An economic analysis of the Irish small-scale fleet

BIM
Ireland's Seafood Development Agency

Curtin, R. 2023. An economic analysis of the Irish small-scale fleet.
Economics and Strategic Services Unit, Bord Iascaigh Mhara.

Table of Contents

Table of Figures

Table of Tables

Economic analysis of the Irish small-scale fleet

Introduction

The small-scale fleet (SSF) is an integral part of the overall Irish fishing fleet representing the majority of registered vessels and over half of all employment in the sector. The fleet is distributed all around the island with vessels registered in over 400 towns and villages. There are over 300 small-scale fishing vessels registered in each of the counties Donegal, Cork and Galway, over 200 each in Kerry and Mayo with significant numbers in Wexford, Waterford, Dublin and Louth. This widespread distribution of the fleet, all around the country, gives the sector wide coverage across the provinces but a consequential lack of concentration, with its associated negative implications.

The lack of concentration manifests itself in some of the main issues facing the SSF in Ireland (and other countries). Important issues facing the fleet are a lack of representation, a lack of data on the activity of the fleet, lower levels of power in the market in terms of trade and a lack of economies of scale in the supply chain.

The representation of the sector has been improving in Ireland over time. In 2014 the Inshore forums were established, composed of six regional fora (RIFF) and one national forum (NIFF)[1]. These bodies provide a platform for dialogue composed of representatives of the fishing sector, the state and other stakeholders at the regional and national level.

In the EU all vessels under 10m in length are exempt from the legal obligation of filling in fishing logbooks and declaring their landings. Article 14 of Council Regulation (EC) No 1244 of 2009 notes that, *"For small fishing vessels of less than 10 metres' length overall an obligation to keep a fishing logbook or to complete a landing declaration would constitute a disproportionate burden in relation to their fishing capacity"*. While this exemption does lower the administrative burden for the SSF it may also lead to an underestimation of the economic significance of the sector.

Fish auctions and the sales of seafood occur in a limited number of locations around the country. To access these the SSF must deliver their landings to these locations which may be long distances from their home ports. This distance from the market puts them at a disadvantage, requiring transport and logistical costs among other costs to overcome and reducing the number of potential buyers of their seafood. This can lead to the SSF being price-takers rather than price-makers in the market.

A lack of concentration can lead to diseconomies of scale whereby the main inputs into the production process of the sector are more expensive than in alternative concentrated areas. Of particular note is the higher costs that the SSF pay for fuel compared to vessels in bigger ports. Fuel prices in bigger ports are lower due to the high volumes demanded and supplied to larger pelagic and whitefish vessels in ports such as Killybegs and Castletownbere. For the SSF sector fishers need to purchase fuel at their local petrol station at higher rates. The dispersed nature makes other inputs more expensive due to transport and logistical costs.

In 2019 the Irish inshore fisheries sector strategy 2019-2023 was published marking a major milestone of the Inshore Fisheries Forum Initiative. The stakeholder led strategy sets out the aspirations and objectives for the future of the sector and identifies clear actions to achieve these. The engagement and participation of the inshore sector was paramount from the beginning, allowing the sector to take ownership of the process and the final product. BIM is leading the implementation of the Strategy in partnership with the NIFF and the SSF. BIM is also participating in the INTERREG project Cabfishman (Conserving Atlantic Biodiversity through Innovative Fisheries co-Management), which aims to address many of the issues facing small-scale fishing fleets across the Atlantic[2].

1 https://inshoreforums.ie/. RIFF – regional inshore fisheries forum; NIFF – national inshore fisheries forum
2 For further information see https://www.cabfishman.net/

In response to requests from the Irish Islands Marine Resource Organisation (IIMRO) and following a Ministerial Request concerning the precarious economic state of the Irish small-scale fleet (SSF) given the elevated costs of fuel and bait, this analysis will assess the economic state of the sector to assess whether current fishing is at this point profitable. High fuel costs throughout 2022 have placed strong pressures on all parts of the Irish fleet, none more so than the small-scale sector. Additional pressures on the sector include the increasing price of bait which is squeezing margins to a high degree in the potting fisheries. The key costs components mentioned by stakeholders as leading to this pressure are therefore fuel and bait costs. Nevertheless, inflation is occurring across the economy and will affect most costs components in the fishing sector. In this analysis multiple data sources will be utilised to assess the economic state of the SSF to understand fishing patterns, fleet structure, landing volumes, sales values and export patterns.

Data and Methods

All available datasets that describe the Irish SSF will be assessed here to generate a detailed picture of the current, or most up-to-date, state of the fleet. The characteristics of the data analysis are listed below.

- Databases accessed
  - Landings declarations
  - Sales notes
  - Vessel register
  - IHS Markit Trade Data
  - Data Collection Framework (DCF) economic data
- Time frame: 2013-2021 (to match database temporal availability except for DCF)
- Vessel sizes: all vessels under 15m
- Length classes: VL0006; VL0610; VL1012; VL1215

Five databases are assessed, namely the landings declarations, the sales notes, the vessel register, the trade database and the DCF economic database. As the years of data within each database vary, we have selected a time frame for the analysis where data is available in all databases, which in this case is 2013-2021. Definitions of small-scale fishing vary considerably around Europe and the world therefore here a simple cut-off of all vessels of 15m or under is used to define SSF, regardless of whether the gear used is static or not. Due to the heterogenous nature of SSF in Ireland the sector was divided into length classes to ensure reasonable definition and characterisation of the varying sizes of vessels in the sector. For example, it would be inappropriate to assume a vessel of 5.5m has a similar landing profile or economic cost structure to a vessel of 14m. The length classes of vessel length (VL) 0-6m, 6-10m, 10-12m and 12-15 are used.

Similarly, variations between vessels will exist between different fisheries exploited where a potting vessel will differ to a vessel that trawls or uses gillnets. The data will be assessed to define the different fisheries exploited and to redefine suitable sub-segments along with the length classes.

Data Assessment

Landings Declarations

The landings declarations file contains a summary of the logbook data for each fishing trip on the day of landing of each vessel. It is a legal obligation for all vessels over 10m in vessel length to declare any landings over 50 KG through the logbook system[3]. As such, this source of data is limited in its coverage of the inshore fleet, particularly those vessels that are of a length under 10m. nevertheless, there is important information in this database for small-scale vessels over 10m and additionally some vessels that do declare under 10m. This source of data will be utilised to assess the general fishing patterns evident and to assess appropriate sub-segments of the SSF for economic analysis.

The segments and length classes of each vessel have been incorporated from the Irish vessel register into the landings declarations database. The main segment with declared landings, seen in figure 1, is the polyvalent general segment, with some landings by the specific segment. The main length classes of SSF are the VL1012 and the VL1215. There are marginal declared landings from the polyvalent potting segment and the two length classes below 10m.

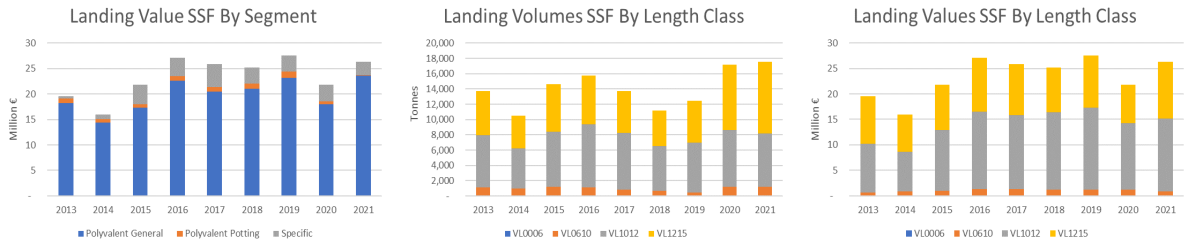


Figure 1: volume and value of declared landings by the main segments and length classes of the Irish small-scale fleet

The main gears utilised by the SSF are defined here as gears that contribute over 20% of a vessel's total annual landings. In figure 2 the main gears in terms of volume landed are from the potting and pelagic gears with much smaller volumes associated with the other gears. However, in value terms, pots are clearly the main gear followed by dredges and trawls. Around 14,000 tonnes are declared as landed annually worth ~€25m.

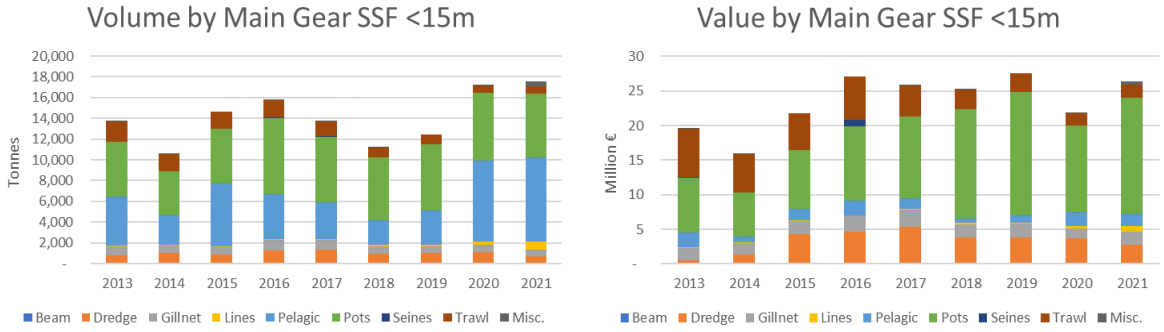


Figure 2: volume and value of declared landings by the Irish small-scale fleet, 2013-2021

In figure 3 the monthly landing volumes and value are shown over the last nine years. A similar pattern is evident across the years where volumes begin the year low and increase in the summer months before falling again in the autumn. Each year in the winter landing volumes increase sharply to their peak with these landings from pelagic gears. All gears apart from pelagic follow the same pattern, peaking in the summer months. Overall value peaks in the summer months.

3 Council Regulation (EC) No 1244 of 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy

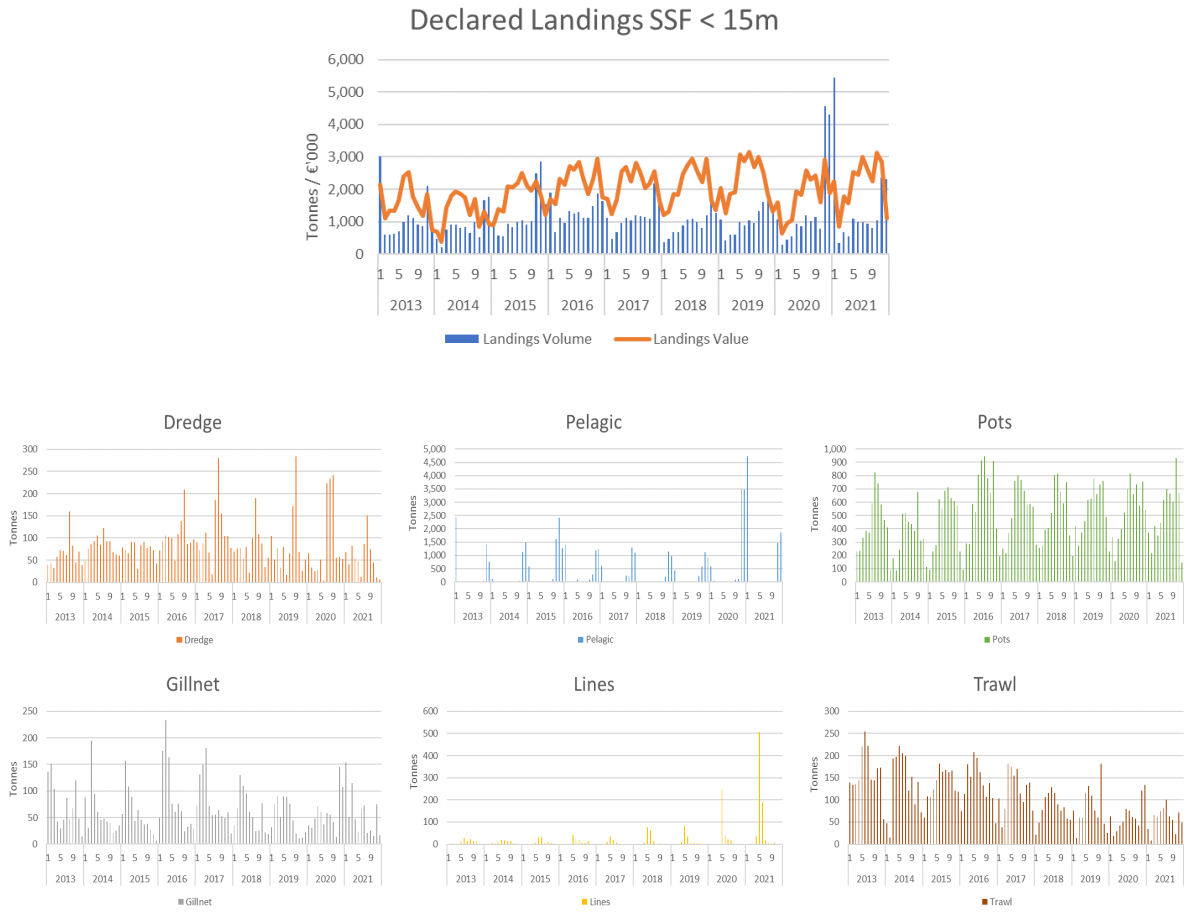


Figure 3: monthly declared landing volumes and value for whole SSF with monthly volumes by main gears

Assessing the main gears of each segment shows that the polyvalent potting segment utilise pots as the main gear while the main gear of the specific segment is the dredge (>90% of landings). Therefore, the main diversity of gears is from within the polyvalent general segment which utilises mainly pots but also gillnets, lines, pelagic and trawl gears throughout time. This is understandable given the definition of polyvalent as versatile or multi-purpose. To what extent do polyvalent general vessels use multiple main gear throughout time? In figure 4 the declared landing volume and value of the SSF is shown by the level of polyvalency within the sector. What is clear is that the vast majority of landings are by vessels that utilise only one main gear (88%).

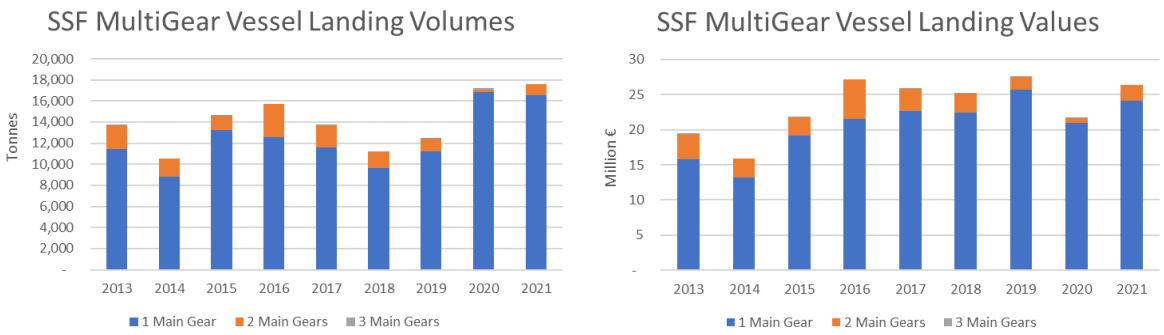


Figure 4: landing volumes and values of SSF by level of polyvalency

Vessels that utilise one main gear landing the highest volume with pelagic gears, followed by pots. The value generated by these pelagic gears falls considerably in terms of the over value while pots account for the majority. Low levels of value are generated by trawls and gillnets.

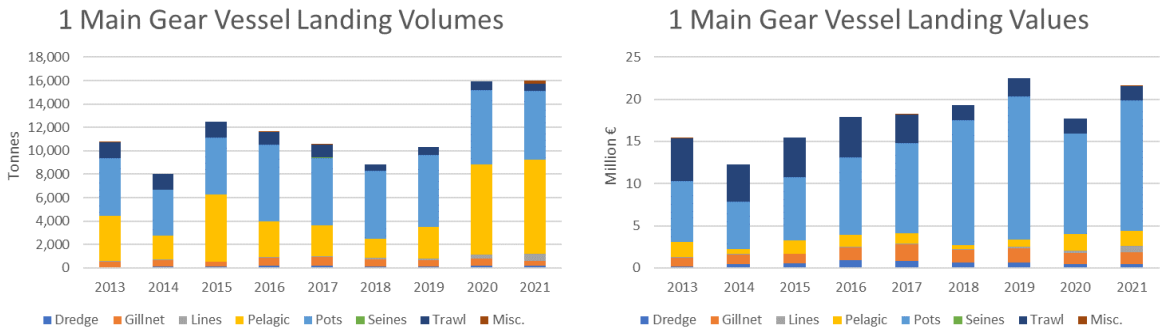


Figure 5: landing volumes and values of SSF vessels that use main one gear

Multi-gear vessels, all from the polyvalent general segment, account for 12% of the landing volume over the time series. Landings from this group are declining over time. Pots and pelagic gears account for the main volumes while pots account for most of the value (trawls previously accounted for significant values but these have declined over the last three years).

Within this small group of multi-gear vessels there exist two main groups. The first utilise pots and gillnets and the second group utilise trawls and pelagic gears. The second group have declined over the time-series while the first group has maintained a relatively consistent level of landings over the time series and now constitutes over 80% of multi-gear landings.

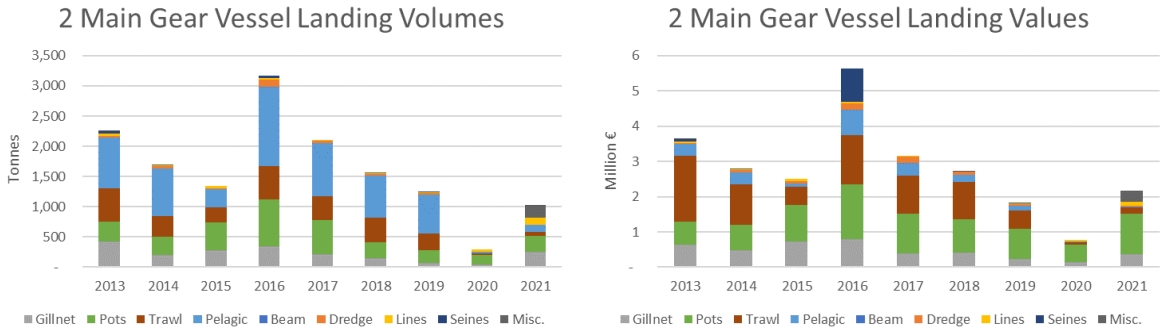


Figure 6: landing volumes and values of SSF by level of multi-gear vessel

The species composition of landings for the main gears used by each segment are shown in figure 7.

