Devon Biodiversity Records Centre

Report on Surveys in 2003/04 of Crab Tiling Activity on Devon's Estuaries and Comparison with 2000/01 Crab Tile Survey Data

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Devon Biodiversity Records Centre is operated by the Devon Wildlife Trust and supported by a partnership of Local Authorities, statutory and non-statutory nature conservation organisations

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Introduction

Crab Tiling, also known as crab potting, is a method of collecting shore crabs (*Carcinus maenas*) for use as fishing bait for anglers. Like all other crustaceans, shore crabs moult their shells at intervals during their life cycle, during which they seek a refuge from predators. Crab tilers exploit this behaviour, providing artificial shelters such as roof tiles (hence the name), guttering, drainpipes, chimney pots and tyres. Whilst sheltering under the tiles, the crabs are in the 'soft shell' state i.e. the hard shell has been shed and the new shell has not yet hardened. It is in this state that the crabs are collected for fishing bait.

Historically, crab tiling has been carried out in many estuaries in the South West, but recently the increasing level of activity has become an issue for those who manage the estuarine environment. The extent to which the activity affects estuarine ecology is not yet known, though research is currently underway in an attempt to understand and determine this. Prior to consideration of any proposals on future management of crab tiling activity in Devon, it was necessary to have a baseline estimate of the numbers of tiles so that trends can be examined. To achieve this, surveys were undertaken during 2000/01 to determine the number and distribution of crab tiles in Devon's estuaries. This was a collaborative project, involving estuary officers and representatives of the South West Federation of Sea Anglers, Devon Sea Fisheries Committee and English Nature.

The Devon Crab Tile Management Forum repeated this survey in 2003 and 2004 in order to see any changes occurring within the crab-tiling fishery. This report was commissioned by English Nature and has been produced by Devon Biodiversity Records Centre. It is based on data collected by the differing surveyors and the resulting digitised data.

Methodology

The survey methodology used was varied but based on the same as used for the Dart estuary crab tile survey in 1999 and the baseline survey of crab tiling activity on Devon's estuaries 2000/01, designed by Stephen Ley (Ley, 2000). Detailed information on this survey methodology is in the appendix. In practise, in this year's survey, the methodology was generally much simplified and data received, from the estuaries involved in the survey, had been collected in slightly different ways. Data from some estuaries (Exe and Taw-Torridge) had been gathered with a full survey as per the 2000/2001 survey methodology (see appendix), whilst data from other estuaries had been gathered with a view to observing changes in distribution and extent only.

This latter methodology used maps from previous surveys and compared them with the situation in the field. The maps were annotated with any perceived changes in crab tile distribution or number. This method was used on the Teign, Salcombe & Kingsbridge, Avon, Tamar, Plym, Lynher and Dart estuaries where constraints meant that a full survey was unable to be carried out. It should be noted that on the Dart estuary, only areas considered representative of the whole estuary were surveyed. It has been assumed that those areas not surveyed have not changed.

Field work was carried out between summer 2003 and spring 2004 by English Nature staff, estuary officers and other members of staff and volunteers from district councils. The data was passed to Devon Biodiversity Records Centre for digitisation onto a geographical information system (GIS), specifically MapInfo, and this report produced assessing the present state of crab tiling and comparing the results with the baseline survey.

Survey results

The results of the survey are presented as tables and maps for each estuary. Only total numbers of crab tiles per estuary have been compared. There follows a series of maps showing the distribution of crab tile sites for each estuary.

It should be noted that the survey on the Dart and some areas of survey in the Tamar complex (Tamar, Tavy, Plym and Lynher) did not cover the entire estuary. In these cases, it has been assumed there have been no changes to numbers of crab tiles in areas not surveyed.

Table 1. Comparison of number of crab tiles per estuary between 2000/01 data and 2003/04 data.

Estuary	Total number of crab tiles/pots 2003/04	Total number of crab tiles/pots 2000/01	Increase in number of crab tiles/pots
Axe	0	0	0
Sid	0	0	0
Otter	0	0	0
Exe	30,302	26,796	3,506
Teign	22,722	21,001	1721
Dart	11,904	11,794	110
Salcombe & Kingsbridge	193	534	-341
Avon	50	0	50
Erme	0	0	0
Yealm	0	0	0
Tamar Complex	8,165	8,403	-238
Taw Torridge	3,741	4,864	-1,123
Total for Devon	**77,077**	**73,392**	**3,685**

Due to the different surveyors, methods of data collection and methods of digitisation it has become apparent that the way that crab tiles have been mapped as blocks varies from estuary to estuary. As a result, area covered by crab tiles should not be looked upon as comparable data or a good indicator of change. Nevertheless the table below does compare areas mapped, but the change in area covered has not been included due to its misleading nature.

