

# **Research and Evaluation**

Of the Social, Economic, and Operational  
Implications of the Outer Hebrides Creel  
Limitation Pilot

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Of the Social, Economic, and Operational Implications of the Outer  
Hebrides Creel Limitation Pilot

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# Acknowledgements

We would like to extend our thanks to our colleagues from Marine Scotland; Kay Barclay, Jim Watson, Stuart Bell and Chloe Aird for their assistance in developing this work and commenting on the draft survey and interview documents. We are particularly grateful to Kay Barclay of Marine Scotland and Dr Anna Mujal-Colilles from the University of St Andrews for assisting in fieldwork and for their help interviewing fishers. We also acknowledge with thanks, Marine Scotland for funding this research. We recognise the invaluable assistance of our contact from the Western Isles Fishermen's Association (WIFA) and Outer Hebrides Regional Inshore Fisheries Group (OHRIFG), Duncan MacInnes. We thank him for his expertise and time in helping us publicise the surveys to members of WIFA and OHRIFG, and for his organisation of the many meetings we attended where we obtained a large proportion of our interviewees. We particularly wish to thank the many fishers and processors that took time out of their busy schedules, often during antisocial hours, to provide their feedback on the project, attend meetings, and provide honest insight into the dynamics of this fishery.

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## Executive Summary

### Key Findings

Fishers were interested in the Outer Hebrides Creel Limitation Pilot (CLP) because they want to improve their catch-per-unit-effort, encourage responsible management of the fishery and prevent fishers from holding valuable patches of the seabed with creels that are not fishing.

23% of fishers made changes to their fishing operations because of the CLP, most of whom had reduced their creel numbers.

Though the social impacts are unquantifiable, evidence from fishers in this project suggests that the CLP may have already brought some benefits with nearly a third of fishers reporting less ground holding in the pilot area, a fifth noticing positive changes to their well-being and almost half saying that reduced creel limits would benefit their health and safety.

It is generally believed that in implementing the pilot area to the east, some large vivier crabbing vessels that work thousands of creels, have been displaced to the west and are competing for crab stocks. According to the fishers, vivier crabbing vessels are not Scottish registered and may represent an issue beyond the localised jurisdiction of the co-management strategy.

For most, income and expenditure remain unchanged, however, there were just under a quarter of respondents reported an increased income as a result of the CLP.

Anecdotal evidence also suggests that lobster and crab stocks may be declining but *Nephrops* stocks seem healthy. This cannot be attributed to the CLP with any certainty, though the pilot area covers largely *Nephrops* grounds and leaves the crab and lobster grounds to the west unprotected from creel saturation.

The most frequently given suggestions for management were to reduce the creel limits further and to see the pilot area extended to the west of the Outer Hebrides.

Creel saturation in the Scottish Inshore Fishery is becoming a problem of increasing concern amongst fishers, creating conflict over marine space and resources. The consequences include decreasing shellfish stocks and falling catch-per-unit-effort (CPUE), where fishers must increase their fishing effort for the same or decreased returns. Creel limits were heralded as a more popular alternative to spatial management amongst Scottish creel fishers, leading to the trial of a creel limitation project by vessel size for a specified area off the east coast of the Outer Hebrides.

Using co-management as a model for the pilot trial, a collaboration between the Regional Inshore Fisheries Group (RIFG) and Marine Scotland was created and a creel limit was implemented across a specified area between the 5<sup>th</sup> of November 2020 and the 31<sup>st</sup> of October 2022. To fish within the pilot area, fishers had to apply for a derogation, agreeing to fish on or below the creel limit assigned to their vessel and for no longer than the agreed soak time.

The Outer Hebrides Creel Limitation Pilot (CLP), aimed to limit the increase in creel numbers, reverse the decline in local shellfish stocks, increase CPUE, examine a local-

scale fisheries management approach and investigate vessel tracking in the inshore fleet. In addition, it was hoped that the pilot would reduce conflict amongst fishers and improve health and safety, well-being, the efficiency of fishing operations and the economic situation of fishers.

Within the final months of the pilot, a research and evaluation project was undertaken to identify whether the aims of the pilot had been successfully met and to understand the social and economic impacts that the pilot may have had on fishers and processors. An online survey was conducted between the 16<sup>th</sup> of July and the 17<sup>th</sup> of September 2022 and distributed via email by the Western Isles Fishermen's Association (WIFA). Alongside the online survey, a series of semi-structured face-to-face interviews with fishers and processors were undertaken on a visit to the Outer Hebrides between the 17<sup>th</sup> and 22<sup>nd</sup> of July 2022.

The online survey attracted thirty-nine usable responses with twenty-six interviews from fishers and two interviews with shellfish processors. There were a minimum of fifty-four unique responses, representing at least forty-nine different fishing vessels from across the Outer Hebrides, giving a total response rate of approximately 22%. Of the one-hundred-and-forty-three CLP derogations issued, forty-three were represented by respondents giving a response rate of 30% of possible participating vessels. Respondents ranged from the Isle of Vatersay in the south to Stornoway in the north of the Isle of Lewis, with over 80% of survey and interview respondents having derogations to fish within the pilot area.

## **Key Recommendations**

From the feedback given by the many respondents, the following recommendations should be considered:

- Reassess and potentially further reduce the creel limits taking into account differences between *Nephrops* and crab/lobster creeling.
- Explore the potential to expand the pilot area to incorporate fishing grounds on the west coast of the Outer Hebrides.
- Up-to-date stock assessments are required for brown crab (*Cancer pagurus*) but also would be beneficial for velvet swimming crab (*Necora puber*) and European lobster (*Homarus gammarus*).
- Track all vessels operating within the CLP area.
- A more responsive approach to the policing of the creel limits by Marine Scotland to ensure fishing effort is reduced and conflict is mitigated.
- An overall cap on fishing effort within the pilot area should be considered to ensure that stocks are not over-exploited.
- Continued co-management of the fishery between the RIFG and Marine Scotland, with additional intervention drafted in for matters beyond the local jurisdiction.
- Long-term monitoring of creel limitation through vessel tracking and catch and landings data to develop more dynamic management measures and provide an evidence base for fishers.

## Introduction

This research and evaluation project presents the findings of the survey made into the operational implications and socio-economic impacts of the Outer Hebrides Creel Limitation Pilot on fishers.

The operational Implications include any changes made to a fisher's regular fishing activity, including:

- Fishing location
- Distance travelled
- Number of creels deployed
- Soak times
- Trip times
- Number of fishing days per week

The socio-economic impacts on fishers were evaluated and included perceptions of changes to:

- Gear conflict
- Personal Well-being
- Health and Safety
- Income and Expenditure
- Shellfish Stocks and landings

The Outer Hebrides Creel Limitation Pilot (CLP) was implemented by Marine Scotland between the 5<sup>th</sup> of November 2020 and the 31<sup>st</sup> of October 2022. Feedback from fishers impacted by the CLP was also sought to better understand the consultation process and how it could be adapted in the future. From the outset, this research was undertaken in a qualitative capacity due to the difficulties in quantifying any socio-economic changes with the backdrop of the EU exit, the COVID-19 pandemic, and the cost-of-living crisis.

## Background to the CLP

In December 2020, the Scottish Government published the Fisheries Management Strategy for 2020 – 2030. The strategy recognises the important relationships already established between Marine Scotland, fishers and the wider community. A major theme of the strategy is to continue to strengthen these relationships through co-management of the fisheries to enable local issues like gear conflict and increasing fishing effort to be tackled using a bottom-up approach by devolving decisions to the Regional Inshore Fisheries Groups (RIFGs). The RIFGs, established in 2016, are non-statutory organisations, seeking the improvement of inshore fisheries management through localised management projects. There are five RIFGs in Scotland; The North and East Coast RIFG, The West Coast RIFG, Orkney Sustainable Fisheries, Shetland Shellfish Management Organisation and the Outer Hebrides RIFG (OHRIFG). (The Scottish Government, 2020).

Of Scotland's 2,082-strong active fishing fleet, 975 (47%) fish predominantly with creels, making it the most populous fishing method in Scotland. The vast majority of creeling vessels are less than 10m in length. Creels, also known as pots or traps, are typically baited to catch a variety of shellfish including European lobster (*Homarus gammarus*),



brown crab (*Cancer pagurus*), velvet-swimming crab (*Necora puber*) and Norway lobster (also known as *Nephrops* or langoustine *Nephrops norvegicus*). The creel fishing sector caught nearly 14,000 tonnes across all species of shellfish in 2021 with a total value of £57.6 million (Marine Scotland, 2022).

In 2017, Marine Scotland released the latest Creel Fishing Effort report, detailing creel use around Scotland to gauge the quantity of effort and inform any management schemes going forwards. As part of this study, researchers interviewed creel fishers on their primary concerns. The most widespread worry was that of gear saturation, whereby the number of creels being fished was so high that fishers were unable to redeploy their creels elsewhere or rest the grounds (Marine Scotland, 2017b). Discontent was expressed over creels being used to ‘hold the grounds’, deliberately keeping away competitors that would want access to the ground whilst a fisher is elsewhere. Associated with gear saturation, is the potential for overfishing shellfish stocks. Another primary concern was that of conflict between creel fishers and mobile gear fishers (e.g. trawlers or scallop dredges), exasperated by the number of creels in the water, giving rise to incidents where strings of creels and associated catch are lost (Marine Scotland, 2017b).

