



Annual Research Report

2018-2019

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NIFCA Annual Research Report 2018/19

NIFCA's Annual Research Plans outlines the work priorities and survey plans for gathering evidence and data over a 12-month period (May – April). In the 2018- 2019 plan the following areas were identified as priorities

- Assessment of shellfish stock status and sustainability of potting within the district
- Assessment of fishing activities within Marine Protected Areas
- Development and implementation of monitoring & control plans for fishing activities
- Development of high resolution seabed maps
- Continuation of annual survey work

The tables below provide a list of the surveys and research conducted by NIFCA and students, as identified in the Annual Research Plan 2018 to 2019. Outcomes of NIFCA actioned surveys are summarised from May 2018 to April 2019 in table (a) and table (b) lists all student research projects conducted relevant to NIFCA and their project status as of April 2019.

Table (a) NIFCA actioned surveys

Survey/ Research	Conducted	Survey/Research Summary	Outcomes	Priority Objective
Mussel Surveys				
Fenham Flats	Annually; 21 st March 2019	Assisted by staff from Natural England, NIFCA officers completed the Fenham Flats survey on 21 st March for the 14 th consecutive year. The overall mussel bed area at the site increased in 2019 to an area of 460,000m ² , an increase of 63,000m ² from the 2018 survey. Despite this overall area increase, the total biomass of the site fell from 1,721 tonnes in 2018, to 1,151 tonnes in 2019. This is associated with the decline in the total number of mussels at the site, which fell by 50% from 2018 to 31,000,000 mussels (Figure 1). This decline in the overall stock, combined with an increasing mean shell size (57.8mm in 2019, compared to 50.8mm in 2018) could highlight a decline stock with an ageing population. Ongoing monitoring of the site will allow for a better understanding of this trend and determine whether this is simply an annual fluctuation or a general decline in the bed	Report for all surveys will be made available on NIFCA website. Surveying of sites will continue annually. Provides information on the status of the mussel beds within the NIFCA district	Continuation of annual survey work

<p>Blyth Estuary</p>	<p>Annually; 18th April 2018</p>	<p>On 12th April 2019, NIFCA officers, assisted with a volunteer from Newcastle University, conducted the annual mussel survey of the Blyth Estuary. The study site is located on the Blyth Estuary in Northumberland. The mussel bed extends from the Blyth Boat Club slipway upstream to just beyond the sewage outfall beneath Cowley Road. Within the Blyth Estuary, the mussel bed has been divided into 6 sectors. Sectors 5 and 6 have been excluded from the 2019 update due to difficulties associated with calculating their exact areas, as well as the lack of samples taken within these areas. For the remaining sectors, the overall bed area increased in 2019 to 16,040 m², from 14,480 m² in 2018. The mean shell length also increased from 32.9mm in 2018 to 35.5mm in 2019. Overall, the density of mussels within the Blyth Estuary has fallen since 2018 to 286 mussels/m². This coupled with the increasing shell size could indicate a decline in the overall bed health and further monitoring of this potential decline is required to determine if there is any marked trend, or these changes are simply annual fluctuations</p>	<p>Report for all surveys will be made available on NIFCA website.</p> <p>Surveying of sites will continue annually.</p> <p>Provides information on the status of the mussel beds within the NIFCA district</p>	<p>Continuation of annual survey work</p>
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Lindisfarne	Annually; 22 nd March 2019	Following on from an initial survey the previous year, it was chosen to repeat the survey at Lindisfarne for a second year to monitor any changes in the bed. Natural England staff again assisted NIFCA officers with the survey on 22 nd March of this year. Overall, the bed area increased from 31,100m ² in 2018 to 40,400m ² in 2019. It is worth noting however that the bed area in 2018 was calculated whilst the tide was flooding the area and it is thought that the perimeter walked during this survey was not an accurate representation of the bed area at the time. The number of mussels found in samples during 2019 was 95, a significant reduction from the 195 found in samples during the 2018 survey. Over this period, the mean shell length increased from 35.2mm to 48.1mm. Given that this site has only been surveyed since 2018, it is difficult to estimate the health of the mussel bed at this site and as such it is proposed to monitor this bed in the future and create a more robust time series before any definitive conclusions can be made.	Report for all surveys will be made available on NIFCA website. Surveying of sites will continue annually. Provides information on the status of the mussel beds within the NIFCA district	Continuation of annual survey work
Lobster Stock Assessment	Weekly (weather permitting); 13 th May 2018, 15 th May 2018, 28 th June 2018, 18 th July 2018, 24 th July 2018, 8 th August 2018, 22 nd August 2018.	The stock assessment model used by North Eastern IFCA has been adapted to fit the Northumberland IFCA fishery/data and the 2017-18 lobster stock assessment data will be analysed in 2019. Inconsistencies in the quantity of data collected between years have made analysing the data more difficult.	Provide detailed information on the status of the NIFCA lobster stock which can be used to inform future management.	Assessment of shellfish stock status and sustainability of potting within the district.
Brown Crab Stock Assessment	Weekly (weather permitting); 6 th February 2019, 14 th February 2019, 19 th	So far, the project has collected data for over 3,300 individual animals through a mix of trips offshore with industry vessels and surveys in fish merchants. This	Provide detailed information on the status of the NIFCA brown crab stock which can be used	Assessment of shellfish stock status and sustainability of potting within the district.