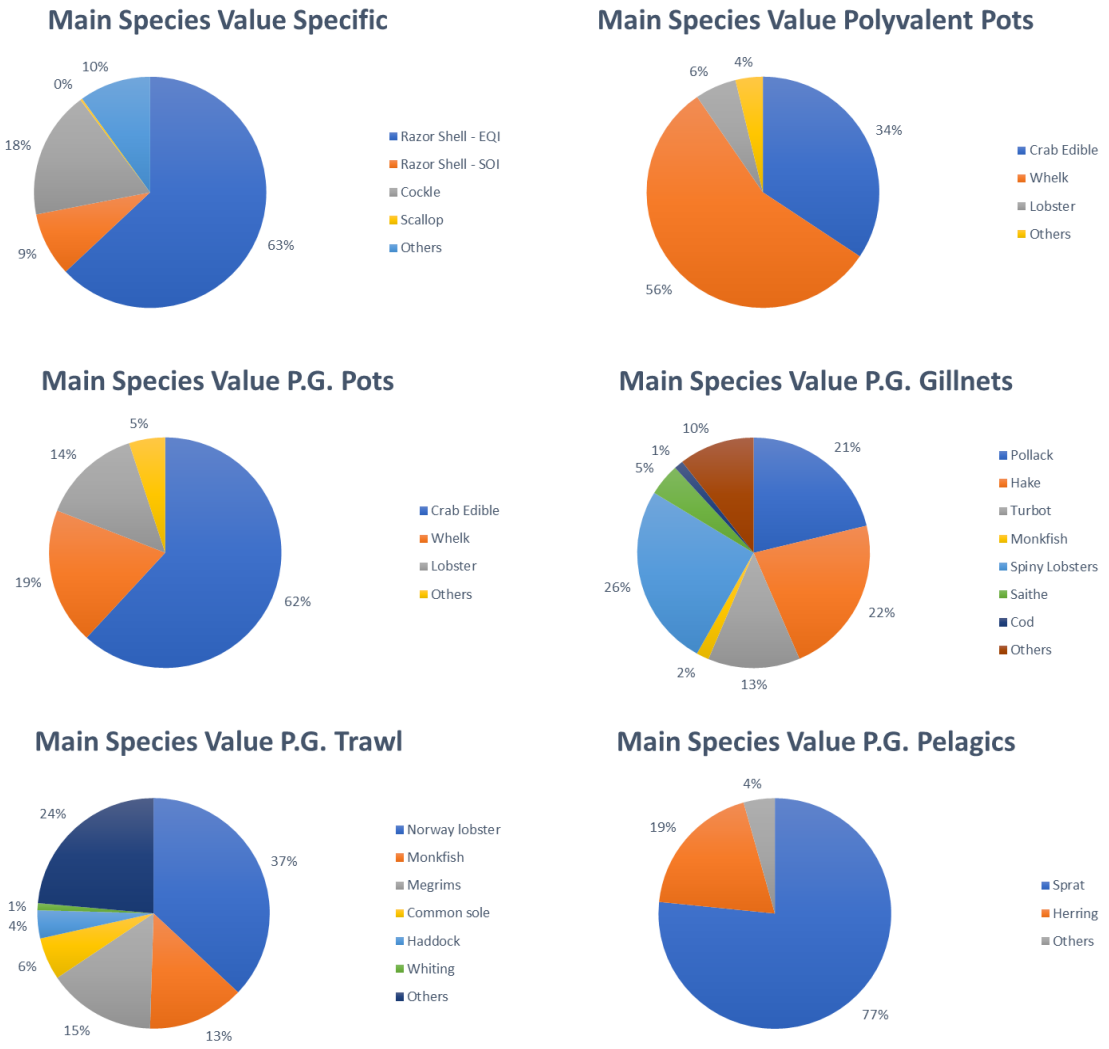


Figure 7: composition of species by value for the main segments (specific dredgers, polyvalent pots and polyvalent general (P.G.)) and gears of the Irish small-scale fleet in 2021

The specific segment generates 71% if its value in 2021 from razor clams, followed by cockle which accounts for 18% of the value. The polyvalent potting segment generates more than half its value from whelk, followed by crab (34%). For the polyvalent general segment, the four main gears of pots, gillnets, trawls and pelagics are described. The pots generate most of their revenue from crab (62%), followed by whelk (19%), and lobster (14%). The most valuable species caught by those using gillnets is spiny lobster, accounting for 26% of total revenue. Hake and pollack account for 22% and 21% of total revenue respectively while turbot accounts for 13%. The main species landed by trawl gears were Dublin Bay prawn, monkfish and megrim, accounting for 37%, 13% and 15% of total value respectively. For pelagic gears sprat is the main species exploited accounting for 77% of total value followed by herring (19%). Additionally, the species caught the segment using lines as their main gear are mainly mackerel (86%) followed by crab and pollack. Landings of mackerel using lines has increased significantly in 2020 and 2021, increasing from a long-term average of 100 tonnes per annum to over 300 T in 2020 and over 700 T in 2021.

Examining individual vessel data, it can be seen that the average vessel landing value for the main gears of the SSF lie mainly between €60,000 - €120,000. Average specific and polyvalent dredge vessel value has declined form ~€100,000 to ~€70,000 in most recent years while gillnet, trawl and pelagic vessels earn ~ €100,000. Lines typically earned €20,000 but this has tripled in the latest year. Pots earn the highest value at above €140,000 per annum on average. Multi-gear vessels typically earned ~€150,000 but this has trended downwards with pots and gillnetters earning €120,000 in 2021.

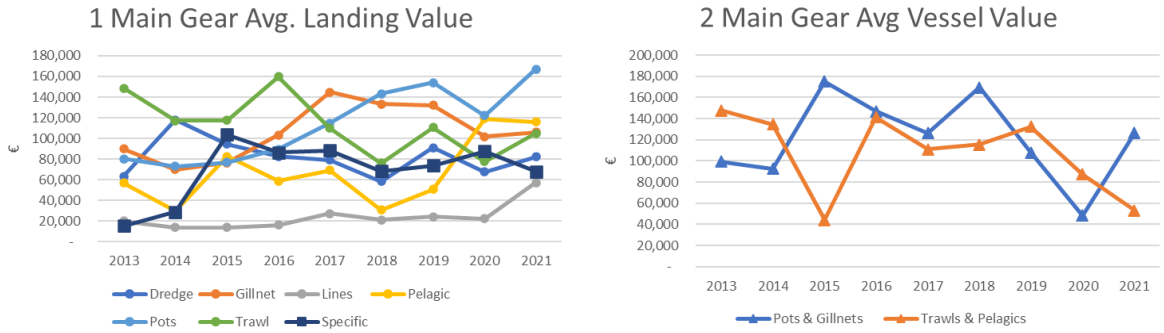


Figure 8: average landing value per vessel for the SSF polyvalent and specific main gears

It is important to note the quantity and the composition of these vessels when assessing these results. Most of these vessels are over 10m with a significant proportion over 12m. In total, 214 SSF vessels (under 15m in vessel length) declared landings in 2021, half of which mainly use pots (102), 35 vessels are in the specific segment using dredges, 19 used trawls, 17 used gillnets, 17 used pelagic gears and 16 used lines as their main gear.

Landings Declarations Summary

To conclude this section, it is evident that there are several distinct segments of the SSF in terms of fishing patterns and target species. Of the three segments of specific, polyvalent pots and polyvalent general, the specific segment is clearly distinct from the other two. The other two are broadly similar in so far as the polyvalent general vessels using pots target the same species as the polyvalent potting vessels, just in different proportions. Most vessels use one main gear with a small minority using 2 main gears (~12%). Therefore, there are a number of sub-segments such as pots, gillnets, trawls, pelagics, lines and also multi-gear vessels using pots and gillnets. Preliminary segments are as follows with vessel numbers in brackets;

- Specific
  - Dredge [35]
- Polyvalent general and potting
  - Pots [93]
  - Gillnets [13]
  - Trawls [16]
  - Pelagics [15]
  - Lines [13]
  - Pots and gillnets [12]

For the latest year of data, the average vessel value within these segments range between €60,000 - €160,000 however it is very important to note that the sample used here is for vessels over 10m with significant landings from vessels between 12 and 15m. Therefore, this is not representative of vessels under 10m which is what forms the vast majority of vessels in the SSF. To generate more information on this category of vessel, analysis of the sales notes database is required.

Sales Notes

The sales notes database is composed of data from sales notes which are filled in by the buyers of fish. Data in the sales notes include the vessel which sold the fish, the place of sale and more detailed data on the quality and format of the fish. Variables that are of interest in this database that is not included in the landings database are the size grades, level of freshness and importantly the price paid. The sales notes database is the primary database that informs the value of seafood landed and sold in Ireland whereas the landings declarations database is the primary database detailing the volume of seafood landed in Ireland.

The sales notes database contains more information on the activity of the SSF because it is a legal obligation to fill in sales notes on the part of the buyers of fish, regardless of the type of vessel that the fish is bought from. Therefore, sales from SSF vessels are included in this database which provides insight into the activity of the sector.

Given the lack of information on the main gears used by the vessels that sell fish within this database, vessel segments and length classes will be assessed here. To begin, the activity of the polyvalent potting segment is described in figure 9. The segment has a sales volume of between 1,000 - 1,500 tonnes per annum, worth ~ €4m. the main length class that contributes to these sales is the 6-10m with minor volumes sold by the 0-6m and 10-12m classes. However, the value of the 0-6m class does reach ~ €1m. In total there are around 150 vessels of this segment selling seafood split evenly between the 0-6m and 6-10m length classes with very few vessels over 10m. The average sales value per vessel of the 0-6m class oscillates around €10,000 per annum while for the 6-10m class ranges between €20,000 - €40,000.

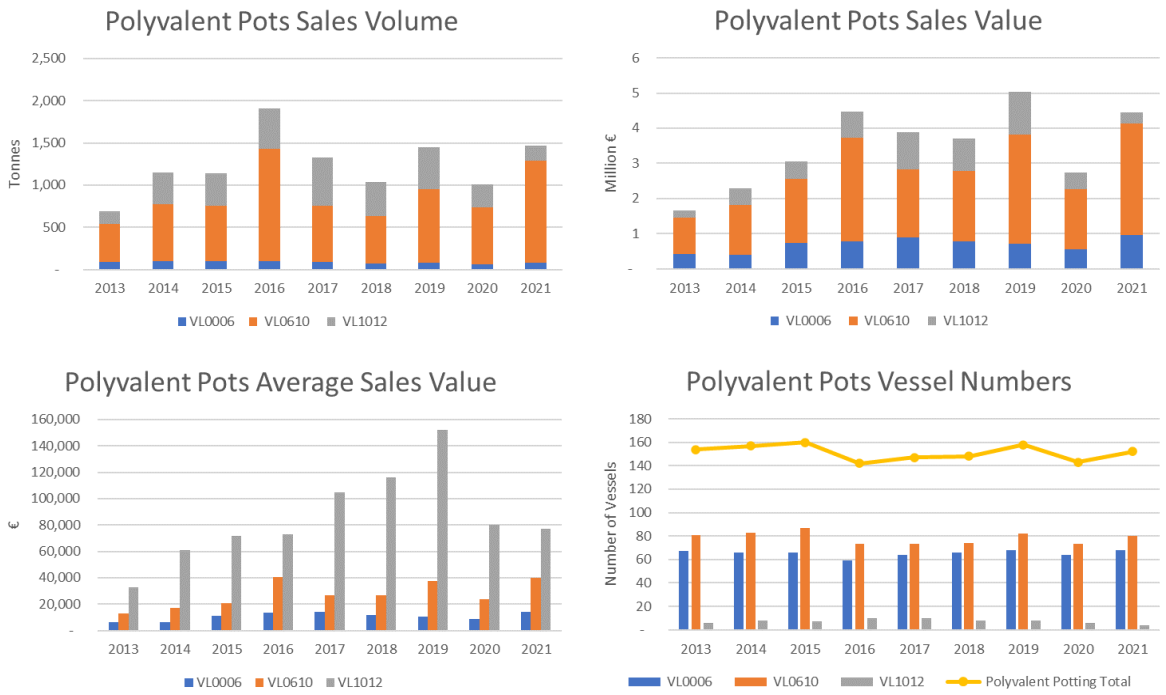


Figure 9: total volume and value of sales, average vessel sales value and vessel numbers for the polyvalent potting segment by length class of the SSF

The species composition of the length classes of the polyvalent potting segment are shown in figure 10. The length classes are seen in each column with volume on the top row and value in the bottom row. Around 80 tonnes of seafood are sold by the length class 0-6m to the value of €800,000 per annum. Around 10 species are sold with Shrimp Palaemonid nei (PAL) and European lobster (LBE) the main species by volume and value. For the vessel between 6-10m whelk (WHE) and crab (CRE) account for the majority of sales volume with them, lobster and shrimp accounting for most of the value. For the potters over 10m whelk and crab are the main species sold.

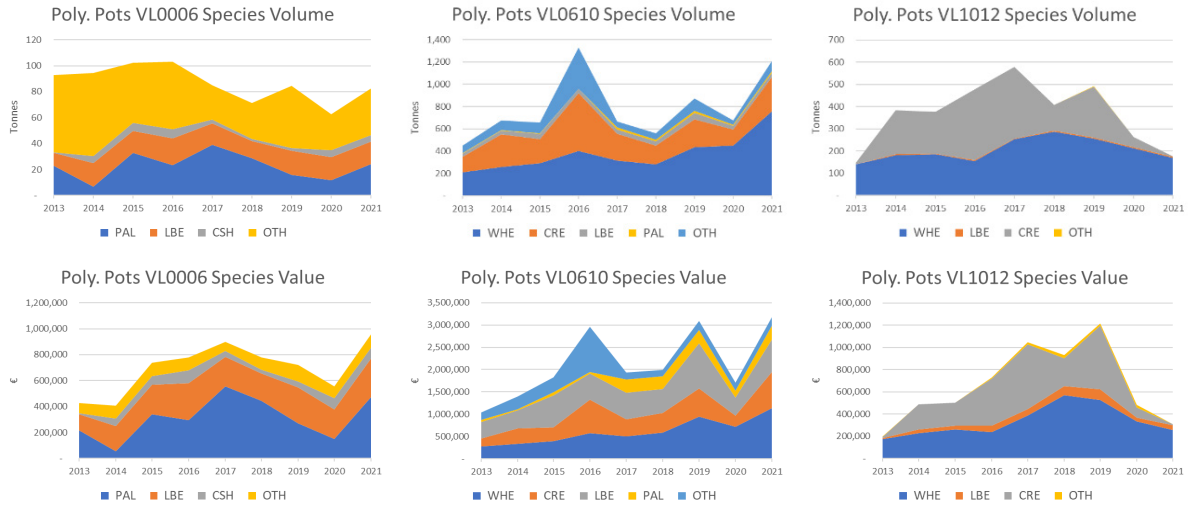


Figure 10: species composition of sales of polyvalent potting length classes in volume (top row) and value (bottom row)

Sales from the specific segment are mainly from vessels from 6-10m and 10-12m. around 600 tonnes are sold annually worth around €3m. average sales value per vessel has been declining since 2015 for all length classes with the 6-10m earning around €40,000, the 10-12m earning ~ €60,000 while the 12-15m class earns under €40,000 in the latest years. There have typically been 30 vessels in both the 6-10m and 10-12m classes with the numbers declining in the 6-10m class, while around 5 vessels remain in the 12-15m class.

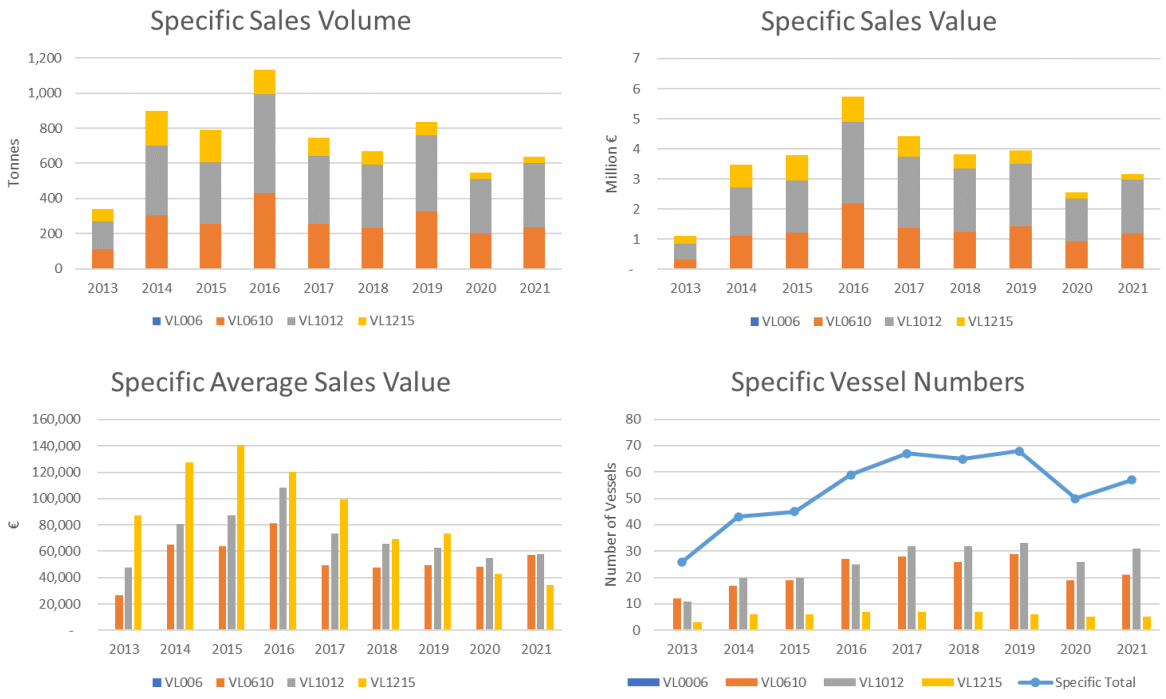


Figure 11: total volume and value of sales, average vessel sales value and vessel numbers for the polyvalent potting segment by length class of the SSF

The main species sold by the specific segment are razor clams (Razor Shells, knife clams nei (SOI) and Razor Sword Shell (EQI)), almost exclusively across the three length classes of 6-10m, 10-12m and 12-15m.

