

## Monthly Shellfish Permit Statistics Analysis

# Summary Statistics 2021

## Introduction

### Summary Statistics 2021

Cornwall IFCA have presented crustacean fishery data from 2016\* to 2021 in three parts:

**Part 1- Fishery Effort**  
**Part 2- Species Summary**  
**Part 3- Area Summary**

The aim is that by presenting and grouping the data based on these three different focused areas it is possible to quickly and easily visualise the data based on the readers area of interest.

For example, comparison of one species in different analysis areas (Part 2), or comparison of different species within one analysis area (Part 3).

*\*Thematically mapped data and tabulated data have been presented from 2017.*

#### Cited as:

Street, K., Sturgeon, S., Jenkin, A., Daniels, C., and Trundle, C. 2022. Cornwall IFCA Monthly Shellfish Permit Statistics Analysis, Summary Statistics 2021. Cornwall Inshore Fisheries and Conservation Authority (Cornwall IFCA), Hayle.

## Cornwall IFCA Monthly Shellfish Permit Statistics Analysis

## Data Handling Method

## Summary Statistics 2021

All Cornwall IFCA shellfish permit holders must submit a monthly shellfish permit return form to Cornwall IFCA detailing their daily fishing activity including; area fished, the type and quantity of gear used (pots or nets) and the weight and species of shellfish retained (kg).

This data has been analysed and presented in the 'Cornwall IFCA Monthly Shellfish Permit Statistics Analysis, Summary Statistics 2016-2018' series as effort (number of pot hauls and meters of nets hauled) per km<sup>2</sup> and landings per unit effort (LPUE).

The method is outlined below and a full method can be found in ‘*Cornwall IFCA Analysis of 2018 Fishing Activity Returns*’ available on the Cornwall IFCA website.

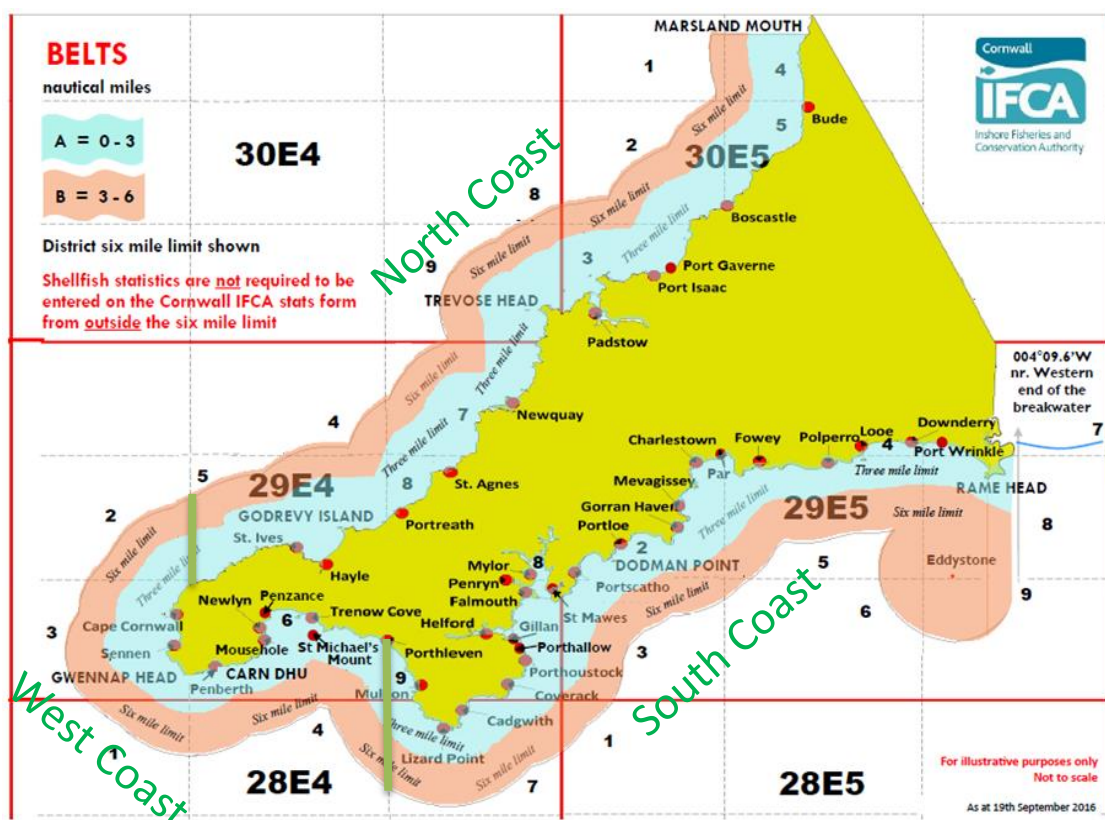


Figure 1: Belted statistical areas within the Cornwall IFCA District and boundaries of the three geographic analysis areas (green lines); *North coast, West coast and South coast*.

## Data Classification

## Spatial

Data is reported to Cornwall IFCA attributed to belted statistical areas. For thematic mapping data was maintained at this resolution. For further analysis belted statistical areas have been grouped into three analysis areas; North, South and West coast, which are further split by band A inshore 0-3nm and band B 3-6nm (Fig. 1)

## Data Descriptors

### Effort

Effort, in terms of the number of pot hauls and length of net hauled, has been normalised based on the area in km<sup>2</sup> of the geographic area (either Cornwall IFCA District, analysis area or belted statistical area), resulting in the effort (the number of pot hauls or length of net hauled) per km<sup>2</sup>.

### Landings per Unit Effort (LPUE)

To estimate landings per unit effort (LPUE), the unit of effort was taken as 100 pot hauls (100Ph) or 100m of net hauled (100m Nh).

For shellfish retained in pots LPUE was calculated as:

$$\text{LPUE (kg of shellfish/100Ph)} = (S_v/E_v) * 100$$

For shellfish retained in nets LPUE was calculated as:

$$\text{LPUE (kg of shellfish/100m Nh)} = (S_v/E_v) * 100$$

Where  $S$  is the weight in kg of shellfish landed in category  $x$ , and  $E$  is the number of pot hauled or length of nets hauled in category  $x$ .

Monthly Shellfish Permit  
Statistics Analysis  
**Summary Statistics 2021**



Part 1

**Fishery Effort**

# Monthly Shellfish Permit Statistics Analysis

## Pot Fishery Effort

### Summary Statistics 2021



#### Summary

Potting effort, in terms of pot hauls, increased slightly in 2021 from 2020 (Fig 3). In 2021 edible crab LPUE continued to decline, and lobster LPUE was lower than the peak in 2020, though still higher than the previous years (Fig. 2). Annual effort continued to be highest in the west coast analysis area in 2021 (Fig 4.), around 25% higher than the north and south analysis areas.



**North Coast;** in 2021 effort inshore increased to a similar value to the offshore (Fig. 7).

**West Coast;** in 2021 effort offshore decreased, and inshore increased (Fig. 9), this increase was influenced by higher than average monthly effort in June and July (Fig 10A).

**South Coast;** inshore monthly effort in 2021 was lower than the five year average for the majority of the year (Fig. 12A) though remained the highest of the analysis areas (Fig. 7, 9 and 11). Offshore, annual potting effort continued to be the lowest of the analysis areas (Fig 7, 9 and 11).

#### Difference in Annual Potting Effort 2017 to 2021

Difference in Annual Potting Effort 2017 to 2021  
(kg/100Ph)

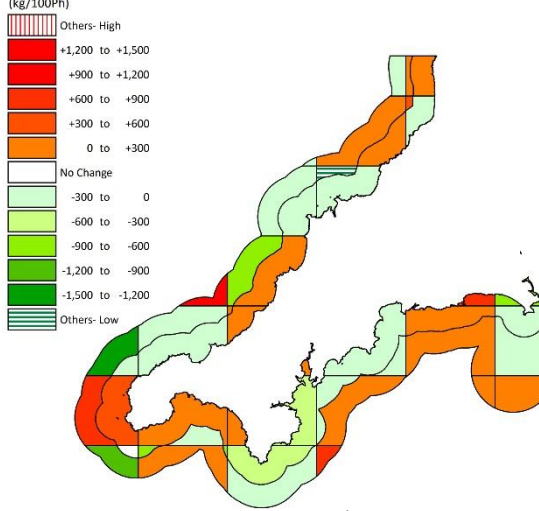


Figure 1: The difference in annual potting effort (Ph/km<sup>2</sup>) between 2017 and 2021 in belted statistical areas thematically mapped in 300Ph/km<sup>2</sup> ranges where positive values i.e. increased effort are red and negative values i.e. decreases in effort, are green 'Others' refers to a value of -4,007 Ph/km<sup>2</sup> in 30E55B.

#### LPUE of retained shellfish

##### All District

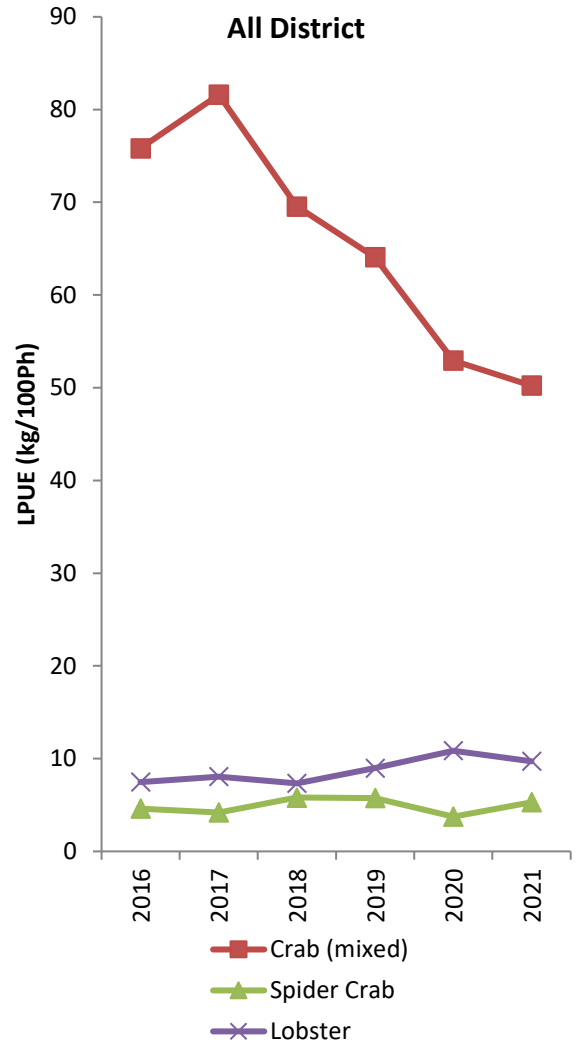


Figure 2: LPUE (kg/100Ph) of the three main species (Crab, Spider Crab and Lobster) retained in pots in the Cornwall IFCA District in from 2016 to 2021.

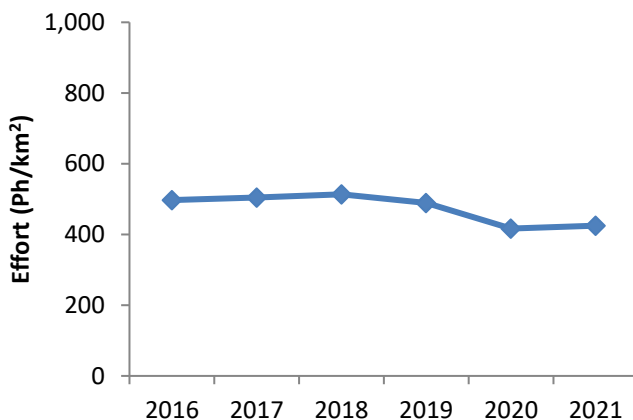


Figure 3: Annual potting effort (Ph/km<sup>2</sup>) by year in the Cornwall IFCA District from 2016 to 2021 (blue line).

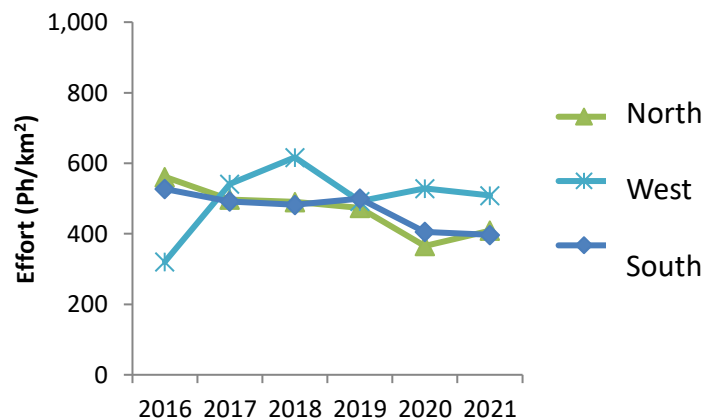


Figure 4: Annual potting effort (Ph/km<sup>2</sup>) split by analysis area (north, west and south) from 2016 to 2021.



## Pot Fishery Effort

### Summary Statistics 2021

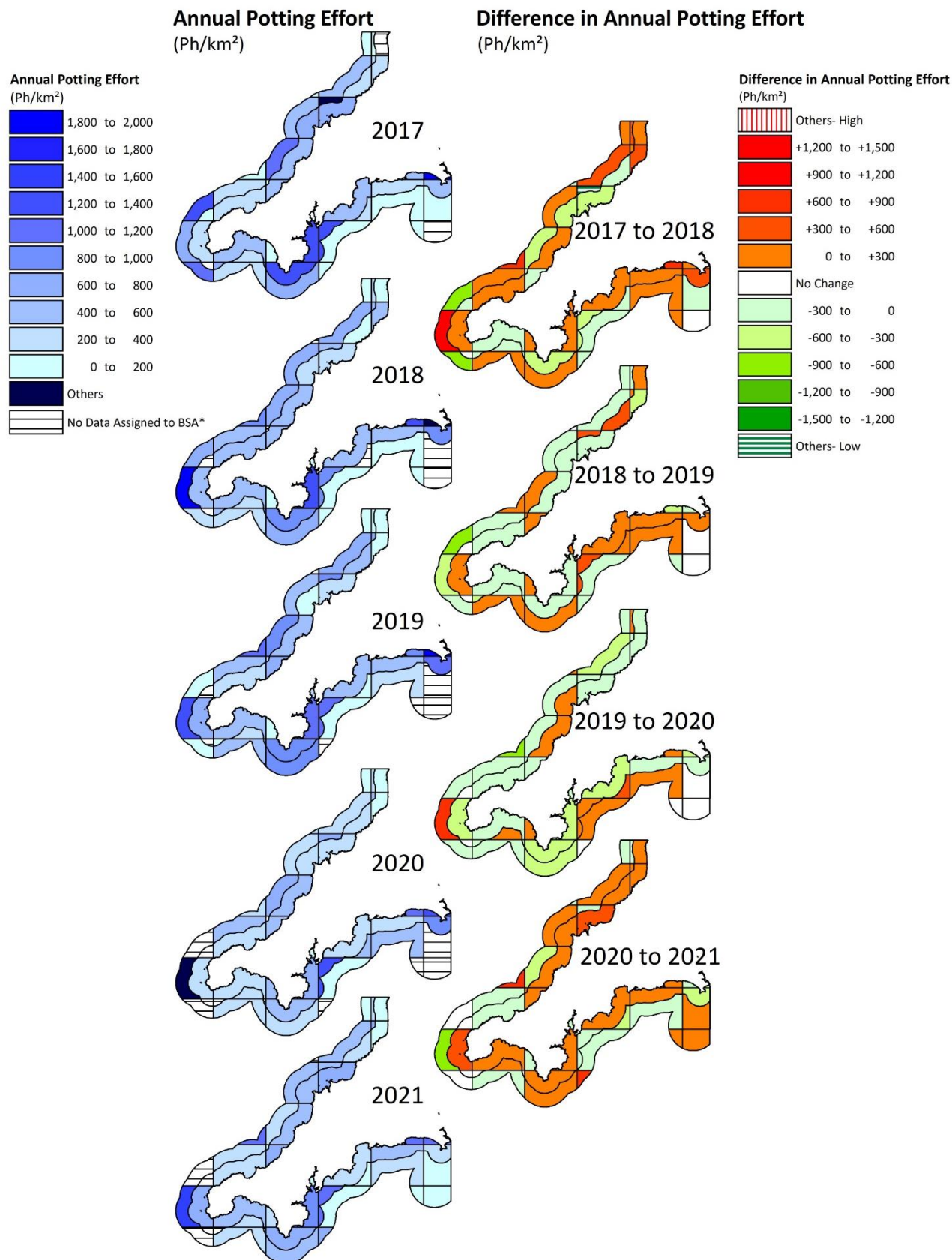


Figure 5: Thematic mapping of annual potting effort (Ph/km<sup>2</sup>) in belted statistical areas in 200Ph/km<sup>2</sup> increments (Left). 'Others' refers to 2,055 Ph/km<sup>2</sup> in 2017 in 30E53B, 2,029 Ph/km<sup>2</sup> in 2018 in 29E57A and 2,245Ph/km<sup>2</sup> in 2020 in 29E43B. And, thematic mapping of difference in potting effort (Ph/km<sup>2</sup>) in belted statistical areas in ranges of 300Ph/km<sup>2</sup> (right) where a positive value i.e. increased effort is red and a negative value i.e. a reduction in effort is green. 'Others' refers to a value of -1,531 Ph/km<sup>2</sup> in 30E53B from 2017 to 2018.

\*In some cases this may be an artefact of the data collection method; fishing effort and catch can only be allocated to one BSA per day, therefore where a vessel works in more than one area only one can be reported.

## Pot Fishery Effort

### Summary Statistics 2021



#### North Coast

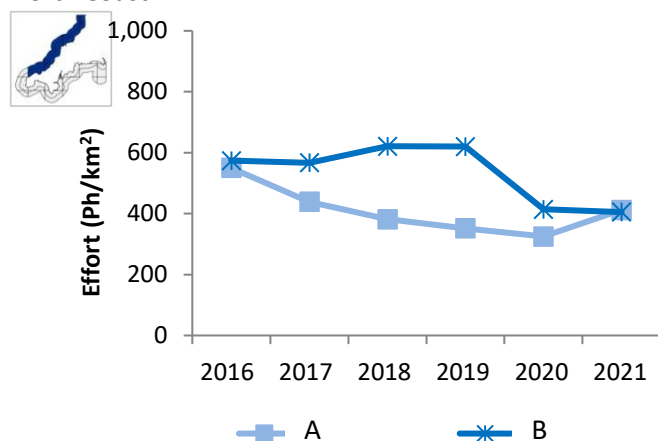


Figure 7: Annual effort (Ph/km²) on the 'North Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

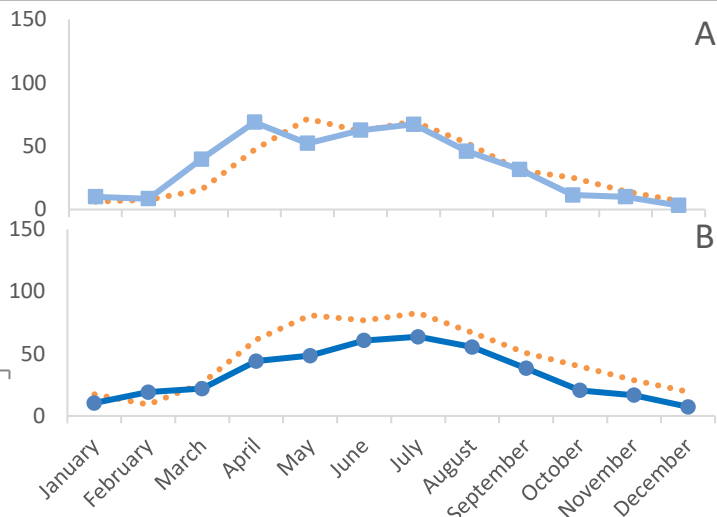


Figure 8: Monthly effort (Ph/km²) on the 'North Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

#### West Coast

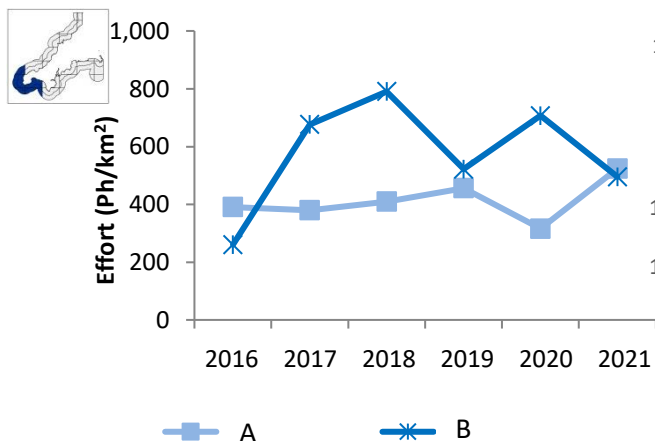


Figure 9: Annual effort (Ph/km²) on the 'West Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

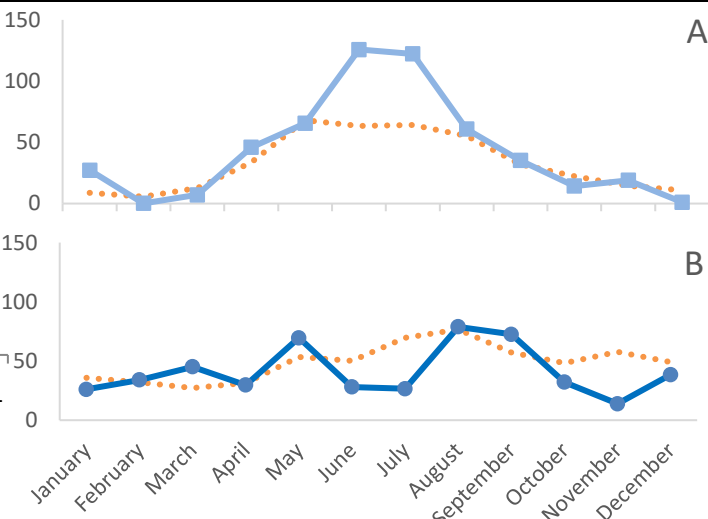


Figure 10: Monthly effort (Ph/km²) on the 'West Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

#### South Coast

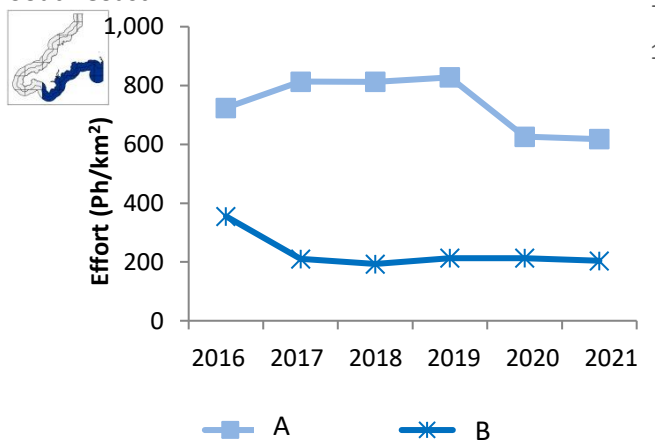


Figure 11: Annual effort (Ph/km²) on the 'South Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

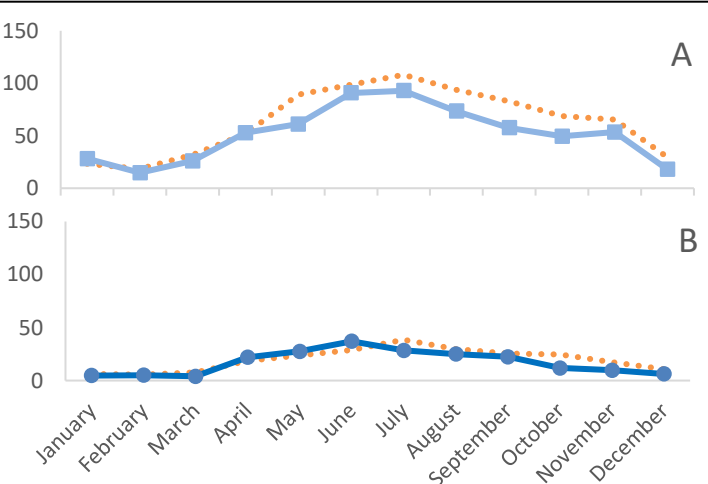
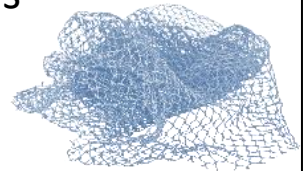


Figure 12: Monthly effort (Ph/km²) on the 'South Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

# Monthly Shellfish Permit Statistics Analysis

## Demersal Net Fishery Effort

### Summary Statistics 2021



#### Summary

In 2021 in the Cornwall IFCA District demersal netting effort increased from that reported in 2020 (Fig.3). This increase was observed in all three analysis areas (Fig. 4). Spider crab and crawfish LPUE continued to rise, however edible crab LPUE declined from 2020 (Fig. 2).