To address these issues, two methods of management were discussed in the 2017 fishing effort study. The first was that of spatial management of static gear either through the introduction of seasonal closures or static-only areas. Whilst some support was found, spatial management was largely unpopular amongst interviewees, with concerns over displacement, enforcement and business viability. The second option was to manage fishing effort through the setting of creel limitations. A much larger proportion of creel fishers from the east and west coast of Scotland favoured a creel limitation scheme, though there was some disagreement on how the limits should be decided (Marine Scotland, 2017b). Concluding remarks suggested that, because of the diversity in fishing practices within the static gear sector around Scotland and the highly localised nature of the conflict, regional management is necessary.

Creel limitation schemes are not new and have been trialled elsewhere in the world, in places such as Australia, Alaska and Europe. In 1984, a pot limitation was trialled on the Southern Zone rock lobster fishery in South Australia. Pot limits were reduced by 15%, to a minimum of 25 and a maximum of 80 pots. Analysis of the pot reduction found that it was successful at reducing fishing effort, however, the reduction in effort was not proportional to the reduction of pots due to ‘input substitution’. Some fishers chose to offset the effect of the limitation by hauling pots more frequently (Staniford, 1987). In the Bristol Bay red king crab fishery, the dramatic increase in fishing effort between 1986 and 1990 saw the number of pots registered to the fishery more than double. This led to economic investigations, via simulation, of two different pot limit regimes to determine if a pot limit could increase season length (Greenberg and Herrmann, 1993). The finding was that fixed pot limits lead to greater disparity between vessels of different sizes than proportional pot limits, where larger vessels lose harvest share and smaller vessels gain. Only marginal extensions were found for season length under either regime.

More recently, the pot and trap octopus fishery of southern Portugal sought to explore co-management through a series of 7 workshops with stakeholder groups, representing fisheries management, research institutions and fishing associations. The project aimed

to create an environment where knowledge could be pooled towards a common goal of implementing sustainable management of the octopus fishery. Amongst other management controls, gear limits were proposed and discussed (Sonderblohm *et al.*, 2017). The outcome of stakeholder engagement favoured a seasonal closure as pot limits were already in place with inadequate policing, though the project itself presents a suitable framework for co-management in a small-scale fisheries context with which lessons can be learned. In their case, a detailed management plan with regular assessment of the agreed strategies was recommended. Management plans facilitate the necessary organisation required to enable stakeholder groups to coordinate on agreed management strategies. Possible management actions were identified by fishers and stakeholders collectively using the 'Strengths, Weaknesses, Opportunities and Threats' (SWOT) methodology to provide insight and recommendations on the proposals (Sonderblohm *et al.*, 2017).

In the UK, a pot limitation scheme is currently being trialled in Northumberland. The Northumberland Inshore Fisheries Conservation Authority (NIFCA) have imposed permits and limits of 800 pots on all commercial shellfish vessels under 12m (NIFCA, 2022). All pots for commercial and hobby fishers must be identified using simple plastic tags. A presentation by Michael Hardy of the Northumberland Sea Fisheries Committee (NSFC) at a conference in May 2010 suggested that in its first year, the NSFC had issued permits to 120 fishers and removed more than 100 untagged pots (Hardy, 2010).

In keeping with the theme of co-management, the proposal for a creel limitation scheme was developed by the OHRIFG. The Outer Hebrides represented an appropriate location for which to trial creel limitation. The Outer Hebrides RIFG is cohesive with strong, active leadership, willing to commit to the trial, providing both a suitable model and scale for which a creel limit could be piloted. Equivocal evidence also pointed to rapidly declining crab stocks. Stakeholders suggested in the Consultation on Proposed Sites to Host Inshore Fisheries Pilots 2017, that in the Outer Hebrides, the tendency towards gear saturation and conflict has been steadily increasing over the last couple of decades (Marine Scotland, 2017a). The proposal was met with strong support and consequently, plans to launch a creel limitation pilot scheme were agreed upon between Marine Scotland and the OHRIFG (Marine Scotland, 2017a) with monitoring subcontracted to scientists at the University of St Andrews.

A visit to observe the pot limits in Northumberland was made by several fishers from the Outer Hebrides. Additionally, correspondence between Marine Scotland and officials in Northumberland suggested that their pot tagging scheme had been challenging to enforce and therefore pot tagging was not put forward for this pilot, though the marking of fleets would be mandatory. In June 2019, members of the OHRIFG, along with the Western Isles Fishermen's Association (WIFA), Marine Scotland and several other fishery associations, agreed to the creel limits allocated to each vessel size (Table 1) and discussed the pilot area boundaries, noting that the area was smaller than on the original proposal (OHRIFG, 2019).

**Table 1) Upper limits are given for different vessels of different size classes.**

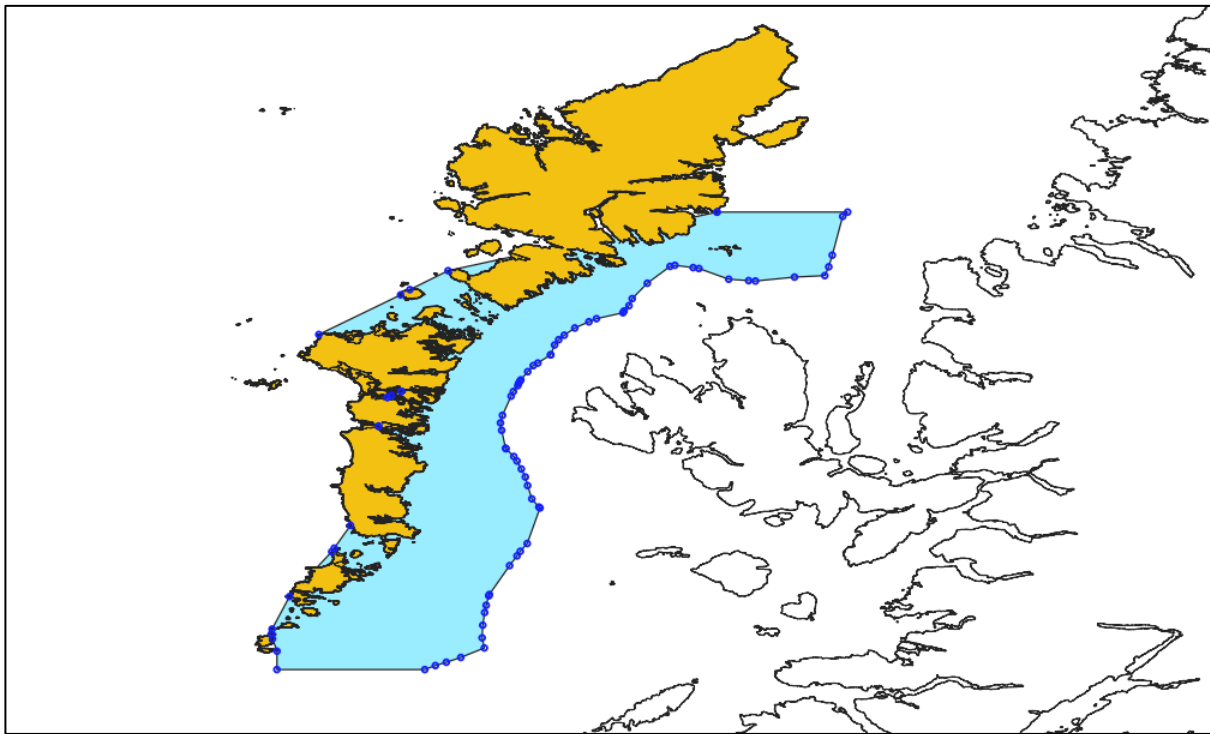
| Vessel Size Class | Maximum Creel Limit | Maximum soak time |
|-------------------|---------------------|-------------------|
| <8m               | 800                 | 3 weeks           |
| 8-10m             | 1200                | 3 weeks           |
| 10-12m            | 1500                | 3 weeks           |
| >12m              | 1800                | 3 weeks           |

### **The Outer Hebrides Creel Limitation Pilot**

The Outer Hebrides Creel Limitation Pilot (CLP) commenced on the 5<sup>th</sup> of November 2020 and came to an end on the 31<sup>st</sup> of October 2022. Its main aims were to:

1. Reverse the declines in shellfish stocks.
2. Reduce fishing effort.
3. Investigate an option to modernise vessel tracking in the inshore fleet (part of the Outer Hebrides Early Adopters Pilot).
4. Examine fisheries management, on a local scale (Bell *et al.*, 2022).

