Intertidal Edible Crab (*Cancer pagurus*) Survey 2021

Final report for the 2021 Intertidal Edible Crab Survey (2021_CIFCA_POR_INT_EDC)

Cornwall Inshore Fisheries and Conservation Authority (Cornwall IFCA)

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Glossary of Terms and abbreviations

BST	British Summer Time
Cefas	Centre for Environment, Fisheries and Aquaculture Science
IFCA	Inshore Fisheries and Conservation Authority
SAC	Special Area of Conservation
UTC	Universal Time Coordinated

1 Introduction

Cornwall Inshore Fisheries and Conservation Authority (IFCA) have been investigating ways to survey the abundance of edible crab (*Cancer pagurus*), also known as brown crab, within the district. In 2012, the Centre for Environment, Fisheries and Aquaculture Science (Cefas), carried out a shoreline survey to sample juvenile edible crab in Cornwall. The survey was carried out to examine the feasibility of shore based sampling of juvenile edible crabs and the utility of the data collected as an abundance index, a source of information on crab growth and further analysis of length frequency data (Smith, M, 2012). Since then, two masters students have carried out separate studies O'Halloran (2015) looked at the nursery function of rockpools for commercially important species of crab, *C. pagurus*, *Necora puber* and *Maja squinado* in Jersey and Heraghty (2013) investigated the abundance, distribution and habitat use of juvenile *C. pagurus* of the intertidal zone around Anglesey and Llŷn Peninsula, North Wales (UK).

Juvenile edible crabs inhabit the intertidal zone for approximately three years before they migrate offshore (Davis, 2007). During that period of time when they are found in the intertidal zone, the carapace width increases to approximately 6-7 cm (Davis, 2007). The migration pattern varies between the sexes. Males have been observed migrating large distances, especially larger, older animals but generally they are nomadic and move in fairy random localised patterns. Females move offshore to spawn then back inshore to mate (Hunter *et al*., 2013). Females travel on a westward axis. It is suggested that this western migration to spawning grounds allows the crabs larvae to hatch and travel in the prevailing tidal currents returning them to settle in areas of their mother's origin (Hunter *et al*., 2013).

In 2020, Cornwall IFCA carried out two recce survey days at Prisk Cove, near Mawnan Smith. This site was chosen due to high records of edible crab numbers during past Seasearch surveys (Matt Slater, pers. comm. 2020). These two surveys trialled different sampling methods; one using a 5 m^2 grid at different stages down the shoreline from the high water mark to the low water mark and the other walking the length of shore at the low water mark parallel to the shoreline. Due to the low numbers of edible crabs at this site from the two survey days, it was decided that repeating the survey at Greeb Point, Portscatho which is the location Cefas chose would be more beneficial. The results from the two survey days at Prisk Cove are not included within this report.

Edible crabs are known to live in a wide range of habitats, from course to muddy sand, gravel and bedrock, under boulders and shingles and females prefer softer sandy substrates (FAO, 2021). The site at Portscatho provides optimal habitat for edible crab.

Due to the refined survey area, drone footage was obtained to accurately show the habitat. This was contracted to Vertical Horizons Media who supplied mosaiced data in 2021.

1.1 Aims and objectives

1.1.1 Aims

- To investigate the abundance of edible crab (*C. pagurus*), at Greeb point located on the south coast of Cornwall.
- To investigate the auditability of the survey as a tool for monitoring crab abundance using the site at Greeb Point as a proxy.

1.1.2 Objectives

- To photograph, measure and record the length (mm) of all edible crabs (*C. pagurus*) observed during the sampling period.
- To record any invasive species observed during the survey.
- To provide recommendations for future survey work.

2 Methodology

2.1 Survey location

The survey was carried out Greeb Point, one mile south of Portscatho on the south coast of Cornwall. This location was sampled by Cefas in 2012 and provides an ideal habitat for edible crab. It comprises a rocky outcrop with gullies that are full of a mixture of coarse sand, stones, cobbles and small boulders (Figure 1). The location is accessed down a narrow, overgrown path and is relatively quiet as it is off the main coastal path. The survey site is situated within the Fal and Helford Special Area of Conservation (SAC).

Figure 1: Survey site at Greeb Point on the south coast of Cornwall

2.2 Survey timing

The survey was carried out one hour either side of low spring tides.

2.3 Personnel

The survey was carried out by one or two scientific officers.

2.4 Personal Protective Equipment (PPE)

Steel toe capped boots were worn while carrying out the survey. A first aid kit and mobile phone were in possession of the officers at all times. There were no reported accidents or near misses during the survey.

2.5 Survey methodology

The positions from the survey carried out by Cefas in 2012 were loaded into a handheld Garmin GPS 60 unit using latitude and longitude and work mobile phones using the what3words app.

Officers initially recorded the weather and tide times into a log sheet and then proceeded to the first position which was closet to them. Stones, cobbles and boulders that were deemed safe (not too heavy or in an awkward position) were overturned and checked for edible crabs hiding underneath.

If crabs were found, these were picked up carefully and photographed with an Olympus Tough TG-5 from above and underneath for the first survey and just solely from underneath for the remaining three surveys. The crabs were measured across the width of the carapace (mm) using vernier callipers and recorded on a log sheet. Once measured the crabs were returned to the place they were found.

2.6 Data handling

Data was entered into a daily log sheet and then transferred to Microsoft Excel.

All photographs taken during the survey were transferred to Cornwall IFCA's servers.

2.7 Data analysis

The data were transferred into length frequency plots in Microsoft Excel.

The GPS track for all survey days were plotted using MapInfo Professional Advanced (Version 17.0.4) over aerial footage from drone photography of the survey site supplied by Vertical Horizons Media.

3 Results

The 2021 intertidal edible crab surveys were carried out on 29th April, 27th May, 23rd June and the 8th October. The daily logs are shown in Annex 1.

3.1 Survey Narrative

All times are Universal Time Coordinated (UTC) unless stated otherwise.