**North Coast;** effort increased in 2021 from 2020 (Fig. 6), especially in August to October offshore (Fig.7B) It is likely this increased effort was directed towards crawfish.



**West Coast;** in 2021 effort both inshore and offshore increased from 2020 (Fig. 8). Inshore monthly effort was higher than the 5 year average for much of the year (Fig. 9A) and peaked in June, a month later than the five year average. Similarly offshore effort peaked three months later than the five year average (Fig.9B).



**South Coast;** inshore annual effort increased slightly from 2020, and effort remained stable offshore (Fig. 10). Both inshore and offshore 2021 monthly demersal netting effort was consistently lower than the five year average (Fig.11).

#### Difference in Annual Netting Effort 2017 to 2021

Difference in Annual Netting Effort 2017 to 2021  
(Nh/km<sup>2</sup>)

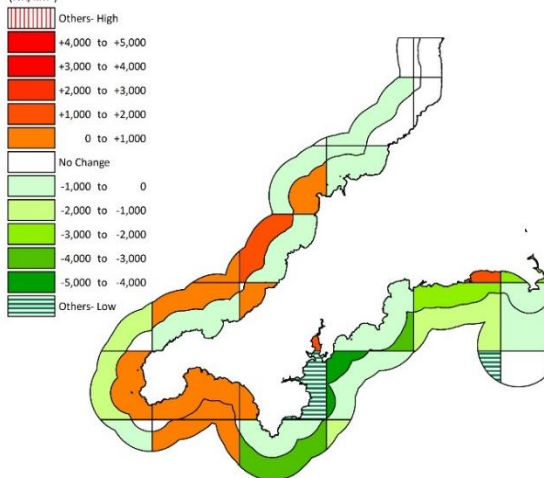


Figure 1: The difference in annual netting effort (Nh/km<sup>2</sup>) in belted statistical areas between 2017 and 2021 thematically mapped in 1,000 Nh/km<sup>2</sup> ranges, where positive values i.e. increased effort are red and negative values i.e. decreases in effort, are green. 'Others' refers to -11,974Nh/km<sup>2</sup> in 29E49A(east) and 8,413Nh/km<sup>2</sup> in 29E56B.

#### LPUE of retained shellfish All District

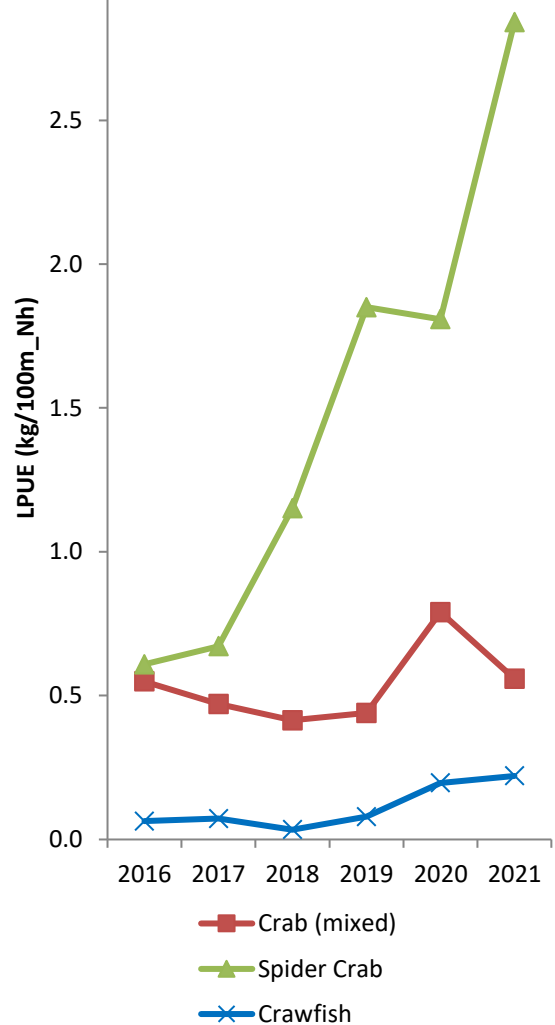


Figure 2: LPUE (kg/100m\_Nh) of the three main species (Crab, Spider Crab and Crawfish) retained in nets in the Cornwall IFCA District from 2016 to 2021.

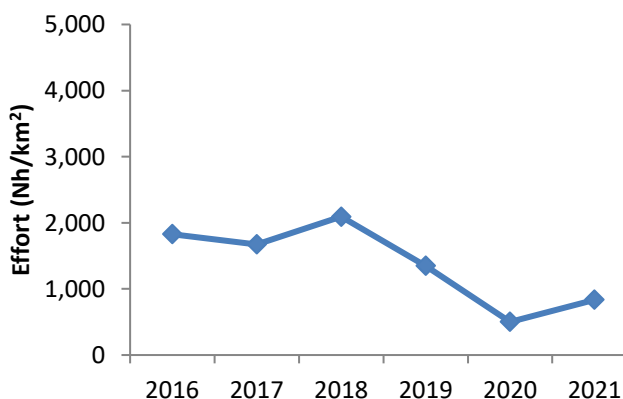


Figure 3: Annual netting effort (Nh/km<sup>2</sup>) in the Cornwall IFCA District from 2016 to 2021 (blue line).

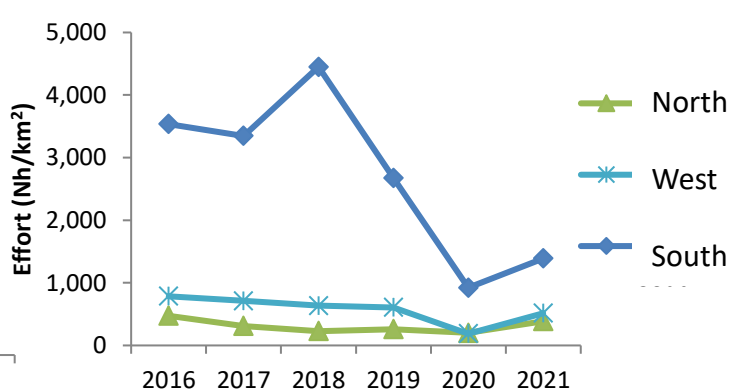


Figure 4: Annual netting effort (Nh/km<sup>2</sup>) split by analysis area (North, West and South) from 2016 to 2021.



## Demersal Net Fishery Effort

### Summary Statistics 2021

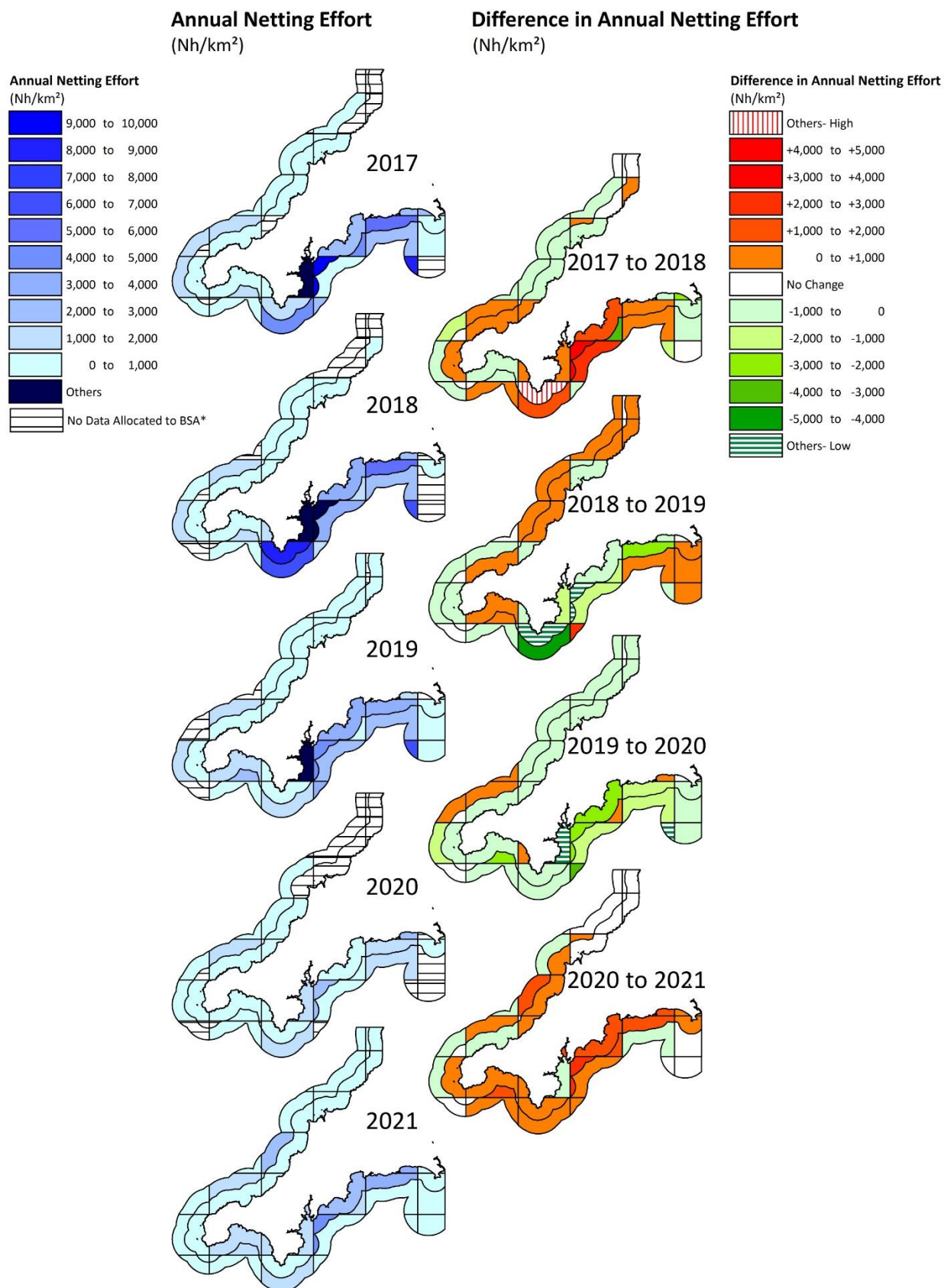
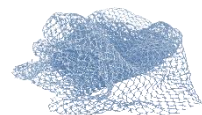
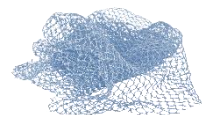


Figure 5: Thematic mapping of annual netting effort (Nh/km<sup>2</sup>) in belted statistical areas in 1,000Nh/km<sup>2</sup> increments (left), 'Others' refers to a value of 15,231 in 2016, 13,136 in 2017, 13,948 in 2018 and 12,802 in 2019 all in 29E49A-East (Falmouth Bay), and 13,232 in 29E53A in 2018. And, thematic mapping of differences in netting effort (Nh/km<sup>2</sup>) in belted statistical areas in ranges of 1,000Nh/km<sup>2</sup> (right) where a positive value i.e. increased effort is red and a negative value i.e. a reduction in effort is green. 'Others' refers to a value of +6,433Nh/km<sup>2</sup> from 2017 to 2018, and -7,071Nh/km<sup>2</sup> from 2018 to 2019 both in 28E47A, -4,170Nh/km<sup>2</sup> from 2018 to 2019 in 28E47B, and -10,833Nh/km<sup>2</sup> in 29E49A (E) and -6,290Nh/km<sup>2</sup> in 29E56B from 2019 to 2020.

\*In some cases this may be an artefact of the data collection method; fishing effort and catch can only be allocated to one BSA per day, therefore where a vessel works in more than one area only one can be reported.

## Demersal Net Fishery Effort

### Summary Statistics 2021



#### North Coast

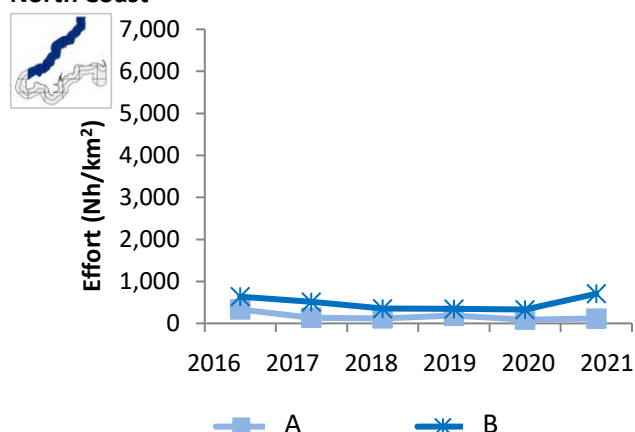


Figure 6: Annual Effort (Nh/km<sup>2</sup>) on the 'North Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

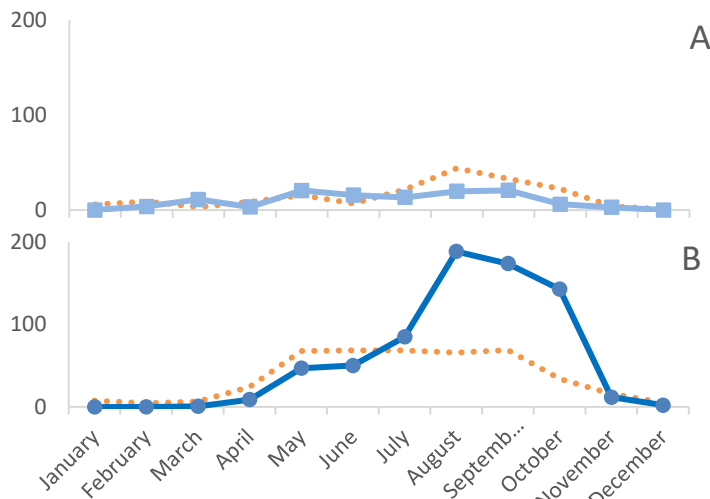


Figure 7: Monthly effort (Nh/km<sup>2</sup>) on the 'North Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

#### West Coast

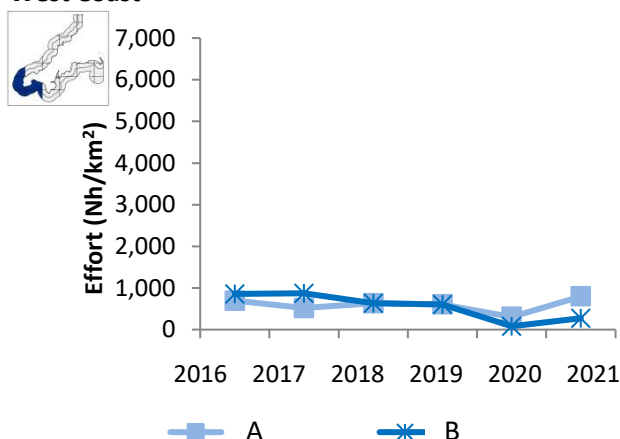


Figure 8: Annual effort (Nh/km<sup>2</sup>) on the 'West Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

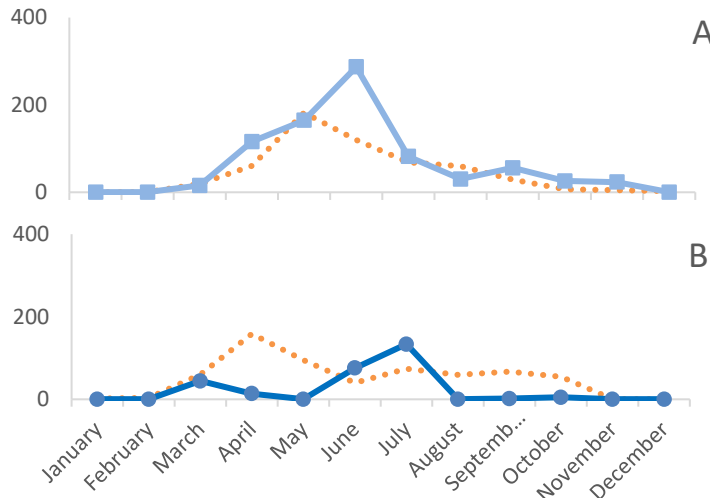


Figure 9: Monthly effort (Nh/km<sup>2</sup>) on the 'West Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

#### South Coast

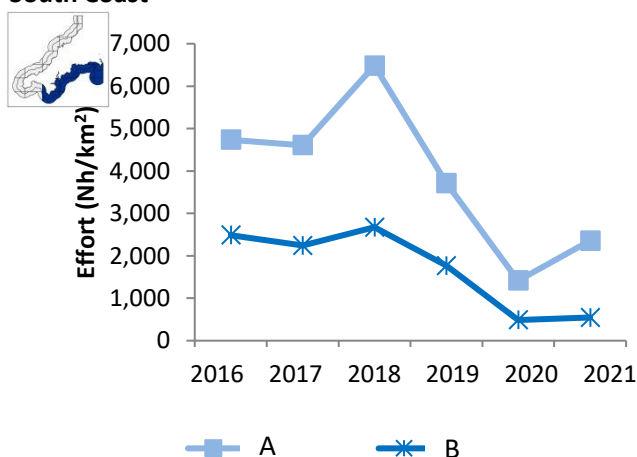


Figure 10: Annual effort (Nh/km<sup>2</sup>) on the 'South Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

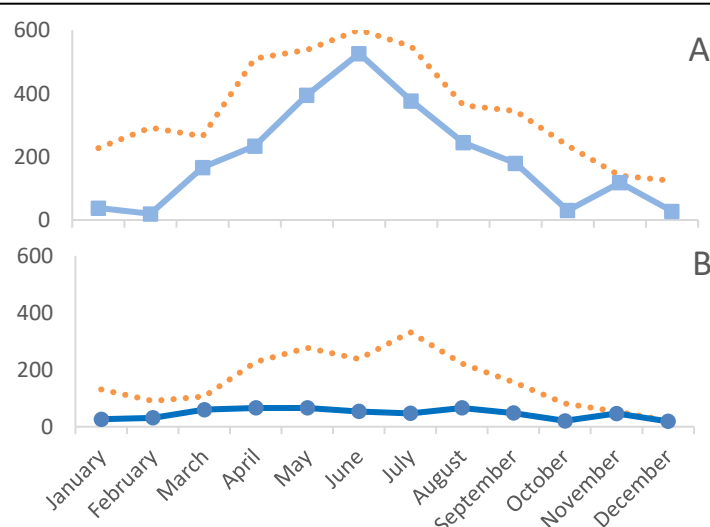


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Monthly Shellfish Permit  
Statistics Analysis  
**Summary Statistics 2021**



Part 2

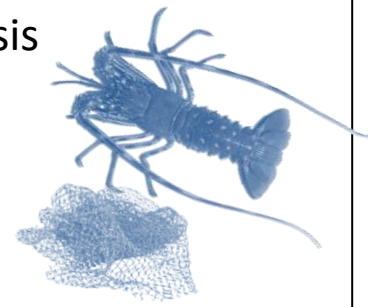
**Species Summary**

# Monthly Shellfish Permit Statistics Analysis

## Crawfish (*Palinurus elephas*)

### Net Fishery

## Summary Statistics 2021



### Summary

In 2021 in the Cornwall IFCA District crawfish landings increased considerably from 2020 (Table 1). LPUE increased at a slower rate than in previous years (Fig 2.) as reported demersal netting effort increased over the time period (Table 1).



**North Coast;** in 2021 LPUE in the north coast was the highest of the three analysis areas (Fig. 3). This biggest area of increase over the reporting period was St Ives Bay (29E45A, Fig. 1) where LPUE increased annually from 2018 to 2021 (Fig. 4).

Monthly LPUE both inshore and offshore in 2021 was higher than the five year average and peaked in September (Fig. 6).



**West Coast;** overall annual LPUE has fluctuated between a low of 0.03kg/100m\_Nh in 2018 to 0.5kg/100m\_Nh in 2020 (Fig. 3). In 2021 annual LPUE dropped both offshore and inshore from the 2020 peak (Fig. 7). Despite this, offshore annual LPUE remained higher than the five year average for much of the year (Fig. 8).



**South Coast;** annual LPUE in the south coast analysis area was consistently the lowest of the analysis areas across the reporting period (Fig. 3). Annual LPUE in 2021 was very similar to 2020 both inshore and offshore (Fig. 9). Both years (2020 and 2021) were the highest in the reporting period, with monthly LPUE higher than the five year average throughout the main season from July to November in 2021, with a larger increase offshore (Fig. 10).