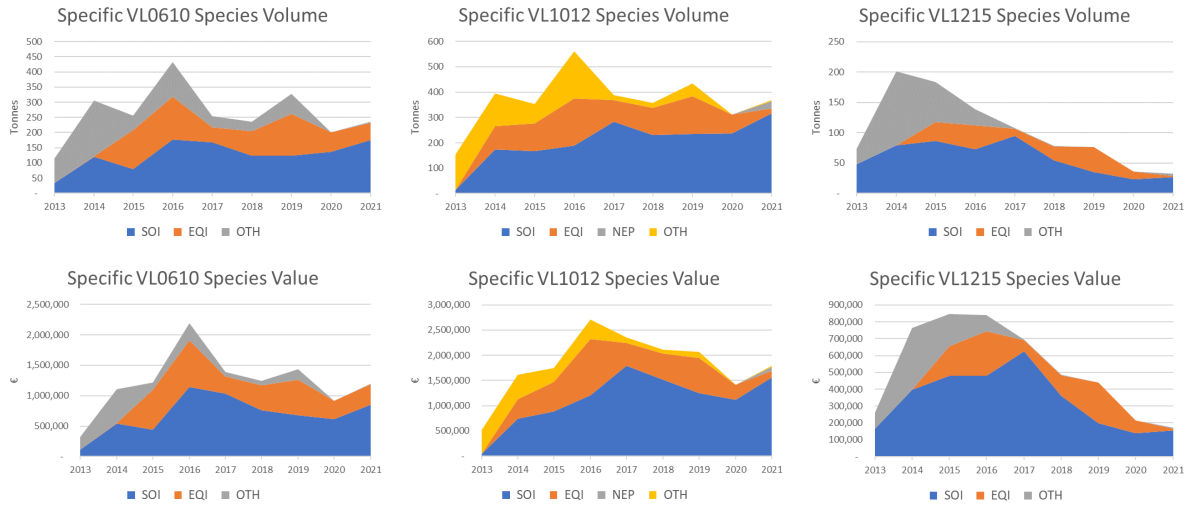


Figure 12: species composition of sales of specific segment length classes in volume and value

In figure 13 the activity of the polyvalent general segment of the SSF is shown. Between 15-20,000 tonnes are sold each year worth €35m. The under 10m length classes are responsible for over half of this activity, mainly the vessels between 6-10m. The average sales value per vessel starts at around €10,000 for vessels below 6m, rising to around €40,000 for those between 6-10m, €100,000 for the 10-12m class and finally ~€150,000 for the 12-15m vessels. In total around 700 polyvalent general vessels of the SSF are recorded as selling seafood, over half of which are from the 6-10m length class. Nearly 200 vessels under 6m sell seafood, 100 vessels note sales within the 10-12m length class while ~50 vessels between 12-15m note sales.

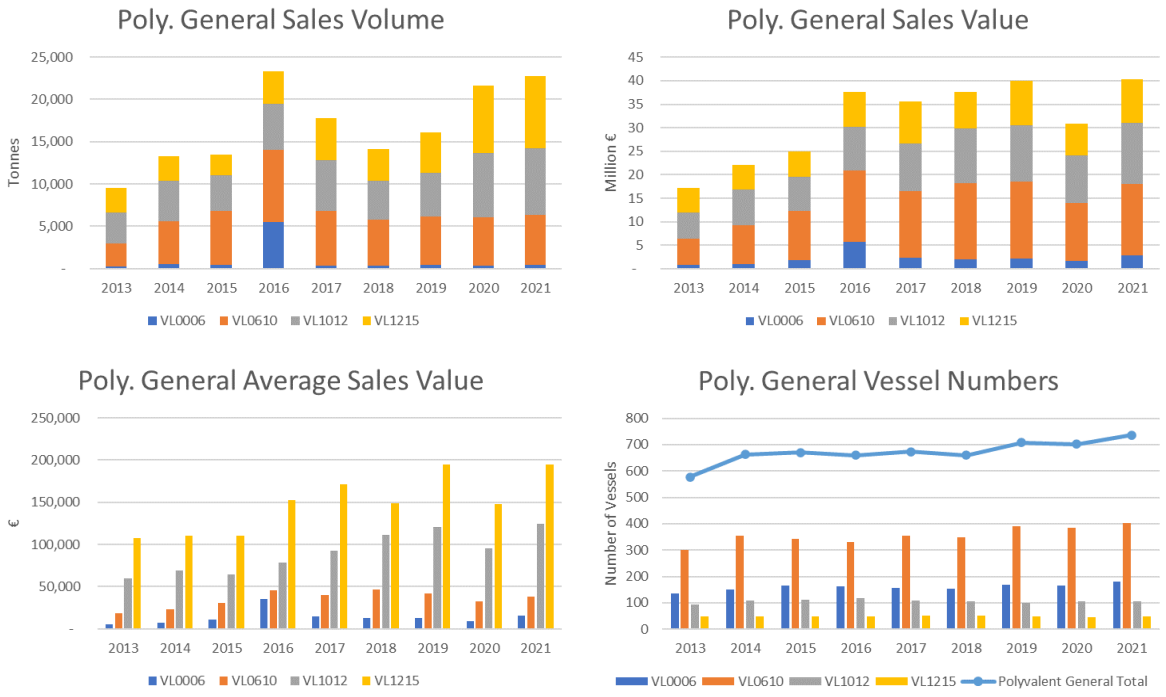


Figure 13: total volume and value of sales, average vessel sales value and vessel numbers for the polyvalent general segment by length class of the SSF

The composition of sales from this segment is shown in figures 14 and 15 for volume and value respectively. For the 0-6m class over 100 species are sold with the main species being shrimp (PAL & CSH), lobster (LBE), velvet crab (LIO) and brown crab (CRE). The 6-10m class sell over 150 different species however crab and whelk form over half of the total volume. The 10-12m class also sell 150 species with the main volumes from crab and whelk. The

12-15m class sell well over one hundred species with the highest volume accounted for by sprat with important volumes of crab also sold.

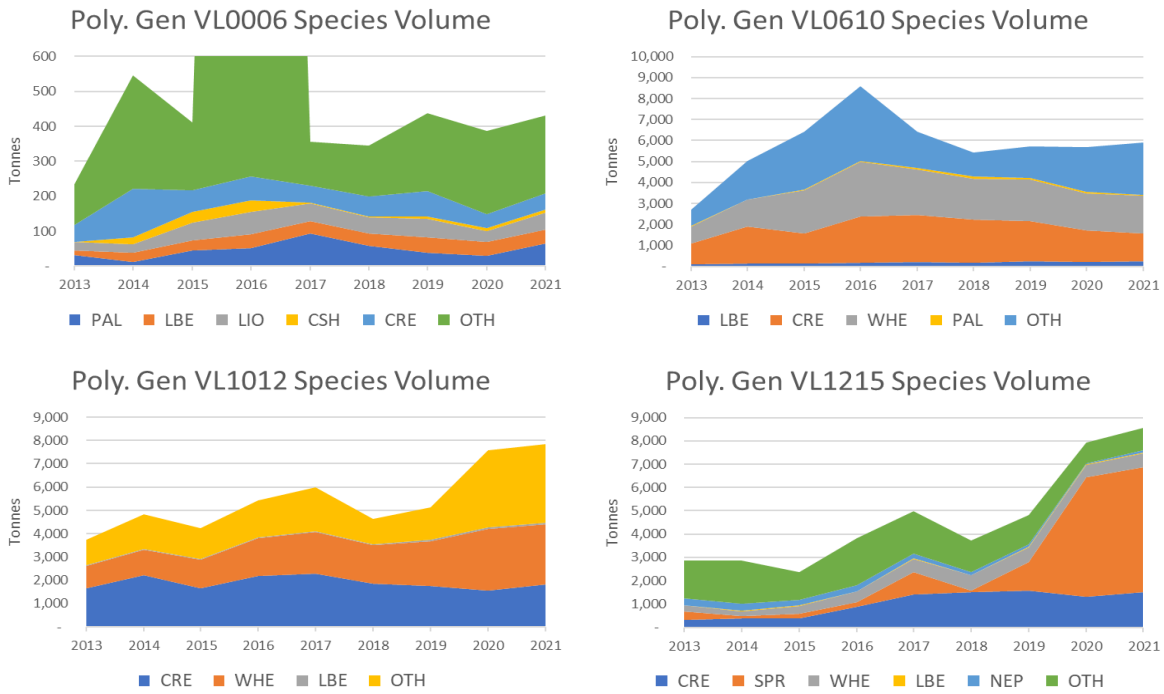


Figure 14: species composition of sales of polyvalent general segment length classes in volume

In terms of the value of sales, shrimp and lobster account for most of the value generated by the smallest length class, 0-6m. for the 6-10m class lobster is the most valuable species with crab, whelk and shrimp other valuable species. Crab and whelk are the most valuable species for the 10-12m class while crab accounts for around half of the value of the 12-15m sales value.

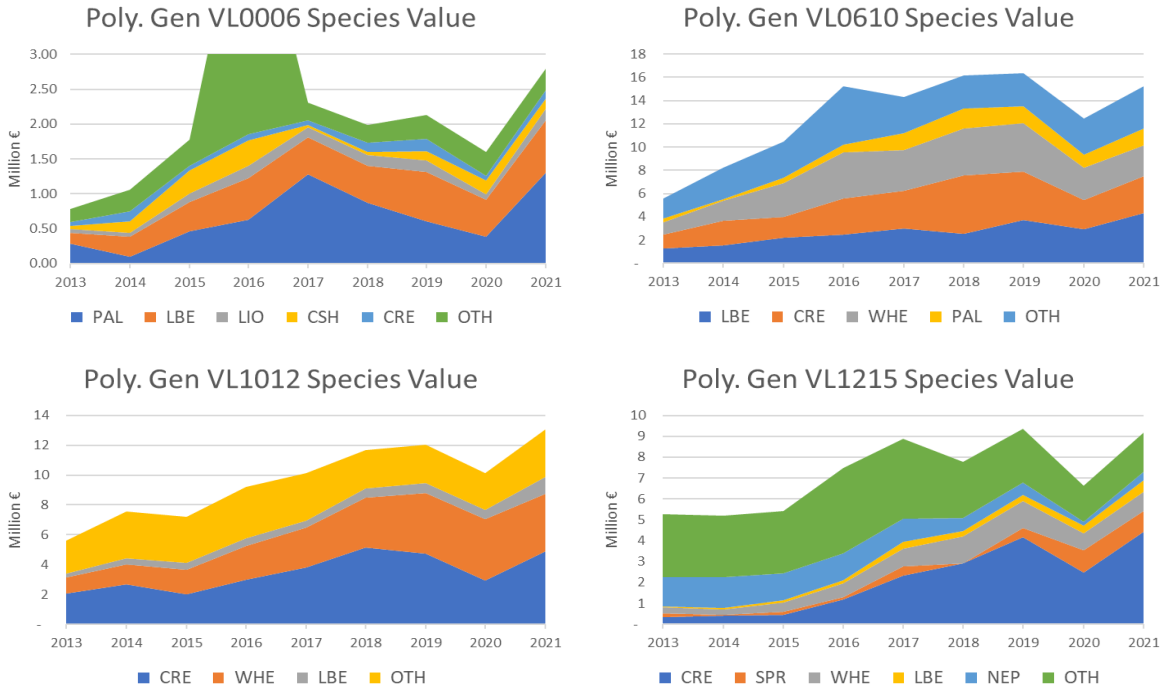


Figure 15: species composition of sales of polyvalent general segment length classes in value

Overall, the SSF sells around 25,000 tonnes of seafood as recorded in the sales note database, worth around €50m. Two hundred vessels under 6m were recorded with an average sale value of €15,000-€20,000. Over 500 vessels between 6-10m were recorded averaging €40,000 per vessel. Over 100 vessels between 10-12m were recorded averaging €100,000. The 50 vessels above 12m average €160,000 in sales value per annum.

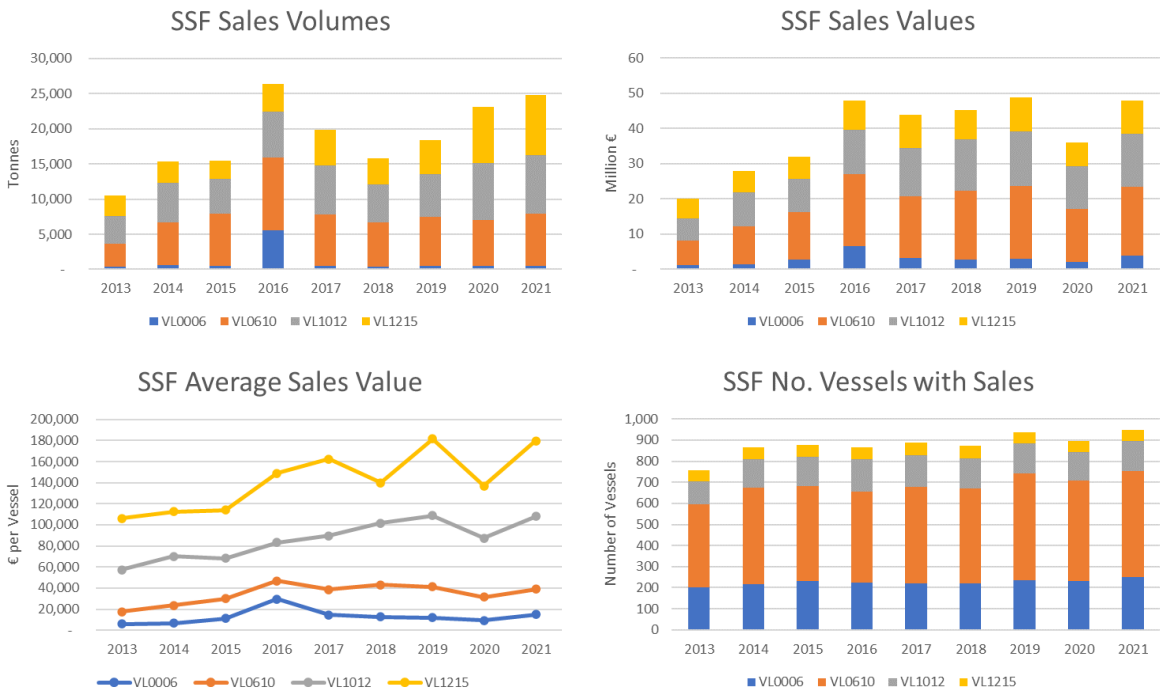


Figure 16: total volume and value of sales, average vessel sales value and vessel numbers by length class of the SSF

Price Analysis

In this section the average prices for the main species sold by each segment will be described. The polyvalent potting segment mainly target shrimps, crabs, lobsters and whelks, across the vessel lengths. Figure 17 shows the average prices for the main species sold by the main length classes of the polyvalent potting segment from 2013 to 2021. The most valuable species sold by the potters under 6m are Shrimp Palaemonid nei (PAL), European lobster (LBE) and common shrimp (CSH). The average prices for all three of these species have increased for this segment over time. Shrimp Palaemonid nei has increased from €10/KG in 2013 to €20/KG in 2021. Lobster has increased from €12/KG to €16/KG in 2021. In 2020, a clear impact is seen in prices due to the Covid-19 pandemic after which a recovery is seen in 2021.

For polyvalent potters between 6 and 10m the main species sold were whelk (WHE), edible crab (CRE), European lobster (LBE) and Shrimp Palaemonid nei (PAL). Whelk is the most valuable species sold by this length class and its price has fluctuated relatively little over the time series. In 2013 the average price was €1.36/KG, rising to €2.17/KG in 2019 but falling to €1.50/KG in 2021 following the pandemic. Crab prices have risen from €1.22/KG in 2013 to €2.69/KG in 2021, an increase of over 100% in less than 10 years. Lobster prices have increased from €13.00/KG in 2013 to €18.00/KG in 2021. Shrimp prices have increased from €12.00/KG in 2013 to over €21.00/KG in 2021.

The larger potters from 10-12m saw price for whelk increasing from €1.25/KG in 2013 to €€1.560/KG in 2021. Lobster prices have remained stable over time between €15-16/KG while crab prices have increased from €1.41/KG to €2.65/KG over the time series.

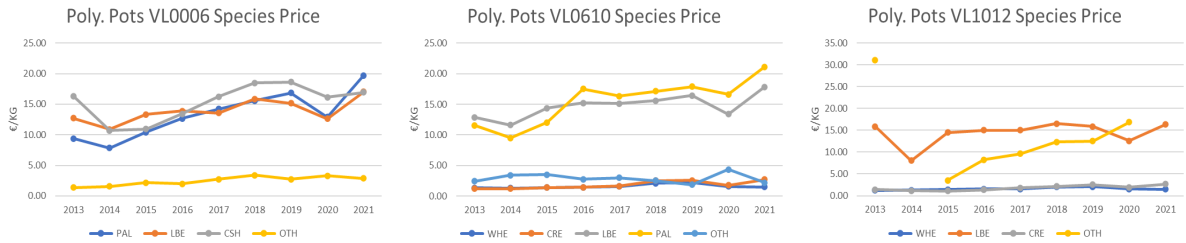


Figure 17: average prices of the main species sold by polyvalent potting segment vessel length classes, 2013-2021

In figure 18 the average prices for the main length classes of the polyvalent general segment are described. Polyvalent general vessels under 6m most valuable species are Shrimp Palaemonid nei (PAL), European lobster (LBE), velvet crab (LIO), common shrimp (CSH) and edible crab (CRE). Shrimp Palaemonid prices have increased from €10.00/KG to €20/KG since 2013. Lobster prices have increased from €13.00/KG to €19.00/KG, velvet crab from €2.20/KG to €3.41/KG, common shrimp has stayed at €20/KG with a significant drop between 2014-2017, while crab has risen from €1.13 to €2.52/KG.

The length class from 6-10m saw prices for lobster increase from €13.00 to €18.00/Kg, crab prices increased from €1.19 to €2.39/KG, whelk prices from €1.33 to €1.49/KG and Shrimp Palaemonid prices increased from €9.20 to €20.70/KG.

The length class from 10-12m mainly sell crab, whelk and lobster. Crab prices have risen from €1.23 in 2013 to €2.69/KG in 2021. Whelk prices increased from €1.15 in 2013 to €1.50/KG. lobster prices have increased form €12.59/KG to €17.00/KG.

The main species that the length class from 12-15m sells are edible crab, sprat, whelk, lobster and nephrops. The price of crab has increased from €1.12 in 2013 to €2.93/KG in 2021. Sprat prices decreased from €0.45/KG in 2013 to €0.19/KG in 2021. Whelk prices increased moderately, from €1.8/KG in 2013 to €1.54/KG in 2021. Lobster prices increased from €13.65 to €18.76/KG over the time series. Nephrops prices increased slightly from €4.44/KG in 2013 to €4.58/KG in 2021.