29th April 2021

The weather conditions were favourable with light winds from the NW of 10 mph and overcast skies with cloud coverage of 8/8. Cornwall IFCA officers arrived on site at 11:15 and did a short recce before the survey

commenced to see what habitat the edible crabs could be found and to locate the position that Cefas had carried out their previous survey. During the recce a large number of edible brown crabs were discovered so the survey started earlier than planned at 11:55. The survey ended at 14:13 and IFCA officers departed the site at 14:45. Low tide on the day was 0.14 m at 14:15 as recorded in Falmouth (BST). 65 brown crabs were recorded as part of the survey.

27th May 2021

The weather conditions were favourable with light winds from the SSE of 10-14 mph and partially overcast skies with cloud coverage of 5/8. A Cornwall IFCA officer arrived on site at 11:45 and started the survey at 11:48. The survey ended at 13:31 and IFCA officer departed the site at 13:45. Low tide on the day was 0.25 m at 13:15 as recorded in Falmouth (BST). 37 brown crabs were recorded as part of the survey. A noticeable increase in velvet swimming crabs and Montagu's crab was observed compared to the previous survey.

23rd June 2021

The weather conditions were favourable with light winds from the NE of 6-10 mph and sunny skies with low cloud coverage of 1/8. Cornwall IFCA officers arrived on site at 09:25 and started the survey at 09:37. The survey ended at 11:23 and IFCA officers departed the site at 11:55. Low tide on the day was 0.72 m at 11:11 as recorded in Falmouth (BST). 35 brown crabs were recorded as part of the survey. A noticeable increase in algae coverage over rocks, Montagu's crabs more abundant and larger velvet swimming crabs.

8th October 2021

The weather conditions were favourable with light winds from the SE of 10-13 mph and sunny skies with low cloud coverage of 1/8. Cornwall IFCA officers arrived on site at 11:55 and started the survey at 12:17. The survey ended at 14:27 and IFCA officers departed the site at 14:40. Low tide on the day was 0.49 m at 13:51 as recorded in Falmouth (BST). 18 brown crabs were recorded as part of the survey. A noticeable increase in brown algae coverage over rocks.

The start of line and end of line positions (WGS 84) are shown in Table 1.

Table 1: Positions of the start of line and end of line for each survey date

Date	SOL position		EOL position	
	Latitude (dd.dddddd)	Longitude (dd.dddddd)	Latitude (dd.dddddd)	Longitude (dd.dddddd)
29th April 2021	50.164500	-4.972300	50.165050	-4.972050
27th May 2021	50.164250	-4.972283	50.164483	-4.972350
23rd June 2021	50.164233	-4.972250	50.165417	-4.972350
8th October 2021	50.164250	-4.972233	50.164567	-4.972550

The GPS track positions for each survey day are shown in Figure 2 to Figure 5.

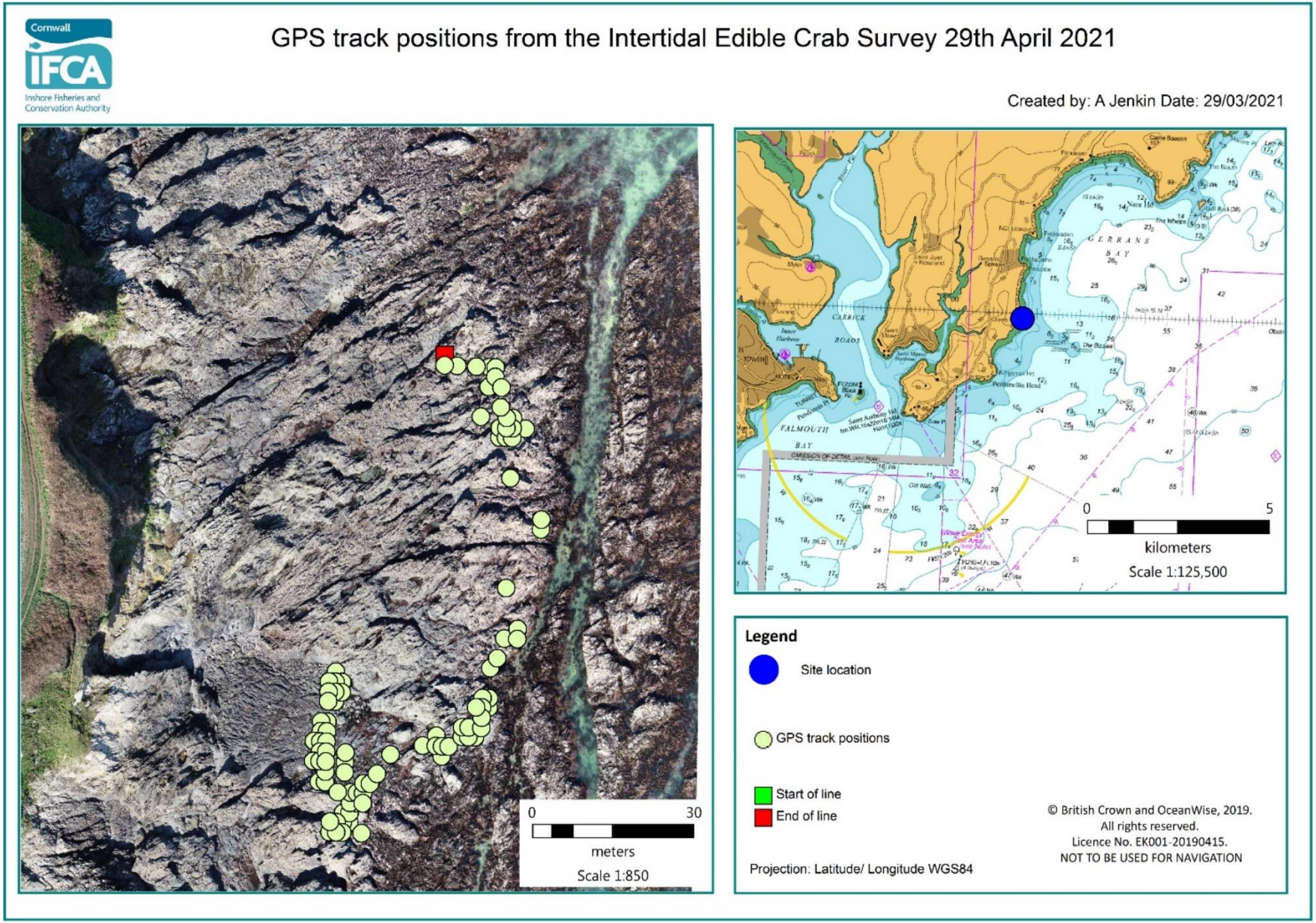

Figure 2: GPS track points from the intertidal survey on 29th April 2021.