### Annual Data

Table 1: Total kg of crawfish (*Palinurus elephas*) reportedly removed from the Cornwall IFCA District from 2017 to 2021, total gear hauled, and resultant calculated LPUE (kg/100m\_Nh)

	2017	2018	2019	2020	2021
Total Gear Hauled	6,684,300	8,359,890	5,390,595	2,004,355	3,338,130
Total Landed (kg)	4,827	2,807	4,240	3,927	7,359
LPUE (kg/100m_Nh)	0.07	0.03	0.08	0.20	0.22

### Difference in LPUE 2017 to 2021

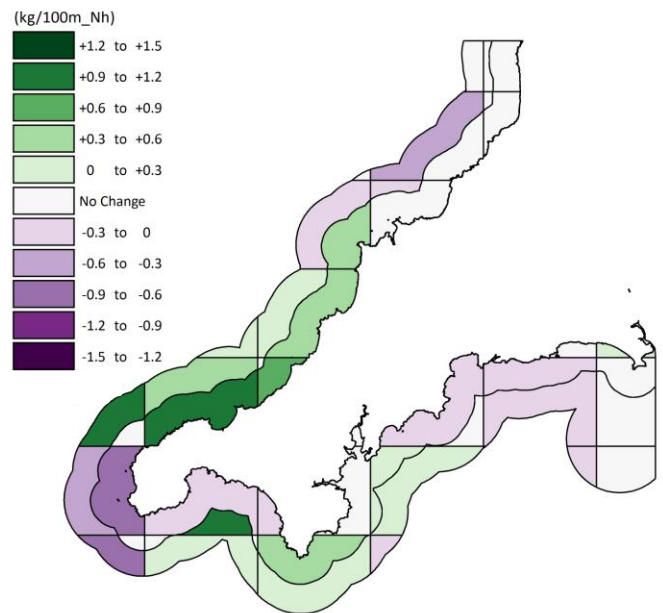


Figure 1: The difference in crawfish (*Palinurus elephas*) LPUE (kg/100m\_Nh) in belted statistical areas between 2017 and 2021 thematically mapped in 0.3kg/100m\_Nh ranges where positive values i.e. increases in LPUE, are green and negative values i.e. decreases in LPUE are purple.

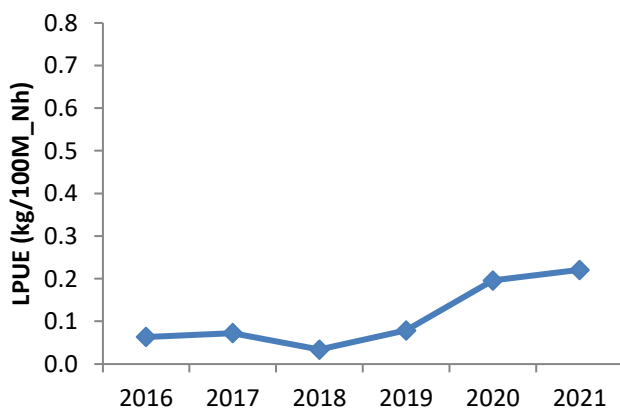


Figure 2: Annual LPUE (kg/100m\_Nh) of crawfish (*Palinurus elephas*) in the Cornwall IFCA District from 2016 to 2021.

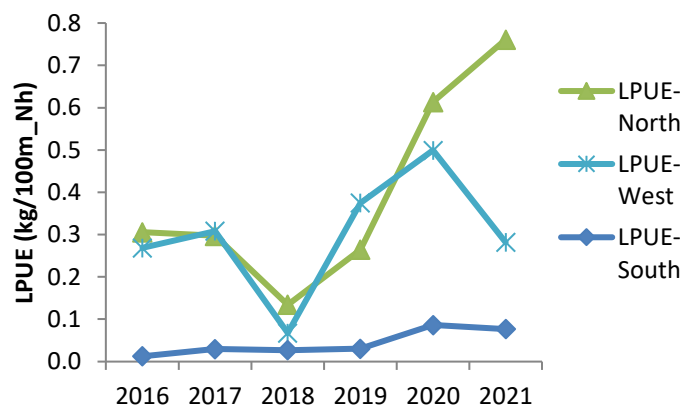


Figure 3: Annual LPUE (kg/100m\_Nh) of crawfish (*Palinurus elephas*) in the Cornwall IFCA District split by analysis area (north, west and south) from 2016 to 2021.



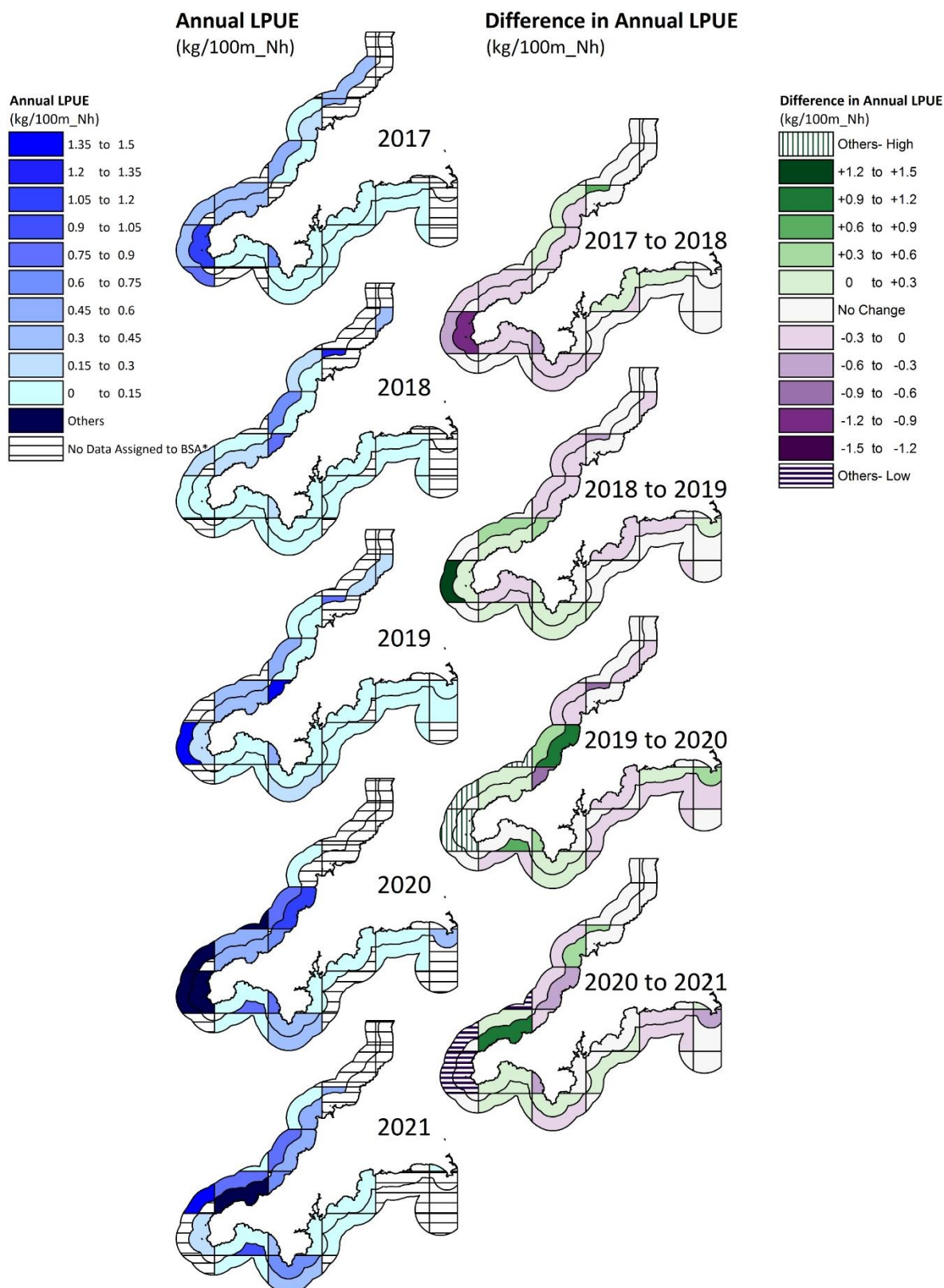


Figure 4: Thematic mapping of annual netting LPUE (kg/100m\_Nh) of crawfish (*Palinurus elephas*) in belted statistical areas in 0.15kg/100m\_Nh increments (left). 'Others' refers to the following values in 2020; 3.2kg/100m\_Nh in 29E44B, 3.5kg/100m\_Nh in 29E42B, 4.4kg/100m\_Nh in 29E43A and 3.9kg/100m\_Nh in 29E43B, and 1.53kg/100m\_Nh in 29E45A in 2021. And, thematic mapping of the difference in annual netting LPUE (kg/100m\_Nh) of crawfish (*Palinurus elephas*) in belted statistical areas in ranges of 0.3kg/100m\_Nh where a positive value i.e. increased LPUE is blue and a negative value i.e. a reduction in LPUE is red (Right). 'Others' refers to the following values between 2019 and 2020; +3.2kg/100m\_Nh in 29E44B, +3.5kg/100m\_Nh in 29E42B, +4.2kg/100m\_Nh in 29E43A and +2.4kg/100m\_Nh in 29E43B, and between 2020 to 2021; -3.05kg/100m\_Nh in 29E44B, -2.14kg/100m\_Nh in 29E42B, -4.16kg/100m\_Nh in 29E43A and -3.86kg/100m\_Nh in 29E43B.

\*In some cases this may be an artefact of the data collection method; fishing effort and catch can only be allocated to one BSA per day, therefore where a vessel works in more than one area only one can be reported.



# Crawfish (*Palinurus elephas*) Net Fishery

## Summary Statistics 2021



### North Coast

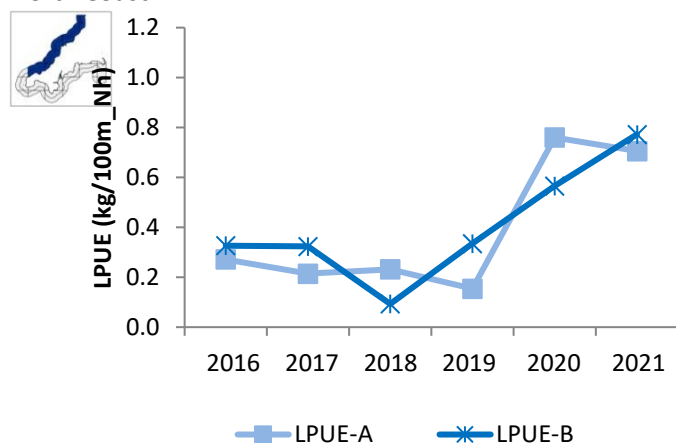


Figure 5: Annual LPUE (kg/100m\_Nh) of crawfish (*Palinurus elephas*) on the 'North Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

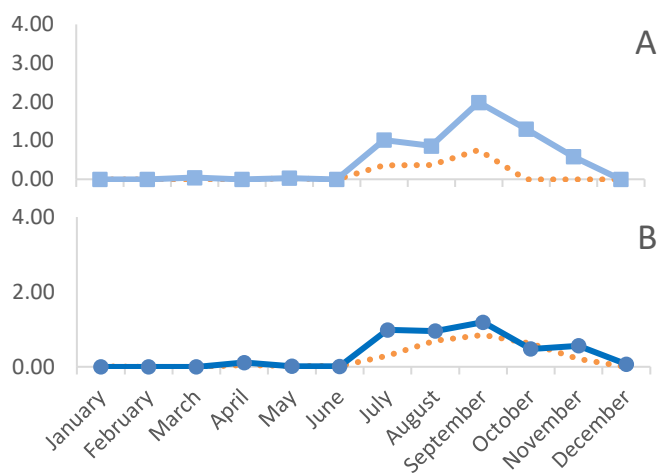


Figure 6: Monthly LPUE (kg/100m\_Nh) of crawfish (*Palinurus elephas*) on the 'North Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

### West Coast

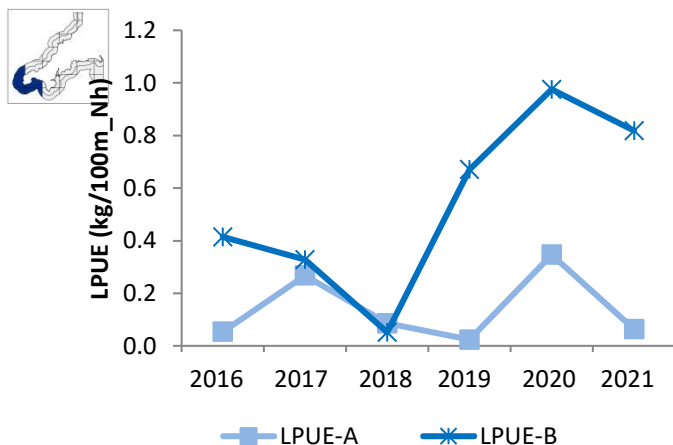


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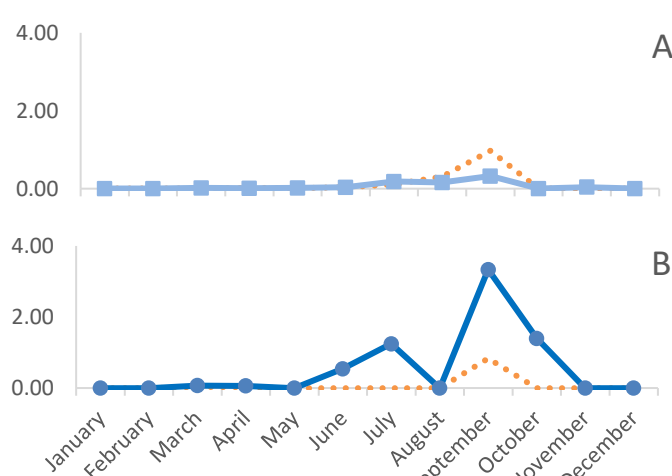


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### South Coast

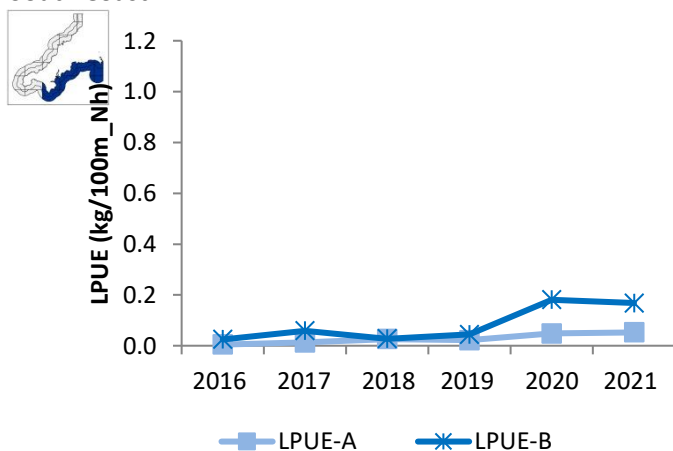


Figure 9: Annual LPUE (kg/100m\_Nh) of crawfish (*Palinurus elephas*) on the 'South Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

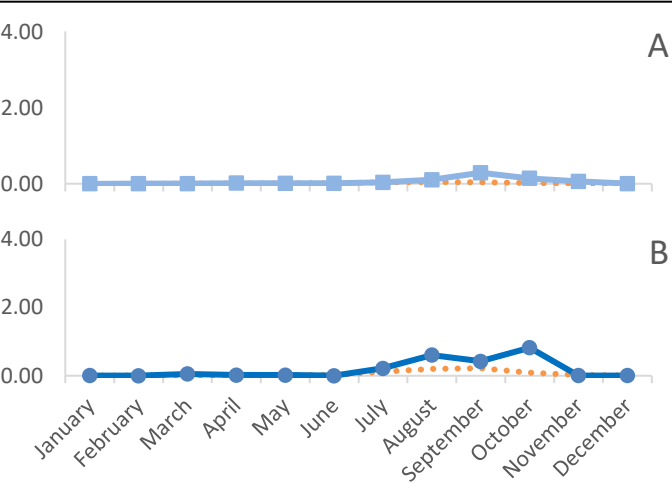


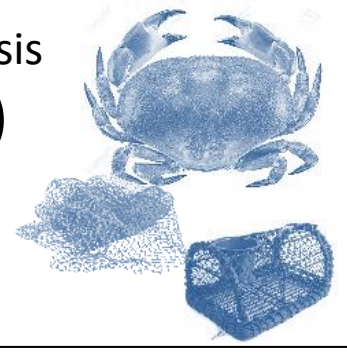
Figure 10: Monthly LPUE (kg/100m\_Nh) of crawfish (*Palinurus elephas*) on the 'South Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

# Monthly Shellfish Permit Statistics Analysis

## Edible crab (*Cancer pagurus*)

### Pot and Net Fisheries

### Summary Statistics 2021



#### Summary

Edible crab LPUE continued to decline in the pot fishery (Table 1 and Figure 2). In the net fishery LPUE declined from the peak in 2020, though was higher than the remainder of the reporting period (Figure 2).



**North Coast;** Split by band, LPUE remained higher offshore and, despite an increase in 2021, LPUE in both bands declined over the reporting period (Fig. 5). The seasonality of the pot fishery has remained similar to the 5 year average, however generally at lower monthly LPUE values (Fig.6). In the net fishery LPUE values remained high from 2016 to 2018, relative to other analysis areas (Fig. 3), then in 2019 to 2021 values were far lower. This pattern was similar in both the inshore and offshore (Fig. 12).



**West Coast;** in the pot fishery LPUE in the west coast was consistently the highest of the analysis areas across the reporting period (Fig. 3) however in 2021 LPUE was similar to that on the south coast (Fig. 3). When split by band, LPUE offshore was consistently higher, however declined at a faster rate than the inshore region (Fig. 7). In the net fishery inshore from 2017 to 2019 LPUE values were relatively high (Fig.14) then in 2020 and 2021 were comparable to offshore.



**South Coast;** in the pot fishery LPUE fell by 29% across the reporting period, the smallest drop of the analysis areas (Fig. 3). In the net fishery offshore LPUE has increased overall across the reporting period (Fig. 16).

#### Annual Data

Table 1: Total kg of edible crabs (*Cancer pagurus*) reportedly removed from the Cornwall IFCA District from 2017 to 2021 from both the pot and net fisheries, total gear hauled, and resultant calculated LPUE (kg/100Ph, or kg/100m\_Nh).

		2017	2018	2019	2020	2021
Pots	Gear Hauled	2,012,495	2,048,953	1,951,737	1,662,397	1,695,535
	Landed (kg)	1,642,165	1,424,739	1,250,556	879,849	851,639
	LPUE(kg/100Ph)	81.60	69.53	64.07	52.93	50.23
Nets	Gear Hauled (m)	6,684,300	8,359,890	5,390,595	2,004,355	3,338,130
	Landed (kg)	31,438	34,564	23,689	15,829	18,642
	LPUE(kg/100m_Nh)	0.47	0.41	0.44	0.79	0.56

#### Difference in LPUE 2017 to 2021

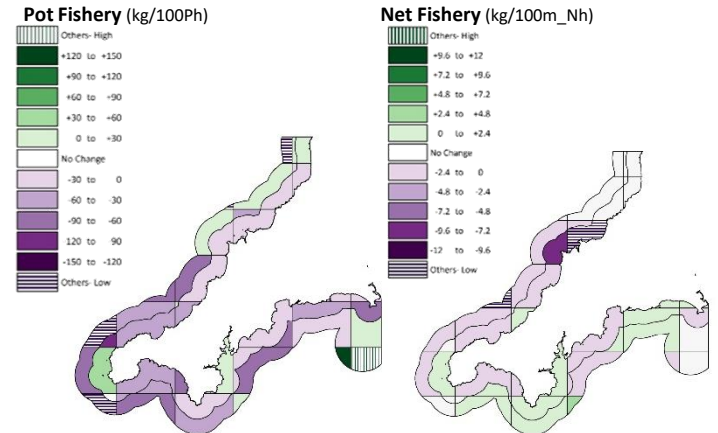
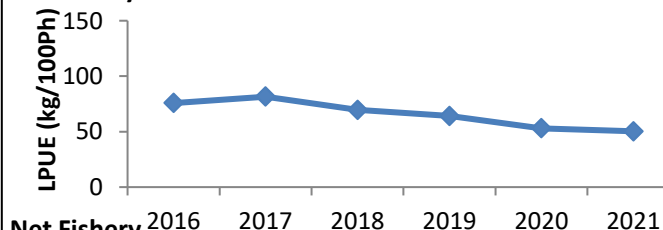


Figure 1: The difference in edible crab (*Cancer pagurus*) annual LPUE (kg/100Ph and kg/100m\_Nh) in the pot and net fisheries, in belted statistical areas between 2017 and 2021. Thematically mapped in 30kg/100Ph ranges (pot fishery), and 2.4kg/100m\_Nh ranges (net fishery) where positive values indicate an increase in LPUE and negative values a decrease. 'Others' Low/High in the pot fishery refers to a value of -186kg/100Ph in 30E51B, -390kg/100Ph in 30E48B, -173kg/100Ph in 29E42B, -167kg/100Ph in 28E41B, and +181kg/100Ph in 29E59B. In the net fishery, -33kg/100m\_Nh in 29E44B, and -13kg/100m\_Nh in 30E53A.

#### Pot Fishery



#### Net Fishery

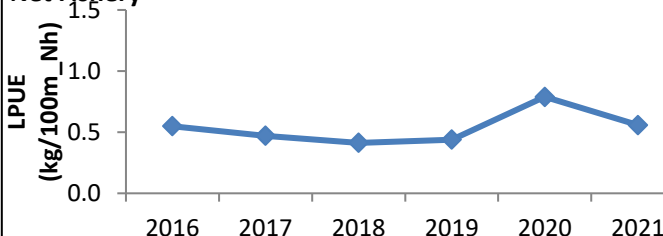


Figure 2: Annual LPUE in the pot fishery (kg/100Ph, top) and annual LPUE in the net fishery (kg/100m\_Nh, bottom) of edible crab (*Cancer pagurus*) in the Cornwall IFCA District from 2016 to 2021.

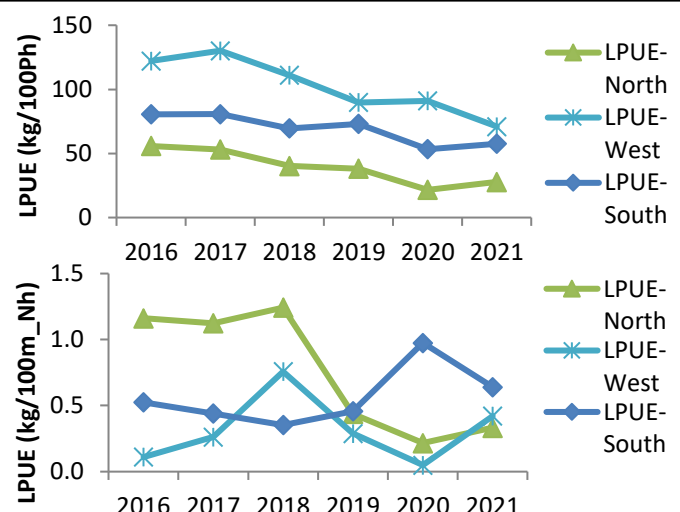


Figure 3: Annual LPUE in the pot fishery (kg/100Ph, top) and annual LPUE in the net fishery (kg/100m\_Nh, bottom) of edible crab (*Cancer pagurus*) in the Cornwall IFCA District split by analysis area from 2016 to 2021.