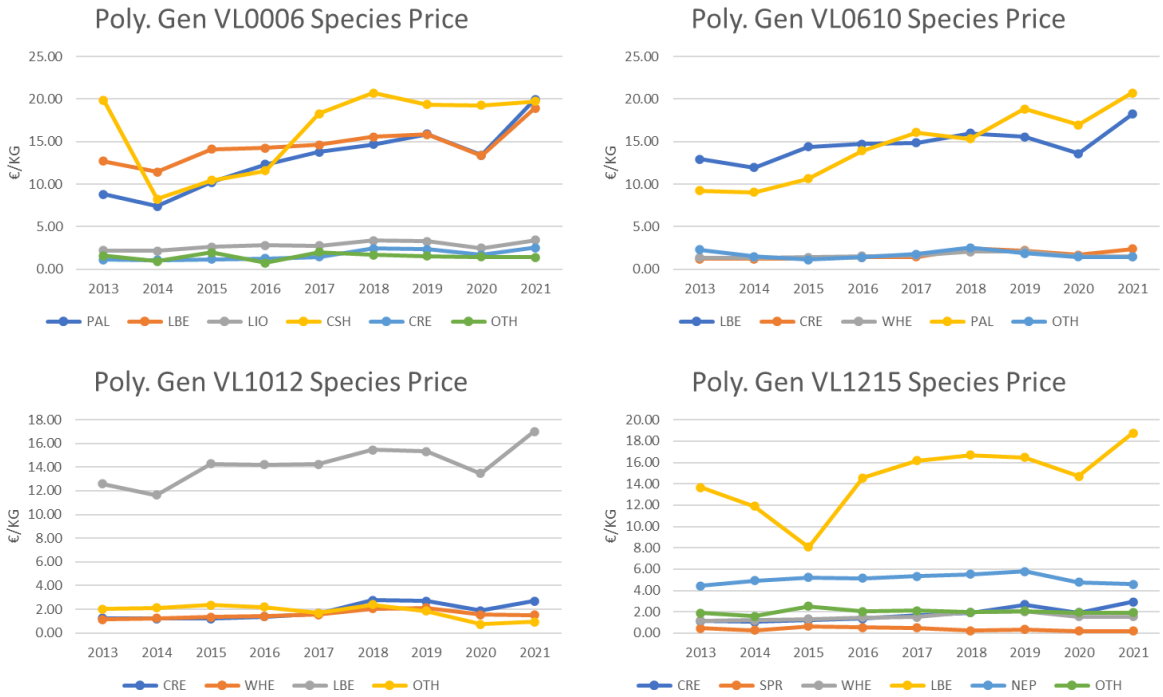


Figure 18: average prices of the main species sold by polyvalent general segment vessel length classes, 2013-2021

In the specific segment razor clams are by far the main species sold with very small levels of other species. Two razor clam species are identified, Razor Shells, knife clams nei (SOI) and Razor Sword Shell (EQI). A similar pattern is seen for each length class of the specific segment where prices increase from 2013 and reach a peak from 2016-2018 before declining in 2019. Prices have remained at a similar level since then.

The length class of 6-10m sees razor calm prices of €3.51/KG in 2013 rising to €6.46/KG in 2016, falling back to €4.90/KG in 2021. For the length class of 10-12m razor prices start off at €3.49/KG in 2013, rising to €6.54 in 2018 before falling back to €4.71/KG.

The length class of 12-15m sees razor prices of €3.44, rising to €6.62 in 2018 and falling back slightly to €5.76/KG in 2021.

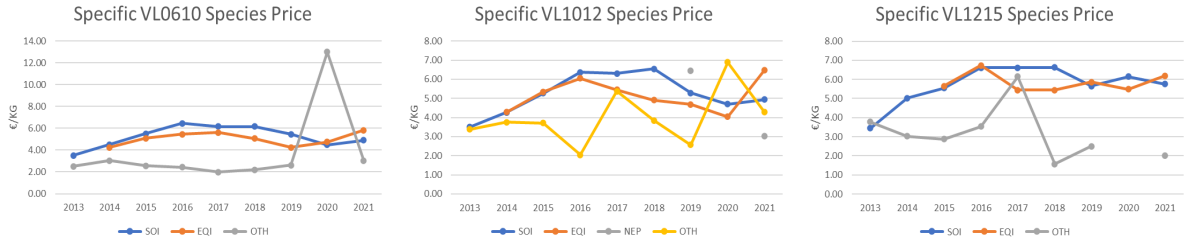


Figure 19: average prices of the main species sold by specific segment vessel length classes, 2013-2021

In general, prices for the main species targeted by the SSF have been increasing over the time series. Prices dipped in 2020 during the pandemic lockdowns but seem to have recovered in 2021. The specific segment is the exception with barriers to trade imposed by China in 20-19 leading to price reductions before the global pandemic. Monthly average prices, from 2013 to 2021, for key species of the Irish SSF are described in Appendix A.

Sales Notes Summary

The sales notes database provides valuable information on SSF under 10m in length. The information gleaned from the database matches up well with the landings database for vessels over 10m where average vessel landing values were found to range between €60,000 - €160,000, similar to what is found in the sales notes. Detailed information on vessels below 10m is shown here where average vessel values for 6-10m class is €40,000 while for vessels under 6m the average sales were ~€15,000. Whereas the landings showed data on 214 SSF vessels, data on 900 SSF vessels is described in the sales notes.

In terms of the vessel sub-segments there is no information on gear used by the vessel so the final output must be used to allocate segmentation. The main groups of species sold by SSF vessels are shellfish, pelagics and demersals. Of those vessels mainly selling shellfish, those with razor clams can be classified as specific dredgers while the rest of the vessels can be classified as from potting vessels. The vessels selling mainly pelagic species are selling mainly mackerel, sprat and herring so these vessels can be classified as polyvalent pelagics. Those mainly selling demersal species sell a more diverse mix of species with nephrops and pollack the top two. The sales from this group are declining over the years which is the same pattern as the landings therefore these vessels can be classified as gillnetters.

Segments can be narrowed down to those in the following table 1.

Table 1: final proposed subsegments of the Irish SSF in 2021

Subsegments	Number of vessels	Length Class 1	Length Class 2	Length Class 3
Polyvalent pots	814	VL0006	VL0610	VL1012
Polyvalent pelagics	68	VL0610	VL1012	VL1215
Polyvalent gillnetters	67	VL0610	VL1012	VL1215
Specific dredgers	57	VL0610	VL1012	VL1215

Vessel Register

In the Irish vessel register around 2,000 vessels are registered as sea-fishing vessels. Over 1,700 of these vessels are under 15m, 85% of the total number. In gross tonnage terms, the total fleet is ~65,000 GTs with engine power of 190,000 kW. The SSF accounts for ~7,600 GTs (12% of the total fleet) and ~ 60,000 kWs (32% of the total fleet).

In terms of length classes there are under 600 vessels registered under 6m, over 800 vessels between 6-10m, over 200 vessels form 10-12m and nearly 70 vessels form 12-15m. Polyvalent general vessels are the biggest segment with over 1,200 vessels (down 90 since 2013), there are 330 vessels registered as polyvalent potting in 2021 (down 130 since 2013) while there are around 140 vessels registered as specific (relatively stable over time series).

Examining the capacity of the various segments and length classes shows that the engine power of the polyvalent potting segments is higher than the polyvalent general segment across the length classes. For the length class under 6m the polyvalent potting engine power per vessel averages 11.15 kW, for the polyvalent general this is 7.75 (only two vessels are registered as specific under 6m). For the 6-10m length class the polyvalent potters average 37kW, the polyvalent general average 31 kW and the specific average 53 kW. For the 10-12m class, the polyvalent potters average 113 kW, the polyvalent general and the specific segments average 73 kW and 85 kW respectively.

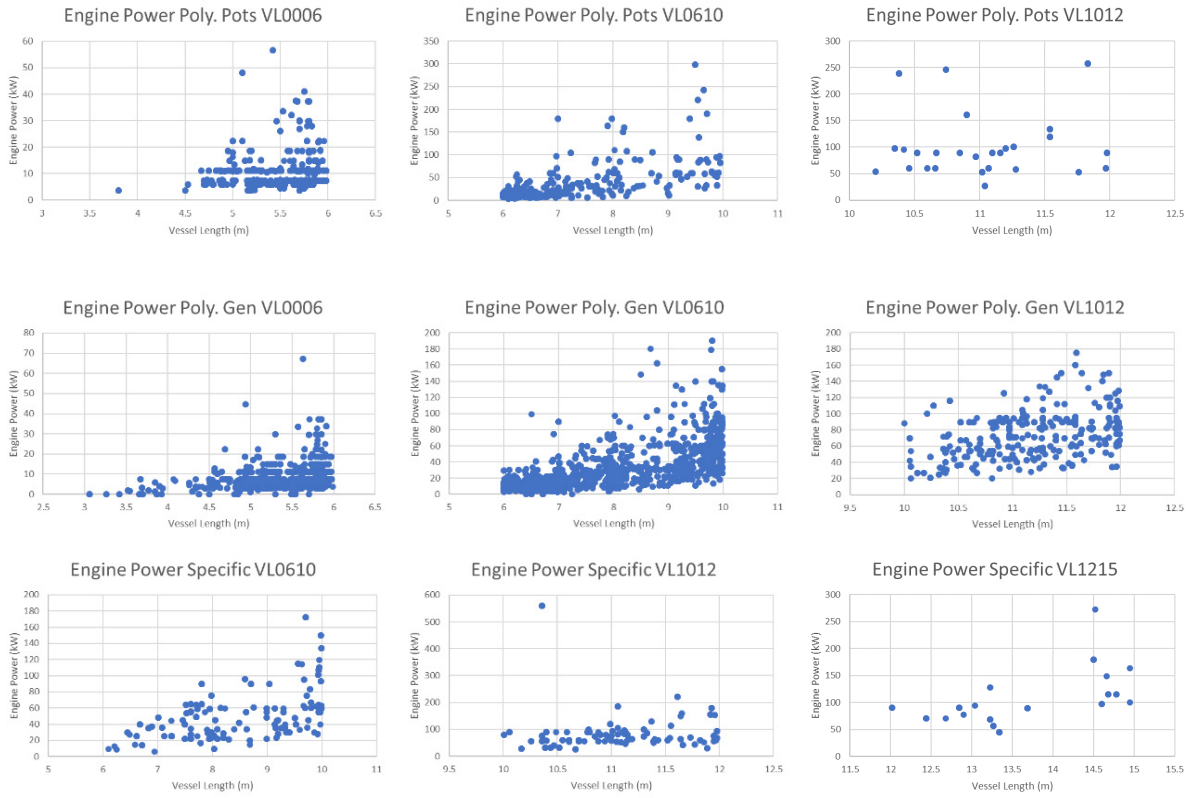


Figure 20: capacity indicators for SSF segment length classes contrasting engine power with vessel length

Comparing vessel data that appears in the landings declarations and the sales notes database with the total registered vessels in the vessel register allows assessment of the apparent activity of the fleet. Previously it was mentioned that 214 vessels of the SSF appeared in the landings declaration database. In the sales notes data on 900 vessels was recorded. In figure 21 the rate of apparent activity is described for the main SSF segment and length classes in terms of vessel numbers and engine power.

The polyvalent potting segment has the lowest activity levels of the three SSF segments with the smallest length class having the lowest activity within the segment. The under 6m class activity has risen 10% over time, from 30% to 40% in 2021 while the 6-10m class has also risen 10% from 40% to 55% in 2021. Activity is higher for the polyvalent general segment, except for the under 6m class which shows the exact same pattern as the potting

rising from 30% to 40% over the timer series. The 6-10m class has ~65% activity, the 10-12m 70% and the 12-15m over 80% activity. Activity in the specific segment increased across length until 2019 when it fell back again. The 6-10m class show 30% activity, the 10-12m class 50% and the 12-15 class 60% in terms of number of vessels active.

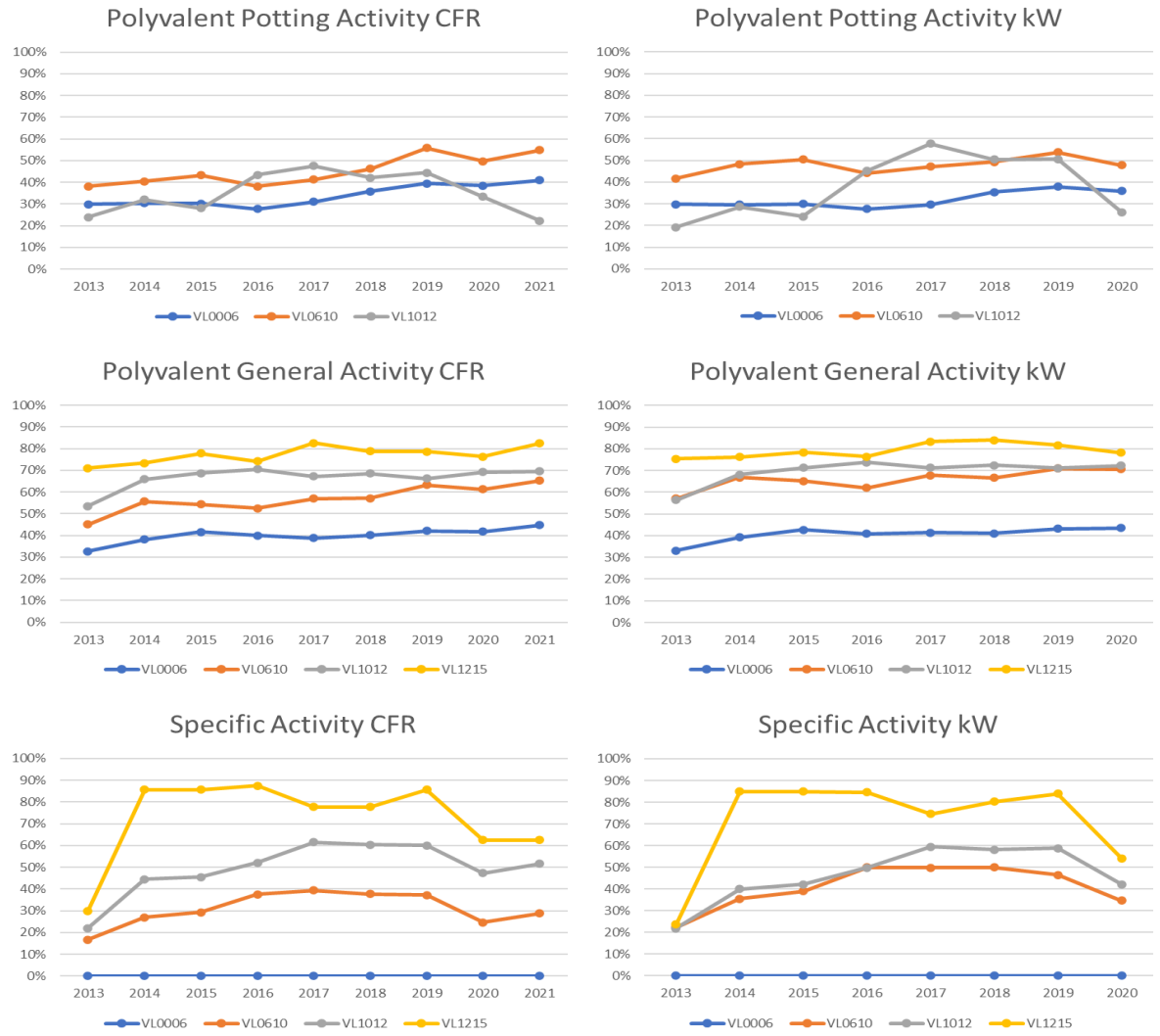


Figure 21: apparent activity levels of SSF fleet segments in vessel numbers (LHS) and engine power (RHS)

Vessel Register Summary

Assessment of the vessel register shows that the SSF accounts for 85% of the number of vessels but one third of the engine power and only 12% of the gross tonnage of the entire fleet. The engine power of the polyvalent potting segment is generally higher than the polyvalent general across the length classes with the specific segment having the highest engine power, unsurprisingly, given their use of hydraulic dredges. Activity within the potting segment is the lowest with only the 6-10m length class surpassing 50% activity. There is a higher level of activity from the polyvalent general segment with all length classes above 6m above 65%. All length classes have increased activity since 2013, with the under 6m at 43% in 2021 with the 6-10m class at 60%, the 10-12m class at 61% and finally the 12-15m class dropping to 52%.

Given that apparent activity rates have been increasing over time without any increases in capacity, and that current activity rates are still quite low, particularly for some length classes, suggests that historically activity has been under-estimated, and this may still be the case for the smaller length classes.

IHS Markit Trade Data

Trade data is looked at here to assess if there are any species where exports appear to surpass landings or sales. Trade data is accessed through the IHS Markit platform where EUROSTAT and national customs data on exports and imports can be assessed. The main species of relevance to the Irish SSF from the trade perspective are crab, lobster, whelk, cold-water shrimps, clams and nephrops. In the trade databases whelk is classified as 'molluscs' while there is no classification for razor clams, only clams. Therefore, molluscs are assumed to represent whelk and clams are assumed to represent razor clams broadly. The objective here is compare the distinct datasets to determine whether there is excess supply of a species which could indicate an underestimate in the recorded value of the Irish SSF. In figure 22 the supply of the six species is described.