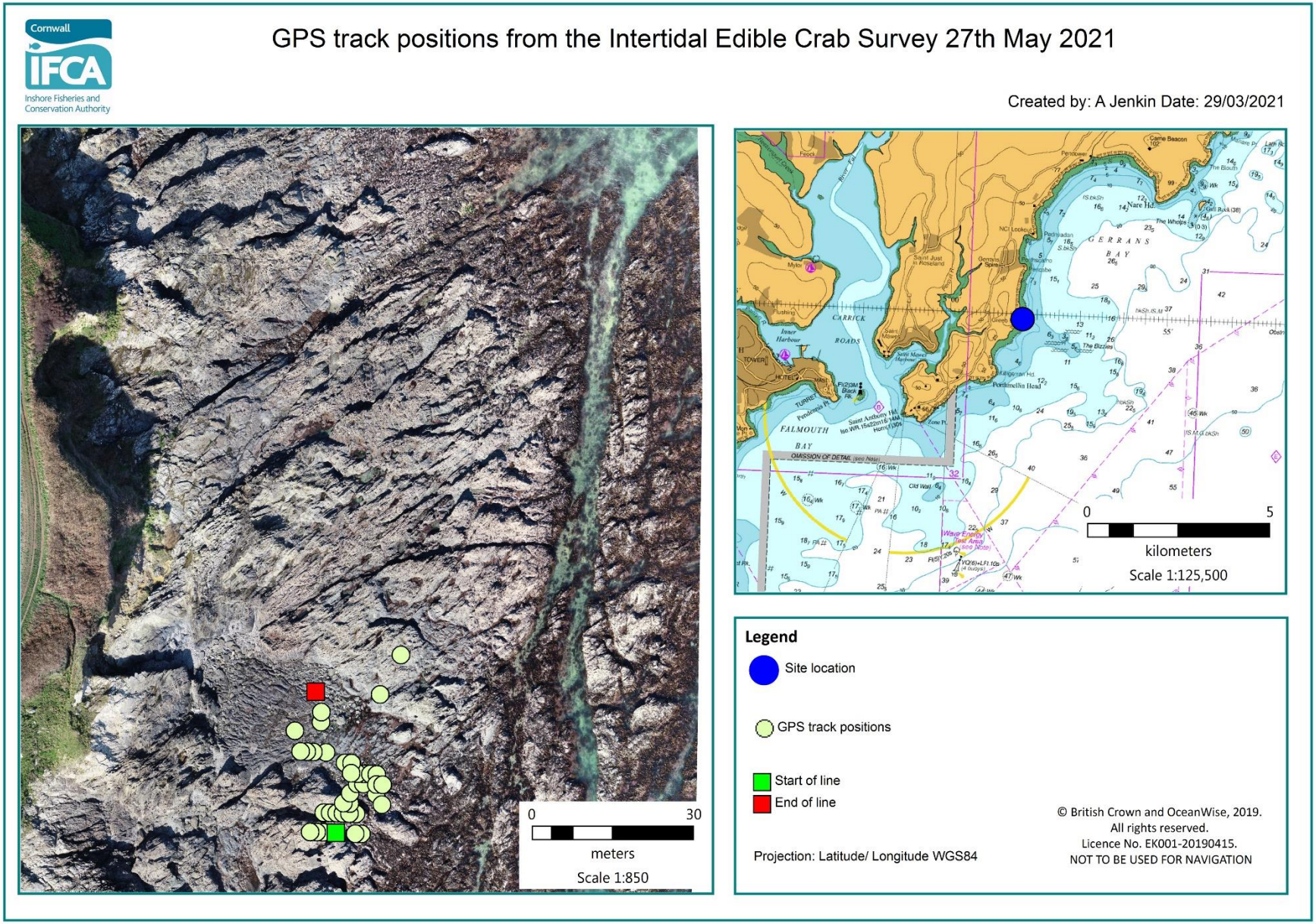

Figure 3: GPS track points from the intertidal survey on 27th May 2021.