Table 2. Comparison of area covered by crab tiles per estuary between 2000/01 data and 2003/04 data.

Estuary	Area covered by crab tiles/pots 2003/04 (hectares)	Area covered by crab tiles/pots 2000/01 (hectares)
Axe	0	0
Sid	0	0
Otter	0	0
Exe	30.4	65.0
Teign	14.4	11.1
Dart	5.2	5.1
Salcombe & Kingsbridge	0.2	0.3
Avon	0.1	0
Erme	0	0
Yealm	0	0
Tamar Complex	9.8	30.1
Taw Torridge	5.1	7.1
Total for Devon	**65.2**	**118.7**

A further breakdown of areas covered, crab tile numbers and other data collected or calculated has not been included in this report but is available in GIS or electronic format on request.

Digitised maps

Survey data from each estuary (where crab tiles have been found) is represented with maps. For each estuary there is an overview of crab tiles on the estuary comparing recent crab tile distribution with that of the previous survey. In the corner of these maps the total number of crab tiles counted and shown in the map is given for each survey. Also given in the overview map is the total number of recently counted crab tiles (and code) for each area of the estuary. Only those parts of each estuary containing crab tiles are shown on the maps.

Following maps represent more detailed views of the current crab tile distribution. Each block of crab tiles is annotated with the code for that block and the number of crab tiles within it. Where estuaries are sufficiently small, only one map for both overview and detailed viewing has been produced i.e. Avon and Plym estuaries.

Conclusion

It is important to mention, at this point, the limitations on the data collected and the conclusions that can be made. The number and area covered by tiles has been presented in table form in order to compare the baseline survey with the re-survey. Limitations are suggested in the results section and apply particularly to the area covered by tiles. Different surveyors, methods of data collection and digitisation all contribute towards inaccuracies. In addition, it must be noted that this is the first re-survey after the baseline and any indications of trends should take into account data limitations.

Over the three years or so since the initial baseline survey there appears to have been an overall increase in the number of crab tiles on estuaries in Devon of nearly 3,700. This represents an increase of approximately 5% on the baseline survey carried out between 1999 and 2001.

This increase in use of crab tiling activity on mudflats is not seen on every estuary throughout Devon. Indeed, only six estuaries (Exe, Teign, Dart, Avon, Lynher and Torridge) saw an increase in the number of crab tiles found. One of these, the Avon, saw an increase from 0 recorded in 2000 to 50 in 2003. However, these crab tiles were part of a study and are not being used commercially. The remaining four estuaries with crab tiles present (Salcombe-Kingsbridge, Plym, Tamar and Taw) saw a decrease, whilst five (Axe, Sid, Otter, Erme and Yealm) remain free of crab tiles.

Increases in crab tile numbers generally seem to be confined to estuaries near high urban populations e.g. Exe, Teign and Dart. However, this is not always the case as other estuaries close to urban populations such as the Plym and Tamar demonstrate.

The Exe estuary saw the greatest increase in crab tile numbers since the initial survey with an added ca. 3,500 being counted. The Taw-Torridge saw the greatest decrease in crab tile numbers with approximately 1,100 less than counted in the previous survey.

What is interesting to note is the change in distribution of crab tiles on some of the estuaries. The Exe, for example, saw an overall increase of 13% and seems to have more on the west side of the estuary than it did previously. Also, whilst the Taw-Torridge estuary as a whole experienced a decrease of 23% in crab tile numbers, the Torridge saw an increase of about 400 and the Taw a decrease of 1,500. Similarly, the estuaries that make up the Tamar complex, as a whole, had a decrease of over 230 crab tiles (2.8%). Yet this was not evenly distributed, as the Tamar and Plym saw a decrease, whilst those on the Lynher increased.

Area has not been used as an indicator of change due to the reasons mentioned above. Therefore no conclusions or observations have been made using this.

For future reference accurately measured areas/blocks of crab tiles would be most useful to have for calculation of statistics such as area used, proportion of shore with crab tiles etc. This can really only be done with calculation/estimation in field or, preferably, with GPS so that calculations can be done with GIS technology.