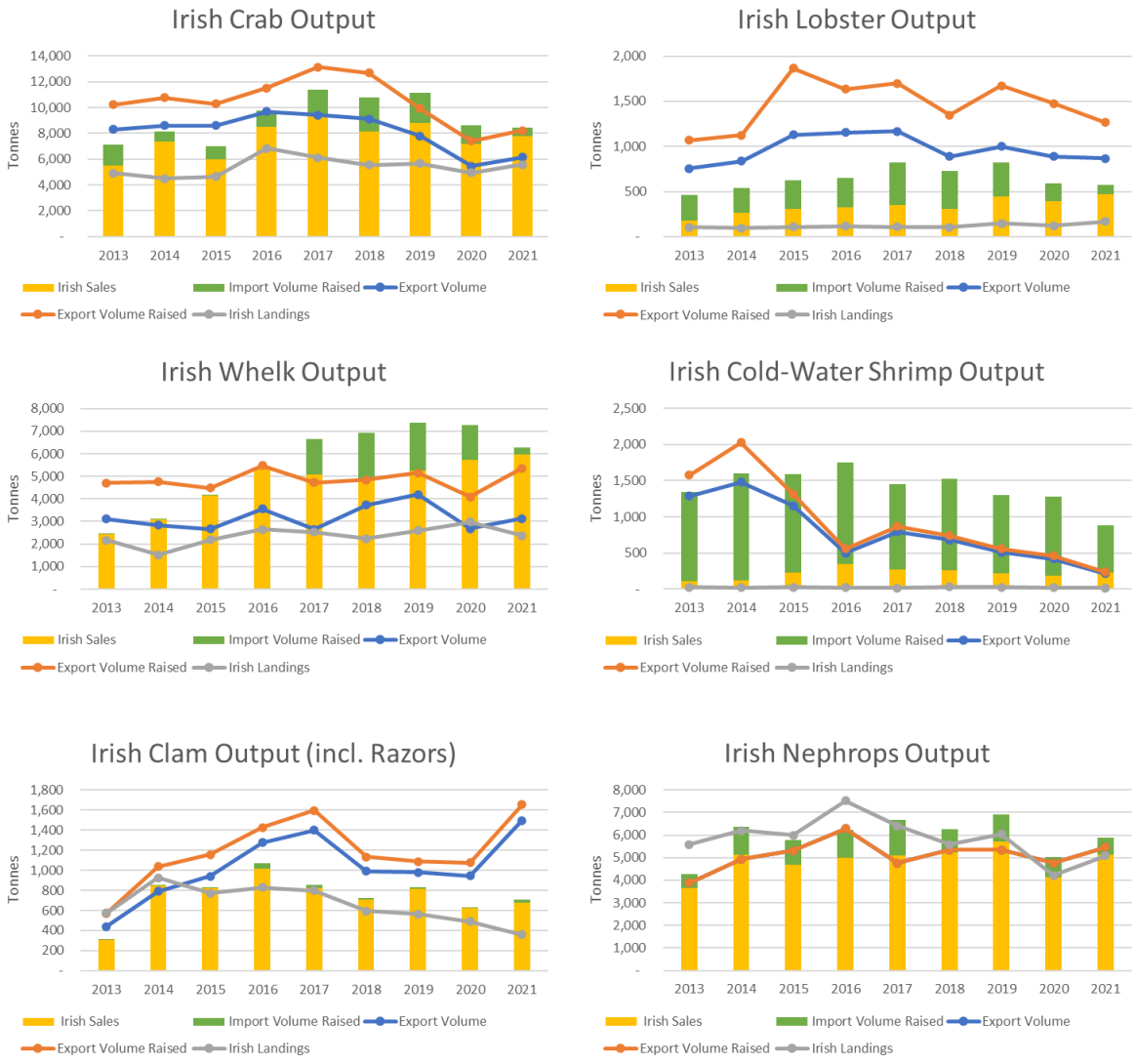


Figure 22: supply chains for six important species exploited by the Irish SSF

In these figures a number of indicators are shown that described the activity of the Irish fleet and seafood sector. The volume of landings declared, and sales recorded are shown to describe the fleet activity. Exports volumes are described along with the raised exports (as many exported seafood products undergo transformation such as filleting, cooking etc. they must be raised by raising factors to estimate the whole at-sea volume for comparative purposes). Finally raised imports are shown, added on top of the sales bars to demonstrate the potential supply of seafood available for export and domestic consumption.

These figures could be interpreted as supply and demand comparisons by species. What is missing in these figures is an estimate for domestic consumption of these species. Analysis of KATAR data shows that in terms of

retailed species in fishmongers and supermarket chains the only defined species appearing from this list is crab with an estimate of around 80 tonnes retailed in 2021. Raising this up to at-sea size could equate to 320 tonnes retailed on fish counters in the year. This does not account for crab retailed in the hospitality sector which could be expected to significantly surpass sales in retail.

For most species pertaining to the SSF the sales volumes are higher than the landing declaration volumes due to the broader coverage of the sales notes data in relation to vessels under 10m in length. For crab, the supply as represented by sales volume plus raised import volume reach over 8,000 tonnes in the latest years which is nearly matched by the raised exports. However, there is non-negligible domestic consumption of crab which could exceed 1,000 tonnes per annum which could be non-recorded sales of the SSF.

For lobster, supply as sales plus imports is around 500 tonnes per annum while exports are over double this volume. The excess quantity of lobster equates to ~700 tonnes not including domestic consumption.

For whelk supply of 6,000 tonnes of sales plus imports (low in 2021 but significant in previous years) compares against ~3,000 tonnes of exports. Raising these export volumes up may explain the mismatch in volumes. There is no apparent consumption of whelk in Ireland therefore any differences here must be caused by raising factors or volumes of whelk in storage awaiting more favourable market conditions in key markets in Asia or Europe.

Cold-water shrimp, which is the most important species for vessels under 6m has seen exports decline significantly since 2013 from heights of 2,000 tonnes to ~250 tonnes in 2021. Comparing sales and imports against exports shows that since 2016 there has been a shift from exports to domestic consumption of these species.

Between 600-800 tonnes of razor clams are recorded in the sales notes annually. This is slightly higher than the declared landings of this species. To assess the supply, chain razor clams need to be compared against 'clams and cockles' in the trade data which covers all clams and cockles. Given there are very low levels of sales of other clams and cockles it can be assumed that this trade category covers mainly razor clams. Exports of clams have ranged between 1,00 and 1,600 tonnes over the years. The excess razor clams apparent here ranges from 300 tonnes to 1,000 tonnes.

For nephrops the supply as composed of sales plus imports seems to match the export figures.

Trade Data Summary

To summarise this section, it seems that there are a few species where exports signal some unaccounted-for sales of the SSF, namely crab, lobster and razor clams. The mismatches here could signal activity of smaller vessels that are not visible in the declared landings and sales notes databases. Guesstimating unaccounted for sales for these species at 1,000 tonnes of crab, 700 tonnes of lobster and 500 tonnes of razor clams would equate to a sales value of €2.4m, €13.3m, and €2.5m respectively using 2021 sales prices.

Economic Assessment

Data Collection Framework (DCF) Economic Data

Economic surveys are sent out to all registered vessels annually requesting information on the main costs, assets, turnover and employment of each vessel on a voluntary basis. Typically, the survey was completed more by larger vessels above 10m however over time the coverage of the SSF has increased from just over 50 vessels in 2008 to nearly 250 vessels in 2019 (from 5% to 15%).

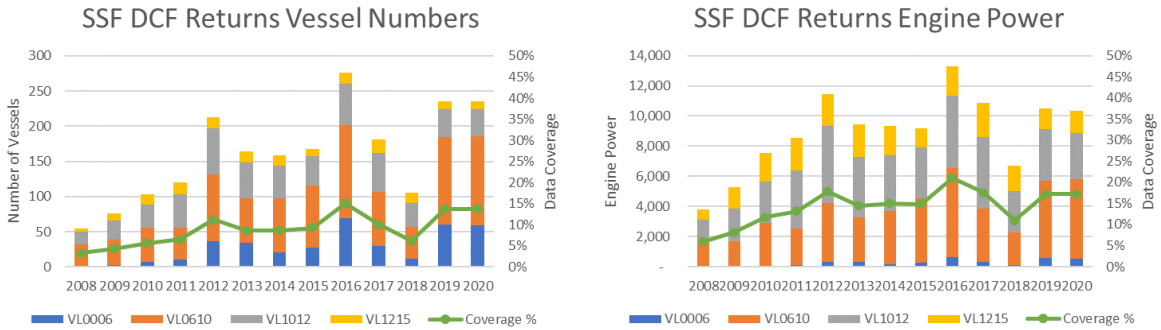


Figure 23: number of SSF vessels and total engine power of DCF economic survey participants

In this survey there are some issues with data quality, particularly with SSF vessels, where many variables are not filled in. In some cases, it is possible that there were no real costs for that variable however in many cases this assumption is unreasonable.

To assess the economic viability of fishing, cost profiles for defined sub-segments of the SSF will be made here based on the previous analyses of fishing patterns in this report. To adequately define these profiles sufficient survey returns will be required for each sub-segment. In cases where there are insufficient economic data returns to define cost profiles for each segment, data from vessels that share some characteristics will be used.

Table 2: economic survey data availability for SSF segments

	VL0006	VL0610	VL1012	VL1215
Polyvalent Pots	Sufficient	Sufficient	Sufficient	Sufficient
Polyvalent Pelagics		Sufficient	Sufficient	Insufficient
Polyvalent Gillnetters		Sufficient	Sufficient	Sufficient
Specific Dredgers		Insufficient	Sufficient	Insufficient

Economic data coverage for the potters is good as is coverage for the gillnetters. The pelagics have good coverage for the 6-10m and 10-12m classes but lack data for the 12-15m class. The data for the lower length classes will be assessed to view if these variables can be extended to cover the higher length class. There is a significant lack of data for the specific segment with only the 10-12m class covered. There is significant activity in this segment below 10m so the data available will be assessed to see if this can be deflated to cover this length class. Interestingly, there are between 50-100 survey returns annually that do not appear in the sales notes database, suggesting unrecorded activity.

In this assessment economic cost variables are summarised into the following cost categories; fuel costs *(FuC)*, crew costs *(CrC)*, repair and maintenance costs *(RmC)*, variable costs *(VaC)*, fixed costs *(FxC)* and capital costs *(CaC)*. Net profit is calculate subtracting these six cost categories from fishing income. The estimated economic state of the sector uses an average of the latest data, from 2018-2020, and projections are made for the years 2021 and 2022 to estimate the current economic state.

The following figure collates the cost structure of the assessed SSF sub-segments as estimated using data from 2018-2020. In these stacked bar charts the height of the bar represents average fishing income per vessel of the labelled segment and length class. The net profit section of the bar represents the total fishing income minus all the specified cost variables. It is important to note that for small scale fishing vessels the net profit represents the fisher's own salary.

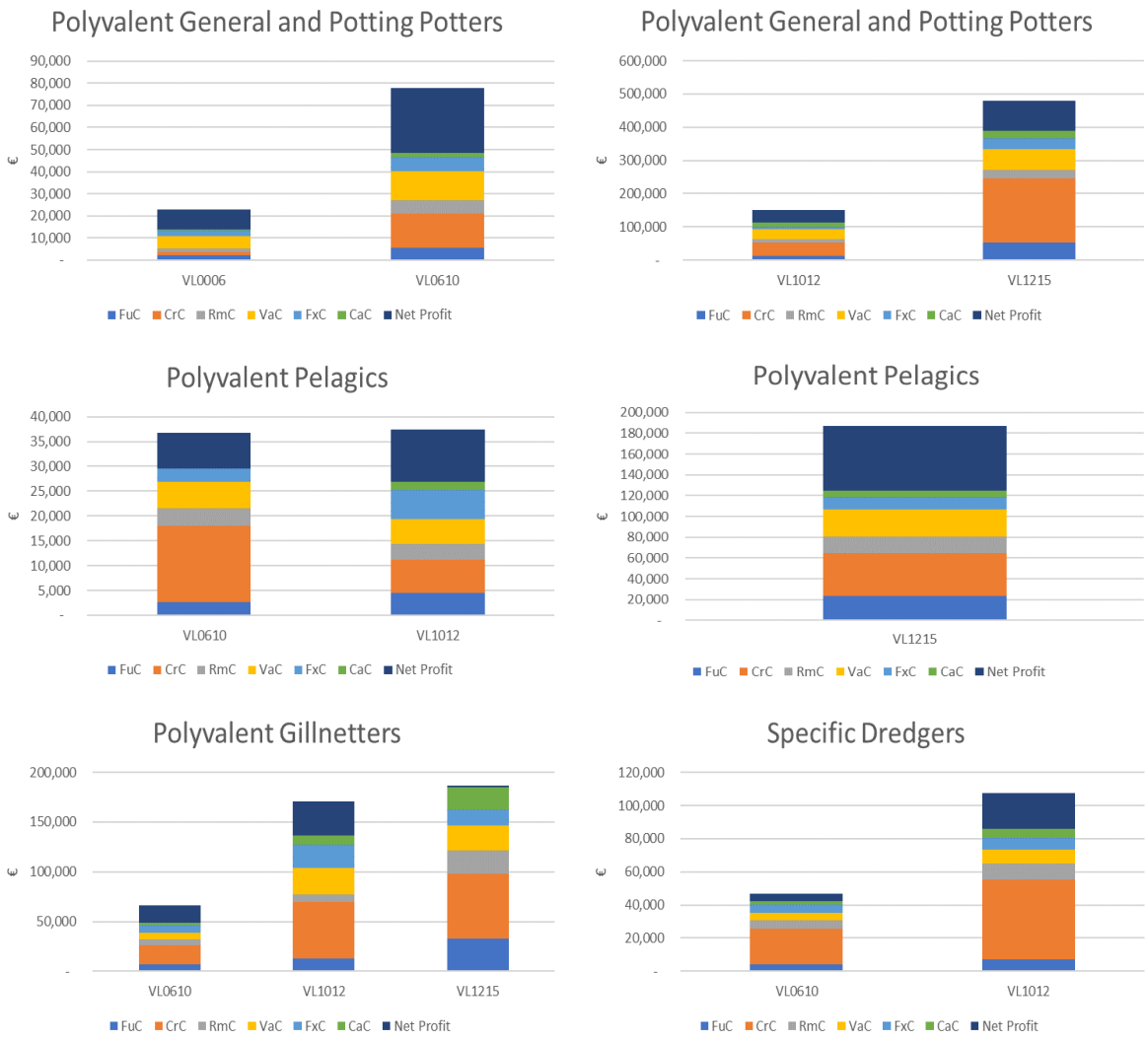


Figure 24: cost structure of SSF subsegments, 2018-2020

Polyvalent potters under 6m are estimated to generate, on average €23,000 in fishing income with a net profit of ~€9,000 per annum. This is a profit rate of 39%. Vessel between 6-10m generate on average €78,000 and a net profit of €29,000 (net profit rate of 38%). For the vessel between 10 and 12m average revenue of €150,000 is generated with a net profit of €36,000 (24% profit rate) while the 12-15m vessels generate ~€480,000 and a net profit rate of €90,000 (profit rate of 19%).

Polyvalent pelagic vessels between 6-10m and 10-12m on average generate around €35,000 however the costs structures are distinct. Net profit rates vary from 20% to 28% with the under 10m length class displaying higher crew costs than the over 10s. the 12-15m length class generates over €175,000 per vessel with net profit of €62,000 (profit rate of 33%). Given the significant lack of data for all length classes of this segment the results here contain high levels of uncertainty.

Gillnetters from 6-10m generate over €65,000 on average per annum with net profit of €17,000 (profit rate of 26%). The length class from 10-12m generate €170,000 on average, with net profit of €34,000 (profit rate 20%) while the 12-15m class generates ~€185,000 with a net profit of €1,500 (profit rate of 1%). The low profit rate of this length class exacerbated by significantly higher repair and maintenance and capital costs than the other length classes.

The specific dredgers between 6-10m generate €47,000 with profit of €4,000 (profit rate of 9%). The length class of 10-12m earn on average €108,000 with profit of €21,000 (profit rate of 20%).

Economic Projections for 2021 and 2022

To estimate the current economic situation of the fleet economic cost variables must be projected into 2021 and 2022 along with fishing income. The main areas where costs have increased for the fishing fleet are fuel (see figure 25), bait, gears costs, insurance and general inflation. Monthly fuel costs for fishing fleets are available up until September 2022 so inflation rates here is available for 2021 and most of 2022. Data shows energy price inflation of 4% in 2021 and 100% in 2022. These increases are applied to all sub segments and length classes.

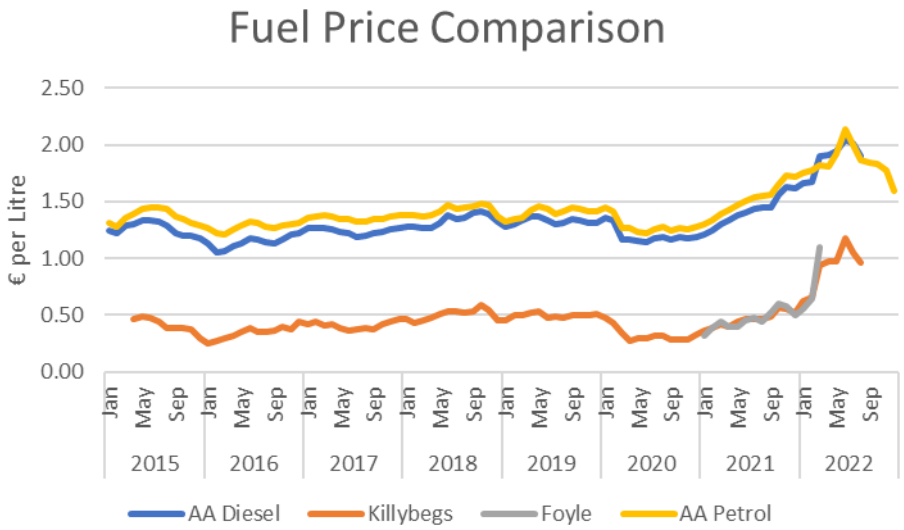


Figure 25: evolution of average monthly fuel prices for diesel at the pump, marine diesel in Killybegs and Greencastle (Foyle) and petrol at the pump. Sources: AA, Art Kavanagh, Foyle Fishermen's Cooperative)

Bait costs are collected under the DCF economic survey with data showing that average SSF vessels increasing by 10% per annum since 2015. This annual increase in price is applied to all length classes in 2021 and 2022.

Gear costs have been noted to have increased significantly in the latest years as a consequence of Brexit. Pots that used to cost €50 each have doubled in price due to rising steel prices and sourcing issues with the UK. The annual gear costs are estimated to increase 40% in 2021 and 43% in 2022 for the potting and specific dredger segments. For the gillnetters and pelagic vessels gear costs are estimated to increase at the rate of general inflation in Ireland for these years.

Insurance and other variable costs are estimated to increase by the rate of general inflation in the Irish economy of 2% in 2021 and 7% in 2022, as noted by the CSO.

Finally, the average value of fishing per vessel has been assessed for each segment and length class using sales notes data for 2020 and 2021 and comparing against the average of 2017-2019. For the polyvalent potting segment average sales value fell by 6% in 2021 for the under 6m length class, increased by 4% for the 6-10m class, and fell by 37% for the 10-12m class. For the gillnetters and pelagics 6-10m class average value falls by 18% in 2021, for the 10-12m class increases by 2% with no changes for the 12-15m class. Specific dredgers between 6-10m see an 8% increase in average value while the 10-12m class sees a 17% decrease in sales value. There is currently no data for the sales in 2022 so a standard increase of 6% is applied across the board for all segment and length classes based on the growth rate of the top 5 species sold by the SSF in 2021.

Results for the estimated economic performance of the polyvalent potting segment in 2022 are shown in figure 26. For each length class the baseline figures from 2018-2020 are shown alongside the projections for 2021 and 2022 for all cost categories and net profit. For the under 6m class fuel costs double while variable costs increase by 28%. Fishing income in 2022 is estimated to be at the same level as before Covid and so net profit falls to below €5,000 per vessel, from over €9,000.

For the 6-10m class fuel costs double and variable costs increase by 29% however an increase in income of 11% over the years leads to a lower impact on profitability. Net profit falls form €29,000 to under €14,000. Potters from 10-12m see fuel costs double and variable costs increase by 35%. Fishing income is estimated to increase by 9% which leads net profit to decrease from €36,000 to €24,000 on average per vessel. The potters above 12m see fuel costs double and variable costs increase 36% however due to an income increase of 15% net profits remain positive however falling from €89,000 to €81,000 per vessel.