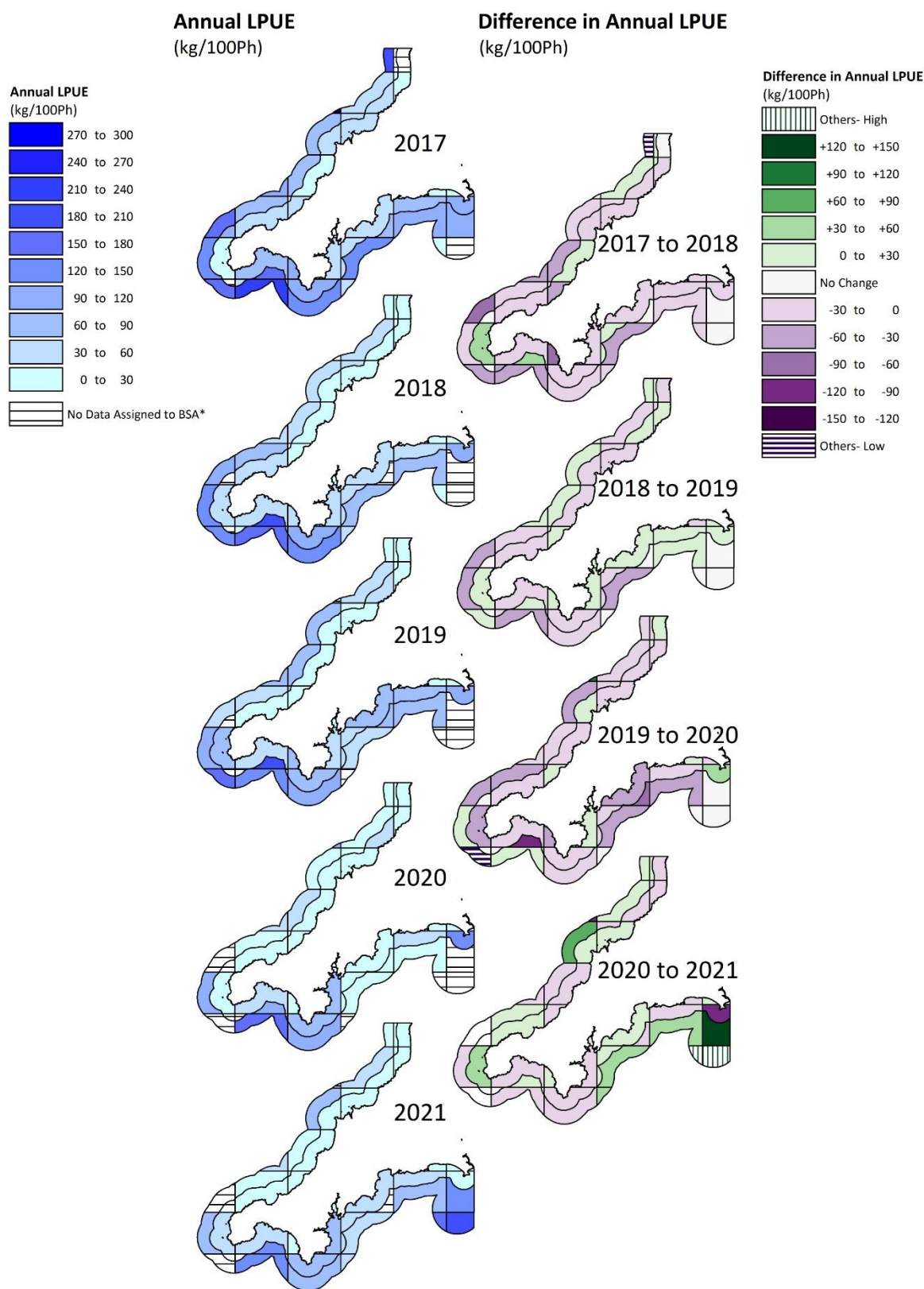


Figure 4: Thematic mapping of annual potting LPUE (kg/100Ph) of edible crab (*Cancer pagurus*) in belted statistical areas in 30kg /100Ph increments (left). 'Others' refers to 390kg/100Ph in 2017 in 30E48B. And, thematic mapping of the difference in annual potting LPUE (kg/100Ph) of edible crab (*Cancer pagurus*) in belted statistical areas in ranges of 30kg/100Ph (right) where a positive value i.e. increased LPUE is green and a negative value i.e. a reduction in LPUE is purple. 'Others' refers to -177kg/100Ph in 30E51B between 2017 and 2018, -150kg/100Ph from 2019 to 2020, +159kg/100Ph in 29E56B and +181kg/100Ph in 29E59B from 2020 to 2021.

\*In some cases this may be an artefact of the data collection method; fishing effort and catch can only be allocated to one BSA per day, therefore where a vessel works in more than one area only one can be reported.



#### North Coast

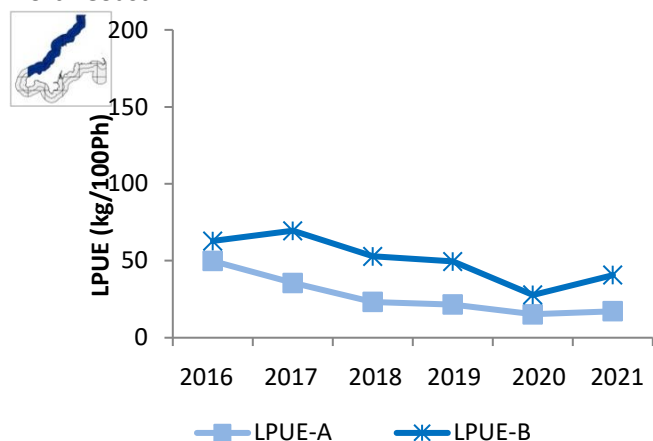


Figure 5: Annual LPUE (kg/100Ph) of edible crab (*Cancer pagurus*) on the 'North Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

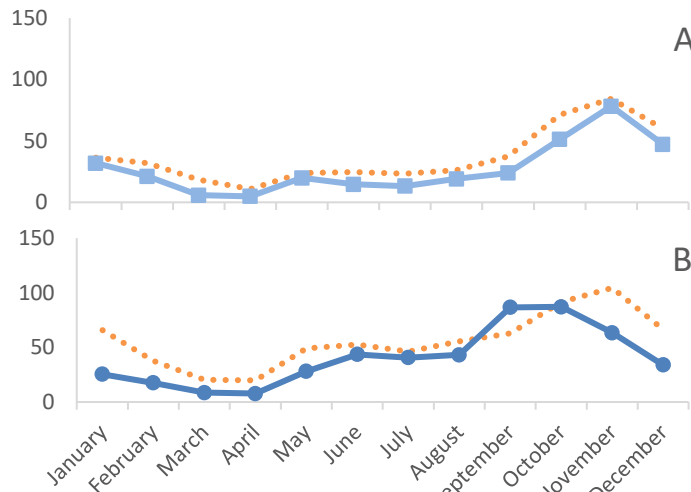


Figure 6: Monthly LPUE (kg/100Ph) of edible crab (*Cancer pagurus*) on the 'North Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

#### West Coast

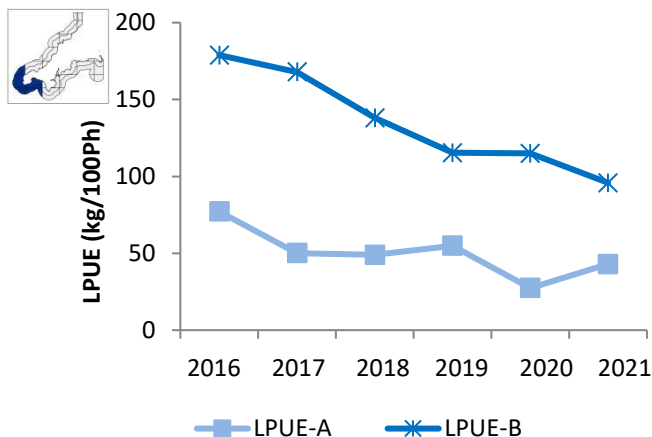


Figure 7: Annual LPUE (kg/100Ph) of edible crab (*Cancer pagurus*) on the 'West Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

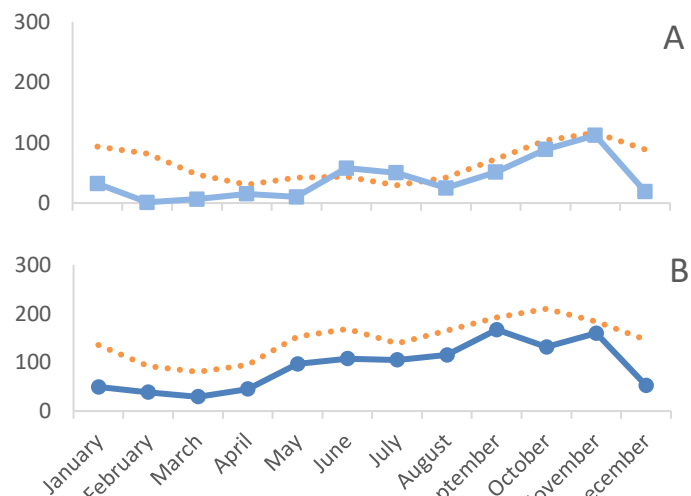


Figure 8: Monthly LPUE (kg/100Ph) of edible crab (*Cancer pagurus*) on the 'West Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

#### South Coast

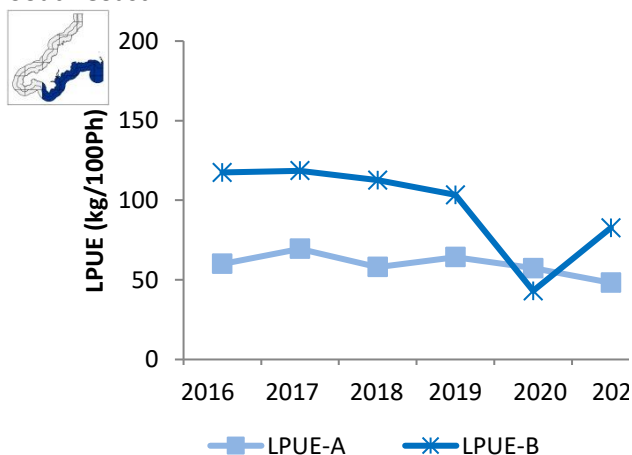


Figure 9: Annual LPUE (kg/100Ph) of edible crab (*Cancer pagurus*) on the 'South Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

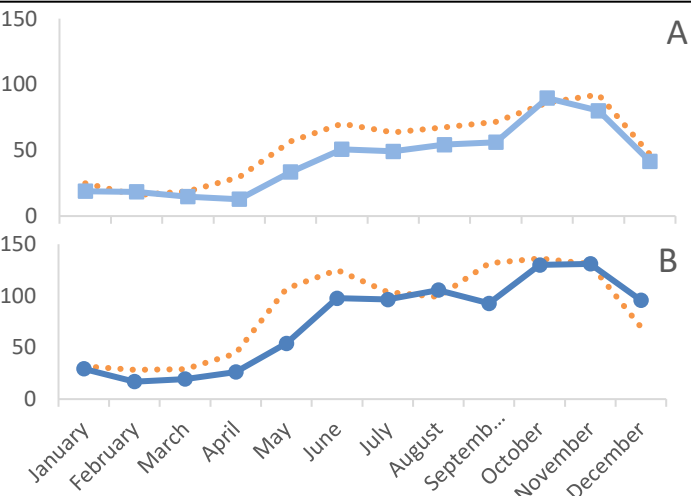


Figure 10: Monthly LPUE (kg/100Ph) of edible crab (*Cancer pagurus*) on the 'South Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).



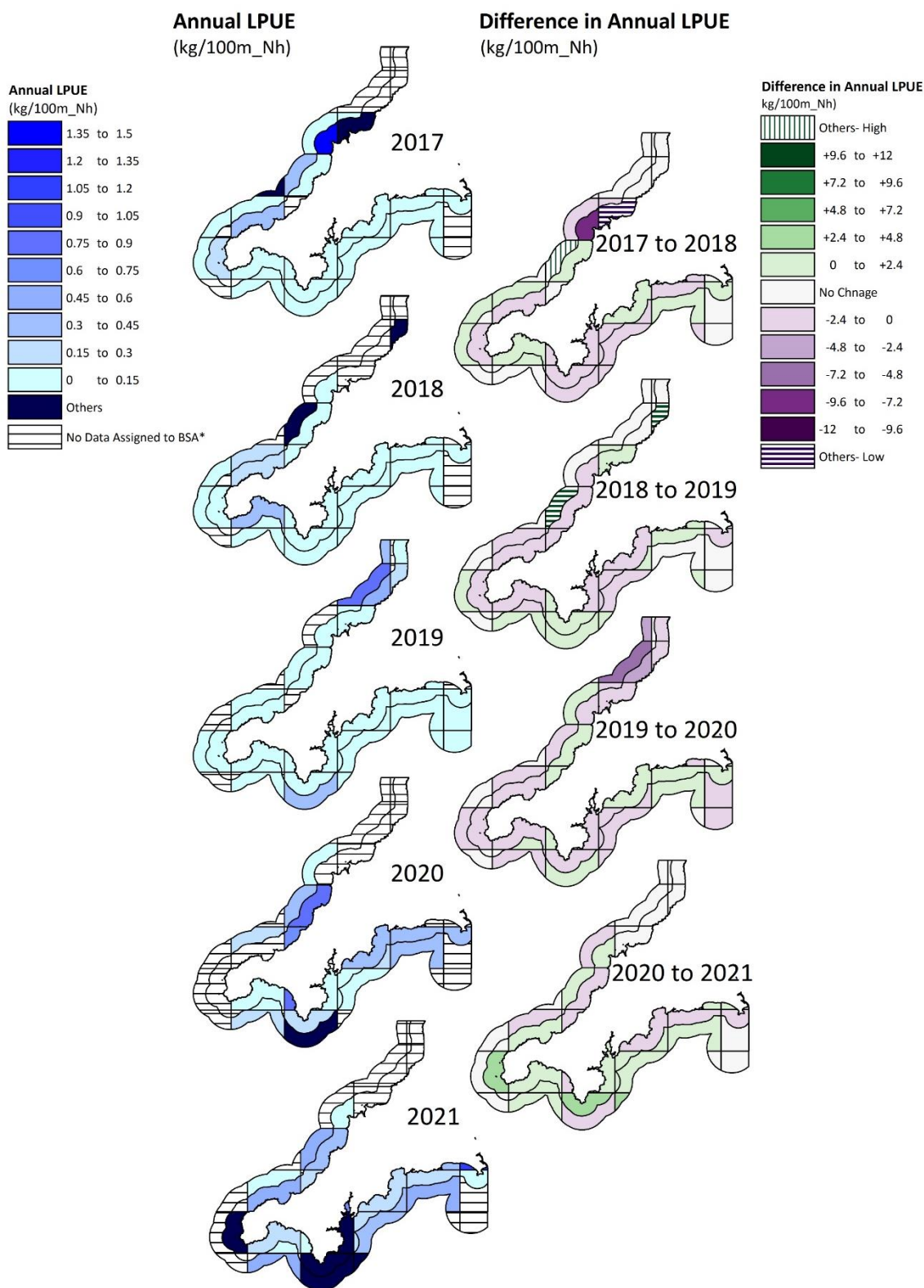


Figure 11: Thematic mapping of annual netting LPUE (kg/100m\_Nh) of edible crab (*Cancer pagurus*) in belted statistical areas in 1kg/100m\_Nh increments (left), 'Others' refers to a value of 13.5kg/100m\_Nh and 33.3kg/100m\_Nh in 30E53A and 29E44B respectively in 2017, 13.6kg/100m\_Nh and 18.7kg/100m\_Nh in 30E55A and 29E47B respectively in 2018, 4.5kg/100m\_Nh and 2.7kg/100m\_Nh in 28E47B in 2020 and 2021 respectively, and also in 2021; 2.7kg/100m\_Nh in 28E47A, 4.1kg/100m\_Nh in 28E51B, 2.7kg/100m\_Nh in 29E43A and 1.8kg/100m\_Nh in 29E4A(E). And, thematic mapping of the difference in annual netting LPUE (kg/100m\_Nh) of edible crab (*Cancer pagurus*) in belted statistical areas in ranges of 2.4kg/100m\_Nh (right) where a positive value i.e. increased LPUE is blue and a negative value i.e. a reduction in LPUE is red. 'Others' High/Low refers to a value of -13.5kg/100m\_Nh and +16.6kg/100m\_Nh in 30E53A and 29E47B from 2017 to 2018 and -12.3kg/100m\_Nh and -18.0kg/100m\_Nh in 30E55A and 29E47B respectively from 2018 to 2019.

\*In some cases this may be an artefact of the data collection method; fishing effort and catch can only be allocated to one BSA per day, therefore where a vessel works in more than one area only one can be reported.





#### North Coast

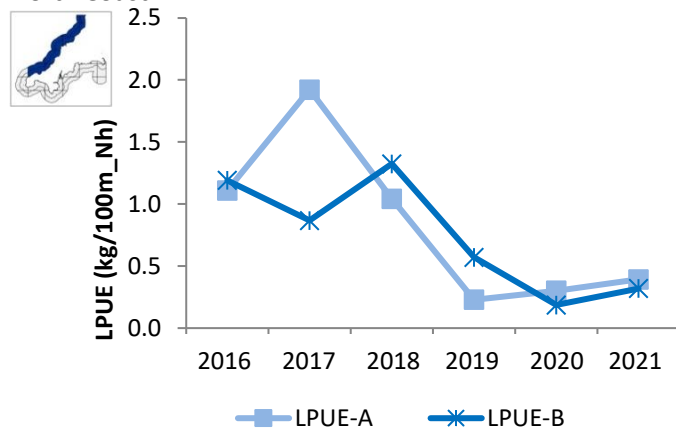


Figure 12: Annual LPUE (kg/100m\_Nh) of edible crab (*Cancer pagurus*) on the 'North Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

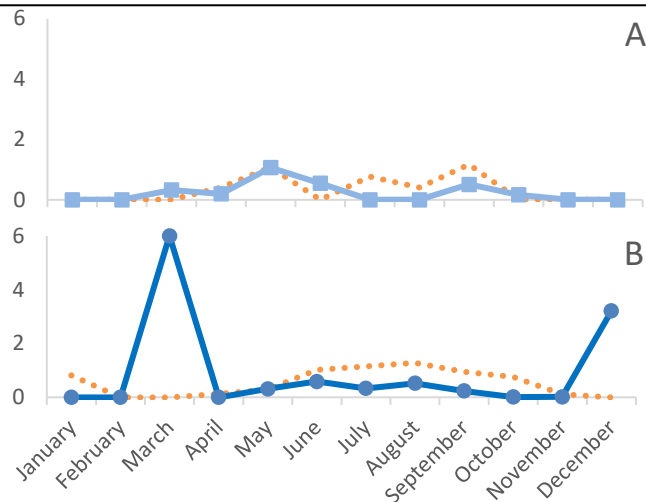


Figure 13: Monthly LPUE (kg/100m\_Nh) of edible crab (*Cancer pagurus*) on the 'North Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

#### West Coast

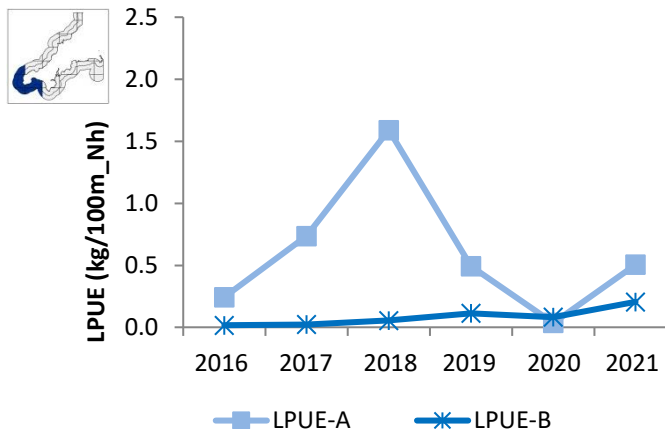


Figure 14: Annual LPUE (kg/100m\_Nh) of edible crab (*Cancer pagurus*) on the 'West Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

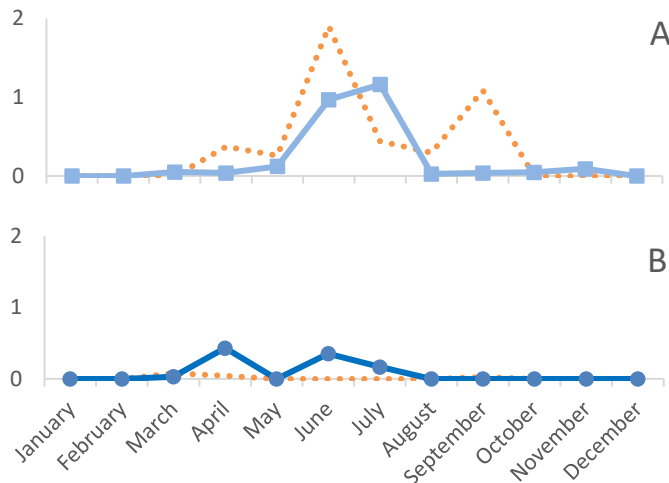


Figure 15: Monthly LPUE (kg/100m\_Nh) of edible crab (*Cancer pagurus*) on the 'West Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

#### South Coast

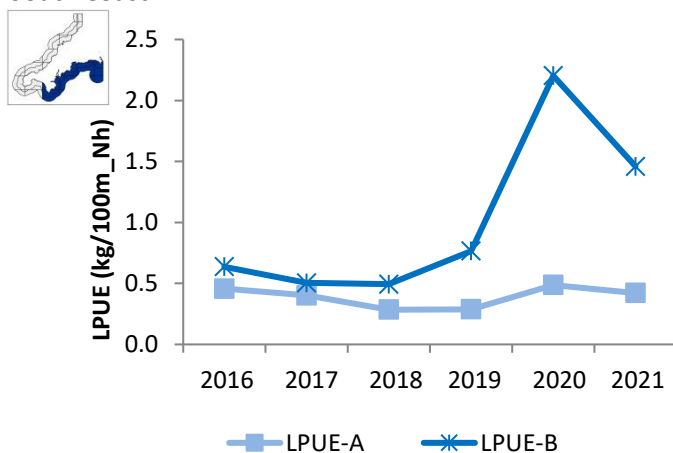


Figure 16: Annual LPUE (kg/100m\_Nh) of edible crab (*Cancer pagurus*) on the 'South Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

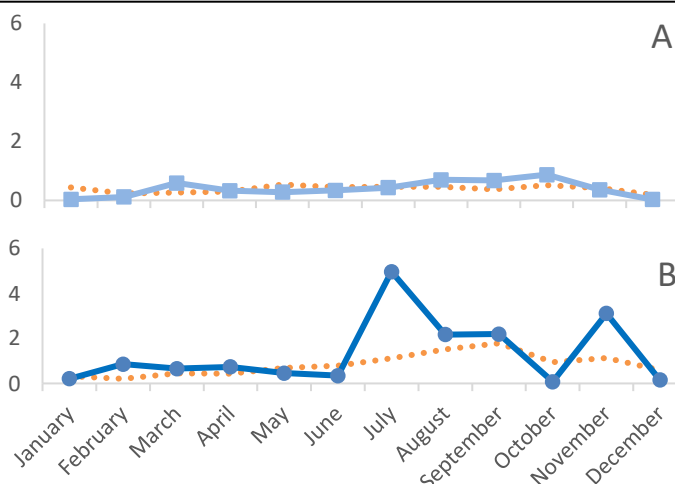


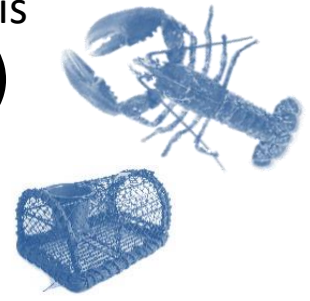
Figure 17: Monthly LPUE (kg/100m\_Nh) of edible crab (*Cancer pagurus*) on the 'South Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

# Monthly Shellfish Permit Statistics Analysis

## Lobster (*Homarus gammarus*)

### Pot Fishery

## Summary Statistics 2021



### Summary

LPUE of lobster in the Cornwall IFCA District increased from 2016 to 2020 by around 45% (Table 1 and Fig. 2). In 2021 total landings and LPUE fell though remained higher than previous years (Table 1 and Fig. 2) as also occurred in the north coast analysis area (Fig. 3). In contrast, annual LPUE in 2021 in the south coast continued to rise (Fig. 3). The majority of belted statistical areas showed an increase in LPUE across the reporting period (Fig. 1), though on the West and North coasts however there was a mosaic of localised increases and decreases in LPUE (Fig. 1).