The pilot hoped to tackle gear conflict, prevent 'holding of the grounds', improve health and safety and increase catch return documentation through the development of a purpose-built mobile phone application (App). A designated pilot area was specified (Figure 1), and 143 derogations to fish within the area were issued. Participants were to not exceed the limit on the number of creels according to their vessel length or the agreed soak times (Table 1) and acknowledged that Marine Scotland may wish to fit a tracker to their vessel.



**Figure 1)** The designated Creel Limitation Pilot area (shown in blue), spanning the east coast of the Outer Hebridean Islands and much of The Minch. Created on QGIS by Dr Anna Mujal-Colilles. Coordinates were taken from [Outer Hebrides Inshore Fisheries Pilot - Year 1 Report](#).

In May 2022, The Outer Hebrides Inshore Fisheries Pilot Year One Report was released. At the time of reporting, mixed feedback had been given, with improvements seen in the reduction of gear conflict and lessened time spent at sea but expressed concern over infringements of the cap on soak times and the holding of grounds. Despite the concern, fishers have not reported any observations of this to Marine Scotland (Bell *et al.*, 2022). More pressing issues raised in the Year One Report were the potential displacement of vessels both within and outwith the pilot area and the decrease in brown crab landings.

More recently, additional pressures have surfaced for the fishery. The Marine Conservation Society (MCS) down-rated Scottish west coast crab and lobster caught in pots, traps and creels as ‘Fish to avoid’ in their UK guide to sustainable seafood, known as the ‘Good Fish Guide’ (MCS, 2022b, 2022a; McVeigh, 2022). The reasons given include not having any formal management in place, no recent stock assessments, no quota system and the potential underreported entanglements of marine megafauna connected to creeling activities (MacLennan *et al.*, 2021). Whilst these problems have only recently come to light, they are long-standing issues. It is hoped that the CLP can begin to address them; reducing the amount of gear on the grounds should reduce the risk of entanglements, as well as capping fishing effort to ensure the sustainable management of shellfish stocks.

Evidence provided in the CLP year one report included an assessment of landings before and during the first year of the pilot which was restricted to data from 2017 onwards because records prior to 2017 were considered inadequate for analysis. This represents a relatively short timeframe for detecting and attributing cause to changes in landings.

The pilot formally started in November 2020 which was during the period of COVID lockdown restrictions and followed Brexit in January 2020. These circumstances are likely to have caused perturbations in both the supply and demand for shellfish from this fishery and compound the challenges of trying to tease out changes to the fishery that may have been linked to the CLP. In addition, evidence of estimated numbers of creels deployed during the first year of the CLP suggested that many fishers were already fishing at or well below the limits set for their vessels. As a result, Marine Scotland, together with the research team at the University of St Andrews, agreed to use a different methodology involving primary data collection through interviews and a survey in order to better understand the pilot and its impacts.

### **Aims of the study**

The purpose of this study was therefore to research and evaluate whether the CLP has been successful in meeting its aims by way of a targeted online survey and face-to-face interviews with stakeholders. This project sought to gather feedback on the consultation process, determine the operational implications to fishers, and the socio-economic impact on participants and the wider community. More specifically, the goals were to:

1. Gather feedback from stakeholders on the consultation, preparation and implementation processes undertaken to facilitate the CLP.
2. Determine changes to operational patterns as a direct result of the CLP. This includes changes made to fishing locations, the number of creels, soak times, distance travelled, trip duration, fishing days per week, policing and perception of other's operational activities.
3. Assess the socio-economic implications of the CLP through investigations on:
  - a. Possible economic changes to income and expenditures and willingness to reduce creel numbers.
  - b. Possible social impacts for:
    - i. Gear conflict between static gear fishers and also between static and mobile fleets, both inside and outwith the pilot area.
    - ii. Health and safety implications related to the changes in fishing activity, both positive and negative.
    - iii. The well-being of fishers and wider communities by looking at changes to business sustainability, quality of life, mental health and physical health.

## **Materials and Methods**

### **Target Audience**

The data collection was directed towards all parties that may have been impacted by the CLP. This included static gear CLP participants and non-participants, either skippers or crew, mobile gear fishers, and key stakeholders such as seafood processors. The wide remit for this survey was to encourage as many respondents as possible to participate in the study and allow for the possibility of potential wide-reaching social and economic impacts.

### **Survey Design**

The survey was designed and distributed using Qualtrics<sup>XM</sup> software version 06:10/2022 (Qualtrics, 2005). Questions were broken down into several sections. The first gathered some essential information about the participant (e.g. plate number, homeport, target species and years of fishing). Following this were sections addressing changes in fishing activity, levels of gear conflict, well-being and economic situation as a result of the CLP. Lastly, there was a section where feedback could be provided on the implementation and details of the pilot. A variety of question types were included to help maintain interest, including multiple-choice, free text, Likert-type and rank order. The survey duration was predicted at 12.6 minutes and was reviewed by academics at the University of St Andrews, social researchers at Marine Scotland and the secretary of the Western Isles Fishermen's Association (WIFA) before distribution. The online survey can be found in Appendix 1.

### **Interview Design**

It is suggested that longer surveys result in higher proportions of drop-off where surveys are started but go unfinished. Indeed, in their handbook, Qualtrics recommends keeping surveys to less than 15 minutes on a computer and 7 minutes on a mobile device to prevent high drop-offs (QualtricsXM, 2019). As a result, the online survey component of the project was concise to cover the different aspects of the project brief in a limited number of questions. To gain additional information, a semi-structured interview was also designed for fishers and processors. This was expected to flesh out the gaps in the survey data by allowing interviewees to expand on why they hold their opinions and to prompt lines of questioning that were not included in the online survey. Additional themes curated into the interviews included health and safety, relationships between fishers, changes to shellfish stocks and concerns for the industry. The semi-structured interviews for fishers and processors can be found in Appendix 2 and 3 respectively.

### **Survey Distribution and Interview Sourcing**

Surveys were distributed in several ways, predominantly via a series of emails to WIFA members between the 16<sup>th</sup> of July and the 17<sup>th</sup> of September 2022 over 9 weeks. The email contained a weblink for the survey and information about the prize draw to incentivise participation. Face-to-face interviews were conducted exclusively on a field trip to the Outer Hebrides by the research team from the 17<sup>th</sup>-22<sup>nd</sup> July 2022. Potential interview participants were opportunistically approached by members of the research team either at a pier side, harbour or at one of three WIFA fisheries meetings that took place across the islands during the visit. Researchers began interviewing in Barra and Vatersay, working their way progressively north through the Uists and Benbecula and

ending in Harris and Lewis, giving a broad geographic spread to the interview participants. For those that did not wish to be interviewed, a flyer with a QR code, detailing the online survey was given. Interview and survey participants were provided with participant information and given the opportunity to ask any questions and then to provide their consent. Further consent was required for interviewees that agreed to have their interviews recorded on an audio recording device for subsequent transcription and analysis. Advertising campaigns for the survey and interview work were limited by time, budgets and communication channels, therefore it was not possible to target fishers that own vessels not registered to the Outer Hebrides, but fish in Hebridean waters.

The project was approved by the School of Biology Ethics Committee on behalf of the University Teaching and research Ethics Committee at the University of St Andrews (UTREC) (Approval Code: BL16415).

## Data Analysis

Audio files from the face-to-face interviews were auto-transcribed using the transcribe function in Microsoft® Word for Microsoft 365 MSO (Version 2212 Build 16.0.15928.20196) and Caption.Ed software (2.2.6) and cross-checked by a researcher to ensure accurate transcription. Online survey data were downloaded from Qualtrics and analysed using Microsoft® Excel® for Microsoft 365 MSO (Version 2212 Build 16.0.15928.20196) and RStudio (R Core Team, 2019). Percentages for answers to multiple-choice answer questions were calculated. Percentages have been rounded to the nearest whole number in the text. For open-ended questions, responses were coded into themes and tabulated by the researchers. For rank order questions, the average rank for each item was calculated to give a definitive order from the cohort of survey participants. Transcribed interviews were analysed using the qualitative data analysis software NVivo 1.7 (1533) (QSR International, 2022). For each interview, the participant was designated certain attributes, including location, fishery, gear type and whether they were participating in the CLP or had a University of St Andrew (USTAN) tracker on their vessel. Next, the interviews were coded into a variety of themes, defined *a priori*, consisting of the project aims, plus any additional themes that emerged from the interviews for thematic analysis. The codes were refined and the codebook detailing the final coding framework can be found in Appendix 4. Any quotations used within this report have been paraphrased and anonymised to prevent recognition.

In some instances, it was appropriate to test if there was a significant relationship between two variables (such as the species fished and the location of a fisher in the Hebrides) to better understand the nature of the fishery and how that might influence responses. Fisher's Exact Tests were used to test for independence between two categorical variables, where the assumptions could not be met for Chi<sup>2</sup> Tests. The general formula to calculate a p-value using a Fisher's Exact Test on a 2x2 contingency table is illustrated below (1) whereby **a**, **b**, **c** and **d** are the four cell counts in the contingency table, **n** is the total (**a+b+c+d**), and **p** represents the p-value.

$$p = \frac{(a+b)!(c+d)!(a+c)!(b+d)!}{a!b!c!d!n!} \quad (1)$$

Fisher's Exact Testing uses the marginal values of the contingency table to compute the probability that the values could be more extreme. Statistical significance and, therefore, a dependency between the two variables is determined if  $p < 0.05$ .



