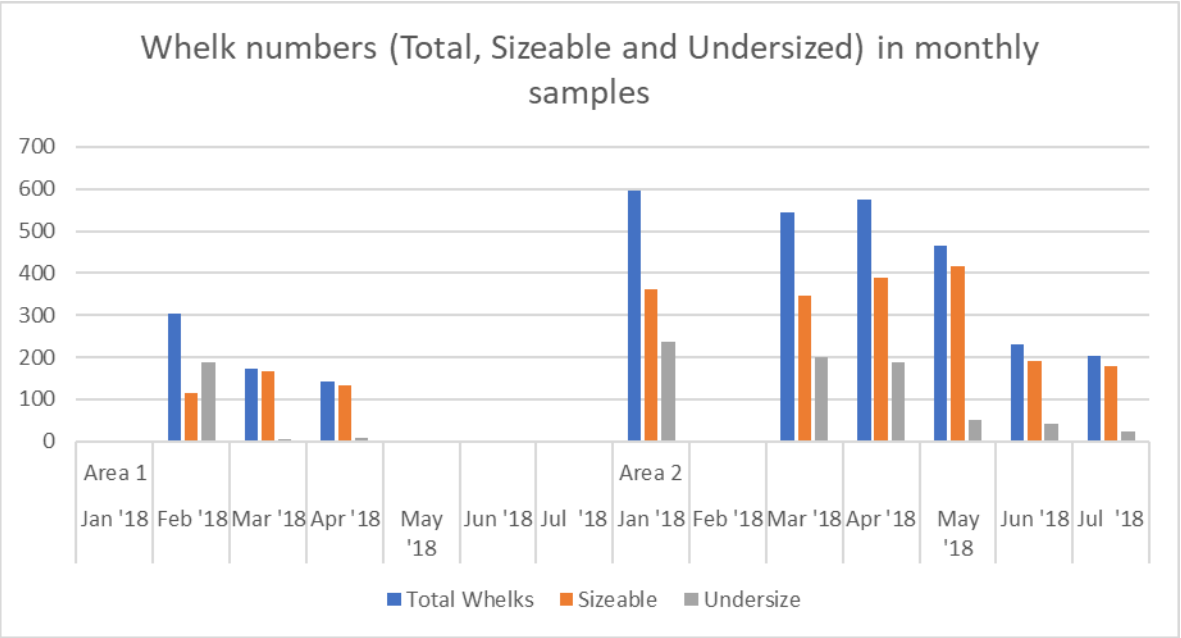

Figure 1: Whelk numbers in 2018 samples (Jan-Jul)

As further processing occurs and more data is added, a fuller comparison of catch, and ratio of sizeable/undersize whelks will be possible.

Some very preliminary analysis of the data collected so far allows an insight into some of the trends which are appearing. The three figures below (Figures 2, 3 and 4) only include data from sizeable whelks within each sample, although undersize whelks can also be included in the data at a later date. Mean sexual maturity will give an indication of readiness to spawn during the year. Mean gonadosomatic index (GSI) will show how gonad development changes before, during and after spawning. Mean meat yield will show any variation in meat yield over the course of the year.