**North Coast;** LPUE in 2021 fell from a peak in 2020 (Fig. 3), this was observed both inshore and offshore (Fig. 5). LPUE was consistently higher inshore across the reporting period, though in 2021 the difference between LPUE inshore and offshore was relatively small (Fig. 5)



**West Coast;** inshore on the west coast the fishery season was longer than the five year average, with higher monthly LPUE values in shoulder months of February and March and September to December (Fig. 8), but lower values in June and July.



**South Coast;** annual LPUE increased over the reporting period, and remained consistently the lowest of the three analysis areas (Fig. 3). LPUE offshore and inshore were very similar for much of the reporting period, other than in 2020 where LPUE offshore fell (Fig. 9).

In 2021 monthly LPUE in the shoulder months was generally higher than the five year average, both inshore and offshore (Fig. 10A).

### Annual Data

Table 1: Total kg of lobsters (*Homarus gammarus*) reportedly removed from the Cornwall IFCA District from 2017 to 2021, total gear hauled, and resultant calculated LPUE (kg/100Ph)

	2017	2018	2019	2020	2021
Total Gear Hauled	2,012,495	2,048,953	1,951,737	1,662,397	1,695,535
Total Landed (kg)	162,396	150,231	175,141	180,418	166,257
LPUE (kg/100Ph)	8.07	7.33	8.97	10.85	9.81

### Difference in LPUE 2017 to 2021

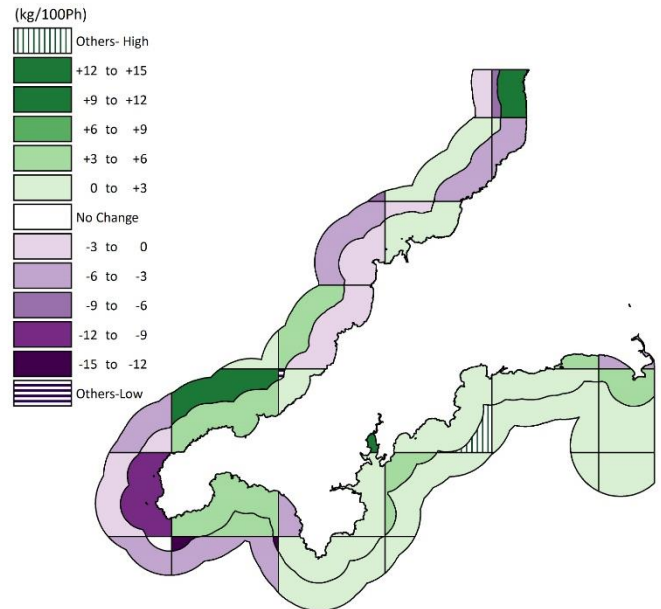


Figure 1: The difference in lobster (*Homarus gammarus*) LPUE (kg/100Ph) in belted statistical areas between 2017 and 2021 thematically mapped in 3kg/100Ph ranges where positive values i.e. increases in LPUE are green and negative values i.e. decreases in LPUE are purple. 'Others' refers to a value of -22kg/100Ph in 29E48B, and +17kg/100Ph in 29E52B.

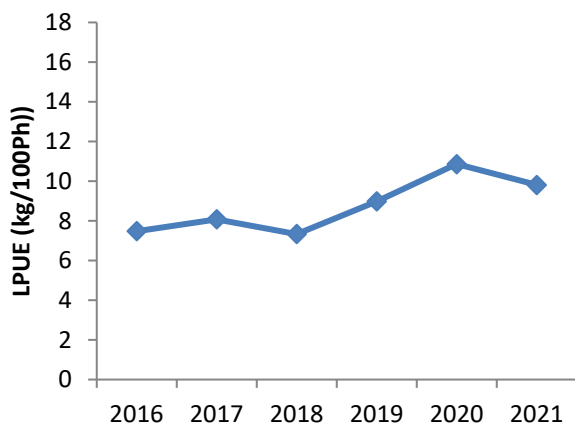


Figure 2: Annual LPUE (kg/100Ph) of lobster (*Homarus gammarus*) in the Cornwall IFCA District from 2016 to 2021.

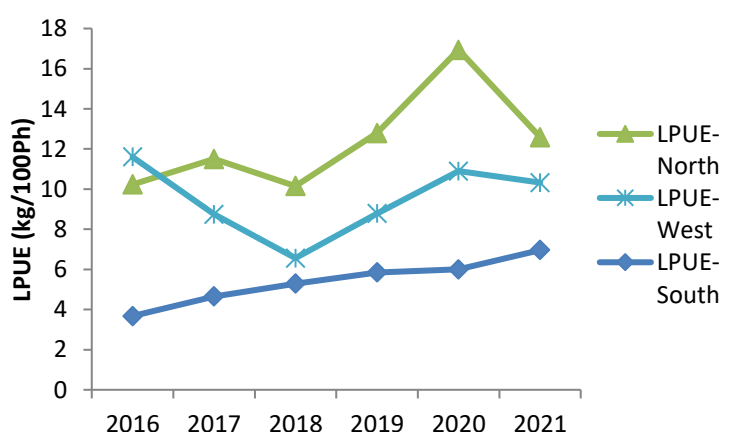


Figure 3: Annual LPUE (kg/100Ph) of lobster (*Homarus gammarus*) in the Cornwall IFCA District split by analysis area from 2016 to 2021.

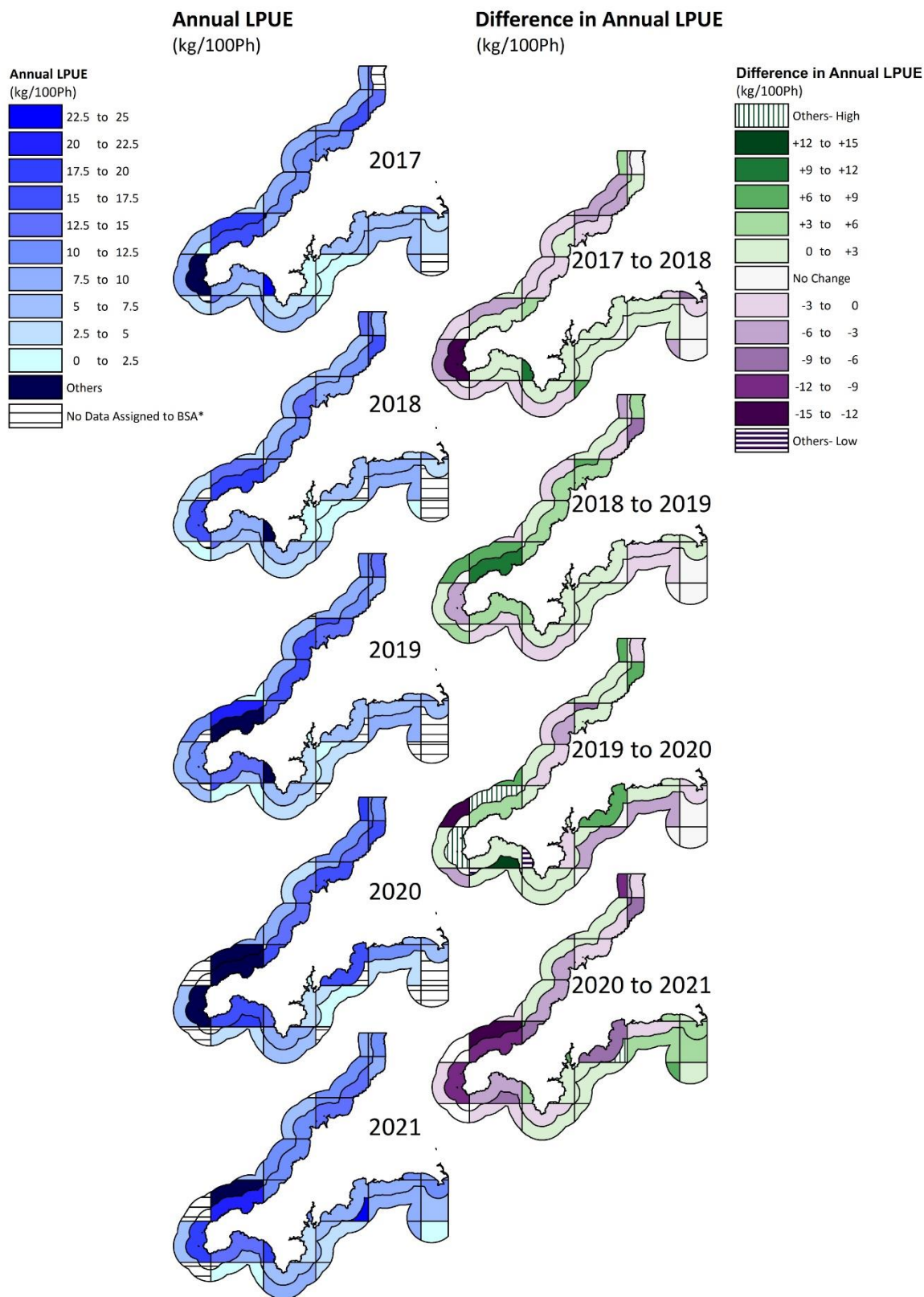
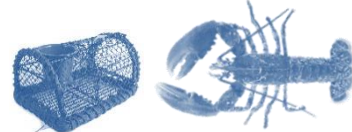


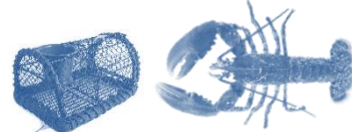
Figure 4: Thematic mapping of annual potting LPUE (kg/100Ph) of lobster (*Homarus gammarus*) in belted statistical areas in 2.5kg /100Ph increments (left) 'Others' in 2017 refers to a value of 28.0kg/100Ph in 29E43A and 30.8kg/100Ph in 29E48B, in 2018 34.0kg/100Ph in 29E49A(W) and in 2019 37.6kg/100Ph in 29E49A(W) and 29.4kg/100Ph in 29E45A, in 2020 34.2kg/100Ph in 29E45A, 41.3kg/100Ph in 29E45B, and 26.96kg/100Ph 29E43A, and in 2021 28.3kg/100Ph in 29E45B.

And, thematic mapping of the difference in annual potting LPUE (kg/100Ph) of lobster (*Homarus gammarus*) in belted statistical areas in ranges of 3kg/100Ph (right) where a positive value i.e. increased LPUE is green and a negative value i.e. a reduction in LPUE is purple. 'Others' refers to +19.4kg/100Ph in 29E45B, -16.4kg/100Ph in 28E44A, +15.2kg/100Ph in 29E43A and -24.1kg/100Ph in 29E49A(W) from 2019 to 2020, and 22.6kg/100Ph in 29E52B from 2020 to 2021.

\*In some cases this may be an artefact of the data collection method; fishing effort and catch can only be allocated to one BSA per day, therefore where a vessel works in more than one area only one can be reported.

# Lobster (*Homarus gammarus*) Pot Fishery

## Summary Statistics 2021



### North Coast

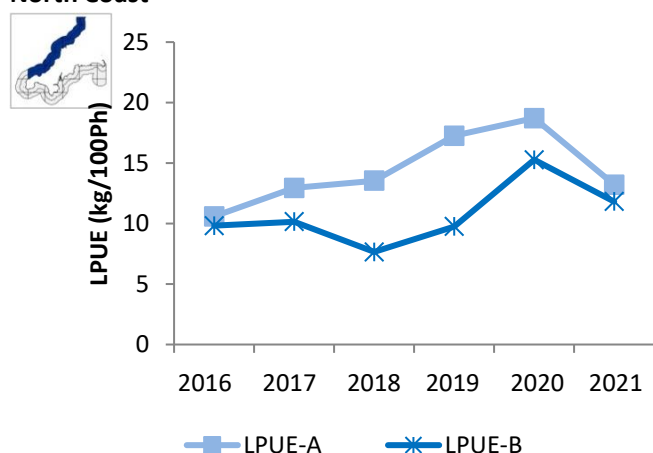


Figure 5: Annual LPUE (kg/100Ph) of lobster (*Homarus gammarus*) on the 'North Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

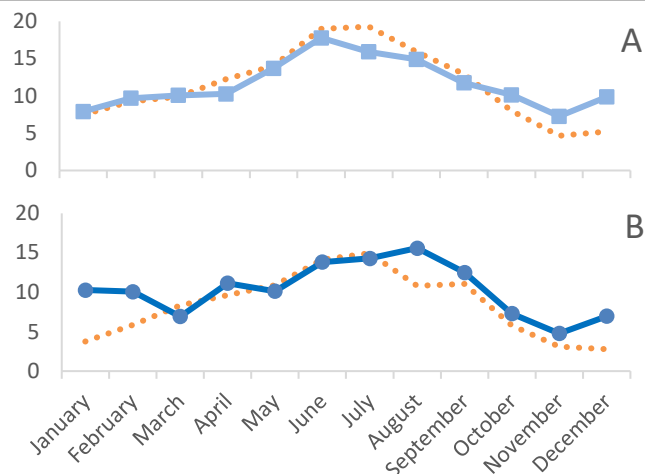


Figure 6: Monthly LPUE (kg/100Ph) of lobster (*Homarus gammarus*) on the 'North Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

### West Coast

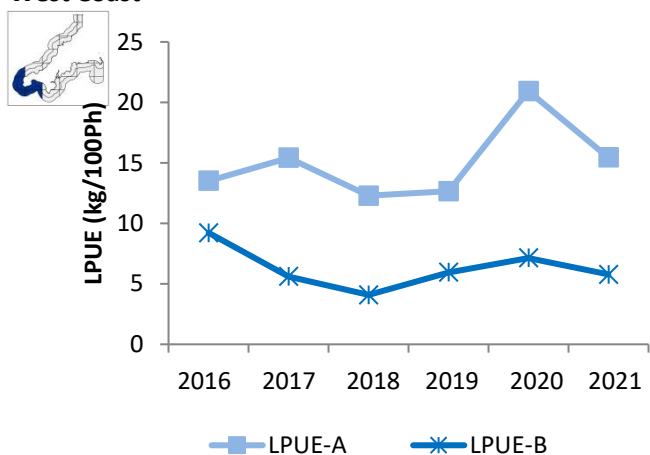


Figure 7: Annual LPUE (kg/100Ph) of lobster (*Homarus gammarus*) on the 'West Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

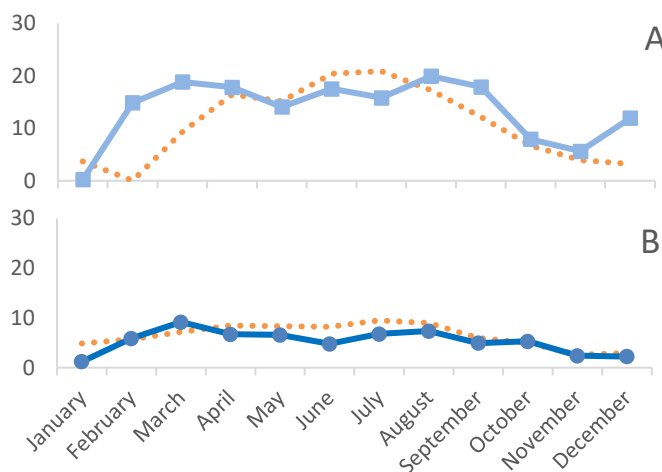


Figure 8: Monthly LPUE (kg/100Ph) of lobster (*Homarus gammarus*) on the 'West Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

### South Coast

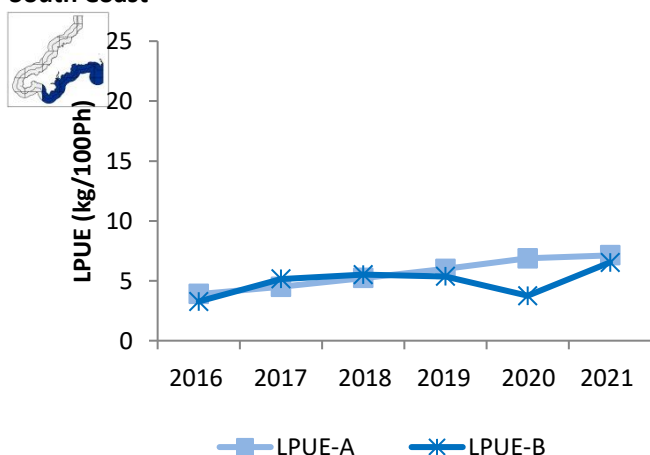


Figure 9: Annual LPUE (kg/100Ph) of lobster (*Homarus gammarus*) on the 'South Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

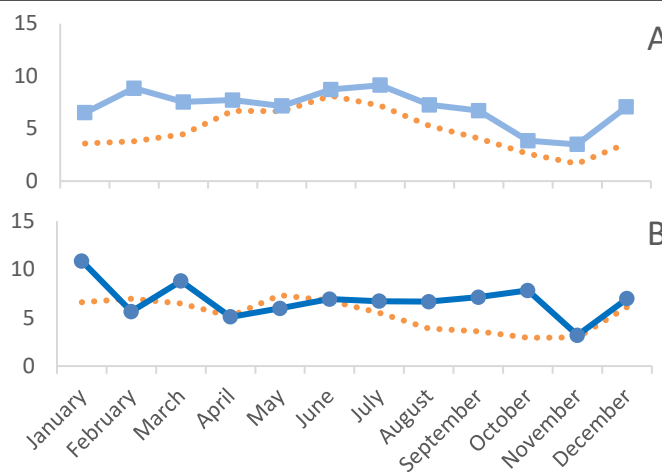


Figure 10: Monthly LPUE (kg/100Ph) of lobster (*Homarus gammarus*) on the 'South Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

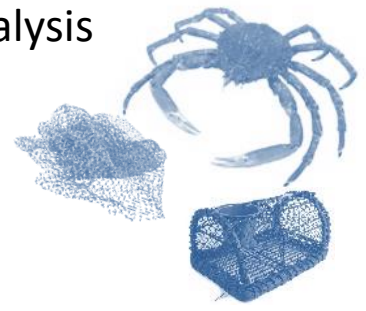


# Monthly Shellfish Permit Statistics Analysis

## Spider crab (*Maja* spp.)

### Pot and Net Fisheries

### Summary Statistics 2021



#### Summary

The spider crab fishery in the Cornwall IFCA District is mainly dictated by market demand, therefore LPUE is unreliable as a proxy or indicator of species abundance or population density.

LPUE of spider crab has increased across the reporting period in both the pot and net fisheries (Table 1, Fig. 2). In 2021 both the pot and net fisheries across the District, saw increases in LPUE compared to 2020 apart from the North Coast Net fishery, which showed a decline (Figs. 2 and 3).



**North Coast.** Inshore in the pot fishery LPUE in 2021 peaked in June (Fig. 6A), as did the net fishery, though the season was much shorter (Fig.13A), both peaks were slightly later than the 5 year average.

**West Coast;** in the pot fishery LPUE inshore increased across the reporting period (Fig. 7), however LPUE declined offshore (Fig. 7). Inshore in 2021 LPUE peaked in May, as did the five year average, however 2021 provided a higher value (Fig. 8A), this was followed by another smaller peak in August which was not present in the five year average.



In the inshore net fishery overall LPUE has increased over the reporting period (Fig. 14) and in 2021 monthly LPUE in the main fishery season was consistently higher than the five year average (Fig. 15).



**South Coast.** LPUE in both the pot and net fisheries has increased over the reporting period (Fig. 3, 9 and 16). The area with the biggest increase was in the pot fishery inshore on the south coast where LPUE increased by 166% from 2016 to 2021 (Fig. 7).

#### Annual Data

Table 1: Total kg of spider crabs (*Maja* spp.) reportedly removed from the Cornwall IFCA District from 2017 to 2019 from both the pot and net fisheries, total gear hauled, and resultant calculated LPUE (kg/100Ph, or kg/100m\_Nh).

		2017	2018	2019	2020	2021
Pots	Gear Hauled	2,012,495	2,048,953	1,951,737	1,662,397	1,695,535
	Landed (kg)	84,632	118,801	112,277	62,416	89,969
	LPUE(kg/100Ph)	4.21	5.80	5.75	3.75	5.31
Nets	Gear Hauled (m)	6,684,300	8,359,890	5,390,595	2,004,255	3,338,130
	Landed (kg)	44,851	96,190	99,723	36,247	94,827
	LPUE(kg/100m_Nh)	0.67	1.15	1.85	1.81	2.84

#### Difference in LPUE 2017 to 2021

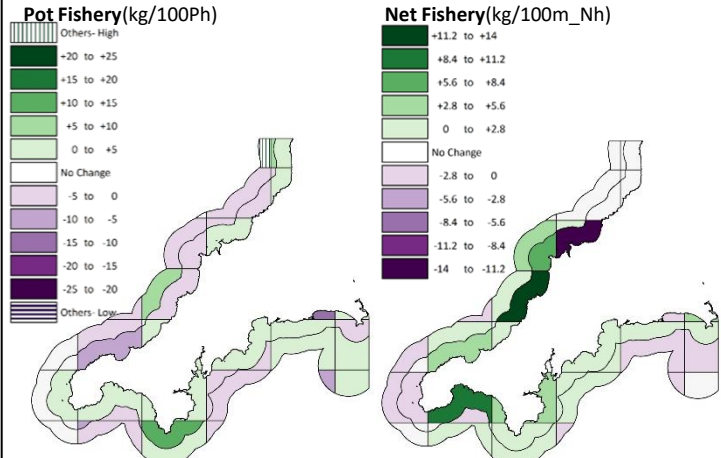
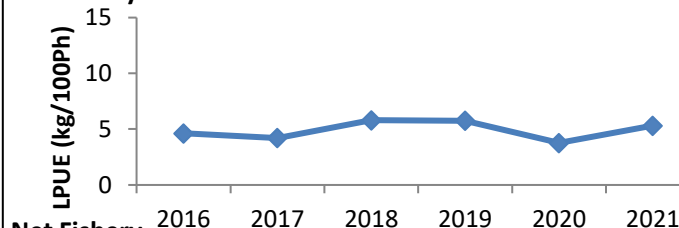


Figure 1: The difference in spider crab (*Maja* spp.) annual LPUE (kg/100Ph and kg/100m\_Nh) in the pot and net fisheries, in belted statistical areas between 2017 and 2021. Thematically mapped in 5kg/100Ph (pot fishery), and 2.8kg/100m\_Nh (net fishery) ranges, positive values indicate an increase in LPUE and negative values a decrease. 'Others' in the pot fishery refers to +26.7kg/100Ph in 30E51B and -39.0kg/100Ph in 30E49B and in the net fishery +44.2kg/100m\_Nh in 30E52B.