## Results

### About the respondents

A total of thirty-nine usable survey responses were gathered, along with twenty-six interviews with fishers and two interviews with seafood processors. A total of eight fishers completed both an online survey and an interview so the total number of unique responses was at least fifty-four and represented at least forty-nine different vessels (though the actual numbers are uncertain due to a few unspecified plate numbers). There are two-hundred-and-twenty registered and licensed vessels in the Outer Hebrides giving an overall response rate of approximately 22%. A number of static gear vessels are likely to have been inactive during the survey period for a variety of reasons including elderly ownership and skippers working offshore etc., therefore the actual response rate for active vessels would likely be higher. A total of forty-three CLP derogations were represented by survey and interview respondents, giving a response rate of 30% of possible vessels participating in the CLP. Survey and interview respondents came from across the Outer Hebridean islands, ranging from the Isle of Vatersay in the south to Stornoway on the Isle of Lewis in the north.

Of the survey respondents, 87% were participating in the CLP and had derogations to fish within the pilot area. The majority of survey respondents were from the central islands of Uists, Benbecula or Eriskay (Table 2). Most had been fishing for 10 to 30 years and had vessels under 8m in length. A third of survey respondents target crab and/ or lobster and over a third of respondents target something additional to crab and/or lobster and *Nephrops*. The majority of the other species fished for were crayfish (*Palinurus elephas*) and wrasse (family *Labridae*), though one survey respondent targets dogfish (family *Squalidae*), turbot (*Scophthalmus maximus*), skate (family *Rajidae*) and tope (*Galeorhinus galeus*) and another targets king scallops (*Pecten maximus*). Similarly, 82% of the interview respondents were participating in the CLP. The majority are from Harris, Lewis and Scalpay. Most had been fishing for between 10 and 30 years, targeting crab and/ or lobster with *Nephrops* and owned vessels between 8m and 10m in length (Table 2). Less than a third fished for other species, including crayfish, wrasse, and scallops. There is no relationship between the island grouping and the fisheries that reside on those islands (Fisher's Exact Test:  $p=0.25$  |  $n=55$ ).

**Table 2) Features of the survey respondents (n=39) and interview respondents (n=28).**

| Response Features | Feature groupings                          | Survey Response count | Survey Percentages (%) | Interview Response count | Interview Percentages (%) |
|-------------------|--------------------------------------------|-----------------------|------------------------|--------------------------|---------------------------|
| Location          | Lewis, Harris & Scalpay                    | 15                    | 38.46                  | 13                       | 46.43                     |
|                   | Uists, Benbecula & Eriskay                 | 16                    | 41.03                  | 9                        | 32.14                     |
|                   | Barra & Vatersay                           | 7                     | 17.95                  | 6                        | 21.43                     |
|                   | Unknown                                    | 1                     | 2.56                   | 0                        | 0.00                      |
| Years fishing     | <10                                        | 8                     | 20.51                  | 7                        | 25.00                     |
|                   | 10 to 30                                   | 17                    | 43.59                  | 11                       | 39.29                     |
|                   | >30                                        | 14                    | 35.90                  | 8                        | 28.57                     |
|                   | NA                                         | 0                     | 0.00                   | 2                        | 7.14                      |
| Target Species    | <i>Nephrops</i>                            | 3                     | 7.69                   | 5                        | 17.86                     |
|                   | Crab &/ or lobster                         | 13                    | 33.33                  | 6                        | 21.43                     |
|                   | Crab &/or lobster & <i>Nephrops</i>        | 9                     | 23.08                  | 9                        | 32.14                     |
|                   | <i>Nephrops</i> & other                    | 0                     | 0.00                   | 1                        | 3.57                      |
|                   | Crab &/ or lobster & other                 | 7                     | 17.95                  | 3                        | 10.71                     |
|                   | Crab &/or lobster, <i>Nephrops</i> & other | 7                     | 17.95                  | 4                        | 14.29                     |
|                   | NA                                         | 0                     | 0.00                   | 0                        | 0.00                      |
| Participation     | CLP Participant                            | 34                    | 87.18                  | 23                       | 82.14                     |
|                   | Non-participant                            | 5                     | 12.82                  | 3                        | 10.71                     |
|                   | NA                                         | 0                     | 0.00                   | 2                        | 7.14                      |
| Vessel Length     | <8m                                        | 17                    | 43.59                  | 8                        | 28.57                     |
|                   | 8-10m                                      | 13                    | 33.33                  | 9                        | 32.14                     |
|                   | 10-12m                                     | 2                     | 5.13                   | 6                        | 21.43                     |
|                   | >12m                                       | 2                     | 5.13                   | 2                        | 7.14                      |
|                   | NA                                         | 5                     | 12.82                  | 3                        | 10.71                     |

In interviews, some respondents shared more about the characteristics of the fishing grounds around the Outer Hebrides. They reported that on the east coast and within the pilot area, the predominant creel fishery is for *Nephrops* with some areas of good crab ground. On the west coast, the predominant fishery is for crab and lobster

though creeling is prohibited on the west from Barra head to the Harris Protected Area during the winter to allow the grounds to rest<sup>1</sup>.

### Key findings from the study

The first section below covers the key findings related to the consultation and implementation process. This includes why participants and non-participants showed interest in the CLP as a project co-managed by the OHRIFG and Marine Scotland, and also their suggestions for improved management. The second section presents feedback on the operational implications of the CLP and details how some fishers altered their

<sup>1</sup> [National Marine Plan Interactive - areas where creel fishing is restricted.](#)

practices as a response to the CLP derogation rules. The findings of the social impacts are then presented, including details of gear conflict, well-being and health and safety, followed by the economic implications, including income and expenditure, market prices, operational costs and shellfish stocks. The following section documents the opinions of two seafood processors located in the Outer Hebrides and whether they noticed the effects of the CLP on their business, and the final section documents other concerns listed by the interview respondents. For a discussion of the significance of the results, please see the section titled: 'Discussion'.

## **Feedback on the consultation, preparation and implementation process**

### **Key findings**

- 66% of survey respondents and 73% of interview respondents attended a consultation event.
- The main reasons for survey respondents showing interest in the CLP were to improve CPUE, to encourage responsible management of the fishery and to prevent a holding of the grounds. Interviewees were interested in lowering fishing effort and promoting sustainability of the fishery.
- The most cited suggestion for management from both interviewees and survey respondents were to further reduce the creel limits and expand the pilot area to include the west coast, encompassing crab and lobster grounds.

Survey and interview respondents were asked a variety of questions regarding the implementation process of the CLP. These questions were focussed around the attendance of consultation events, whether the pilot was something that they were interested in and why. This helped the researchers to gauge what are the priorities for fishers in the Outer Hebrides. Respondents were also asked to provide feedback on the CLP and offer suggestions for its improvement. Suggestions for management ought to be reviewed in detail by the co-management partnership.