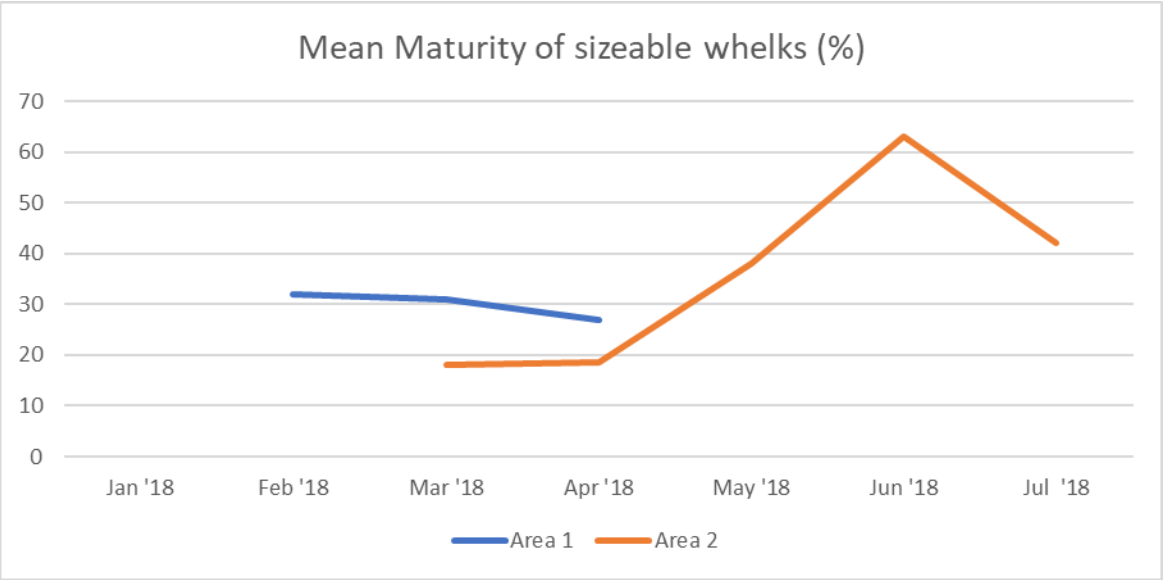

Figure 2: Trend in mean maturity of whelks

On such limited data, it is difficult to read too much into these figures. Figure 2 (above) shows only 3 months of data for whelks in Area 1, and 5 months of data for whelks in Area 2. While a trend towards increasing sexual maturity may be expected as the whelks approach spawning, a complete, 2 year dataset will provide evidence of when sexual maturity starts to increase in preparation for spawning. The reduction in sexual maturity for Kent (Area 2) whelks seems anomalous at this stage and should be viewed in a wider context as more data becomes available.

In a similar way, mean GSI can be seen in Figure 3. As an indicator of gonad size and development, it would be reasonable to assume a similar trend to that of % maturity. As the dataset is filled out, a comparison of the maturity and GSI trends will be possible.

Meat yield, as displayed in Figure 4 (below) shows the weight of the edible portion of the whelk as a proportion of total body weight. With a complete dataset it will be possible to see how this yield changes over the course of the year. Comparisons of yield in each area may highlight differences or emphasise similarities (The whelk genetics MSc with Essex University will look into potential differences in whelk populations in different areas within the district).