Should this process be repeated, it is recommended that a full survey be carried for each estuary or at least if only changes are to be monitored then the entire estuary must be surveyed and not some areas of the estuary that are considered representative.

Appendix

2000/2001 METHODOLOGY

A standardised methodology compatible for all Devon's estuaries, that would provide consistency in data, was an essential requirement for this survey. Agreement was reached during the Crab Tile Management Forum in March 2000 that the method used for the Dart estuary crab tile survey in 1999, designed by Stephen Ley (Ley, 2000), gave the most accurate results out of the methods previously used to collect data on crab tiling activity. His approach therefore formed the basis for this project.

Devon Wildlife Trust organised a survey training day for estuary officers and other interested individuals and organisations. Stephen Ley provided training in his survey method, which consisted of a theory session followed by a practical exercise on the Exe estuary.

Survey packs were produced by Devon Wildlife Trust and Devon Biodiversity Records Centre for the estuaries which required a survey. The contents of the packs were as follows

- Task brief – short summary of what crab tiling is, and the need for survey
- Guidance notes to aid survey
- Survey forms
- Series of overlapping OS maps of the estuary
- Health and Safety guidelines

Estuary officers co-ordinated the surveys on their individual estuaries and provided training for surveyors where required. Devon Wildlife Trust provided volunteers from their membership to help with the survey.

SURVEY

Surveys were undertaken on foot during periods of Low Water Spring tides for approximately one and a half hours either side of low water when the maximum extent of foreshore is exposed, therefore minimising the possibility of overlooking tiles sited on the very low shore.

A survey form was completed for each crab tile site, (see example in Appendix I). Surveyors counted individual tiles in each site and marked the site on the relevant Ordnance Survey (OS) map to ensure accuracy of site location in relation to landmarks and other crab tile sites.

Where possible, surveyors spoke to the crab tilers collecting on site, explained what they were doing, and in many cases gained further useful information on who was working the site, and whether adjacent sites were active or not.

EQUIPMENT

- Thigh waders or wellingtons
- Waterproof clothing
- Weatherwriter
- Survey pack
- Tide tables
- Mobile phone

COLLATION OF DATA

Completed survey forms and associated OS maps showing location of crab tile sites were sent to Devon Biodiversity Records Centre. Crab tile numbers and distribution were digitised onto GIS Mapinfo.

FOR OFFICE USE ONLY
Site No:
Checked by EO? ☐
Checked by DBRC? ☐
Tide Times:
MLW am pm
MHW am pm

CRAB TILE SURVEY FORM

ESTUARY:
TEMP. SITE No:
GRID REF OF SITE:
* Please mark location of site on copy of OS map(see guidance notes)

DATE OF SURVEY:
START TIME AT THIS SITE:
FINISH TIME AT THIS SITE:
AMOUNT OF TIME
AT THIS SITE:

SURVEYOR NAME/S:

CONTACT PHONE No:

SITE DESCRIPTION:
(See guidance notes)

NAME & ADDRESS OF CRAB TILER (If known):

NUMBER OF TILES:

SPACING OF TILES: (1-5 scale):
(See guidance notes)

SEDIMENT TYPE:
FINE ☐
MEDIUM ☐
COARSE ☐
OTHER ☐
(please specify)

SHORE POSITION: (see guidance notes)
HIGH ☐
MEDIUM ☐
LOW ☐

TILES IN USE?
YES ☐
NO ☐
UNSURE ☐
(See guidance notes)

EPIFLORA & FAUNA ON TILES:
(see guidance notes)

		COVERAGE 1=slight 2=medium 3=dense
SEAWEED	☐	☐
BARNACLES	☐	☐
NONE (Tiles clean)	☐	☐
OTHER (Please specify)	☐	☐

MATERIAL OF TILE:

PLASTIC PIPING ☐
TERRACOTTA ROOF TILE ☐
TYRE ☐
CORRUGATED IRON ☐
CHIMNEY POT ☐
OTHER ☐
(Please specify)

ORIENTATION OF TILES: (see guidance)

FLAT ☐
45° ☐
UPRIGHT ☐
OTHER ☐
(please specify)

EASE OF PUBLIC ACCESS:

POTENTIAL CONFLICTS: please list here
(See guidance notes)

SKETCH MAP OF SITE:
(Please include distribution and pattern of tiles)
(see guidance notes)

PLEASE RETURN FORM TO ESTUARY OFFICER BY …….. date

THANK YOU