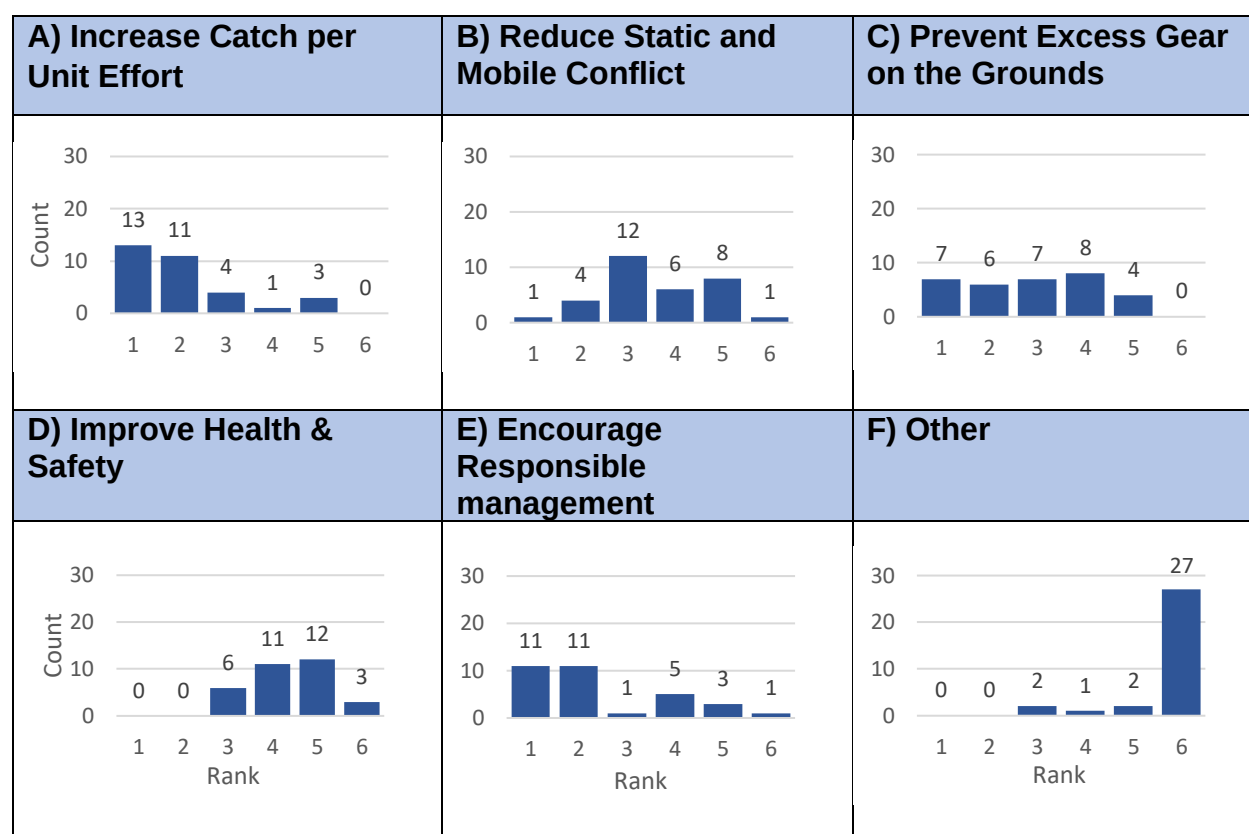
### **Consultations**

Of the survey respondents (n=39), 44% had completed a Marine Scotland consultation response for the CLP and 66% had attended a consultation event before the CLP began. Of the interviewees, nineteen of the twenty-six fishers (73%) had attended a consultation event. Processors had not been invited to the consultations. The survey respondents that did attend a consultation event were asked if they felt that their views and opinions had been heard or acted upon. Of that cohort, 75% said that they felt their views and opinions were heard and acted upon (n=24). The remaining 25% disagreed. Of the six participants that disagreed, three gave suggestions of what they would like to have seen, including a tag system akin to the creel limitation in Northumberland, more severe restrictions for hobby fishers and a uniform limit of one-thousand creels per vessel.

### **Interest**

Whilst interest in a creel limitation scheme was assumed for those who participated, of those survey participants that were not taking part in the CLP (n=5), 100% said that they supported the pilot and its aims.

In the survey, both CLP participants and non-participants were separately asked to rank the aims of the survey to show their primary reasons for showing support for the CLP. The overall ranks were calculated by averaging the responses to get an average rank for each reason. Of the pilot participants in the survey, the most frequently picked reason for supporting the pilot was to ‘increase catch-per-unit-effort’ (CPUE), followed in second place by the ‘encouragement of responsible management for the fishery’. ‘To prevent gear being placed on the grounds to prevent others from fishing’ was ranked third overall (Figure 2). For those that listed ‘other reasons’ (n=6), the most frequently listed reason was to keep large or nomadic vivier vessels (often working thousands of creels) out of the fishery. The issues surrounding vivier vessels will be discussed in more depth in ‘Social Implications: Gear Conflict’.



**Figure 2)** The frequency at which each reason was ranked in terms of why the CLP was supported by CLP participants. Items were ranked from 1-6 with a rank of 1 being the most important reason for supporting the CLP and 6 being the least important, with rank along the X axis and response count along the y axis. (n=32). The ranks were averaged to give a definitive overall ranking.

Of the five fishers that were not participating in the CLP, four ranked their primary reasons for their support. Non-participants ranked ‘encouragement of the sustainable management of the fishery’ as their primary reason for support. ‘To prevent gear being placed on the grounds to prevent others from fishing’ and to ‘increase catch-per-unit-effort’ had the same average ranked score, making them joint second in terms of priorities. Of the interview respondents, 88% of fishers (n=26) said that they were interested in a creel limitation scheme. The reasons given by interviewees are presented

in Table 3. The majority of interviewees were interested in the CLP because they wanted to see reduced fishing effort and sustainability in their fishery.

**Table 3) Those interviewees that were interested in the CLP were asked an open-ended question about why they were interested. The coded reasons are below. (n=23).**

| <b>Code</b>                  | <b>Code Description</b>                                                                                                                                                               | <b>Number of Interviewees</b> |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Less Creels</b>           | Interviewees were interested because they wanted to see less gear being used and fishing effort reduced.                                                                              | 7                             |
| <b>Future Sustainability</b> | Interviewees were interested in a creel limitation scheme because they want to ensure that the fishery will be sustainable in the future.                                             | 6                             |
| <b>Taken a long time</b>     | Interviewees expressed an interest when the proposals were drawn as they had been hoping for a creel limitation scheme for approximately 20 years.                                    | 3                             |
| <b>Next Generation</b>       | Interviewees were keen to ensure that the fishery was viable for the next generation, sometimes expressing a desire for their children to also become fishers.                        | 3                             |
| <b>Larger vessels</b>        | Interviewees specifically desired to see fewer creels allowed for larger vessels.                                                                                                     | 3                             |
| <b>Gear Saturation</b>       | Interviewees were interested in tackling the issue of gear saturation.                                                                                                                | 3                             |
| <b>Necessity</b>             | Interviewees were interested because they felt 'something had to be done'.                                                                                                            | 2                             |
| <b>Improve stocks</b>        | Interviewees were interested in a creel limitation scheme to improve stocks.                                                                                                          | 1                             |
| <b>Community</b>             | Interviewees acknowledged that fishing is an important part of the small self-sufficient community in the Outer Hebrides and wanted to utilise the fishery to preserve the community. | 1                             |
| <b>Control</b>               | Interviewees were interested in a creel limitation because they desired to see stricter controls on the industry.                                                                     | 1                             |
| <b>Security</b>              | Interviewees were interested in the creel limitation because they think it might help with job security and business viability.                                                       | 1                             |

### **Management suggestions**

When asked to provide suggestions on anything that could have been done differently at the consultation, preparation or implementation, the two main recommendations by fishers were to further reduce the creel limits and to extend the pilot area around the west coast (Table 4). It should also be noted that amongst the suggestions, positive feedback was also recorded. Of the survey respondents, 87% said they would be willing to accept a lower creel limit (n=39). Of the interviewees, 73% said that they would be willing to accept a lower creel limit if scientific evidence could prove that it makes fishing more sustainable (n=26).

**Table 4) Coded suggestions given for improvements to the consultation, preparation and implementation processes for the CLP. Survey and interview responses have been combined. (n=30).**

| <b>Code</b>                           | <b>Code Description</b>                                                                                                                                                                             | <b>Number of Respondents</b> |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>Reduce creel limit</b>             | Respondents felt that the agreed creel limit was too high and needs lowering. Some suggested lowering the limits for larger vessels only.                                                           | 11                           |
| <b>Increased area</b>                 | Respondents would like to see the pilot area extended. One reason given is to keep vivier crabbers away from the west coast.                                                                        | 10                           |
| <b>Improved policing</b>              | Respondents were dissatisfied with policing and desired to see something done about those that flaunt the rules.                                                                                    | 7                            |
| <b>Limits on permits</b>              | Respondents felt that having additional vessels on their grounds undermined the benefits of the creel limitation and would like to see limits on the number of permits.                             | 7                            |
| <b>1000 pot limit</b>                 | Respondents felt that an alternative arrangement of 1000 creels per vessel, regardless of vessel size or fishery type would be a better model.                                                      | 6                            |
| <b>Area/ Species Specific</b>         | Respondents felt that the limit might need to be adjusted for different areas/ different fisheries.                                                                                                 | 6                            |
| <b>Date Extension</b>                 | Respondents felt that the Creel Limitation should be temporally extended beyond October 2022.                                                                                                       | 4                            |
| <b>Regulations on other fisheries</b> | Respondents reported ongoing issues with other fisheries and suggested that they also have some regulations, for example, limits on where trawlers can fish.                                        | 3                            |
| <b>Responsiveness</b>                 | Respondents were frustrated with how long it took to get the scheme going or are concerned that it may need to be more responsive in being adapted depending on shellfish stocks.                   | 3                            |
| <b>Educate communities</b>            | Respondents suggested that more education regarding the creel limitation scheme for the wider community is needed to inform unlicensed leisure boaters and hobby fishers of management regulations. | 2                            |
| <b>Tag system</b>                     | Respondents suggested using a tag system to ensure all vessels have the same number of creels.                                                                                                      | 2                            |

|                              |                                                                                                                   |   |
|------------------------------|-------------------------------------------------------------------------------------------------------------------|---|
| <b>Evening consultation</b>  | Respondents suggested that the consultations should be in the evenings as fishers often are at sea during the day | 1 |
| <b>Gear Permits</b>          | Respondents suggested issuing permits for gear types to prevent creel fishers from switching to mobile gear.      | 1 |
| <b>Exclusion zone limits</b> | Respondents suggested exclusion zones should be changed depending on vessel size.                                 | 1 |
| <b>Quota System</b>          | Respondents felt that a quota system would be the best way of managing shellfish stocks.                          | 1 |
| <b>Crew Dependent</b>        | Respondents felt that the number of crew should be a determining factor in setting the creel limit.               | 1 |

## Operational Implications

### Key findings

- 23% of fishers made changes to their fishing activities as a result of the CLP.
- The most common change was in reducing creel numbers, though there were no clear drivers in terms of location, fishery type or vessel size, for doing this.
- 54% of interviewees said that the creel limits were too high and wanted to see them lowered.
- 65% of survey respondents believed that there had been no changes in policing despite the derogation being a legal requirement.