	March 2019, 27 th March 2019.	<p>quarter, 4 trips offshore on industry vessels have been completed, with the data collected from this including animal carapace width, gender and condition. In addition to this, data relating to fleet location, depth, pot type, bait type, soak time, the number of pots in a fleet, as well as other abiotic conditions deemed to aid in analysis of the stock is collected.</p> <p>Further to the survey work that has been undertaken, a number of office-based days have allowed for the creation and refinement of a model to be used for the assessment of the stock once data has been collected during the 12-month allocated window for surveys, as well as contribute to and update the existing Brown Crab Fisheries Management Plan. Additionally, ongoing contact with Shellfish Scientists at Cefas have helped provide further information on a variety of parameters, such as the size of maturity for brown crab within the Central North Sea stock unit.</p>	to inform future management.	
Wholesaler Surveys	Occasional; 5 th June 2018, 21 st January 2019, 23 rd January 2019, 28 th February 2019, 4 th March 2019, 26 th March 2019.	Surveys in merchants have been conducted to determine the relationship between animal size and weight. From the information collected during these surveys, a length/weight relationship can be determined and fed into the wider stock assessment.	<p>Provide information on the status of lobster, brown crab and velvet crab within the NIFCA district.</p> <p>Provides information on the relationship between carapace size and weight and feeds into overall assessments of the biomass of the stock.</p>	Assessment of shellfish stock status and sustainability of potting within the district.
Fleet and Quayside Sampling	Weekly; 7 th June 2018, 10 th July 2018, 20 July 2018, 27 th July	Data is included in stock assessments mentioned above.	Provide information on the status of lobster	Assessment of shellfish stock status and sustainability of

	2018, 30 th July 2018, 1 st August 2018, 17 th October 2018.		within the NIFCA district.	potting within the district.
Fish Surveys				
Aln Estuary	Biannually; 24 th and 25 th May 2018, 5 th and 6 th September 2018.	<p>During the 2018 surveys, 611 individuals of 10 species were caught and counted. Lesser sandeel was the most abundant species recorded (31.6%), however sprat (21.8%) and herring (19.1%) also form a large percentage of the composition (they may have been the most abundant species recorded, however were subsampled in the final seine net).</p> <p>In May, 154 fish were caught and counted, in September >457 individuals were counted with more caught. Four species were recorded in May with ten recorded in September. Species caught in both May and September were flounder, greater sandeel, lesser sandeel and goby sp. All species were more abundant in the September survey, with the exception of flounder. The mean length of all species caught in both months was greater in September than May for all species except flounder. There is a significant difference between the number of species and individuals caught in May and September, which could be a function of how species (specifically herring and sprat) use the estuaries throughout the year . Mean lengths of species recorded was below size at maturity for most commercially important species, indicating the Aln Estuary is an important site for Juvenile fish.</p>	2018 Aln Estuary Report produced. Data provided to EA to inform estuarine status under WFD.	Continuation of annual survey work.

Blyth/Cambois (Bass nursery grounds)	Once every 2 months; 11 th July 2018. Cancelled due to Access and Health and Safety concerns	N/A	N/A	
Periwinkle Survey	Monthly; 13 th June 2018, 15 th June 2018. Cancelled due to resource availability, existing information was available from Quigley (1998) and Tinlin-Mackenzie (2017).	N/A however periwinkles collection is an ongoing workstream for 2019/20.	N/A	
NEBBS				
Druridge Bay	Monthly; 8 th May 2018, 26 th July 2018, 23 rd October 2018, 18 th September 2018, November 2018, March 2019.	Remains of 1 gull sp., 4 guillemots and 5 unidentified birds were recorded.	Data provided to NEBBS surveyor. Information to help inform NIFCA HRAs.	Continuation of annual survey work
Beadnell Bay	Monthly; 6 th July 2018, 19 th September 2018, 23 rd October 2018, 28 th November 2018 March 2019.	Only one unidentified wing bone recorded.	Data provided to NEBBS surveyor. Information to help inform NIFCA HRAs.	Assessment of fishing activities within Marine Protected Areas
Broadscale Habitat Mapping	Weekly during routine patrols.	N/A	Upgrade of mapping systems (OLEX and Furuno) successfully funded through EMFF to map the seabed with higher accuracy and level of confidence.	Development of high resolution seabed maps.
MSFD Project Grab Sampling and SPI Baited Video	13 th August 2018, 14 th August 2018. 28 th September 2018, 24 th October 2018, 16 th October	N/A	Joint project with Newcastle University, Natural England and NEIFCA. Survey work to continue into 2019-20, analysis will be	Develop and test Indicators for mud and reef features.