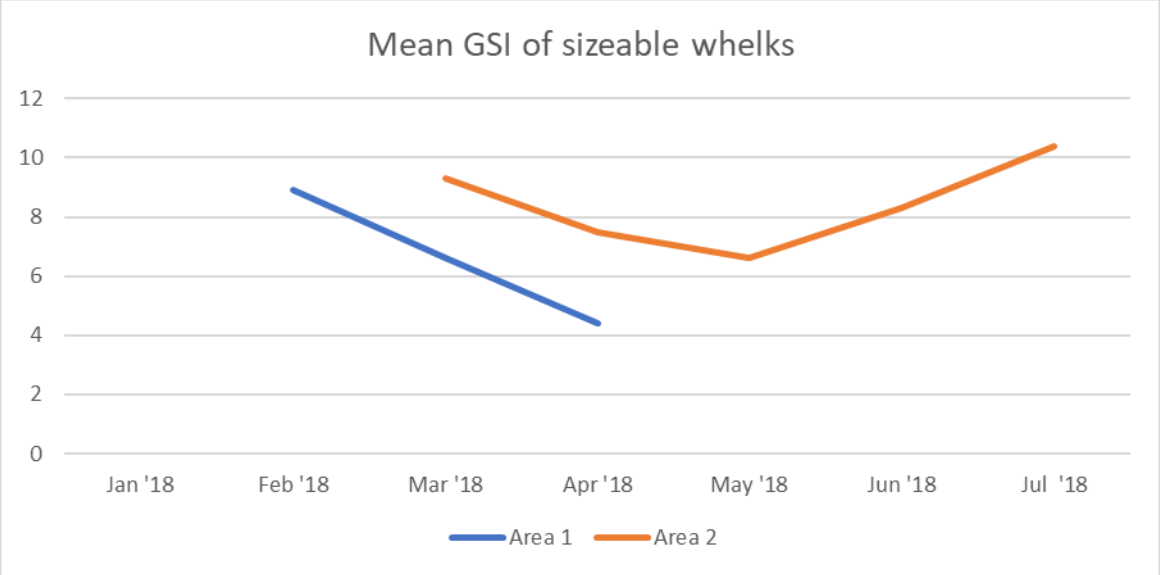

Figure 3: Trend in mean gonadosomatic index of whelks

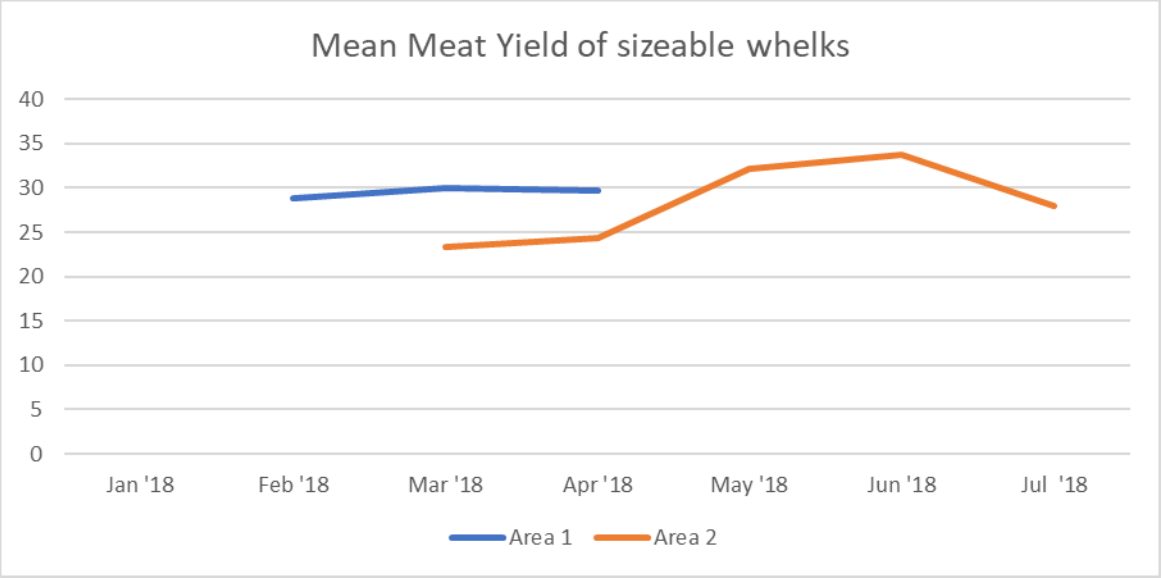

Figure 4: Trend in meat yield of whelks

With very limited data at this point it is difficult to draw any conclusions as to what the data is showing. However, once all of the 2018 samples have been processed, a fuller report will be issued. EMFF require an interim report as a condition of the funding and this will be published during 2019. A wider analysis of the whelk population as a whole along with both sizeable and undersized whelks will give an increased understanding of current harvestable whelk stocks in the district (sizeable whelks) and indicators for the potential stock for future years (undersized whelks)

2019 sample collection is continuing, with the last sample collection date for the project being December 2019. The dataset produced during this project will be an integral part of future decision making on the whelk permit fishery within the KEIFCA district. Whelks continue to be a species of interest nationwide, and KEIFCA is contributing to a wider debate on whelk fisheries management with other IFCAs through the Technical Advisory Group. The work done to date shows KEIFCA to be leading the way with whelk research. Other IFCAs are looking to replicate the work carried out by KEIFCA with Dr. Hollyman in order to gain a better understanding of the changing population demographics around the UK.

Recommendations:

To **NOTE** and **DISCUSS** the report