Survey and interview participants were asked about how the CLP had impacted their fishing operations. Specific operations that fishers were asked about included fishing location, distance travelled, number of creels, soak times, trip times and number of fishing days per week.

Of the survey respondents (n=39), nine (23%) reported making changes to their fishing activities. Of these nine respondents, all were participants in the CLP. Of the interview respondents, six fishers (23%) (n=26), have changed their fishing activities. Of those six interviewees, all were also CLP participants. The respondents that had made changes to aspects of their fishing activities were asked further questions about the nature of those changes. None of these respondents had made changes to their fishing locations or the number of days fished per week. Drivers for change were investigated only for those that reduced their creel numbers on account of small sample sizes (n<=5) for other changes.

### The main changes that were made were as follows:

#### Distance

Of the survey respondents that have changed their fishing activities (n=9), one (11%) has changed their distance travelled per fishing trip, reducing the distance by 1-10 km.

Additionally, one interview respondent reported a reduction in distance travelled. Another interviewee hypothesised that the decision to reduce the distance travelled may instead be a result of an increase in the cost of fuel.

#### Time at sea

Of the survey respondents that have changed their fishing activities (n=9), a third have decreased the amount of time spent at sea by 0-2 hours.

An additional two interviewees have also reduced the amount of time they spend at sea because they are hauling less gear.

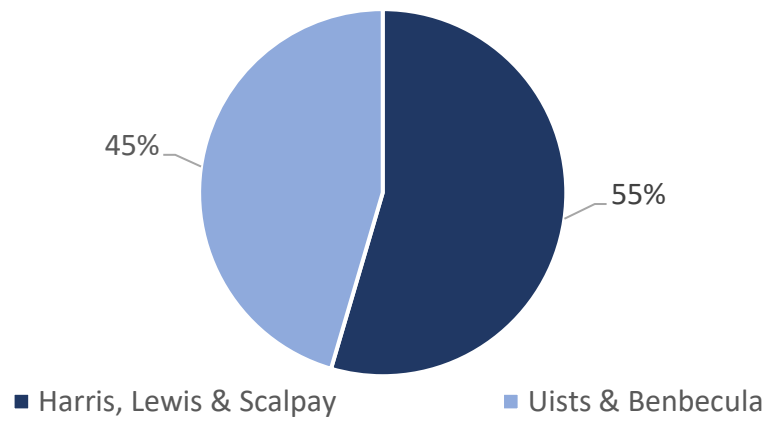
#### Creel numbers

Of the survey respondents that have changed their fishing activities (n=9), 56% have decreased their fleets by more than 50 creels.

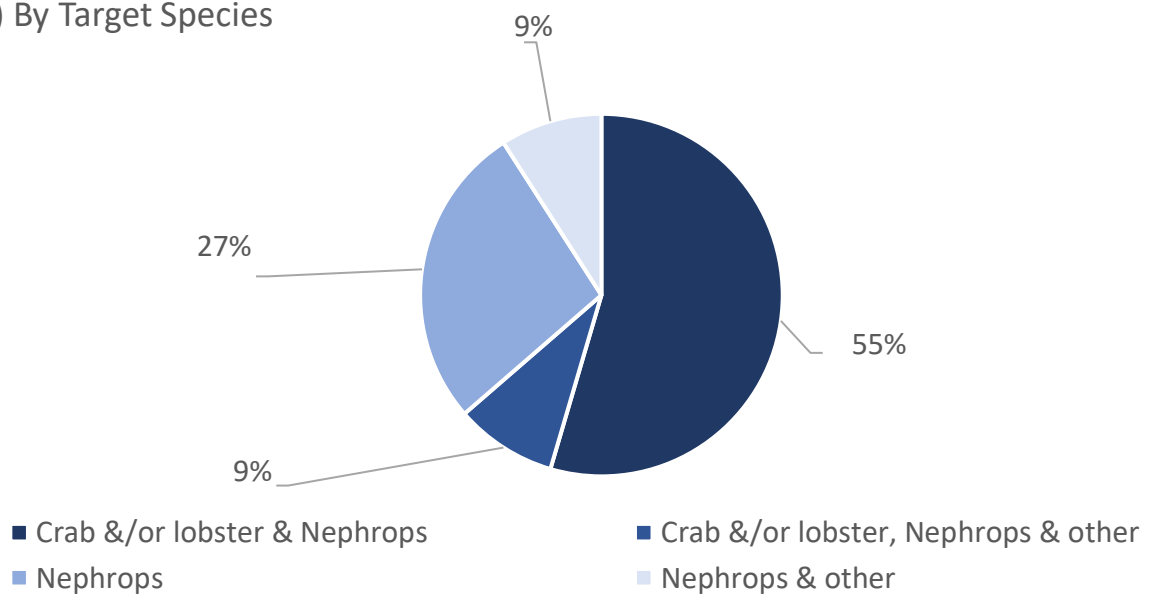
Of those interviewed, six additional respondents have reduced their creel numbers, though one did so out of preference and not as a direct result of the CLP. As this was the most popular change to operational patterns, the drivers for change, including vessel size (relating to the creel limits), target species, and a fisher's location, were explored (Figure 3). Of note, no fishers residing in Barra or Vatersay made any changes to their creel numbers. The majority of fishers that had reduced their creel numbers fish for a combination of crab and/or lobster with *Nephrops* from mid-sized vessels between 8 and 12m in length.

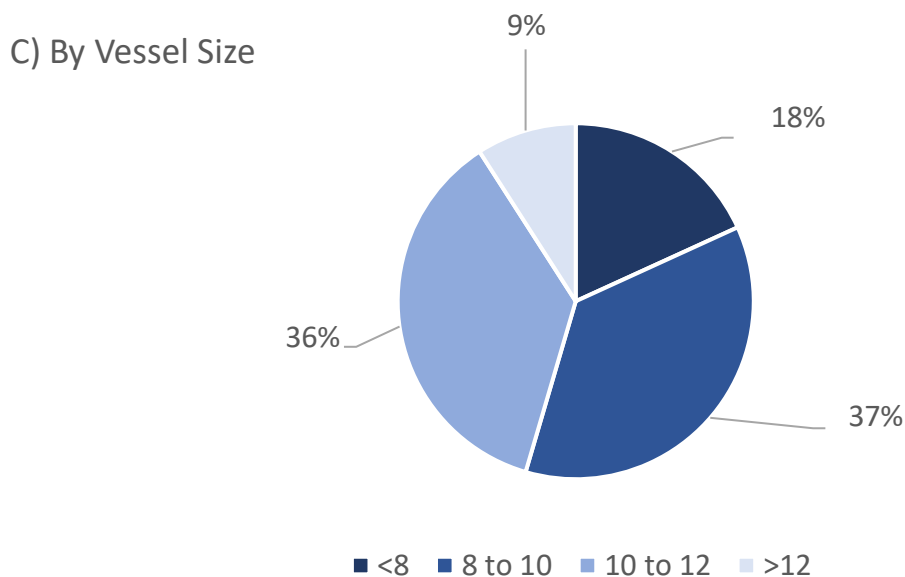


### A) By Island



### B) By Target Species





**Figure 3)** Location in the Hebrides **(A)**, target species **(B)** and vessel size (m) **(C)** were all identified as possible drivers for fishers to reduce their creel limits. (n=11).

### Soak time

Of the survey respondents that have changed their fishing activities (n=9), one fisher (11%) has reduced their soak time by more than one week.

An additional three interviewees also made changes to their soak times because of the CLP. Each adapted their soak times differently; with fewer creels, the first fisher can now haul all their creels every day, thereby reducing their soak time. Because of the CLP, the second fisher is now able to get by working a three-day week and hauling their creels every other day, though they did not mention what their soak time was before the CLP. Their adaptation of soak time, unlike the first fisher, is because the economics have improved. Similarly, the third fisher lifts all their creels on a two-day cycle, lifting four-hundred one day and the remaining two-hundred and forty the second day. Before the CLP, the third fisher would haul all their creels every day to make their business economically viable. In marginally increasing their soak times, they have reduced their effort for the same or better returns.

### Expected landings

Of the survey respondents that have changed their fishing activities (n=9), seven (78%) expect their landings to increase and two (22%) expect that their landings will stay the same. For more information on what fishers have noticed about shellfish stocks and landings because of the CLP, see 'Economic Implications: Shellfish stocks and Landings'.