#### Pot Fishery



#### Net Fishery

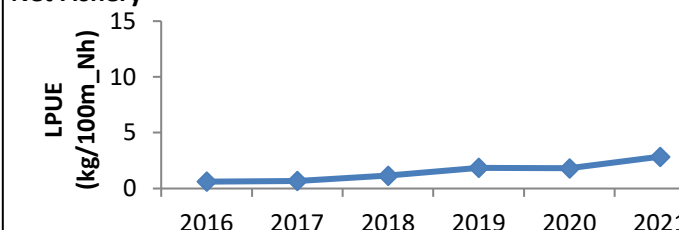


Figure 2: Annual LPUE in the pot fishery (kg/100Ph, top) and annual LPUE in the net fishery (kg/100m\_Nh, bottom) of spider crab (*Maja* spp.) in the Cornwall IFCA District from 2016 to 2021.

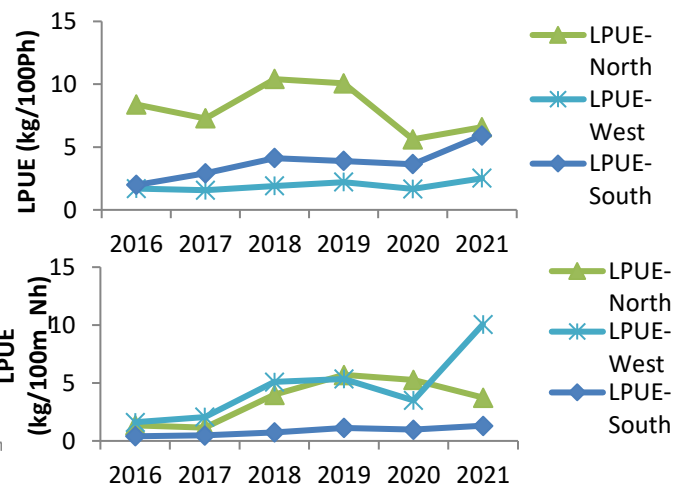


Figure 3: Annual LPUE in the pot fishery (kg/100Ph, top) and annual LPUE in the net fishery (kg/100m\_Nh, bottom) of spider crab (*Maja* spp.) in the Cornwall IFCA District split by analysis area from 2016 to 2021.



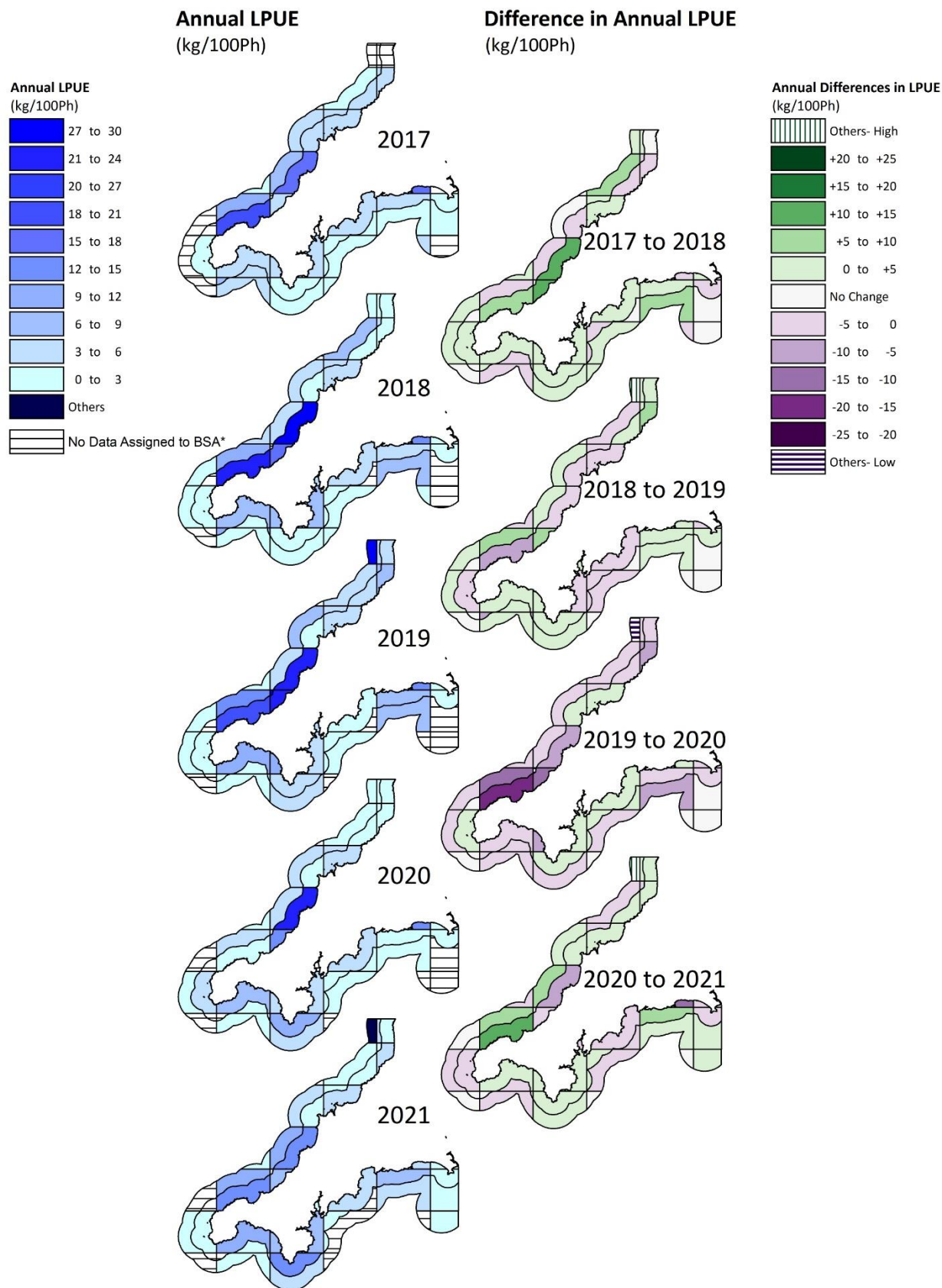


Figure 4: Thematic mapping of annual potting LPUE (kg/100Ph) of spider crab (*Maja* spp.) in belted statistical areas in 3kg /100Ph increments (left). 'Others' refers to 52.1kg/100Ph in 2021 in 30E51B. And, thematic mapping of the difference in annual potting LPUE (kg/100Ph) of spider crab (*Maja* spp.) in belted statistical areas in ranges of 5kg/100Ph (right) where a positive value i.e. increased LPUE is green and a negative value i.e. a reduction in LPUE is purple. 'Others' refers to +27.5kg/100Ph, -28.0kg/100Ph and +50.7kg/100Ph in 30E51B from 2018 to 2019, 2019 to 2020 and 2020 to 2021 respectively. \*In some cases this may be an artefact of the data collection method; fishing effort and catch can only be allocated to one BSA per day, therefore where a vessel works in more than one area only one can be reported.



#### North Coast

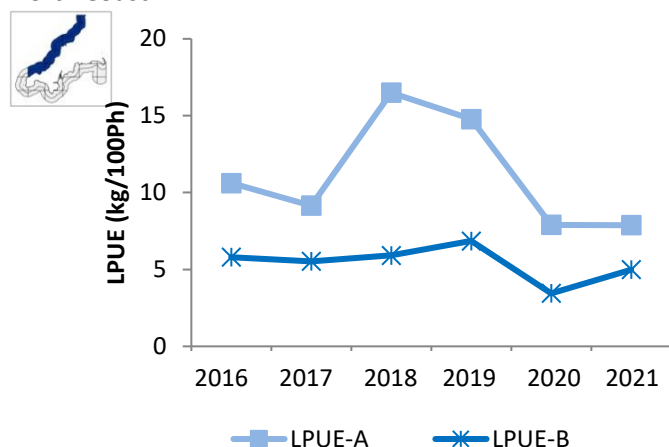


Figure 5: Annual LPUE (kg/100Ph) of spider crab (*Maja* spp.) on the 'North Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

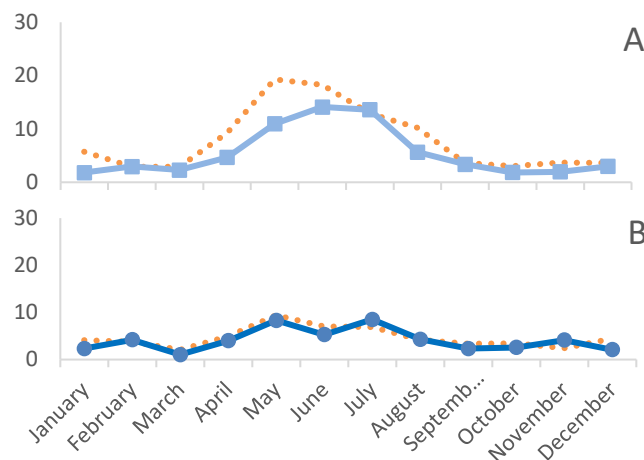


Figure 6: Monthly LPUE (kg/100Ph) of spider crab (*Maja* spp.) on the 'North Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

#### West Coast

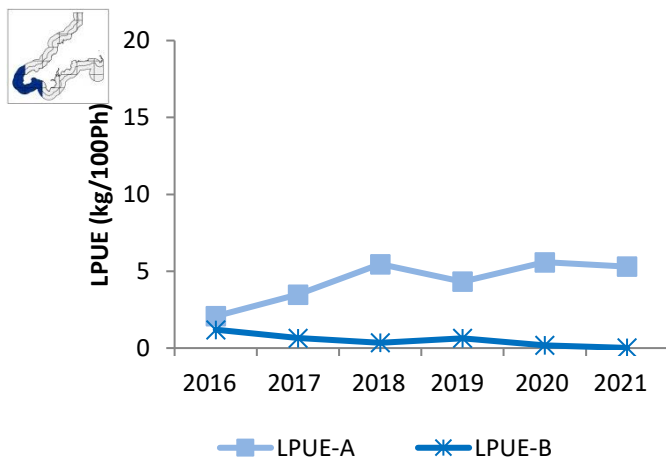


Figure 7: Annual LPUE (kg/100Ph) of spider crab (*Maja* spp.) on the 'West Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

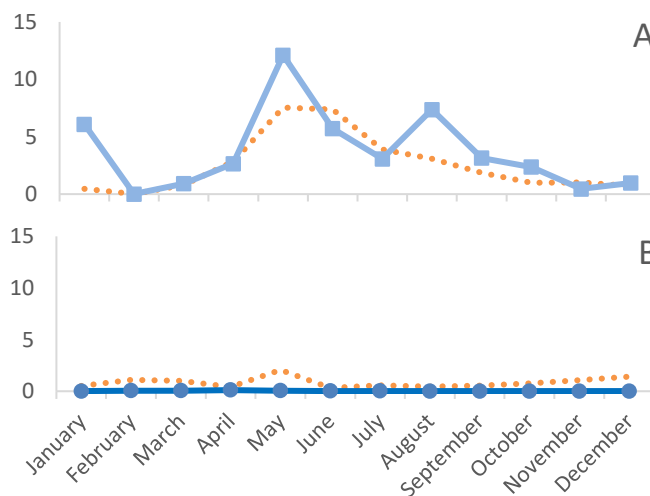


Figure 8: Monthly LPUE (kg/100Ph) of spider crab (*Maja* spp.) on the 'West Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

#### South Coast

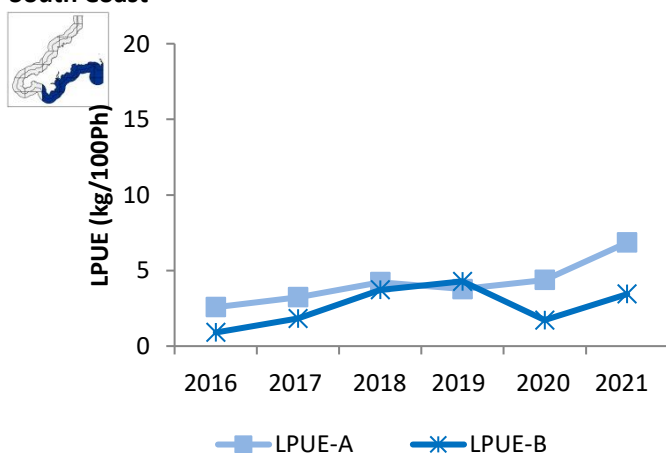


Figure 9: Annual LPUE (kg/100Ph) of spider crab (*Maja* spp.) on the 'South Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

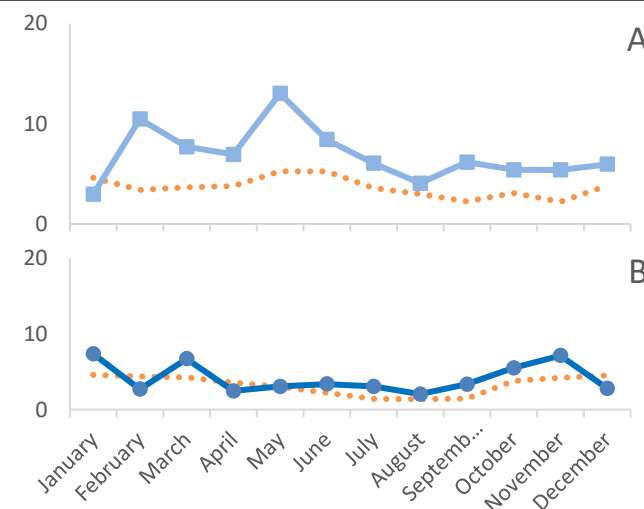


Figure 10: Monthly LPUE (kg/100Ph) of spider crab (*Maja* spp.) on the 'South Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

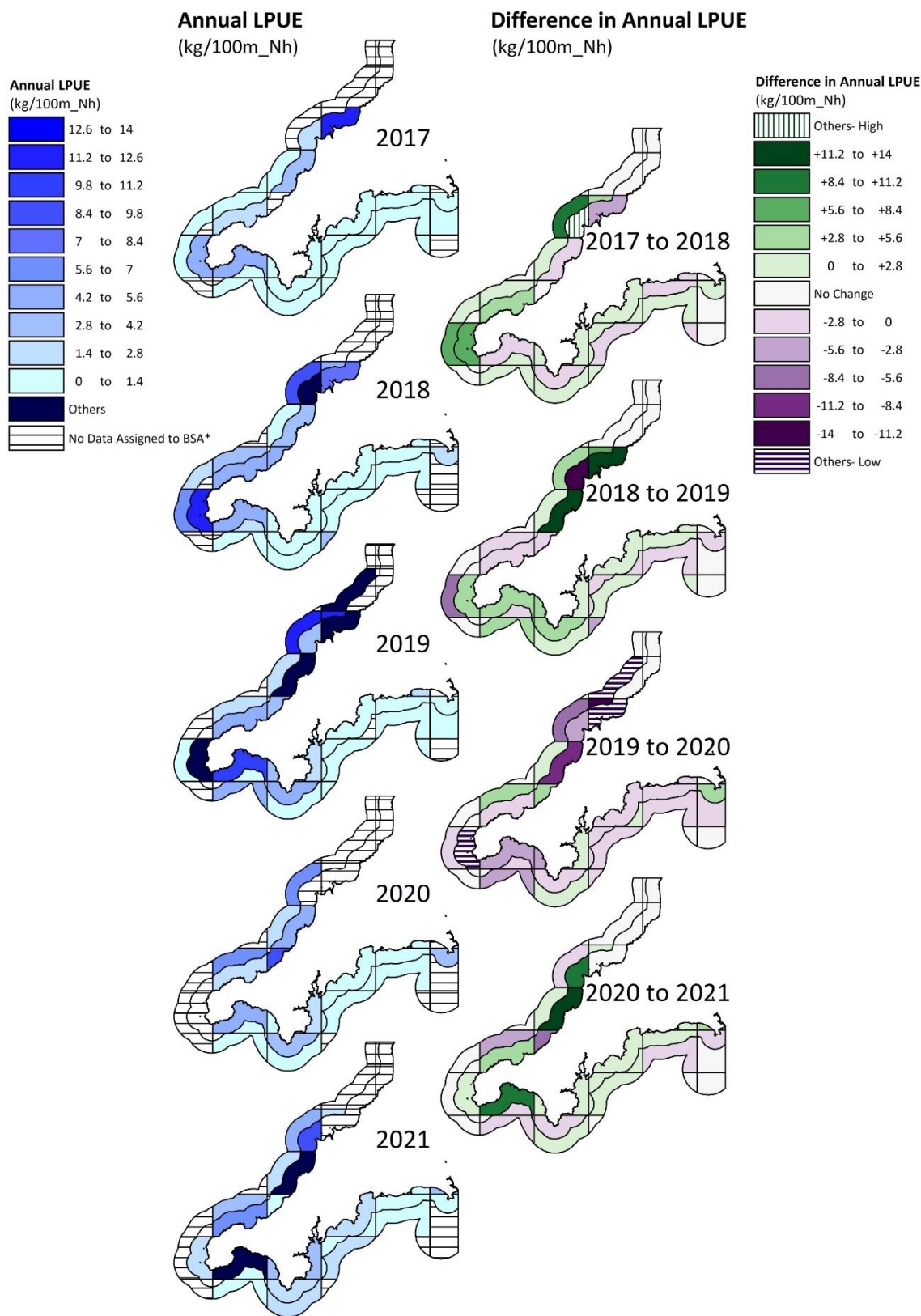
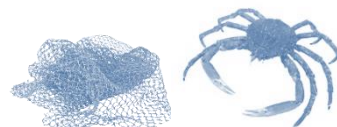
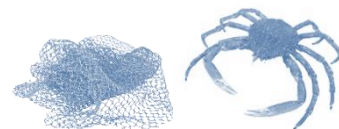


Figure 11: Thematic mapping of annual netting LPUE (kg/100m\_Nh) of spider crab (*Maja* spp.) in belted statistical areas in 1.4kg /100m\_Nh increments (left). 'Others' refers to 16.2kg/100m\_Nh in 30E49A in 2018, in 2019; 45.0kg/100m\_Nh in 30E52B, 20.0kg/100m\_Nh in 30E53A, 15.0kg/100m\_Nh in 29E47A and 15.3kg/100m\_Nh in 29E43A and in 2021 17.64kg/100m\_Nh in 29E47A and 15.5kg/100m\_Nh in 29E46A. And, thematic mapping of the difference in annual netting LPUE (kg/100m\_Nh) of spider crab (*Maja* spp.) in belted statistical areas in ranges of 2.8kg/100m\_Nh (right) where a positive value i.e. increased LPUE is blue and a negative value i.e. a reduction in LPUE is red. 'Others' refers to 44.2kg/100m\_Nh in 30E52B between 2017 and 2018, and between 2019 and 2020; -15.3kg/100m\_Nh in 29E43A, -45.0kg/100m\_Nh in 30E52B and -20.0kg/100m\_Nh in 30E53A.

\*In some cases this may be an artefact of the data collection method; fishing effort and catch can only be allocated to one BSA per day, therefore where a vessel works in more than one area only one can be reported.

# Spider crab (*Maja* spp.) Net Fishery

## Summary of Statistics 2021



### North Coast

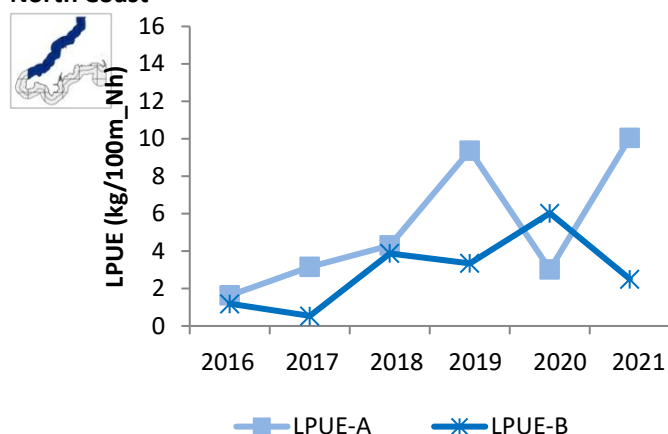


Figure 12: Annual LPUE (kg/100m\_Nh) of spider crab (*Maja* spp.) on the 'North Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

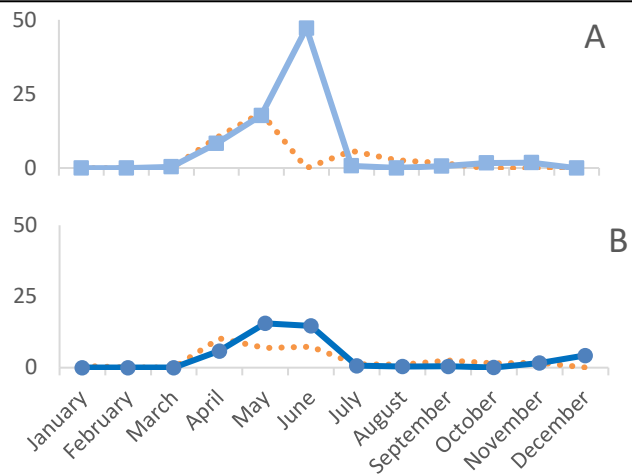


Figure 13: Monthly LPUE (kg/100m\_Nh) of spider crab (*Maja* spp.) on the 'North Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

### West Coast

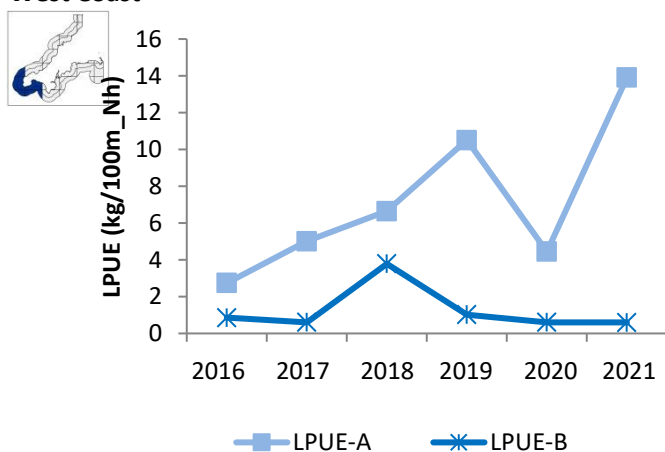


Figure 14: Annual LPUE (kg/100m\_Nh) of spider crab (*Maja* spp.) on the 'West Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

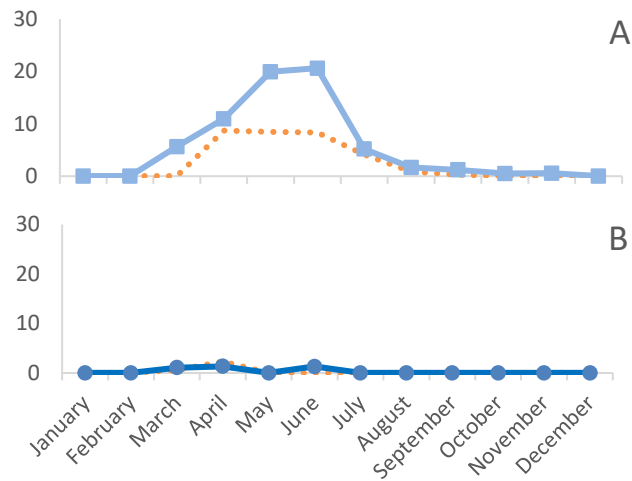


Figure 15: Monthly LPUE (kg/100m\_Nh) of spider crab (*Maja* spp.) on the 'West Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

### South Coast

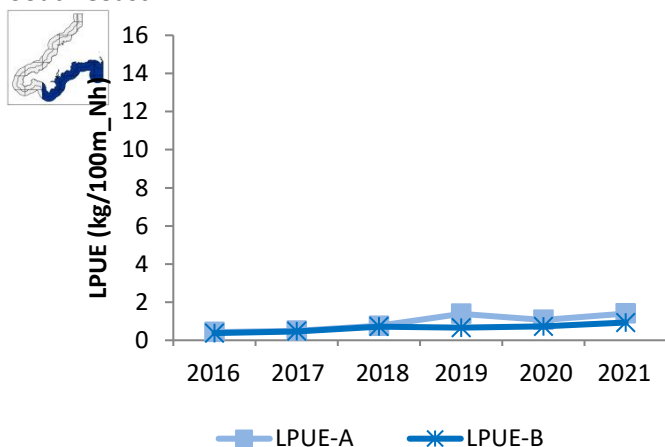


Figure 16: Annual LPUE (kg/100m\_Nh) of spider crab (*Maja* spp.) on the 'South Coast' from 2016 to 2021 split by band A (inshore 0-3nm, light blue squares) and B (offshore 3-6nm, blue stars).