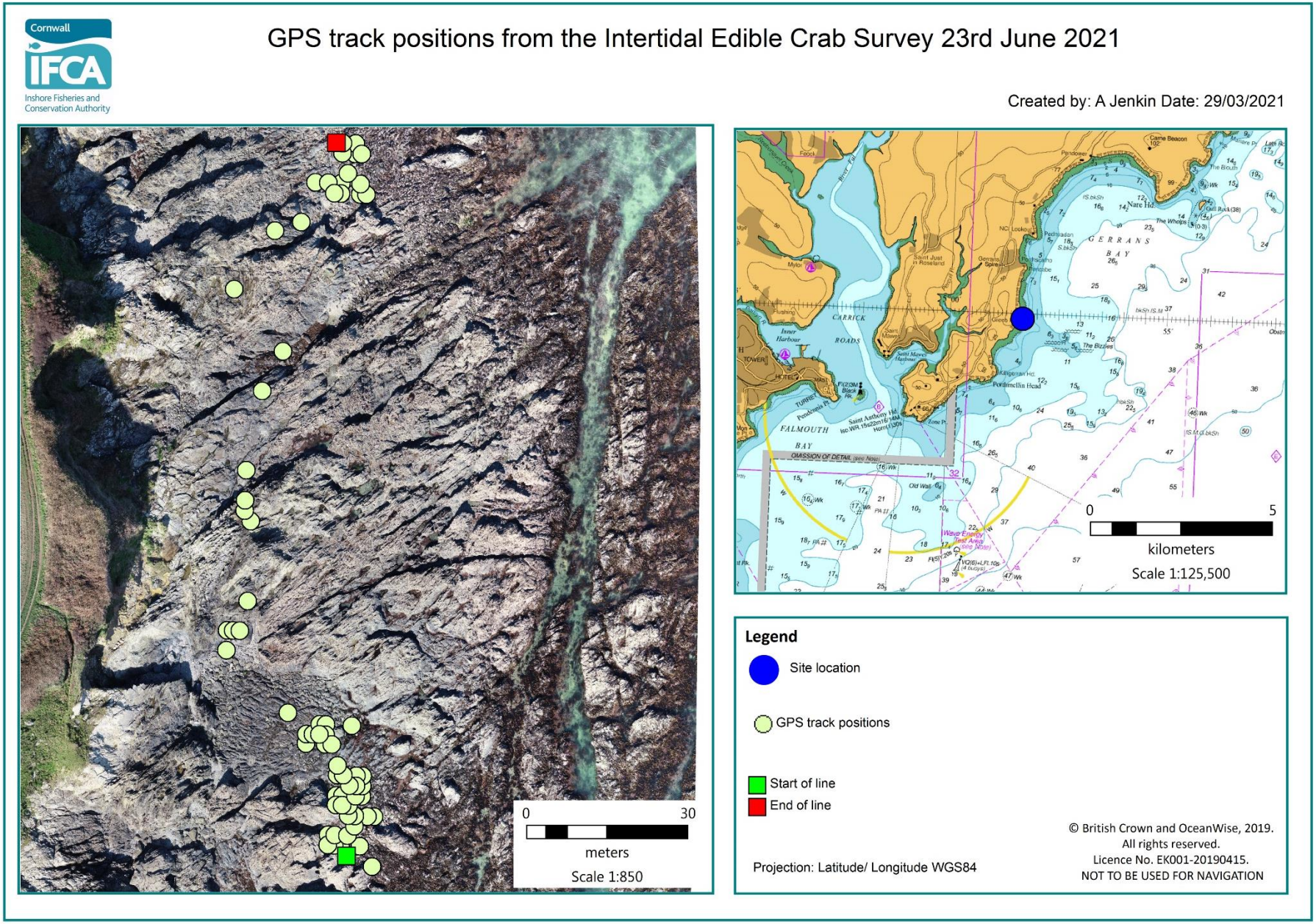

Figure 4: GPS track points from the intertidal survey on 23rd June 2021.

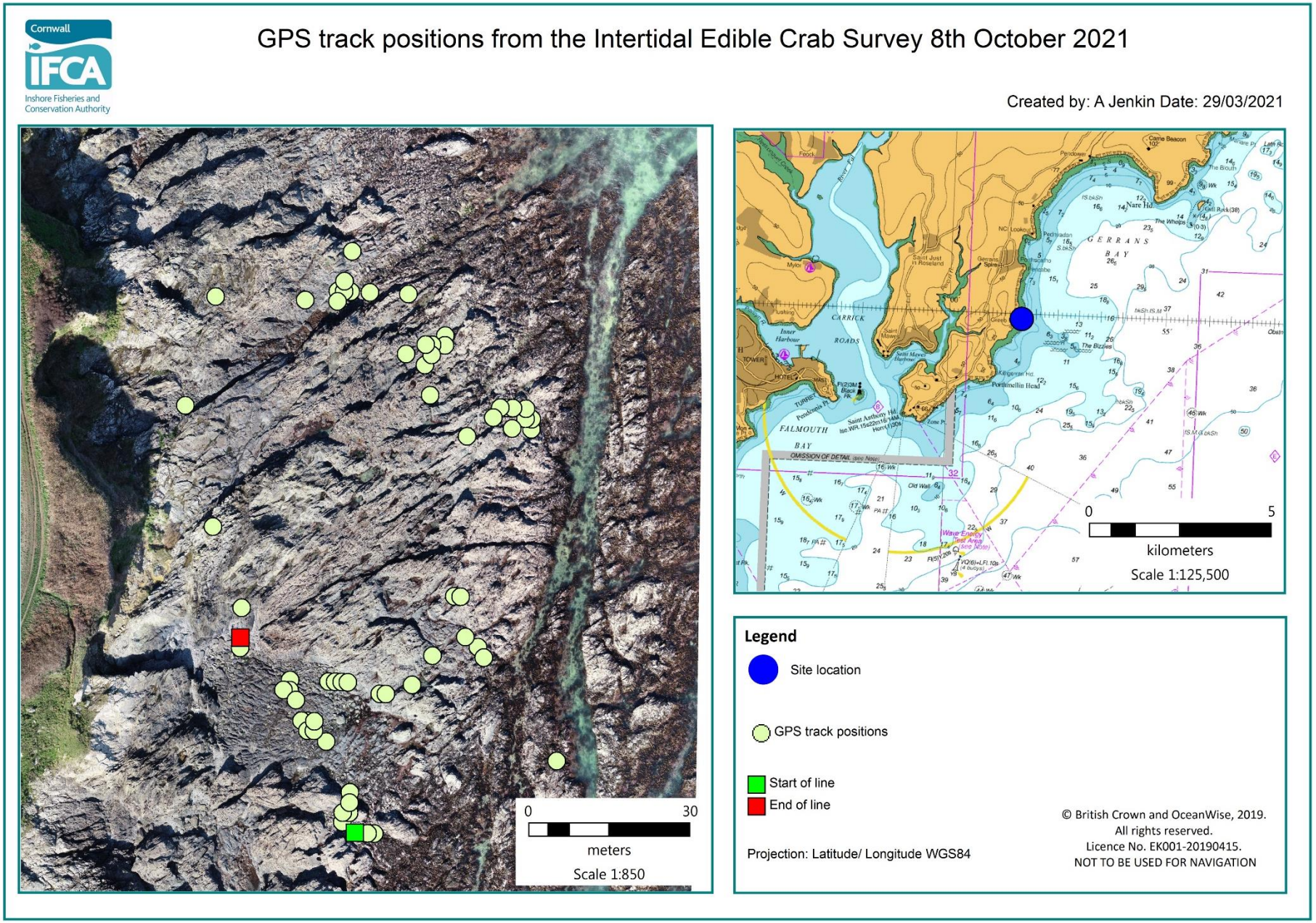

Figure 5: GPS track points from the intertidal survey on 8th October 2021.