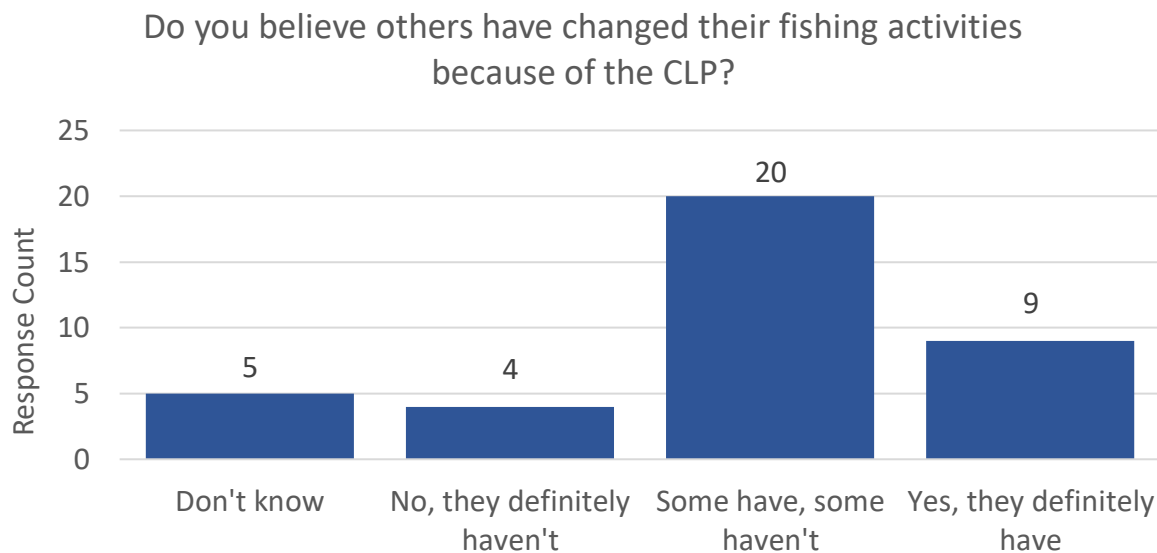
### Policing

Of the survey respondents that were participating in the CLP (n=34), six (18%) believe that policing has increased, twenty-two (65%) believed that it had remained the same and six (18%) were unsure.

### Other's fishing activities

To determine what fishers thought towards the operational patterns of their contemporaries, fishers were asked if others had made changes to their fishing

operations. Of the survey respondents (n=39), the majority assume that there has been a mixed response to the CLP, reckoning that some had changed their operating patterns and some had not (Figure 4). Of the survey respondents, twenty (53%) (n=38) believe that some fishers have changed their operations and some have not. A further nine (24%) believe that other fishers had made changes to their fishing operations. How respondents think others have adapted their operational patterns is documented in Table 5. (Two respondents answered this question in both the survey and the interviews where their answers were contradictory and so their answers have not been included in Table 5.)



**Figure 4)** Fisher's observations of the changes made to other's fishing patterns as a result of the Outer Hebrides Creel Limitation Pilot (CLP). (n=38).

**Table 5) Coded ways in which both survey and interview respondents have observed changes in the fishing patterns of others. (n=35).**

| <b>Code</b>                 | <b>Code Description</b>                                                                                                                                                                                                                  | <b>Number of Respondents</b> |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>Reduced creels</b>       | Respondents reported that they noticed some other fishers reducing their creel numbers.                                                                                                                                                  | <b>15</b>                    |
| <b>Increased creels</b>     | Respondents reported that they had noticed some other fishers increasing their creel numbers or effort, possibly to get up to the limit.                                                                                                 | <b>6</b>                     |
| <b>Displacement</b>         | Respondents reckoned that some fishers were displacing some or all of their effort outside the pilot area so that they can fish the same number of creels without breaking the regulations.                                              | <b>4</b>                     |
| <b>Reduced soak times</b>   | Respondents alluded to others lifting their creels more frequently and not leaving gear soaking indefinitely.                                                                                                                            | <b>4</b>                     |
| <b>Rule breaking</b>        | Respondents reported that some fishers are deliberately not sticking to the regulations laid out in the CLP.                                                                                                                             | <b>3</b>                     |
| <b>Less vessels</b>         | Respondents believe that some other fishers (with large vessels and many creels higher than the limit) came out of the fishery before the creel limits were enforced or moved out of their area more frequently to target other species. | <b>3</b>                     |
| <b>More space</b>           | Respondents stated that there was now more space on the grounds than previously but did not mention an individual gear reduction as the reason.                                                                                          | <b>3</b>                     |
| <b>Additional vessels</b>   | Respondents believe that some other fishers have bought an additional vessel to work their grounds or seen an uptake of new smaller vessels to gather the benefits of the CLP.                                                           | <b>2</b>                     |
| <b>Creel management</b>     | Respondents reported that some other fishers that fish different target species with different types of creel have had to remove some creels to put out a different type of creel for a different target species.                        | <b>2</b>                     |
| <b>Less time at sea</b>     | Respondents reckon that some other fishers are spending less time at sea.                                                                                                                                                                | <b>1</b>                     |
| <b>Prevent new entrants</b> | Respondents suggested that the CLP regulations have prevented some new entrants to the fishery, particularly those that would have joined with several thousand pots.                                                                    | <b>1</b>                     |
| <b>Staying east</b>         | Respondent reckons some vessels that would usually switch from fishing in the east to fishing                                                                                                                                            | <b>1</b>                     |

|                             |                                                                                                                                                                                                                |          |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|                             | on the west of the Hebrides are instead staying on the east, inside the pilot area. This could be due to better returns in the east or the increased cost of fuel making it less economical to travel further. |          |
| <b>Increased soak times</b> | Respondent suggested that soak times were longer as some others were fishing more creels and not hauling them all every day.                                                                                   | <b>1</b> |

Of the twenty-six fishers interviewed, fourteen (54%) said that the creel limits were not conservative enough, desiring to see them come down further. Many argued that the limits were so high that it did not make a difference to the number of creels in the water. There were seven respondents (27%) that felt that the limits were appropriate and one (4%) thought that the limits were too conservative, wanting to manage the number of creels without limiting them. One respondent (4%) was unsure. A respondent (4%) wanted the limits to be slightly higher for smaller vessels to allow fishers to fish different types of creels without having to take some ashore, and a lower limit for larger vessels.

Five respondents (19%) stated that they would like to see a limit of one-thousand creels regardless of vessel size and one respondent also commented on the number of crew, stating that a vessel would need one-thousand creels if it is financially supporting three or more crew members. The opinion on the creel limit was not related to the size of the vessel (Fisher's Exact Test:  $p=0.95$  |  $n=21$ ). (Respondents were asked whether they thought the creel limits were too conservative, not conservative enough or just right. When cross-referenced for those respondents that answered both the survey and interview, it was noticed that their answers were contradictory. It is assumed that this is because the question wording was unclear or misinterpreted, therefore only the interview responses where a researcher could expand on the question and check the results were analysed.)

## Social Implications

### Key findings

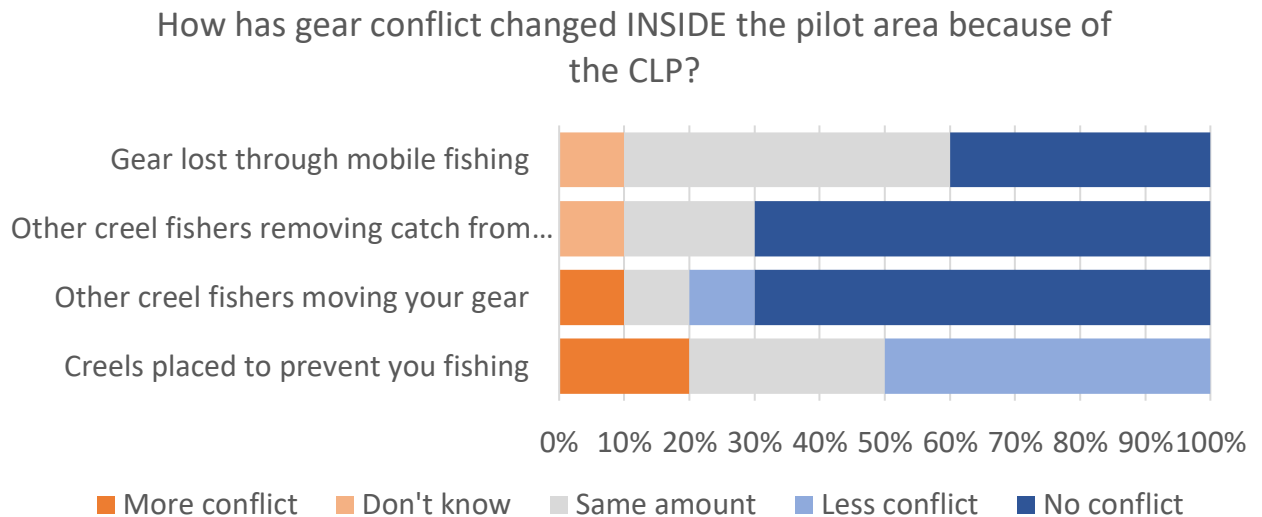
- 29% of pilot participants noticed changes to gear conflict inside the pilot area and the majority of those attributed that to less creels holding fishing grounds.
- 77% of fisher said that the CLP had not affected their levels of gear conflict outside of the pilot area.
- Conflict with vivier vessels inside the pilot area appears to have been resolved by the CLP, but displacement of vivier vessels to the west of the islands is still a concern, as is the lack of regulation and what happens once the pilot project ends.
- In terms of well-being, at least 20% of survey respondents had noticed positive changes in the six well-being indices tested for, including income and profitability, business sustainability, health and safety, quality of life, mental health and physical health.
- 46% said that reducing their creel numbers would improve health and safety by reducing time at sea, fatigue and wear and tear.