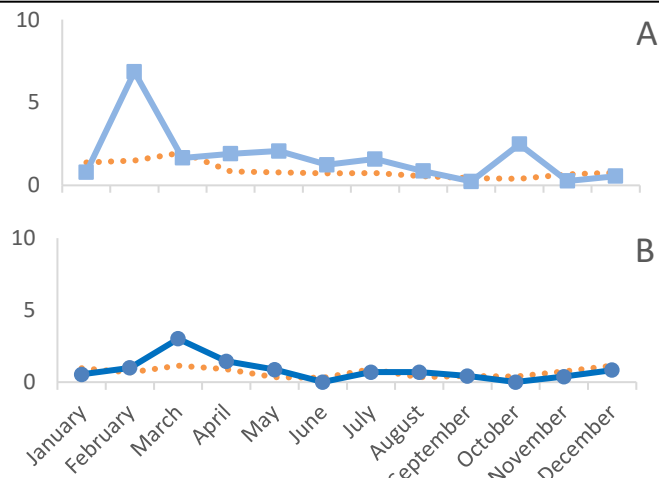
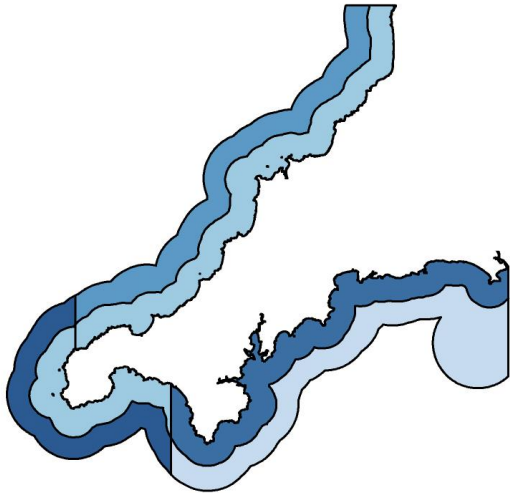


Figure 17: Monthly LPUE (kg/100m\_Nh) of spider crab (*Maja* spp.) on the 'South Coast' in 2021 (blue line) and 5 year average from 2016 to 2020 (Orange dotted line), split by band A (inshore 0-3nm, top) and B (offshore 3-6nm, bottom).

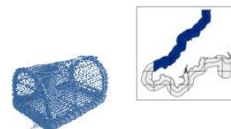


Monthly Shellfish Permit  
Statistics Analysis  
**Summary Statistics 2021**



Part 3

**Area Summary**



- Overall, effort declined across the reporting period (Fig. NP1). In 2021 monthly potting effort was below the 5 year average from May to the end of the year (Fig. NP1).
- Overall edible crab LPUE fell, and lobster rose (Fig. NP2).
- Inshore, in 2020 lobster LPUE was higher than crab, making it the more dominant species in the catch (Fig. NP2).
- The 5 year average peak in spider crab catches was in May, followed by lobster in June or July, than crab around October. In 2021 the seasonality of all three species remained similar to the five year average (Fig. NP3).

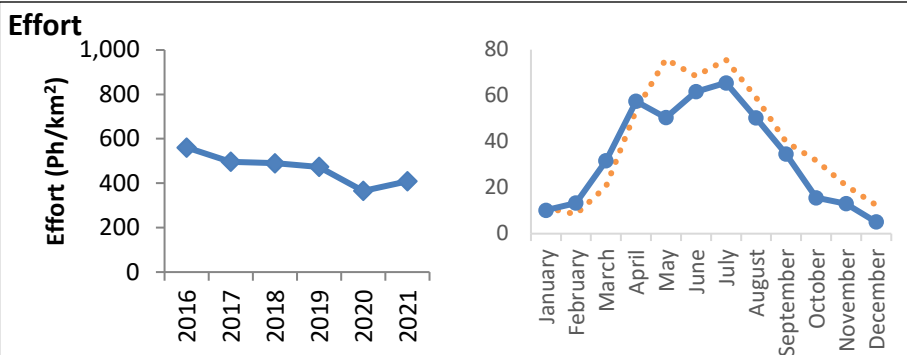


Figure NP1: (left) Annual potting effort (Ph/km²) in the north coast analysis area from 2016 to 2021 and (right) monthly potting effort (Ph/km²) in the north coast analysis area in 2021 (blue line) and 5 year average monthly potting effort from 2016 to 2020 (orange dotted line).

#### Annual LPUE

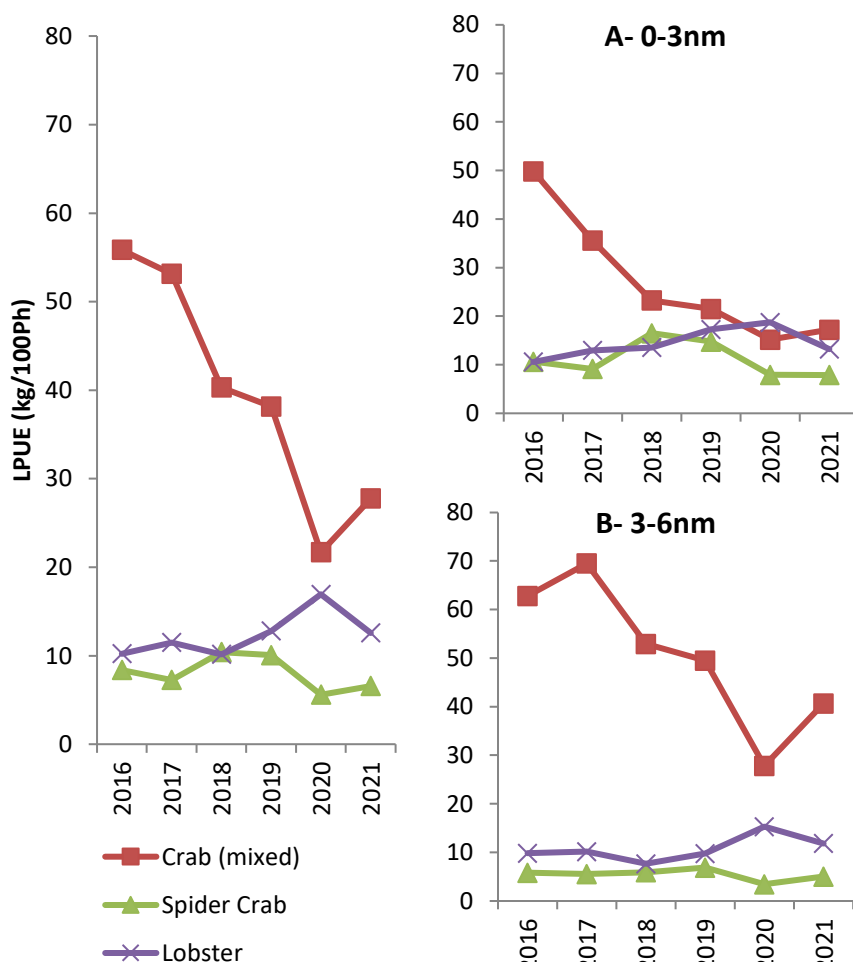
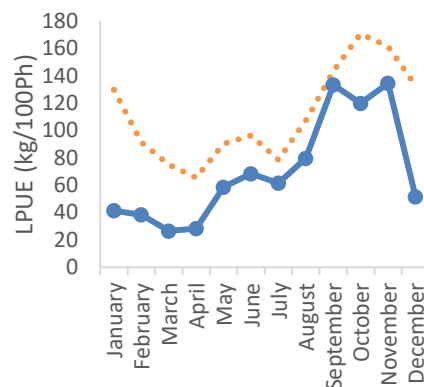


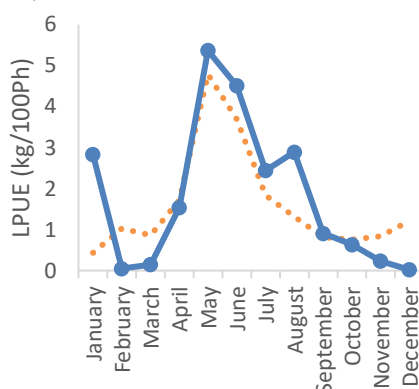
Figure NP2: (left) annual LPUE (kg/100Ph) of edible crab, spider crab and lobster from 2016 to 2021 in the north coast analysis area, further split by band; inshore A (top right) and offshore B (bottom right).

#### Seasonality

##### Edible Crab



##### Spider Crab



##### Lobster

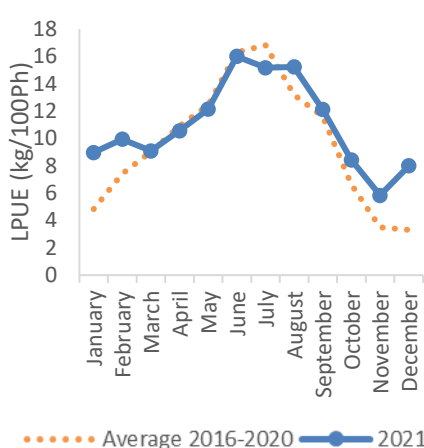
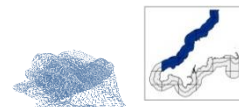


Figure NP3: monthly LPUE (kg/100Ph) in the north coast analysis area in 2021 (blue line) and the five year monthly average from 2016 to 2020 (orange dotted line) of edible crab (top), spider crab (middle) and lobster (bottom).



- Demersal netting effort has fluctuated across the reporting period, in 2021 effort increased by 89%(Fig. NN1), and monthly effort from August to October was higher than the 5 year average (Fig. NN1).
- LPUE of spider crab increased from 2017, though in 2020 and 2021 LPUE decreased from the peak in 2019 (Fig. NN2). In 2021 from April to June, monthly LPUE was higher than the 5 year average (Fig. NN3).
- Edible crab LPUE fell both inshore and offshore after peaks in 2017 and 2018 respectively (Fig. NN2), to lower than 2016.
- Crawfish LPUE increased in 2020 and 2021, in 2021 peak LPUE was in July, earlier than the five year average.

#### Effort

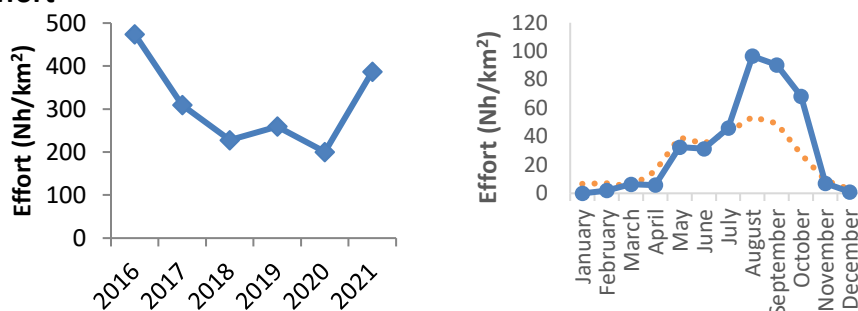
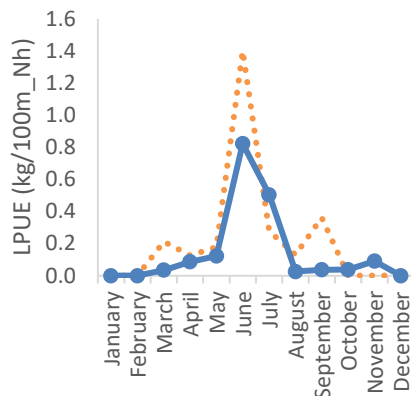


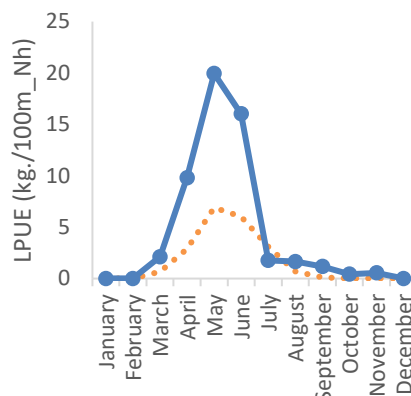
Figure NN1: (left) Annual netting effort (Nh/km²) in the north coast analysis area from 2016 to 2021, and (right) monthly netting effort (Nh/km²) in the north coast analysis area in 2021 (blue line) and 5 year average monthly potting effort from 2016 to 2020 (orange dotted line).

#### Seasonality

##### Edible Crab



##### Spider Crab



##### Crawfish

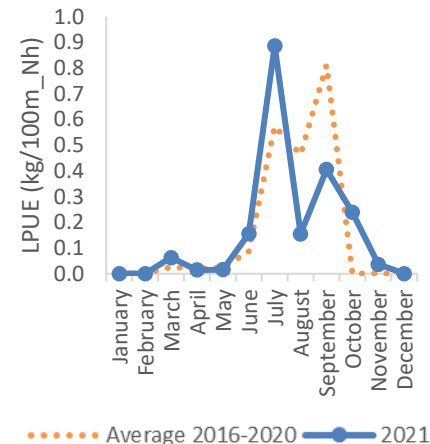


Figure NN3: monthly LPUE (kg/100Ph) in the north coast analysis area in 2021 (blue line) and the five year monthly average from 2016 to 2020 (orange dotted line) of edible crab (top), spider crab (middle) and crawfish (bottom).

#### Annual LPUE

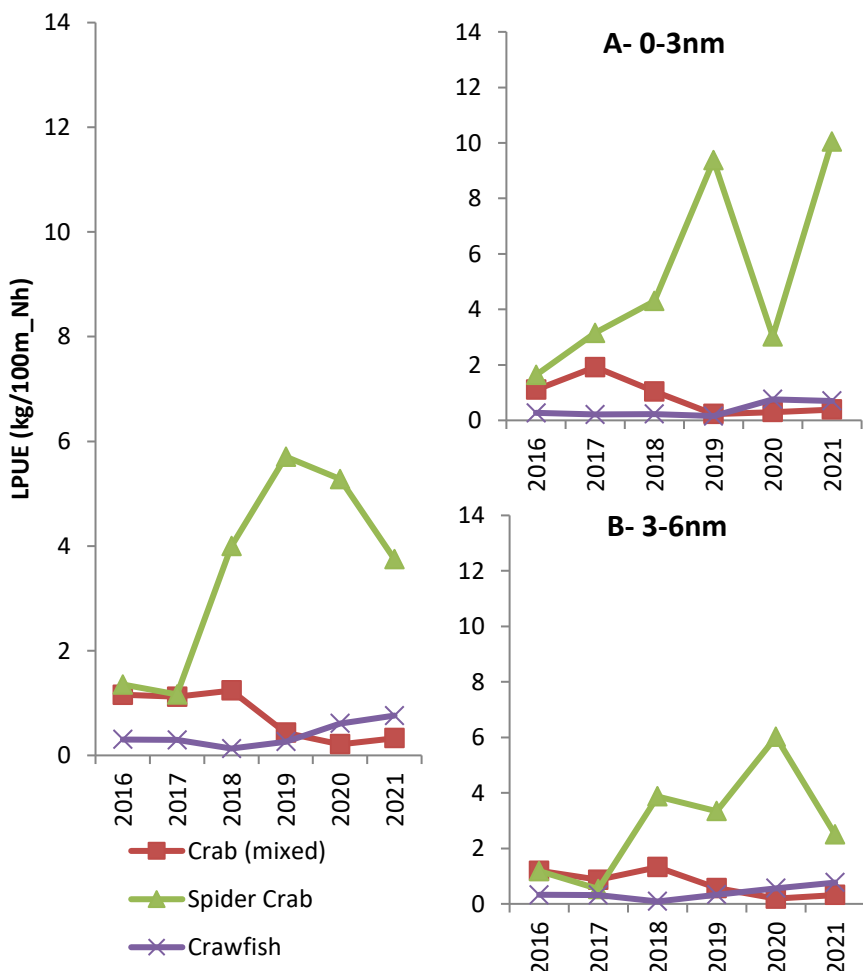
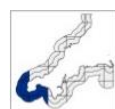


Figure NN2: (left) annual LPUE (kg/100m\_Nh) of edible crab, spider crab and crawfish from 2016 to 2021 in the north coast analysis area, further split by band; inshore A (top right) and offshore B (bottom right).



- Effort rose from 2016 to 2018, then fell in 2019 and remained fairly stable to 2021 (Fig. WP1). In 2021 monthly effort was higher than the five year average in June, and lower from October to December (Fig. WP1).
- Edible crab annual LPUE fell across the reporting period by around 50% both in the offshore and inshore areas (Fig. WP2), and monthly LPUE was lower than the 5 year average for the majority of 2021 (WP3).
- Spider crab LPUE remained relatively stable across the reporting period both inshore and offshore (Fig. WP2).
- Offshore lobster LPUE fell across the reporting period, inshore LPUE fell in 2021 but remained higher than 2016 (Fig. WP2).

## Effort

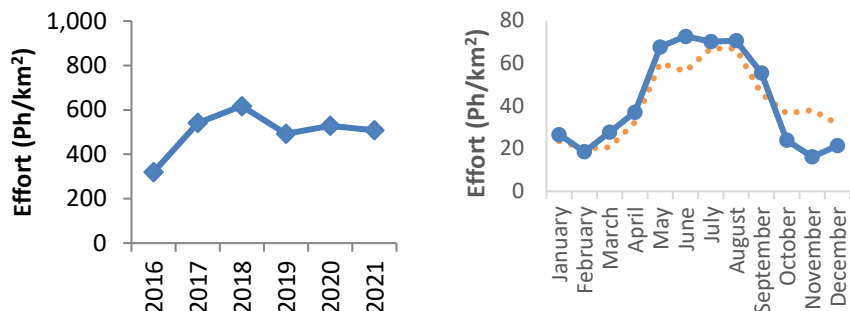
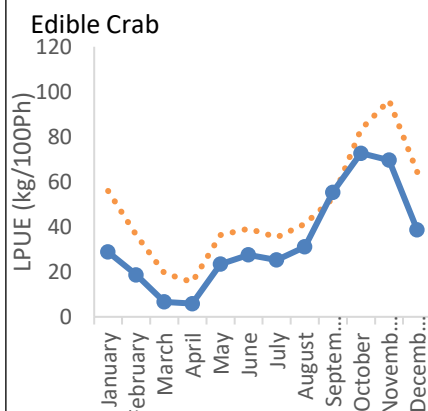
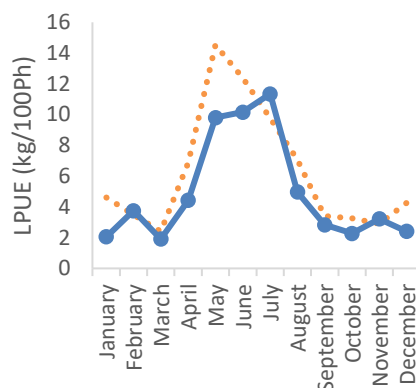


Figure WP1: (left) Annual potting effort (Ph/km<sup>2</sup>) in the west coast analysis area from 2016 to 2021 and (right) monthly potting effort (Ph/km<sup>2</sup>) in the west coast analysis area in 2021 (blue line) and 5 year average monthly potting effort from 2016 to 2020 (orange dotted line).

## Seasonality



## Spider Crab



## Lobster

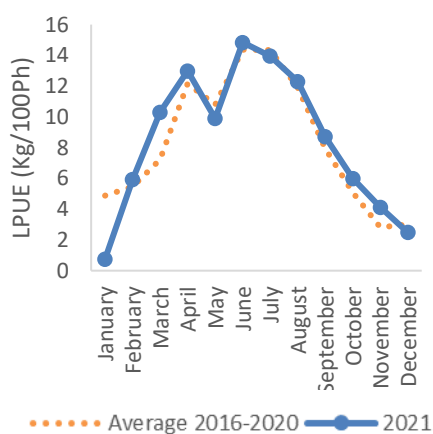


Figure WP3: monthly LPUE (kg/100Ph) in the west coast analysis area in 2021 (blue line) and the five year monthly average from 2016 to 2020 (orange dotted line) of edible crab (top), spider crab (middle) and lobster (bottom).