3.2 Edible Crab (*Cancer pagurus*)

The carapace size (mm), sex and comments for individual crabs for each survey day are shown in Annex 2.

The total number of edible crabs, the minimum size (mm), maximum size (mm) and average size (mm) of edible crabs for each of the survey days is shown in Table 2.

Table 2: The total number, minimum size (mm), maximum size (mm) and average size (mm) of edible crabs (*Cancer pagurus*) for each of the survey days in 2021.

Date	Total number of crabs measured	Minimum size (mm)	Maximum size (mm)	Average size (mm)
29th April 2021	65	12	92	32.51
27th May 2021	37	16	77	37.35
23rd June 2021	35	16	102	43.37
8th October 2021	18	19	72	47.39

The total length frequency for all edible crabs sampled for each of the survey dates is shown in Figure 6.

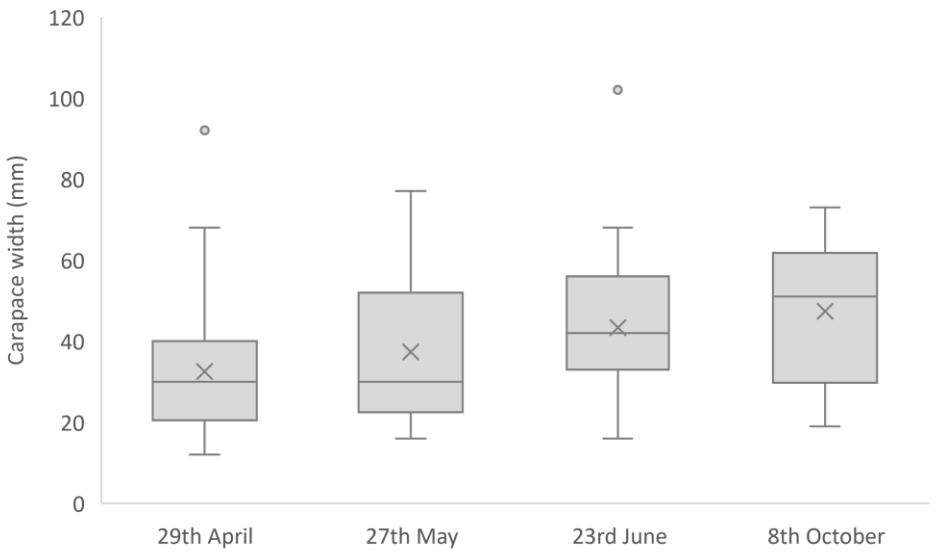

Figure 6: Total carapace width for edible crab (*Cancer pagurus*) from surveys in 2021. Data is grouped by survey day. The X represents the mean, the line represents the median, boxes represent the inter-quartile range, error bars represent the range, and the filled circles represent outliers.

A total of five soft crabs were recorded next to exuvae, providing the growth increment to be tabulated (Table 3).

Table 3: Edible crab (*Cancer pagurus*) growth increment data collected on 29th April 2021.

Date measured	Premoult width (mm)	Postmoult width (mm)	Increment (mm)	Increment (% premoult size)
29th April 2021	71	92	21	29.6
27th May 2021	45	55	10	22.2
27th May 2021	17	22	5	29.4
8th October 2021	56	70	14	25.0
8th October 2021	24	30	6	25.0

Examples of soft shelled crabs and the dead moults from 29th April and 8th October 2021 are shown in Figure 7.

Figure 7: Soft shelled edible crabs (*Cancer pagurus*) and the dead moults found next to each other from 29th April 2021 and 8th October 2021 respectively.

The size class distribution for 2 mm and 5 mm size classes is shown in Figure 8 and Figure 9 respectively.

2 mm size class

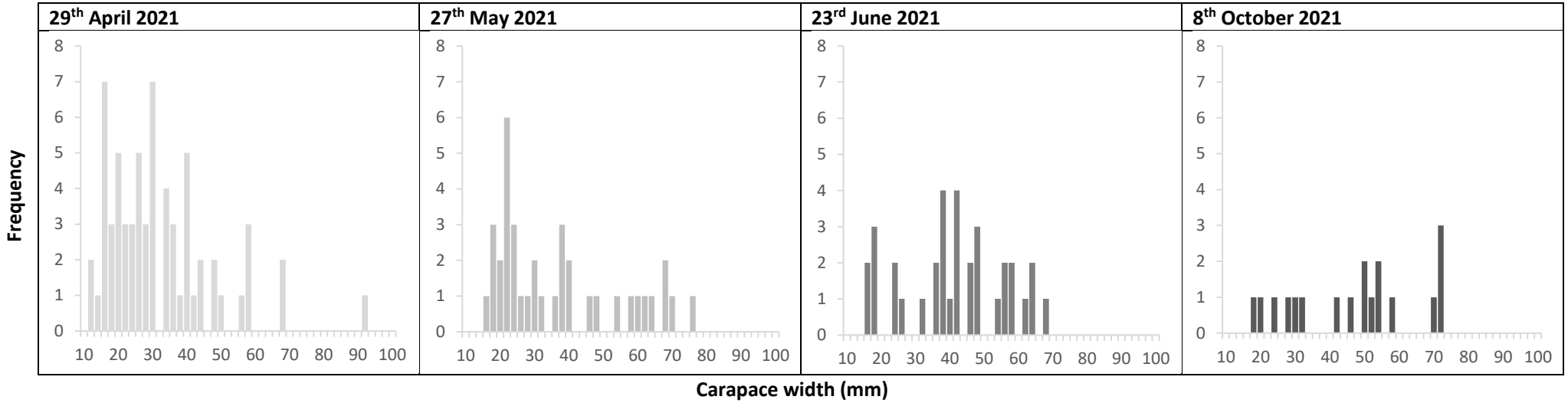

Figure 8: Edible crab (*Cancer pagurus*) size class distribution for the 2 mm size class.