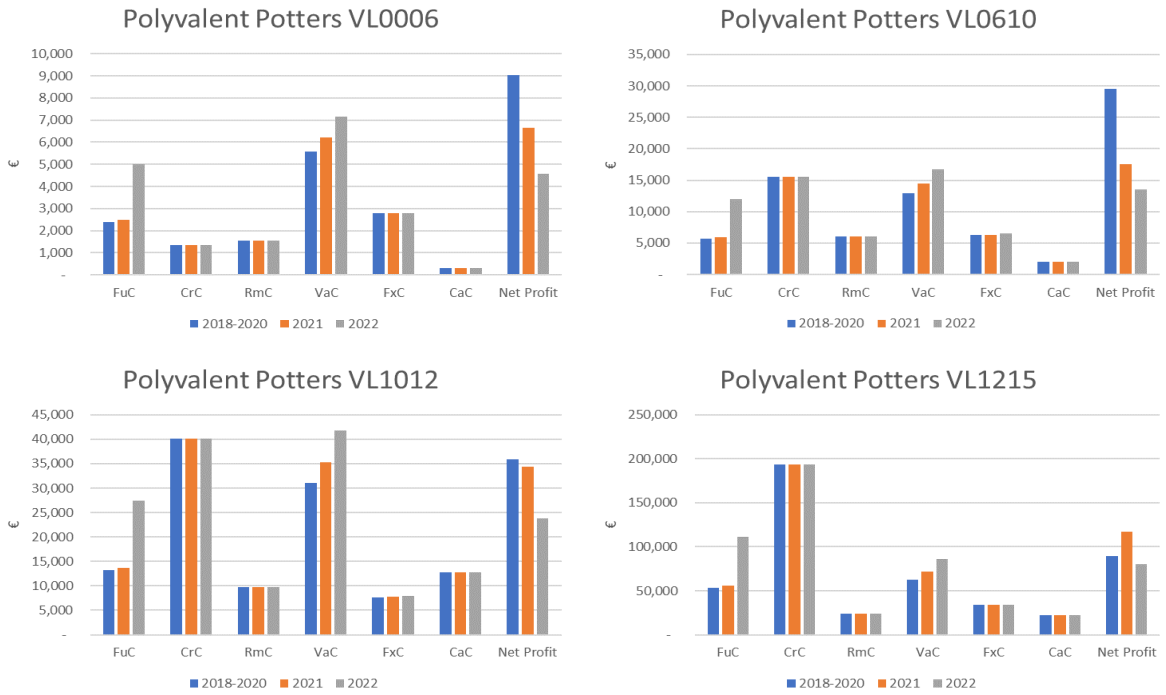


Figure 26: projections of average vessel costs and profitability change from base period to 2022 for the polyvalent potting segment

The polyvalent gillnetters between 6-10m see fuel cost double and variable costs increase by 11%. The increase in variable costs is lower than the potters due to less usage of bait and lower inflation in gear costs. Fishing income increases by 2% from the base period following the impact of Covid-19. Net profit falls from €17,000 per vessel to €10,000 in 2022. For the 10-12m class fuel doubles and variable costs increase by 10%. Fishing income increases by 2% which leads net profit to fall from €34,000 to €21,000 on average. For the class between 12-15m fuel doubles and variable costs increase by 10%. Fishing income increases by 2%. Net profit falls from €1,500 per vessel to -€32,000 in 2022.

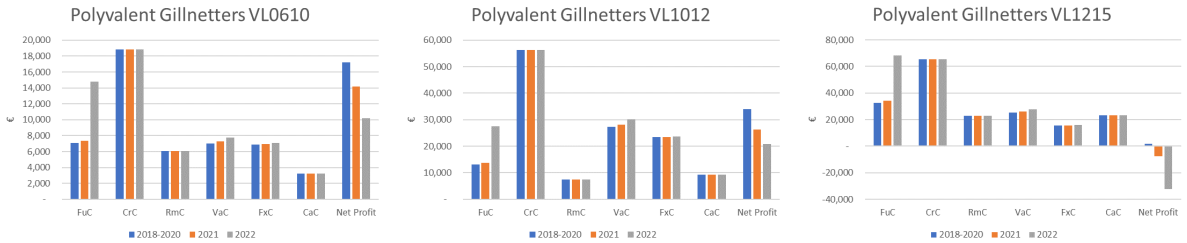


Figure 27: projections of average vessel costs and profitability change from base period to 2022 for the polyvalent gillnetter segment

The polyvalent pelagic segment of length class 6-10m see fuel costs double and variable costs increase by 10%. Fixed costs also increase by 10% for this segment which shows insurance as a major cost within the fixed costs category. Fishing income increases by 4% for this length class which leads net profits to fall from €7,000 to €5,000 per vessel. For the 10-12 class fuel doubles, variable costs increase 13% and fixed costs increase by 5%. Fishing

income increases by 4% which leads to net profit falling from €10,000 to below €6,000 per vessel. The 12-15m class sees fuel costs double, variable costs increase by 10% and fixed costs increase by 5%. Fishing income increases by 4% leading net profit to fall from €62,000 to €40,000 per vessel.

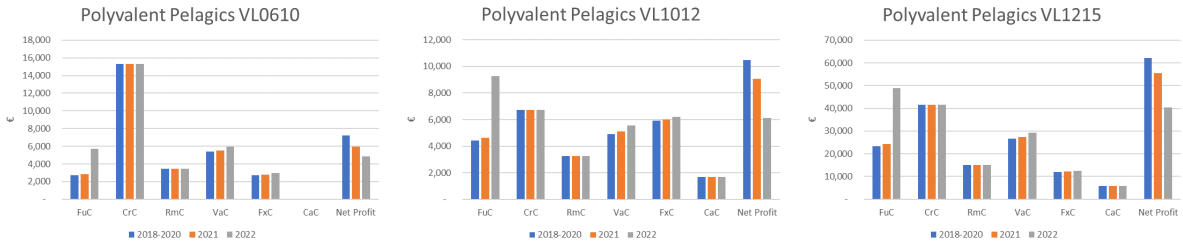


Figure 28: projections of average vessel costs and profitability change from base period to 2022 for the polyvalent pelagic segment

The specific dredgers from 6-10m see fuel costs double and variable costs increase by 26%. Fishing income increases by 6% since the base period which leads to a decrease in net profit from €4,000 to €1,000 per vessel. For the dredgers over 10m fuel costs double and variable costs increase by 43%. Fishing income decreases by 11%, which may be due to the disruption to demand for razor clams in China throughout the pandemic. Net profit falls from €21,000 per vessel to a loss of over €2,000 per vessel in 2022.

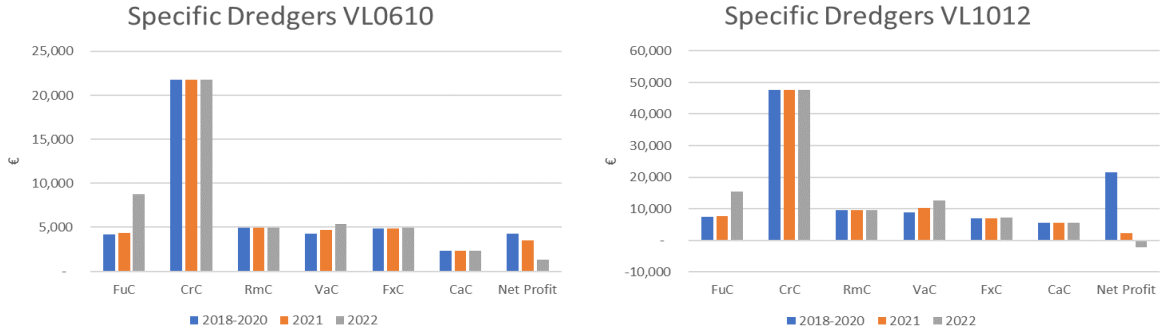


Figure 29: projections of average vessel costs and profitability change from base period to 2022 for the specific dredger segment

Breakeven Revenue for the Irish SSF

Breakeven revenue (BER) is an economic indicator that reflects the level of income required before the fixed costs of a business are covered and any new income generated contributes to the net profit of the business. This indicator refers to the point where a business begins to generate profit and so is of use to determine the point in the year when the business is not operating a deficit. Broadly speaking, the fixed and capital costs of the fishing vessel must be paid each year independent of the level of fishing effort. Even if a vessel does not fish at all these costs must be paid. So, this indicator shows at what level of income the vessel can cover these costs along with the variable costs required to generate that level of income. After reaching the BER any further effort and associated landings value will cover the variable costs (associated with fishing effort, such as fuel costs, repairs, crew costs and other variable costs) and what is left over is profit.

Breakeven revenue is estimated for SSF segment length classes and applied to the average monthly vessel sales to show when BER is achieved. This breakeven point (BEP) is shown for 3 time periods, 2018-2020, 2021 and 2022, to assess how the economic sustainability of the fleet has changed over time. The BEPs are shown in tables 3-6 for the polyvalent potting, polyvalent gillnetters, polyvalent pelagics and specific dredgers respectively.

The polyvalent potting segment generally reaches it BEP by early summer. The length class under 6m reaches this point during the month of July according to current data available from 2018-2020. Due to inflationary pressures estimated here BEP in 2021 and 2022 is pushed out to August. For the 6-10m class BEP was reached in May.

For 2021 this was estimated to occur in June and in 2022 this was extended into the month of July. For both length classes above 10m the BEP was reached in June. In 2021 this remained in June (but later in the month) and for 2022 this was reached in July.

While these results may appear to be benign it is important to note that for this segment, and particularly the lower length classes, fixed costs are generally low so BEP can be reached relatively early. Another important point is that lots of effort and activity for this segment occurs in summer months and in favourable weather conditions which inhibits activity other seasons.

Table 3: breakeven revenue of latest data period (2018-2020) with estimates for 2021 and 2022 for the Irish polyvalent potter subsegment

Polyvalent Potting Length Class	Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Net Losses
VL0006	BEP 2018-2020	-1	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	No
	BEP 2022	-1	-1	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	No
VL0610	BEP 2018-2020	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2022	-1	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	No
VL1012	BEP 2018-2020	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2022	-1	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	No
VL1215	BEP 2018-2020	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2022	-1	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	No

The polyvalent gillnetters' BEPs are shown in table 4. The length class of 6-10m reaches BEP in May based on current data for 2018-2020. The economic projections estimate this BEP extending to June for 2021 and 2022. The 10-12m class currently reach BEP in June and the projections show this is reached in the same month in 2021 (but later in the month) and in July for 2022. The 12-15m class reach BEP in November based on current data. In 2021 and 2022 cost increases extend BEP beyond the new year and so ensure highly unprofitable activity and net losses for the year.

Table 4: breakeven revenue of latest data period (2018-2020) with estimates for 2021 and 2022 for the Irish polyvalent gillnet subsegment

Polyvalent Gillnetters Length Class	Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Net Losses
VL0610	BEP 2018-2020	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2022	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	No
VL1012	BEP 2018-2020	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2022	-1	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	No
VL1215	BEP 2018-2020	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	Yes
	BEP 2022	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	Yes

The polyvalent pelagic segment results are shown in table 5. For the length class 6-10m BEP is currently reached in May. The cost inflation in the intervening years does not affect the month of BEP. The 10-12m class currently breaks even in May which remains the case for 2021 but extends to June for 2022. The 12-15 class reaches breakeven in January and remains in this month for 2021 and 2022.

The results of this segment are very positive within the Irish SSF and reflect a combination of low fixed costs and high temporal landing volumes and values, particularly for the 12-15m class. Pelagic landings vary highly throughout the year and in the sales year selected here (2021) this class had very high sales in January which ensured all fixed costs for the year were covered.

Table 5: breakeven revenue of latest data period (2018-2020) with estimates for 2021 and 2022 for the Irish polyvalent pelagic subsegment

Polyvalent Pelagics Length Class	Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Net Losses
VL0610	BEP 2018-2020	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2022	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	+1	No
VL1012	BEP 2018-2020	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2022	-1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	No
VL1215	BEP 2018-2020	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2021	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2022	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	No

The breakeven points for the specific dredgers are shown in table 6. For the 6-10m class current data shows that BEP is reached in September. Inflation in 2021 is estimated not to change the month however further inflation pushes BEP into November for 2022. The 10-12m class currently has a BEP of April. Estimated cost increases strongly impact this and push BEP out to November for 2021. Continued inflation in 2022 ensures net losses for the year with no possibility of breaking even.

Table 6: breakeven revenue of latest data period (2018-2020) with estimates for 2021 and 2022 for the Irish specific dredger subsegment

Specific Dredgers Length Class	Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Net Losses
VL0610	BEP 2018-2020	-1	-1	-1	-1	-1	-1	-1	-1	+1	+1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	-1	-1	-1	-1	+1	+1	+1	+1	No
	BEP 2022	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	+1	+1	No
VL1012	BEP 2018-2020	-1	-1	-1	+1	+1	+1	+1	+1	+1	+1	+1	+1	No
	BEP 2021	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	+1	+1	No
	BEP 2022	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	Yes

Breakeven Prices

A brief analysis on breakeven prices is now incorporated. This analysis has been requested by stakeholders however a number of issues pertain to this analysis. Breakeven prices describe what price is required per species to ensure the breakeven revenue is achieved for each segment. As segments catch numerous species it is not straightforward how the price of one species of the overall catch can ensure breakeven revenue is achieved. The method here is to show the most important species caught by each segment and what price would, in general, ensure breakeven revenue is achieved. Given that most segments achieve breakeven revenue already, the breakeven price will be lower than the average price already achieved. However, for those that do not achieve breakeven revenue then here the breakeven price will show what is required for this to be achieved.

The polyvalent potting segment average prices and breakeven prices are described in figure 30. For the length class under 6m Palaemonid shrimp accounts for 48% of total value while lobster accounts for 28%. Average prices are high for these two species and breakeven price is 40% of the average price based on the estimation of breakeven revenue. The length class between 6-10m shows lobster, brown crab and whelk which account for 29%, 24% and 22% respectively. The breakeven prices for these species are 38% of the current average prices based on the estimation of breakeven revenue for this length class. For the potters 10-12m the main species are brown crab and whelk which account for 44% and 37% of total value respectively. The breakeven prices are 47% of the current average prices. The length class 12-15m main species is brown crab which accounts for 71% of total value. The breakeven revenue is 41% of the current average price.

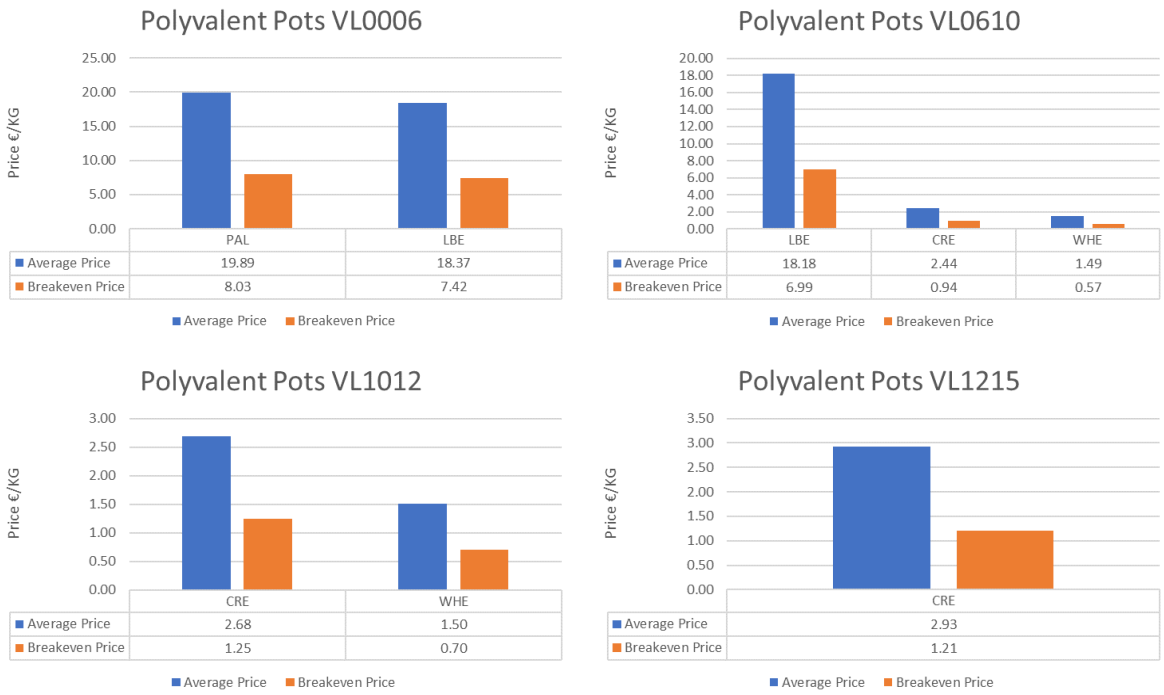


Figure 30: average price in 2021 and breakeven price for the main species of the polyvalent potting segment

The polyvalent gillnetter segment average prices and breakeven prices are described in figure 31. The length class of 6-10m main species are pollack, Norway lobster and Palaemonid shrimp which account for 31%, 20% and 10% of total value. The breakeven prices are 50% of the current average prices. The length class of 10-12m main species are hake, Norway lobster, pollack, turbot and saithe which account for 24%, 15%, 15%, 14% and 7% respectively. The breakeven prices are 61% of the current average price received. For the 12-15m length class the main species are Norway lobsters, megrim, monkfish, sole and turbot which account for 22%, 14%, 13%, 9% and 8% respectively. The breakeven prices for this length class are far above the current average prices received due to this segment failing to achieve breakeven revenue. The prices required for this length class to break even are 6 times higher than what are achieved currently.

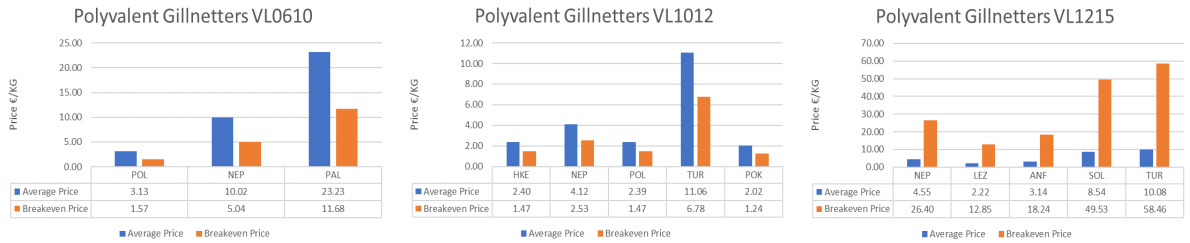


Figure 31: average price in 2021 and breakeven price for the main species of the polyvalent gillnetter segment

The polyvalent pelagic segment average prices and breakeven prices are described in figure 32. For the length class of 6-10m the main species caught are mackerel and herring which account for 51% and 28% of the total value respectively. The breakeven prices are 38% of the current average prices received. The length class 10-12m mainly catches mackerel and sprat which account for 40% and 32% of total value respectively. The breakeven prices are 56% of current average prices. The length class of 12-15m main species is sprat which accounts for 67% of total value. The breakeven revenue is 31% of the current average price.