## Annual LPUE

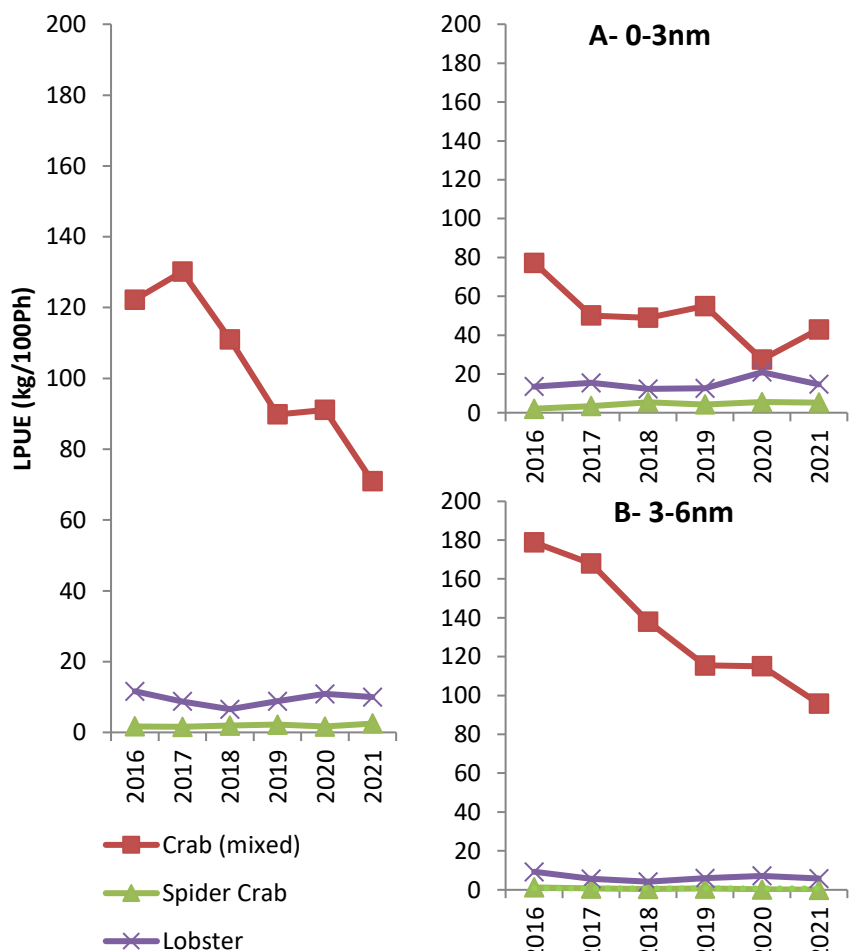


Figure WP2: (left) annual LPUE (kg/100Ph) of edible crab, spider crab and lobster from 2016 to 2021 in the west coast analysis area, further split by band; inshore A (top right) and offshore B (bottom right).





- Overall effort declined across the reporting period, however in 2020 effort was comparatively very low (Fig. NW1), as was spider crab LPUE inshore (Fig. NW2).
- In 2021 monthly peak effort occurred in June, a month later than the 5 year average (Fig. NW1), this also occurred in peak spider crab LPUE which was also double the 5 year average (Fig. WN3).
- Crawfish LPUE increased from 2018 (Fig. WN2), in 2021 monthly LPUE was often higher than the 5 year average (Fig. WN3).
- Edible crab LPUE increased in 2018 inshore (Fig. WN2), and monthly LPUE in December 2021 was unusually high (Fig. WN3).

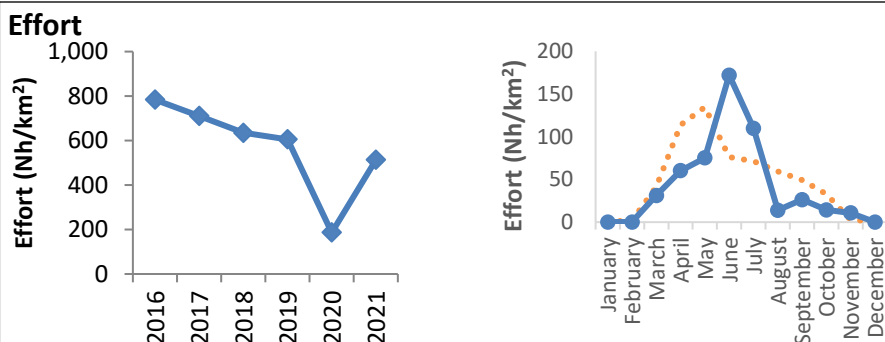


Figure WN1: (left) Annual netting effort (Nh/km²) in the west coast analysis area from 2016 to 2021, and (right) monthly netting effort (Nh/km²) in the west coast analysis area in 2021 (blue line) and 5 year average monthly potting effort from 2016 to 2020 (orange dotted line).

## Annual LPUE

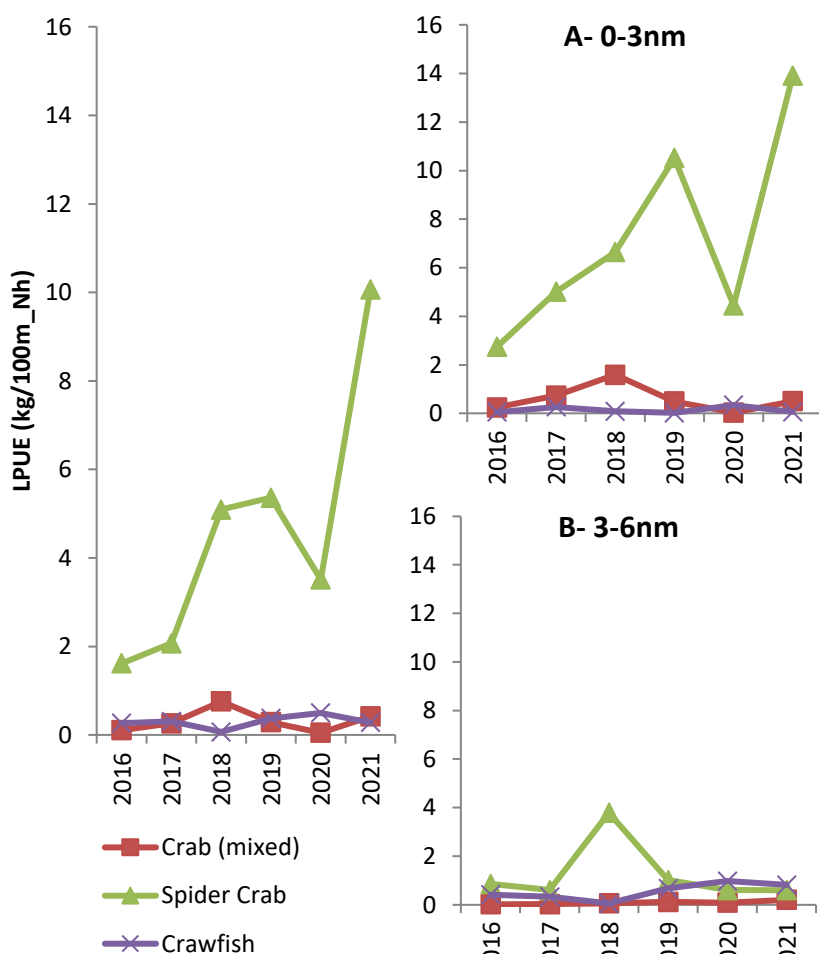
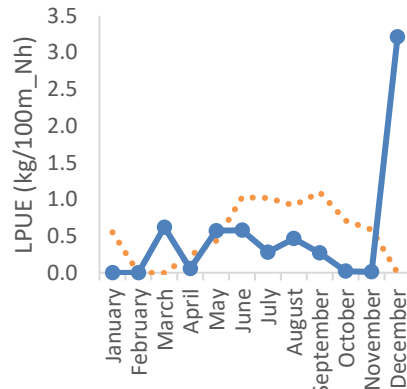


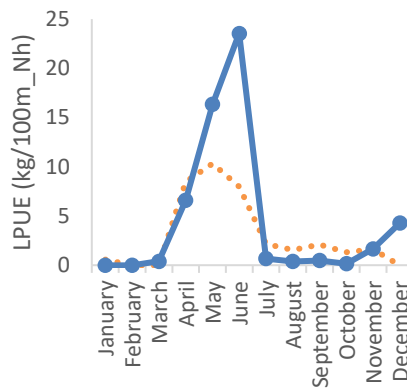
Figure WN2: (left) annual LPUE (kg/100m\_Nh) of edible crab, spider crab and crawfish from 2016 to 2021 in the west coast analysis area, further split by band; inshore A (top right) and offshore B (bottom right).

## Seasonality

### Edible Crab



### Spider Crab



### Crawfish

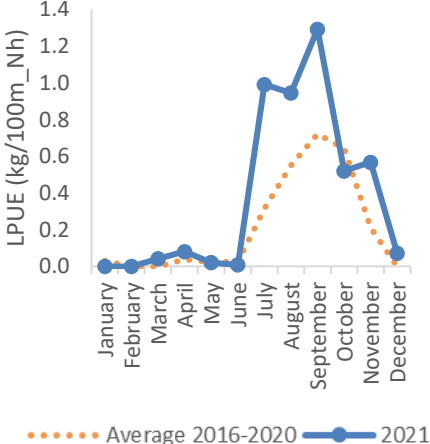
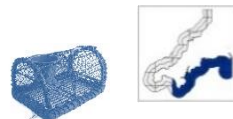


Figure WN3: monthly LPUE (kg/100Ph) in the west coast analysis area in 2021 (blue line) and the five year monthly average from 2016 to 2020 (orange dotted line) of edible crab (top), spider crab (middle) and crawfish (bottom).



- Effort has declined overall across the reporting period (Fig. SP1). In 2021 effort in the second half of the year was generally lower than the 5 year average (Fig. SP1).
- Spider crab and lobster LPUE increased over the reporting period, and edible crab LPUE decreased (Fig. SP2).
- Crab followed the same seasonality in 2021 to the 5 year average, though with lower monthly LPUE (Fig. SP3).
- Spider crab and lobster monthly LPUE in 2021 was higher than 5 year average for the majority of the year, however both had higher than average monthly LPUE in February and March in 2021 (Fig. SP3).

## Effort

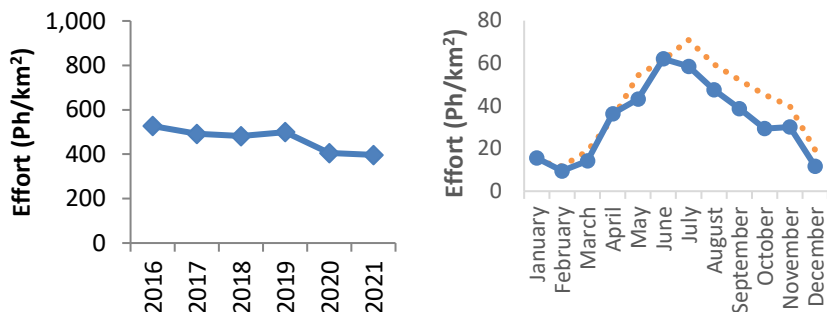


Figure SP1: (left) Annual potting effort (Ph/km<sup>2</sup>) in the south coast analysis area from 2016 to 2021 and (right) monthly potting effort (Ph/km<sup>2</sup>) in the south coast analysis area in 2021 (blue line) and 5 year average monthly potting effort from 2016 to 2020 (orange dotted line).

## Annual LPUE

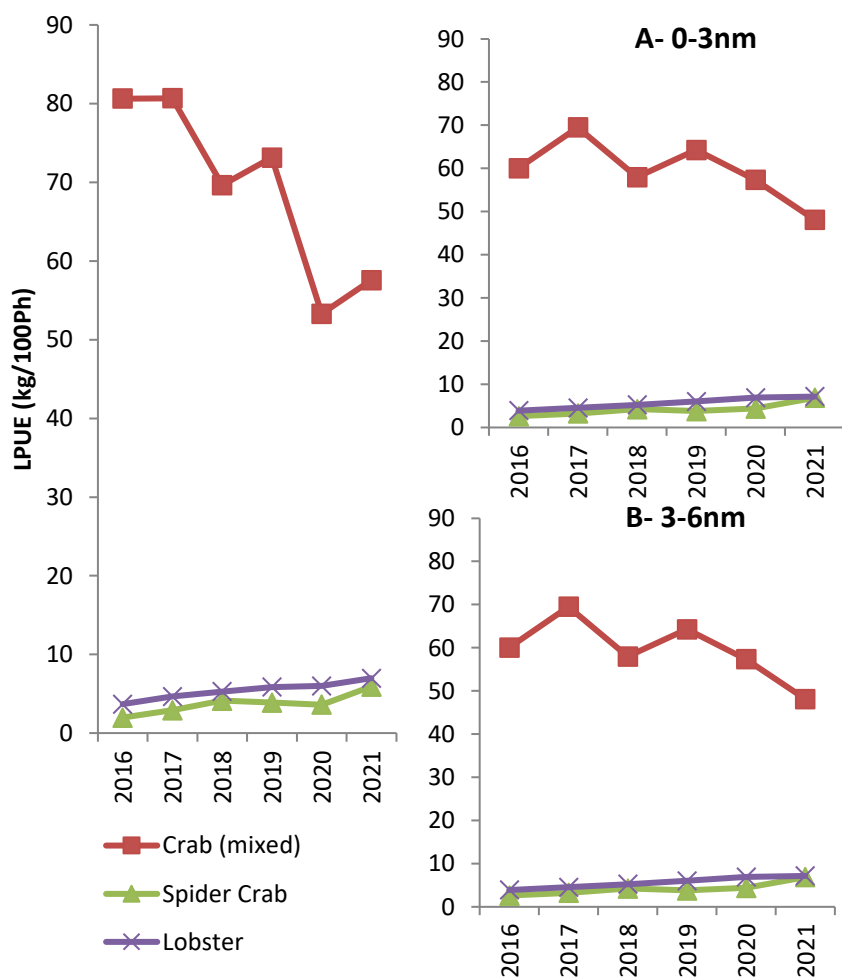
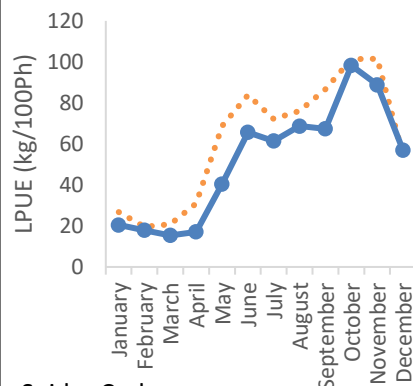


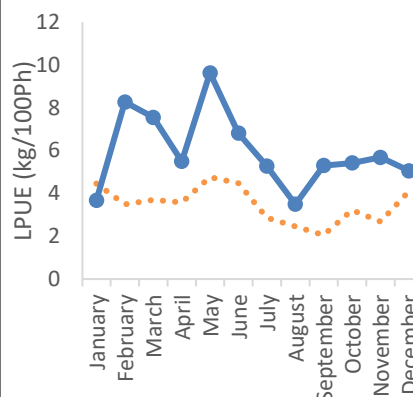
Figure SP2: (left) annual LPUE (kg/100Ph) of edible crab, spider crab and lobster from 2016 to 2021 in the south coast analysis area, further split by band; inshore A (top right) and offshore B (bottom right).

## Seasonality

### Edible Crab



### Spider Crab



### Lobster

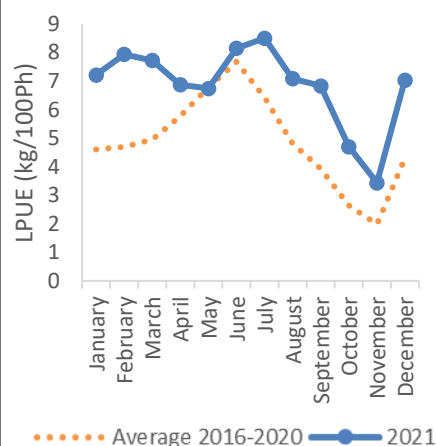
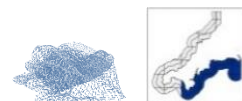


Figure SP3: monthly LPUE (kg/100Ph) in the south coast analysis area in 2021 (blue line) and the five year monthly average from 2016 to 2020 (orange dotted line) of edible crab (top), spider crab (middle) and lobster (bottom).



- Demersal netting effort fell overall in the reporting period (Fig. SN1). In 2021 monthly effort was consistently lower than the 5 year average, though followed much the same trend (Fig.SN1).
- Spider crab LPUE increased across the reporting period, other than a fall inshore in 2020, in the same year edible crab LPUE peaked inshore and offshore , though the peak was more marked offshore (Fig. SN2) .
- Crawfish LPUE increased in 2020 (Fig. SN2). In 2021 annual LPUE fell slightly from 2020, still remaining higher than previous years (Fig. SN2). Monthly LPUE was higher than the 5 year average in the main season; August to October (Fig. SN3).

#### Effort

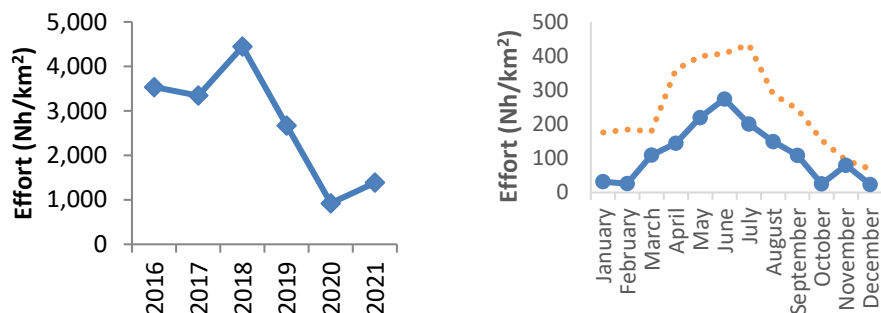
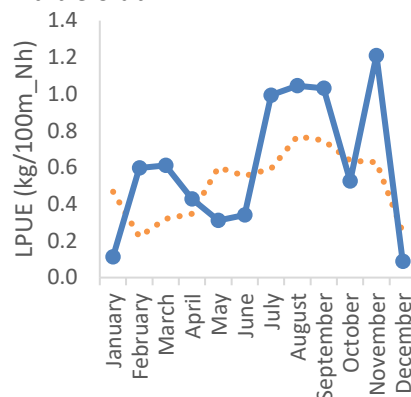


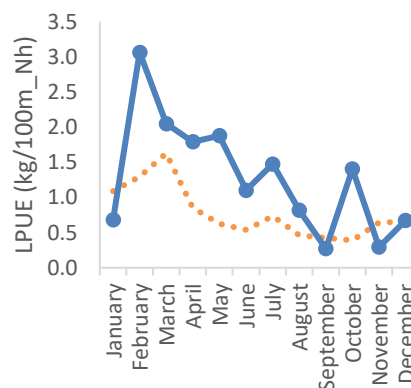
Figure SN1: (left) Annual netting effort (Nh/km²) in the south coast analysis area from 2016 to 2021, and (right) monthly netting effort (Nh/km²) in the south coast analysis area in 2021 (blue line) and 5 year average monthly potting effort from 2016 to 2020 (orange dotted line).

#### Seasonality

##### Edible Crab



##### Spider Crab



##### Crawfish

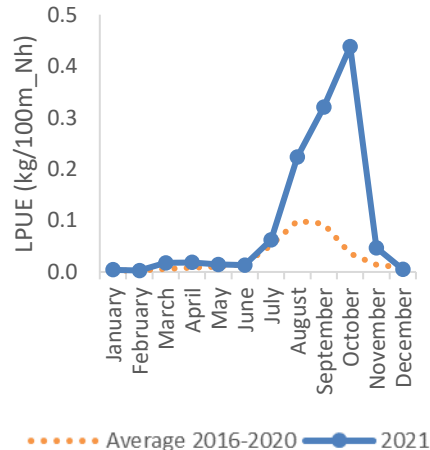


Figure SN3: monthly LPUE (kg/100Ph) in the south coast analysis area in 2021 (blue line) and the five year monthly average from 2016 to 2020 (orange dotted line) of edible crab (top), spider crab (middle) and crawfish (bottom).

#### Annual LPUE

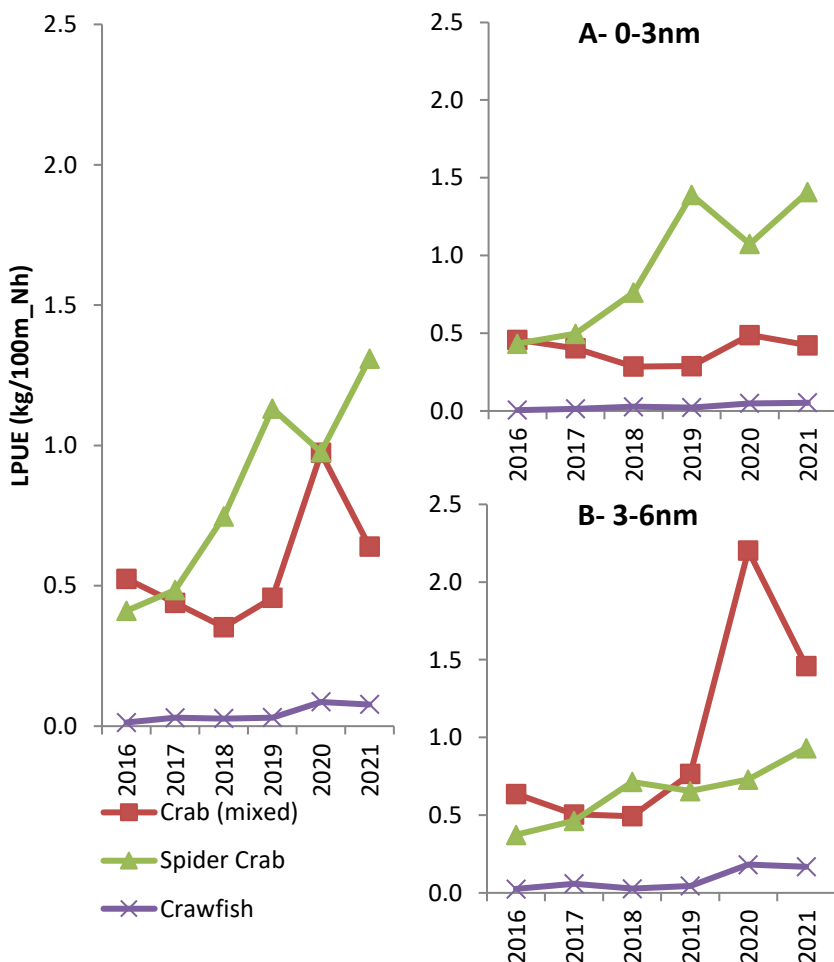


Figure SN2: (left) annual LPUE (kg/100m\_Nh) of edible crab, spider crab and crawfish from 2016 to 2021 in the south coast analysis area, further split by band; inshore A (top right) and offshore B (bottom right).

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**Cited as:**

Street, K., Sturgeon, S., Jenkin, A., Daniels, C., and Trundle, C. 2022. Cornwall IFCA Monthly Shellfish Permit Statistics Analysis, Summary Statistics 2021. Cornwall Inshore Fisheries and Conservation Authority (Cornwall IFCA), Hayle.