5 mm size class

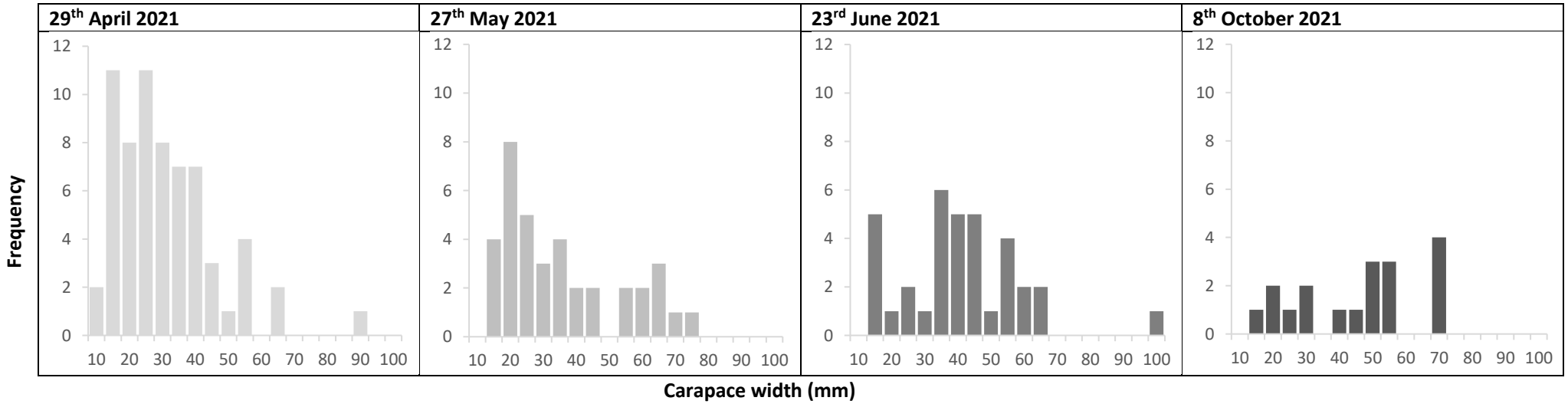

Figure 9: Edible crab (*Cancer pagurus*) size class distribution for the 5 mm size class.

3.3 Non-native species

Scientific officers were focused on finding and recording edible crabs therefore the observing and recording on non-native species was a minor part of the survey. A large amount of Japanese wireweed (*Sargassum muticum*) was noted in the pools.

4 Discussion

The survey was successful in sampling pre-recruit edible crabs.

Pre-recruit edible crabs were found in abundance at this survey site during all surveys. The crabs were mostly found buried in coarse sand under pebbles, cobbles and boulders, often located within gullies. The ideal habitat is shown in Figure 10.

Figure 10: The habitat surveyed during the intertidal edible crab survey.

The length frequency distributions showed a number of modes, with a greater number of smaller crabs recorded earlier in the year and larger crabs recorded later in the year.

Determining the sex of individuals was difficult as the differences in the abdominal flaps were found to not be as distinct as adult edible crabs. Therefore, officers recorded the sex of all crabs as unknown. Examples are shown in Figure 11. It is possible the first and second images are male and the third image female, however without dissection officers are not 100% sure therefore all crabs were classed as unsexed.

Figure 11: Images of the underside of edible crab (*Cancer pagurus*) as recorded during the intertidal edible crab survey.

Total number of crabs recorded decreased through the year. The low number of crabs recorded during October could be explained because a considerable amount of brown algae had grown across the survey site compared to spring and the conditions were a lot cooler. The lower number of crabs recorded on the survey in May could be explained because only one officer carried out the survey instead of two and during the survey in June it was considerably warmer. In June the tidal pools were full of algae and the water in the pools and gullies was noticeably warmer. The influence of the warmer conditions was not investigated further but perhaps the crabs buried deeper to find cooler conditions.

Recently moulted crabs provided an indicator of growth of the crabs along this stretch of coastline.

The data should not be directly compared to the findings of Smith (2012) as the exact track he took is not known. Other differences included IFCA officers spending time taking photos of the crabs individually which was not done previously and took up time, also there were two IFCA officers on the survey for three of the days instead of just one person looking. Due to the amount of area being covered and number of crabs recorded officers didn't have time to survey all the way to the end point that Cefas recorded in 2012 during the first two surveys. Taking photos of the crabs individually, an addition to the Cornwall IFCA survey, added extra time.

This type of sampling could be suitable as a proxy for long term trends in abundance on a local scale (survey area). However, to scale it up to monitor the abundance of the whole Cornwall IFCA district would take a considerable amount of time and effort and would depend on time and resource constraints.

5 Limitations

- An abundance of algae during periods of hot weather could have limited officers being able to find crabs as the pools were full of it.
- A number of edible crabs were seen in nooks and crevices but could not be measured as there was no easy way to extract them without damaging them.

6 Recommendations

6.1 Recommendations for 2022

- Consider monitoring the site at Portscatho during the Spring when edible crab are in abundance to monitor long term trends, depending on resource and time constraints.
- Possibly extend the survey to include another site in a different part of the district (north or west coast) depending on resource and time constraints.
- Record the air temperature on the survey day.
- Record the temperature of the rockpools on the survey day.
- Officers are considering not taking photos of all individuals for future surveys to save time and just consider the sample as unsexed.

7 References

Davis, S. 2007. Cornish Inshore Waters Shellfish Stock Survey 2003-2006. Cornwall Sea Fisheries Committee Research Report R200701.