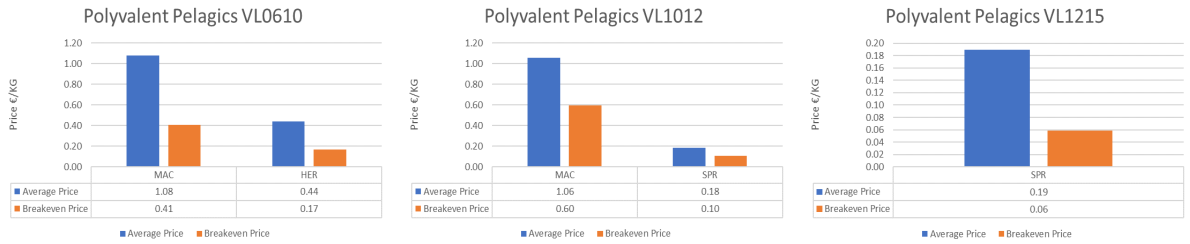


Figure 32: average price in 2021 and breakeven price for the main species of the polyvalent pelagic segment

The specific dredgers segment average prices and breakeven prices are described in figure 33. The main species sold by the 6-10m length class are both razor clams (Razor Shells, knife clams nei (SOI) and Razor Sword Shell (EQI)) which account for 71% and 28% of total value respectively. Breakeven prices for this length class are 85% of the current average price. For the higher length class of 10-12m the same species are the main ones sold accounting for 87% and 7% respectively. The breakeven prices are higher for this length class as it did not achieve its breakeven revenue. Prices need to be 22% higher for the 10-12m length class to break even.

Figure 33: average price in 2021 and breakeven price for the main species of the specific dredger segment

The breakeven prices described here naturally follow from the breakeven revenue estimations and so the majority of length classes already achieve higher sales prices. For the two length classes that do not reach BER, the polyvalent gillnetters 12-15m and the specific dredgers 10-12m, the breakeven prices required vary significantly. The gillnetters require prices to multiply by 6 to break even therefore this is highly unlikely to occur which signals major problems with the costs structure of this length class. For the dredger the required price increase of 22%

is much more possible to achieve however this does also highlight issues with regard to their costs structure, particularly as the other length classes within these segments are achieving break even with similar prices.

An important factor that must be taken into account with this analysis is that for the lower length classes breakeven revenue does not include the vessel owner salary. Therefore, the breakeven price only describes what level the price needs to be for the vessel to be non-loss-making with salary for the owner at €0.

Economic Assessment Summary

It is clear that for most parts of the Irish small-scale fleet there are major impacts due to the ongoing fuel crisis combined with aftereffects of the Covid-19 pandemic and effects of Brexit. Costs are increasing most notably for fuel but importantly for bait, gear, insurance and general inflation in most products and services. The assessment here has estimated the cost structure for various subsegments and length classes of the Irish SSF for the period 2018-2020. In general, the net profit, which is in effect the salary of the SSF fisher, is very low compared to the average salary in Ireland. This gives very little leeway for cost inflation if fish prices to not rise accordingly. What is evident from the databases assessed is that fish price inflation and the average value of fish sold by the sector has differed considerably across the segments in 2021 (the latest year of data on fish prices).

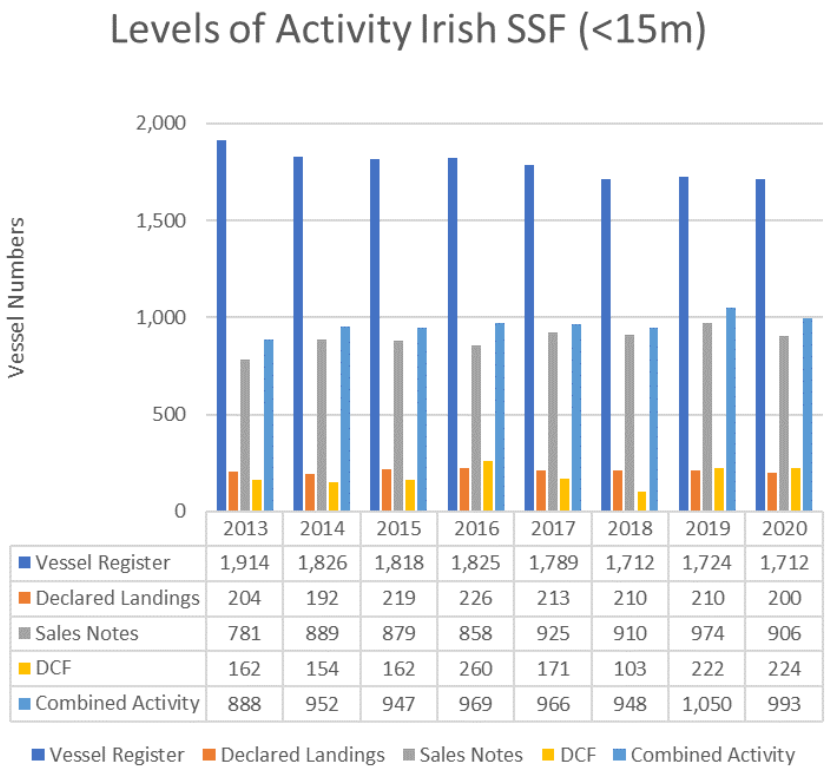
The economic projections for 2022 see all subsegments impacted to varying degrees. Looking at length classes, for the under 6ms, the polyvalent potters see their net profit fall by 50% to under €5,000. In the 6-10m class the impacts range from a 33% reduction in net profit for the pelagic vessels to a 70% reduction for the potters. Gillnetters net profit falls from €17,000 per vessel to €10,000, the pelagics go from €7,000 to under €5,000. The potters fall from €29,000 to €14,000 while specific dredger net profit falls from €4,000 to €1,000.

For length class of 10-12m the potters fare the best with a 34% reduction in net profit from €36,000 to €24,000. The gillnetters fall 39% from €34,000 to €21,000 in 2022. The pelagics net profit falls from €10,000 to €6,000 per annum while the dredgers fall from €21,000 to -€2,000.

For the 12-15m class the gillnetters previously had a net profit of just €1,500 which falls to -€32,000 in 2022. The pelagic boats net profit falls 35% from €62,000 to €40,000. The potters see the lowest fall in profitability of 10% from €89,000 to €81,000 per annum.

Discussion

In this assessment of the Irish SSF all available databases have been analysed in order to capture as much information on the activity of the fleet as possible. In figure 34 the levels of activity across the three databases of landings declarations, sales notes and the DCF economic survey are shown with the combined total of appearances of any vessel across the three databases. While the sales notes database is clearly the most informative of the three in terms of vessel numbers it still does not cover all vessels as between 50 -100 vessels per annum are picked up through the other databases.



	2013	2014	2015	2016	2017	2018	2019	2020
Vessel Register	1,914	1,826	1,818	1,825	1,789	1,712	1,724	1,712
Declared Landings	204	192	219	226	213	210	210	200
Sales Notes	781	889	879	858	925	910	974	906
DCF	162	154	162	260	171	103	222	224
Combined Activity	888	952	947	969	966	948	1,050	993

Figure 34: official activity levels of the Irish SSF as noted in official databases landings declarations, sales notes and data collection framework economic survey returns with combined activity as appearance of any vessel in one of the three former databases

The level of combined activity has increased from 46% in 2013 to 61% in 2019 which demonstrates greater coverage of SSF activity over time however there is potentially underestimation of activity due to this relatively low coverage of the total registered vessels as well as the gaps in supply apparent from the analysis of trade data for important species exploited by the SSF. In figure 35 the activity rates of each length class are described.

Activity trends for all length classes of the Irish SSF have been increasing since 2013. The 0-6m class increase activity levels from 36% to 45% over the time series. The levels increase from 46% to 59% in 2020 for the 6-10m class. The 10-12m class increase actrivity from 67% to 77% while the 12-15m class increase activity form 73% in 2013 to 81% in 2020.

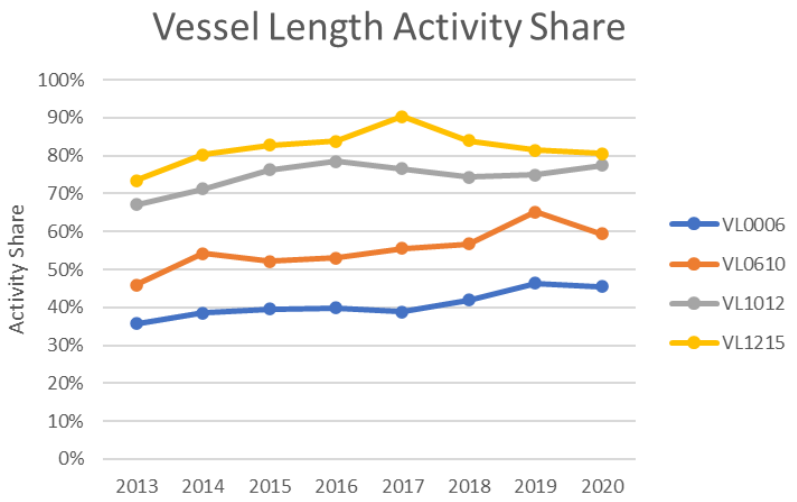


Figure 35: combined activity levels from assessment of all databases for Irish SSF length classes.

Applying the vessel level economic assessment of the Irish SSF subsegment to the combined activity we can estimate the overall economic performance of the fleet. The results of the main economic variables can be seen in tables 7 and 8, by subsegment and length class respectively.

Table 7: overall economic performance of the Irish SSF subsegments, 2018-2020 average. (FuC – fuel costs; CrC – crew costs; RmC – repair and maintenance costs; VaC – variable costs; FxC – fixed costs; CaC – capital costs; FI – Fishing income; NP-rate – net profit rate)

Segments	FuC	CrC	RmC	VaC	FxC	CaC	FI	Net Profit	NP-Rate
Polyvalent Potting	6,122,971	17,114,130	4,904,617	12,473,018	5,360,339	2,972,166	71,286,058	22,338,817	31%
Polyvalent Gillnets	1,118,500	3,036,475	769,503	1,326,737	1,035,239	729,187	9,393,278	1,377,637	15%
Polyvalent Pelagics	214,013	536,149	170,927	294,011	171,674	45,595	1,999,978	567,609	28%
Specific Dredges	466,527	2,695,194	544,199	528,446	452,494	306,907	6,035,212	1,041,445	17%
All Irish SSF	7,922,010	23,381,948	6,389,246	14,622,212	7,019,746	4,053,854	88,714,526	25,325,508	29%

Results show the polyvalent potting subsegment to be the most important with an estimate fishing income of €71m, followed by polyvalent gillnets (€9m), specific dredgers (€6m) and polyvalent pelagics (€2m). Profit rates are highest for the potters and the pelagics, both around 30%.

Table 8: overall economic performance of the Irish SSF length classes, 2018-2020 average. (FuC – fuel costs; CrC – crew costs; RmC – repair and maintenance costs; VaC – variable costs; FxC – fixed costs; CaC – capital costs; FI – Fishing income; NP-rate – net profit rate)

Length Class	FuC	CrC	RmC	VaC	FxC	CaC	FI	Net Profit	NP-Rate
VL0006	613,338	347,705	400,639	1,427,781	709,834	75,326	5,881,488	2,306,866	39%
VL0610	3,095,921	8,822,891	3,242,832	6,565,329	3,367,606	1,122,369	40,927,660	14,710,712	36%
VL1012	2,018,114	7,421,459	1,589,627	4,283,249	1,662,884	1,783,009	24,239,760	5,481,417	23%
VL1215	2,194,638	6,789,894	1,156,147	2,345,853	1,279,423	1,073,151	17,665,618	2,826,513	16%
All Irish SSF	7,922,010	23,381,948	6,389,246	14,622,212	7,019,746	4,053,854	88,714,526	25,325,508	29%

The length class with the highest estimated value is the 6-10m class with a fishing income of ~€41m. the 10-12m class has an estimated value of €24m, the 12-15m class a value of €18m while the length class under 6m has an estimated fishing income of €6m. Profit rates are highest for the smallest length class at 39% and decreases as the length increases with rates of 36%, 23% and 16% for the 6-10m, 10-12m and 12-15m classes respectively.

Overall, the fishing income of the Irish SSF is estimated to reach €89m per annum, which is far higher than previous estimates of the sector (the Annual Economic Report of EU fishing fleets notes the Irish SSF to have a gross value of landings of €41m). However, caution must be taken when using these estimates given the uncertainty here due to the lack of data for the sector. Uncertainty exists on both sides of these estimates as there could be activity that is not incorporated in these estimates (which would suggest underestimation) however there could also be overestimation of the economic variables (which could suggest overestimation of the total value of the fleet).

To answer the initial question of whether current fishing is profitable, the breakeven analysis found that most subsegments of the Irish SSF traditionally reach their breakeven point during the summer months. However, due to the cumulative impacts of the covid-19 pandemic, the beginning of Brexit and the war in Ukraine, the economic situation of most SSF subsegments has deteriorated in 2021 and 2022. The potting subsegment has seen it breakeven point being pushed out by one or two months however across all length classes this is reached by August at the latest. This means that at any point after august fishing activity is currently profitable.

The gillnetter subsegment faces a much different scenario, particularly the biggest length class. Previous BEP was reached in November however for 2021-2022 fishing activity is unprofitable. For the smaller length classes activity is profitable after the month of July at the latest.

The pelagic subsegment has highly profitable activity across all length classes with BEP reached by June at the latest.

Finally, the specific subsegment under 10m class reaches BEP in November whereas pre-covid this was in September. For the 10-12m class the economic situation has deteriorated significantly over the last two years with BEP formerly reached in April but now this is estimated not to be reached at all, ensuring loss-making activity.

Conclusion

This analysis has incorporated a wide variety of data sources to paint as complete a picture as possible of the Irish SSF. Each database provides important information on the variety that exists within and across vessel sizes and segments of this fleet. The landings declarations database probably had the lowest quantity of information on the SSF due to the low coverage of vessels under 10m in length. Nevertheless, very interesting information was seen in terms of the fisheries exploited by those vessels over 10m and the types of gear utilised. Along with dredges, pots, gillnets and pelagic other main gears identified included trawls and lines. Further research into use of these gear in the sector could be of interest.

The sales notes database was the richest database assessed due to the wide coverage of vessels under 10m included here by the buyers of fish throughout Ireland. While 224 SSF vessels appear in the landings declarations database, 900 SSF vessels appear in the sales notes. While this data source does not contain information on the gear used by the vessels some subsegments could be distinguished based on their type of seafood sold. Three subsegments of polyvalent vessels were assigned, pots, pelagic and gillnetters with the specific dredgers.

The vessel register gives a description of the maximum limits of the SSF with all registered vessels included. This database contains detailed information on the technical characteristics of the fleet and interesting information on its geographical distribution. This database allows one to assess the level of activity within the other databases in terms of vessel numbers or other technical variables.

The trade database is of interest to assess what happens to the output of the SSF post-sale. The typical landings of the fleet such as crab, lobster, shrimps and razor clams are highly appreciated internationally with increasing demand in Europe and Asia. While there can be some issues with the classification of species in trade datasets and with the formats assigned (whole, filleted, etc.) the assessment here highlighted possible underestimates of SSF activity for crab, lobster and razor clams.

The economic assessment using DCF data allowed detailed cost profiles to be created for the range of subsegments and length classes in the Irish SSF. This is the first time cost profiles have been developed in detail for the Irish SSF which has allowed estimation of the net profit of small, medium and larger vessels. The costs structures and profitability of the fleet segments have been projected into the current year in order to assess the current economic state of the sector. The results are of interest given the differences evident between the subsegments and length classes.

The breakeven analysis found that many subsegments and length classes broke even, in economic terms, during the summer months. The current crises have delayed this by some months for nearly everyone but most subsegments still breakeven. Nevertheless, what we term as net profit here is in fact the salary of the vessel owner. For many length classes, particularly the lower ones, this salary was at a very low level and the current economic crises have exerted major cost pressures and squeezed this income significantly. It was not possible to incorporate a standard wage per vessel owner for the smallest length classes as there is not enough information on the composition of the fleet in terms of part-time and full-time employees. In the future more data must be collected, particularly on vessels under 10m, to accurately assess the composition of employment and the economic cost structures of these length classes that will allow more accurate estimation of breakeven revenue and prices. Work planned by BIM in 2023 involves carrying out a census of the Irish small-scale fleet to accurately describe the composition of part-time, full-time and inactive vessels in the fleet which will hopefully provide adequate data to estimate wages, net profit and break-even points for the sector.

The Seafood Task Force that reported in 2021 acknowledged the importance of the inshore sector to local communities and recommended a range of specific initiatives to assist the sector. These initiatives included a range of short-term and longer-term measures that aim to return this to a vibrant sector providing employment across coastal communities as well as specific measures to assist in the marketing and processing of catches from inshore vessels. To date several of these schemes - Brexit Inshore Fisheries Business Model Adjustment Scheme, Brexit Blue Economy Enterprise Development Scheme and Marketing Support Scheme – have been implemented and provided financial assistance to the sector. Several other schemes recommended under the Task Force relating to fleet restructuring are under discussion. Support has also been provided to the sector through the Inshore Fisheries Conservation Scheme, funded under the EMFF. However, given the outstanding issues in the inshore fisheries sector further assistance is likely to be required to assist the sector overcome the serious challenges currently posed.