Towed Video	<p>2018, 7th September 2018, 29th September 2018, 2nd September 2018, 29th August 2018, 30th August 2018, 31st August 2018.</p> <p>28th August 2018, 29th August 2018, 31st August 2018, 2nd September 2018, 4th October 2018, 10th October 2018, 16th October 2018, 19th October 2018.</p>		conducted by Newcastle University. Results and reports will be shared with NIFCA when available.	
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MPA management

HRAs	<p>Desk-based activity throughout the year.</p> <p>Regular meetings with NE advisor.</p>	<p>Simple tLSEs for Northumberland Marine SPA Complete.</p> <p>Detailed tLSEs for Northumberland Marine SPA in progress.</p> <p>Appropriate Assessment for Potting on reef within BNNC SAC awaiting sign-off.</p>	Assessments completed so far conclude that no further management required at this time.	Assessment of fishing activities within Marine Protected Areas.
MCZ Assessments	<p>Desk-based activity throughout the year.</p> <p>Regular meetings with NE advisor.</p>	<p>MCZ Assessments for Aln Estuary MCZ complete (pending sign-off).</p> <p>Draft of Coquet to St Mary's MCZ Assessment. Otter Trawling on reef and mud interactions identified.</p>	Management options are being discussed.	Assessment of fishing activities within Marine Protected Areas.
Bait Digging and Hand Gathering Assessments	<p>Desk-based activity throughout the year.</p> <p>Regular meetings with NE advisor.</p>	Bait Digging and Hand gathering Assessments for all MPAs within the NIFCA district are in progress.	TBC	Assessment of fishing activities within Marine Protected Areas.

Development of Monitoring and Control Plans	Regular meetings with NE advisor.	Monitoring and Control (M and C) plans have been drafted for trawling, potting and static netting. The dredging M and C plan is in progress.	Provides a framework for monitoring fishing activity.	Assessment of fishing activities within Marine Protected Areas.
Monitoring of bait collection activity	Weekly (routine patrols); May 2018 – April 2019	Hotspots for bait digging and hand gathering activity: Bait digging = Whitley Bay (North end of beach), Blyth Estuary, Hadston, Hauxley, Boulmer, Berwick. Cleeving = Whitley Bay (rocks south of St Mary's Lighthouse) Hand gathering for periwinkles (mainly a commercial activity) = Berwick, North Blyth, Whitley Bay (rocks south of St Mary's Lighthouse) Hand Gathering for mussels = Blyth Estuary Crab tiling = Blyth estuary and Coquet estuary.	Spatial and temporal data collected to inform future impact assessments for NIFCAs HRAs and MMO National Risk Assessment.	Continue to monitor activity throughout the NIFCA district.

Table (b) Student Projects

Project Title	Institute / Project type / Student	Status
Effects of collection of <i>Littorina littorea</i> and <i>Arenicola marina</i> from sandy/ muddy shores within the BNNC EMS, based on social and ecological field data on the extent and locations of activities, potential effects on the target species and associated communities.	Newcastle University / PhD / Ashleigh Tinlin-MacKenzie	Complete awaiting corrections.
Comparison of trawl data and fishery food webs between present and 100 years ago in Northumberland.	Newcastle University / PhD / Georgina Hunt	Due: 2020
Lobsters on the ground: improving understanding of shellfish populations on the Northumberland Coast.	Newcastle University / MSc / Jimmy Wright	September 2018
An Overview of Recreational Potters within the Northumberland District.	Newcastle University / BSc / Emily Henderson	September 2018
Fenham Flats Mussel Surveys (2005-2019)	Newcastle University / BSc / Imogen Dent	Due: August 2019
Comparison of historic and current pot catch data.	Newcastle University / BSc / Molly Stockill	Due: August 2019