FAO, 2021. FAO Fisheries & Aquaculture - Species Fact Sheets - *Cancer pagurus* (Linnaeus, 1758). Available from: http://www.fao.org/fishery/species/2627/en [Accessed 29/09/2021].

Heraghty, N. 2013. Investigating the abundance, distribution and habitat use of juvenile *Cancer pagurus* (L.) of the intertidal zone around Anglesey and Llŷn Peninsula, North Wales (UK). MSc thesis, Bangor University, Fisheries & Conservation report No. 29, Pp.75.

Hunter, E., Eaton, D., Stewart, C., Lawler, A. and Smith, M.T., 2013. Edible crabs "Go West": migrations and incubation cycle of *Cancer pagurus* revealed by electronic tags. *PLoS One*, *8*(5), p.e63991.

O'Halloran, J. 2015. The nursery functions of rockpools for commercially important species of crab, *Cancer pagurus*, *Necora puber* and *Maja squinado.*

Smith, M. 2012a. Trip report – Shoreline sampling of juvenile edible crabs on the south Cornwall coast - Survey 1, May.

Smith, M. 2021b. Trip report – Shoreline sampling of juvenile edible crabs on the south Cornwall coast - Survey 2, June.

8 Appendices

Annex 1 – Daily logs

Daily log 1

Annex Table A: Daily log for 29th April 2021.

Project	Intertidal Survey for edible crabs		**Survey code**	20210429_CIFCA_INT_GRE		
Date	2021-04-29	**Coordinate reference system**	WGS84	**Weather**		
Location	Greeb Point	**Position Fix**	Handheld GPS	**Wind direction**	NNW	
Survey Type	INT	**Horizontal Accuracy**	Approx 6m	**Wind speed**	10 mph	
		Time zone	UTC	**Beaufort scale**	4	
IFCA officers	Annie Jenkin, Stephanie Sturgeon			**Cloud coverage**	8/8	
Others	None			**Time recorded**	11:50	
Low water time	14:15:00 (BST)	**Time start**	11:55:00 (UTC)	**Wind direction**		*Data entered by*
Low water (m)	0.14 m	**Time end**	14:13:00 (UTC)	**Wind speed**		SS (2021-04-30)
Tide recorded from	Falmouth	**Safety talk time**	11:45	**Beaufort scale**		
				Cloud coverage		
				Time recorded		
Description of survey	Trial intertidal survey for edible brown crab at Greeb Point, near Portscatho on the S coast of Cornwall. 65 brown crabs were recorded as part of the survey					

Time	**Type**	**Details/description**
11:15		Arrive Greeb Point
11:55	INT	Location 1 Start
14:13	INT	Location 1 End
14:45		Depart Greeb Point

Daily log 2

Annex Table B: Daily log for 27th May 2021.

Project	Intertidal Survey for edible crabs		**Survey code**	20210527_CIFCA_INT_GRE		
Date	2021-05-27	**Coordinate reference system**	WGS84	**Weather**		
Location	Greeb Point	**Position Fix**	Handheld GPS	**Wind direction**	SSE	
Survey Type	INT	**Horizontal Accuracy**	Approx 6m	**Wind speed**	10-14 mph	
		Time zone	UTC	**Beaufort scale**	2	
IFCA officers	Stephanie Sturgeon			**Cloud coverage**	5/8	
Others	None			**Time recorded**	11:45	
Low water time	13:15:00 (BST)	**Time start**	11:48:00 (UTC)	**Wind direction**		*Data entered by*
Low water (m)	0.25 m	**Time end**	13:31:00 UTC)	**Wind speed**		SS (2021-05-28)
Tide recorded from	Falmouth	**Safety talk time**		**Beaufort scale**		
				Cloud coverage		
				Time recorded		
Description of survey	Intertidal survey for edible brown crab at Greeb Point, near Portscatho on the S coast of Cornwall. 37 brown crabs were recorded as part of the survey. A noticeable increase in velvet swimming crabs and Montagu's crab was observed compared to the previous survey.					
Notes	Three strings of gear near survey site. Pair of white and orange flags just off long gully. Blue bottle to white bottle further off. Pair of orange bouys north of acess point. Pair of orange bouys near Towan Beach.					

Time	**Type**	**Details/description**
11:45		Arrive Greeb Point
11:48	INT	Location 1 Start
13:31	INT	Location 1 End
13:45		Depart Greeb Point

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Daily log 3

Annex Table C: Daily log for 23rd June 2021.

Project	Intertidal Survey for edible crabs		**Survey code**	20210623_CIFCA_INT_GRE		
Date	2021-06-23	**Coordinate reference system**	WGS84	**Weather**		
Location	Greeb Point	**Position Fix**	Handheld GPS	**Wind direction**	NE	
Survey Type	INT	**Horizontal Accuracy**	Approx 6m	**Wind speed**	6-10 mph	
		Time zone	UTC	**Beaufort scale**	3	
IFCA officers	Stephanie Sturgeon and Annie Jenkin			**Cloud coverage**	1/8	
Others	None			**Air temperature**	17 °C	
				Time recorded	09:35	
Low water time	11:11:00 (BST)	**Time start**	09:37:00 (UTC)	**Wind direction**		*Data entered by*
Low water (m)	0.72 m	**Time end**	11:23:00 (UTC)	**Wind speed**		SS (2021-06-25)
Tide recorded from	Falmouth	**Safety talk time**	09:30	**Beaufort scale**		
				Cloud coverage		
				Time recorded		
Description of survey	Intertidal survey for edible brown crab at Greeb Point, near Portscatho on the S coast of Cornwall . 35 brown crabs were recorded as part of the survey.					
Notes	A noticeable increase in algae coverage over rocks, Montagu's crabs more abundant and larger velvet swimming crabs.					

Time	**Type**	**Details/description**
09:25		Arrive Greeb Point
09:37	INT	Location 1 Start
11:23	INT	Location 1 End
11:55		Depart Greeb Point

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Daily log 4

Annex Table D: Daily log for 8th October 2021.