Appendix A – Monthly Sales Prices Key SSF Species 2013-2021

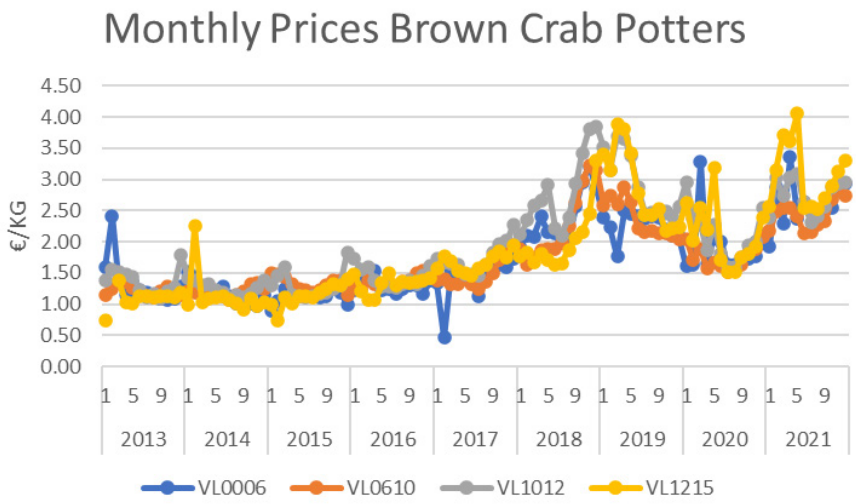


Figure 36: average monthly sales prices for brown crab sold by the polyvalent general and potting segment, 2013-2021

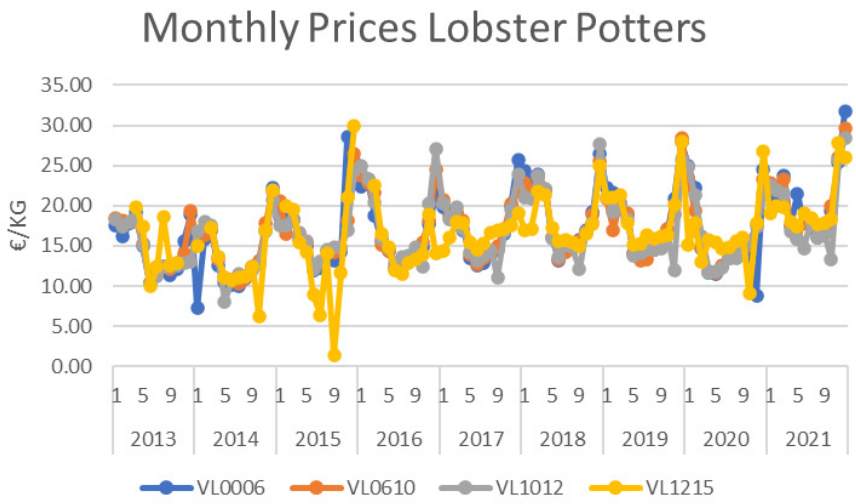


Figure 37: average monthly sales prices for lobster sold by the polyvalent general and potting segment, 2013-2021

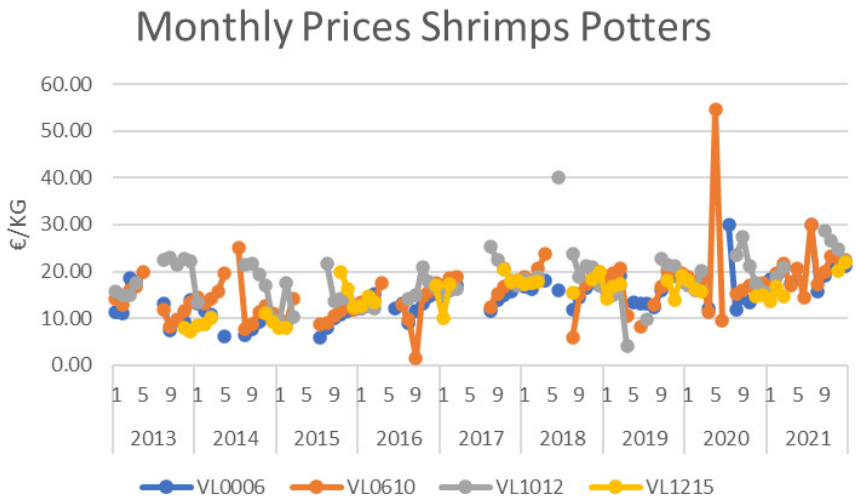


Figure 38: average monthly sales prices for shrimps sold by the polyvalent general and potting segment, 2013-2021

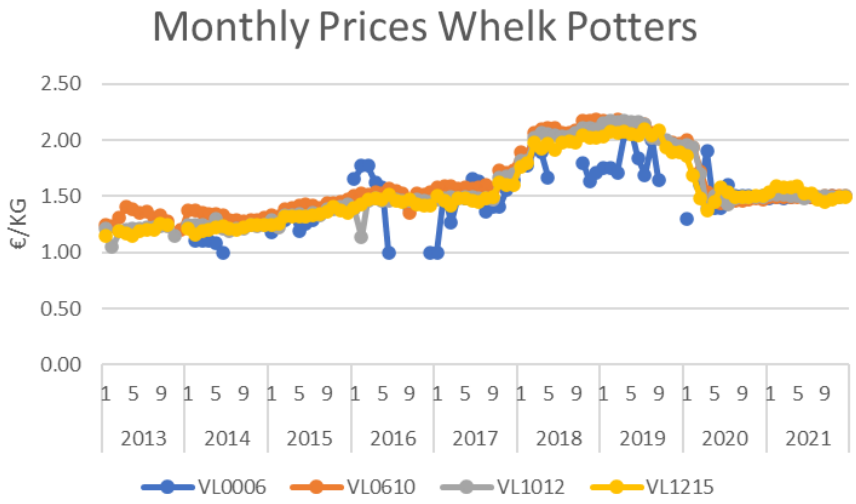


Figure 39: average monthly sales prices for whelk sold by the polyvalent general and potting segment, 2013-2021

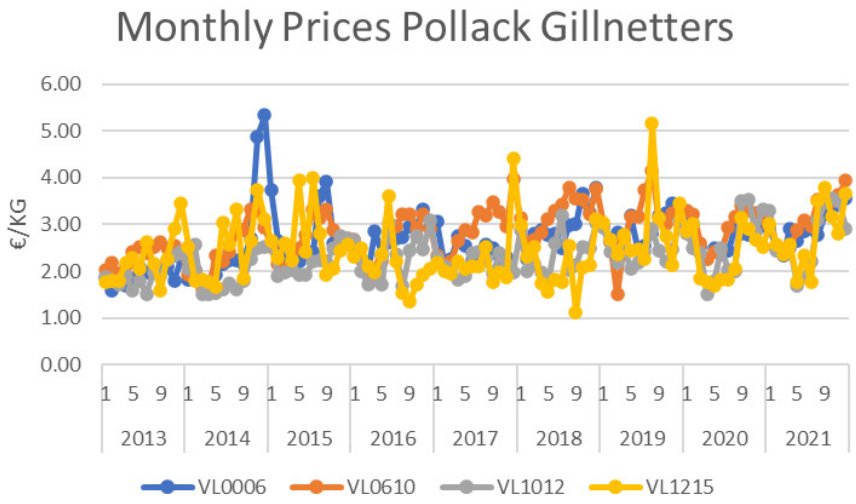


Figure 40: average monthly sales prices for pollack sold by the polyvalent gillnetter segment, 2013-2021

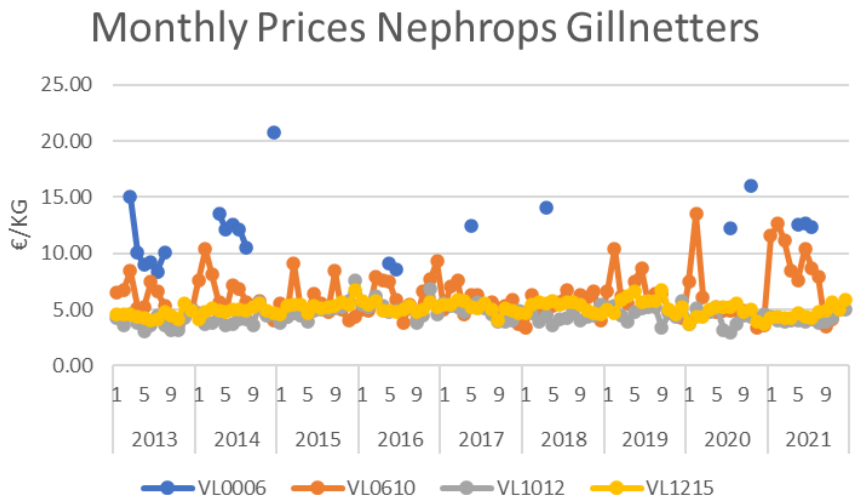


Figure 41: average monthly sales prices for Norway lobster sold by the polyvalent gillnetter segment, 2013-2021

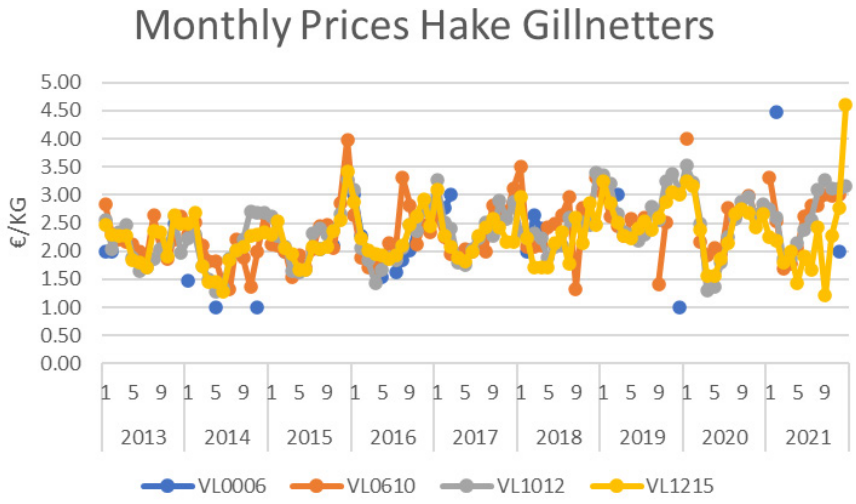


Figure 42: average monthly sales prices for hake sold by the polyvalent gillnetter segment, 2013-2021

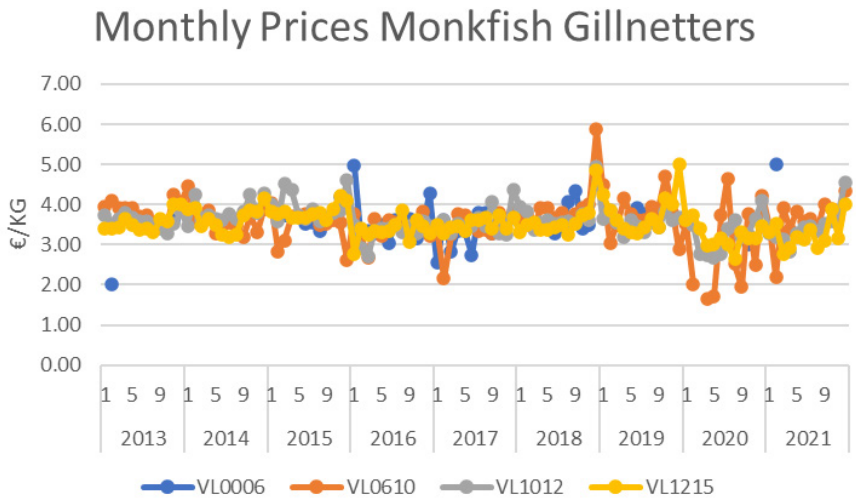


Figure 43: average monthly sales prices for monkfish sold by the polyvalent gillnetter segment, 2013-2021

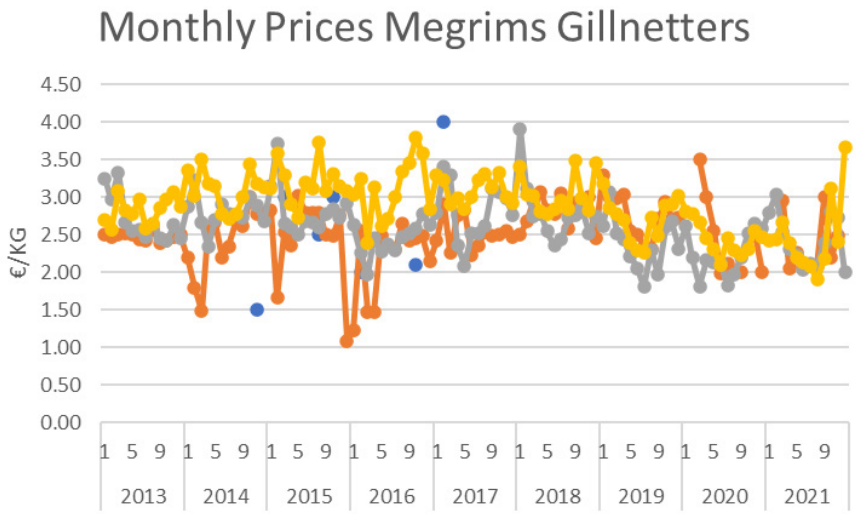


Figure 44: average monthly sales prices for megrim sold by the polyvalent gillnetter segment, 2013-2021

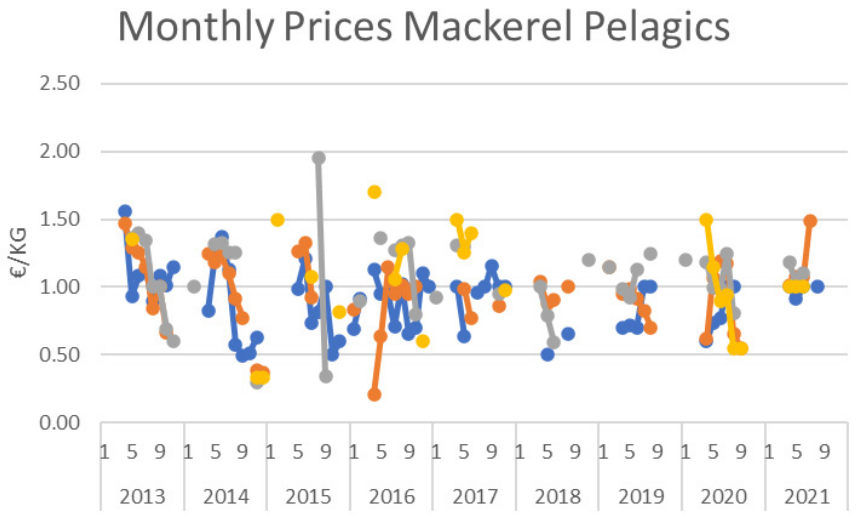


Figure 45: average monthly sales prices for mackerel sold by the polyvalent pelagic segment, 2013-2021

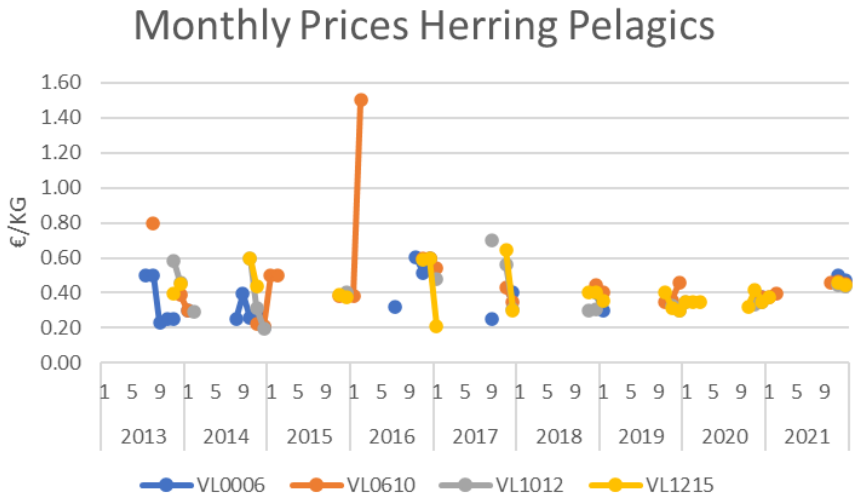


Figure 46: average monthly sales prices for herring sold by the polyvalent pelagic segment, 2013-2021

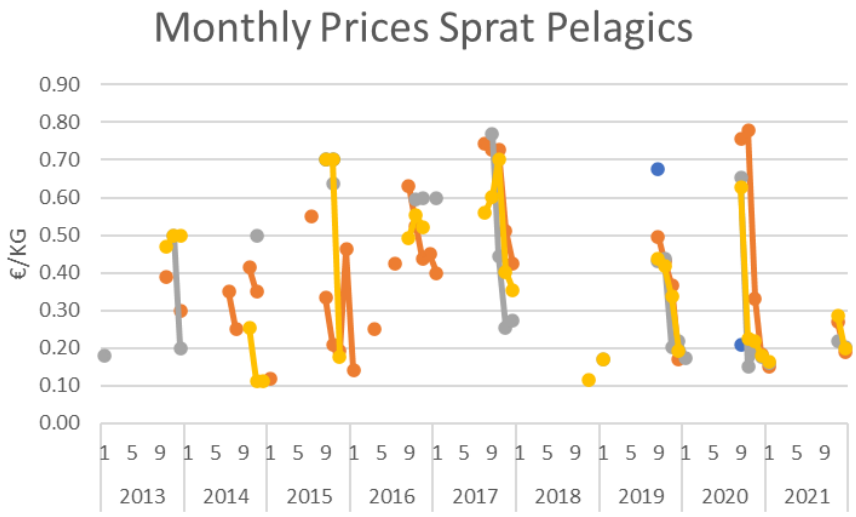


Figure 47: average monthly sales prices for sprat sold by the polyvalent pelagic segment, 2013-2021

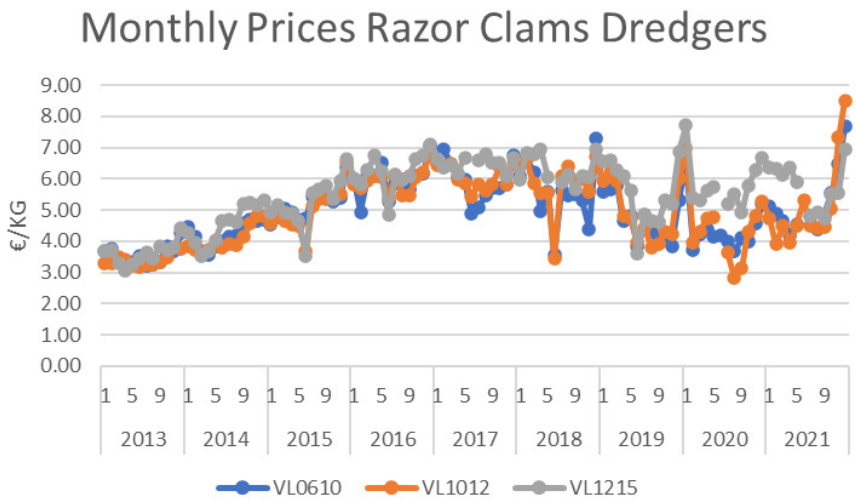


Figure 48: average monthly sales prices for razor clams sold by the specific dredger segment, 2013-2021

BIM
Ireland's
Seafood
Development
Agency

bim.ie