Project	Intertidal Survey for edible crabs		**Survey code**	20211008_CIFCA_INT_GRE		
Date	2021-10-08	**Coordinate reference system**	WGS84	**Weather**		
Location	Greeb Point	**Position Fix**	Handheld GPS	**Wind direction**	SE	
Survey Type	INT	**Horizontal Accuracy**	Approx 6m	**Wind speed**	10-13 mph	
		Time zone	UTC	**Beaufort scale**	3	
IFCA officers	Stephanie Sturgeon and Annie Jenkin			**Cloud coverage**	1/8	
Others	None			**Air temperature**	17 °C	
				Time recorded	12:10	
Low water time	13:51 (BST)	**Time start**	12:17:00 (UTC)	**Wind direction**		*Data entered by*
Low water (m)	0.49	**Time end**	14:27:00 (UTC)	**Wind speed**		AJ (2021-10-11)
Tide recorded from	Falmouth	**Safety talk time**	12:10	**Beaufort scale**		
				Cloud coverage		
				Time recorded		
Description of survey	Intertidal survey for edible brown crab at Greeb Point, near Portscatho on the S coast of Cornwall. 18 brown crabs were recorded as part of the survey, 2 were seen stuck in crevices and 1 sunk in to the sediment before it could be measured					
Notes	A noticeable increase in brown algae coverage over rocks and less green algae					

Time	**Type**	**Details/description**
11:55		Arrive Greeb Point
12:17	INT	Location 1 Start
14:27	INT	Location 1 End
14:40		Depart Greeb Point

Annex 2 – Survey data

A total of 65 edible crabs were measured and recorded during the survey on 29th April 2021 (Annex Table E).

Annex Table E: The edible crab (*Cancer pagurus*) records including carapace size (mm), sex (U - Unsexed) and notes from the survey on 29th April 2021.

Crab No.	Carapace size (mm)	Sex (M/F/U)	Other
1	58	U	
2	37	U	
3	45	U	Cracked carapace
4	40	U	
5	27	U	
6	35	U	
7	17	U	
8	12	U	
9	44	U	
10	39	U	
11	25	U	Dead - recent moult?
12	20	U	No claws
13	21	U	
14	48	U	Recently moulted
15	35	U	
16	30	U	
17	19	U	
18	22	U	
19	16	U	
20	22	U	
21	22	U	
22	15	U	
23	26	U	
24	16	U	
25	17	U	
26	12	U	
27	25	U	One claw
28	68	U	
29	40	U	
30	49	U	
31	16	U	
32	20	U	
33	57	U	
34	25	U	Dead - recent moult? One claw mangled
35	27	U	
36	31	U	Cracked carapace
37	16	U	
38	31	U	
39	21	U	Light orange carapace
40	41	U	
41	30	U	
42	20	U	
43	19	U	
44	35	U	
45	28	U	
46	58	U	
47	28	U	

48	19	U	
49	30	U	
50	17	U	
51	40	U	
52	34	U	Dead - recent moult?
53	41	U	
54	31	U	
55	59	U	
56	37	U	
57	36	U	
58	68	U	
59	43	U	
60	28	U	
61	26	U	
62	50	U	
63	27	U	
64	30	U	One claw
65	92	U	Freshly moulted - Moulted shell carapace 71 mm

A total of 37 edible crabs were measured and recorded during the survey on 27th May 2021 (Annex Table F).

Annex Table F: The edible crab (*Cancer pagurus*) records including carapace size (mm), sex (U - Unsexed) and notes from the survey on 27th May 2021.

Crab No.	Carapace size (mm)	Sex (M/F/U)	Other
1	40	U	
2	23	U	
3	18	U	
4	41	U	
5	26	U	
6	55	U	Moult 45 mm
7	20	U	
8	68	U	
9	49	U	
10	62	U	
11	47	U	
12	71	U	
13	25	U	
14	39	U	
15	30	U	
16	58	U	
17	25	U	
18	60	U	
19	19	U	
20	23	U	
21	38	U	
22	65	U	
23	30	U	
24	21	U	
25	22	U	
26	16	U	No photo
27	38	U	
28	18	U	

29	22	U	Moult 17 mm
30	36	U	
31	33	U	
32	23	U	
33	69	U	
34	25	U	
35	28	U	
36	22	U	
37	77	U	Dead. Moult? No photo

A total of 35 edible crabs were measured and recorded during the survey on 23rd June 2021 (Annex Table G).

Annex Table G: The edible crab (*Cancer pagurus*) records including carapace size (mm), sex (U - Unsexed) and notes from the survey on 23rd June 2021.

Crab No.	Carapace size (mm)	Sex (M/F/U)	Other
1	16	U	
2	46	U	
3	42	U	
4	59	U	
5	43	U	
6	17	U	
7	43	U	
8	33	U	
9	38	U	
10	42	U	
11	68	U	
12	39	U	
13	39	U	
14	62	U	
15	48	U	
16	37	U	
17	59	U	
18	24	U	
19	102	U	
20	26	U	
21	25	U	
22	19	U	Cracked carapace
23	49	U	
24	18	U	
25	64	U	
26	54	U	
27	38	U	
28	36	U	
29	19	U	Damage to edge of carapace
30	46	U	No photo
31	48	U	Recently moulted
32	65	U	
33	57	U	
34	56	U	
35	41	U	

A total of 18 edible crabs were measured and recorded during the survey on 8th October 2021 (Annex Table H.

Annex Table H: The edible crab (*Cancer pagurus*) records including carapace size (mm), sex (U - Unsexed) and notes from the survey on 8th October 2021.

Crab No.	Carapace size (mm)	Sex (M/F/U)	Other
1	70	U	Freshly moulted - Moulted shell carapace 56 mm
2	59	U	
3	20	U	
4	72	U	
5	72	U	
6	51	U	
7	46	U	
8	19	U	
9	30	U	Freshly moulted - Moulted shell carapace 24 mm
10	29	U	
11	55	U	
12	32	U	
13	53	U	
14	42	U	
15	73	U	
16	55	U	
17	51	U	
18	24	U	