This next section explains the social Implications of the CLP. Social implications include changes to gear conflict, well-being and health and safety. 'Gear conflict' involves interactions between static gear fishers, including vivier crabbing vessels, and between static and mobile gear fishers, including *Nephrops* trawlers and scallop dredges. 'Well-being' includes changes made to income and profitability, business sustainability, quality of life, health and safety, mental health and physical health. 'Health and safety' asks whether respondents are satisfied with their health and safety under the CLP and whether they think it could be improved if creel limits were further reduced.

### Gear Conflict

Pilot Participants in the online survey reported mixed experiences in terms of gear conflict in its various forms inside the pilot area with nearly one in three (29%) reporting changes of conflict, but 68% reporting no change and 3% preferring not to say (n=34). Change in gear conflict inside the pilot area is unrelated to the number of years in which a fisher has been fishing locally (Fisher's Exact Testing:  $p=0.45$  |  $n=33$ ). The perception of change in gear conflict is also seemingly unrelated to the respondent's location in the Outer Hebrides (Fisher's Exact Test:  $p=0.88$  |  $n=32$ ).

Of the 29% that noticed a change, the majority (50%,  $n=10$ ) said that there was less gear placed on the grounds to prevent fishing inside the pilot area (Figure 5) though 20% instead noted an increase in creels being placed on the grounds. Though this is suggestive that the CLP may be working towards reducing conflict through less holding of the grounds, the sample size is too small to conclude this definitively. In terms of the different types of conflict, it appears that it is very seldom that fishers have noticed that catch has been removed from their creels. The impact to conflict with mobile gear is unchanged with four noting no conflict, five noticing the same amount of conflict and one was unsure.

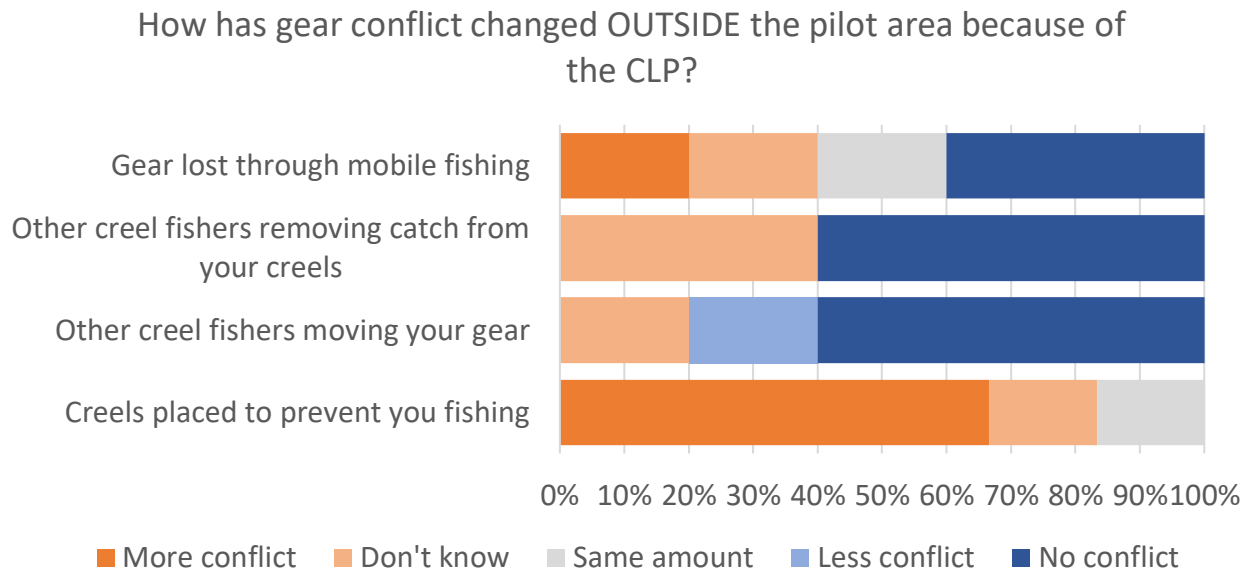


**Figure 5)** The changes noticed in the occurrences of different types of gear conflict inside the pilot area, as observed by fishers (n=10). Types of gear conflict surveyed included holding of the grounds, others moving your gear, others taking your catch and static gear lost through interactions with mobile gear.

Outside the pilot area, 15% of survey participants reported changes in the levels of gear conflict (n=39). The majority of survey respondents (77%) said that the CLP has not affected their levels of gear conflict outside the pilot area and the remaining 8% chose not to say. There is no relationship between whether a change in levels of gear conflict was noticed, and the location of a fisher (Fisher's Exact Test:  $p=0.09$  |  $n=35$ ). No relationship was found between perceived changes in levels of gear conflict outside the pilot area and the number of years a survey participant had been fishing locally (Fisher's Exact Test:  $p=0.61$  |  $n=36$ ). In contrast, within the pilot area, the change reported by most participants was that more creels are being placed on the grounds and potentially more creels are being lost to mobile fishers, though this remains speculative due to a small sample size (Figure 6). Interviewees explained the problem in more detail:

"Creels are bought because they hold the grounds. It's like buying land; fishers buy creels and put them on their fishing grounds and then leave them for months whilst they work somewhere else. Nobody else can fish those grounds, it's their area so only they benefit." – Interviewee 7

"Gear can be left lying for 3 months whilst you go and fish elsewhere and then the gear holds onto your patch. We see it most with Nephrops." – Interviewee 27



**Figure 6)** The changes noticed in the occurrences of different types of gear conflict outside the pilot area, as observed by fishers (n=6). Types of gear conflict surveyed included holding of the grounds, other's moving your gear, others taking your catch and static gear lost through interactions with mobile gear.

Non-participants, who are not taking part in the CLP (n=5), were also asked about their views on how gear conflict has changed, particularly between static and mobile gear fishers. Of the five non-participants, three fished static gear, one fished mobile gear and one did not say. Of the three static gear fishers, two said that they sometimes lose gear to mobile fishers, but they also said that the level of conflict has not changed as a result of the CLP. The remaining respondent felt that there was no conflict. The mobile gear fisher reported seeing the same amount of conflict inside the pilot area, but less conflict outside the pilot area. (n=1). Whilst all opinions are valid, the small sample sizes limit their utility.

Interviewees were also asked about their experiences of gear conflict and how it might have changed because of the CLP. As previously established, no relationship between gear conflict and location or years of fishing was established. Therefore, instead, data from the interviews was pooled into positive, negative and neutral sentiments. Feedback was mixed with many fishers giving both positive and negative views, so the arguments have been coded into sentiment-based themes (Table 6). Here, there was also no mention of other fishers taking catch from creels or lifting other fisher's gear.



**Table 6) Sentiment from interviewees regarding static-static or static-mobile gear conflict. (n=26).**

| <b>Sentiment</b> | <b>Conflict type</b> | <b>Code</b>                              | <b>Description</b>                                                                                                                                         | <b>Number of interviewees</b> |
|------------------|----------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Positive</b>  | <b>Static-Static</b> | <b>Less creels</b>                       | Respondents have noticed fewer creels on their grounds.                                                                                                    | 5                             |
|                  |                      | <b>Improvements with Vivier crabbers</b> | Respondents reported that the conflict with vivier crabbing vessels has stopped inside the pilot area.                                                     | 4                             |
|                  |                      | <b>Space on the grounds</b>              | Respondents have noticed that there is more space on the grounds to shoot their creels in different places.                                                | 3                             |
|                  |                      | <b>No holding grounds</b>                | Respondents noted conflict with other fishers in holding grounds with unused creels had stopped or reduced.                                                | 2                             |
|                  |                      | <b>Less vessels</b>                      | Respondents have noticed fewer vessels on their grounds.                                                                                                   | 1                             |
|                  | <b>Static-mobile</b> | <b>Less trawlers</b>                     | Respondents have noticed fewer trawlers in the area, though not necessarily as a direct result of the CLP. May be to do with economics or an ageing fleet. | 3                             |
|                  |                      | <b>Helped trawlers</b>                   | Respondents reckoned the creel limits have been helpful for trawlers because there was less gear on the ground.                                            | 2                             |
|                  |                      | <b>Better communication</b>              | Respondents reported better communication between mobile and static gear fishers.                                                                          | 2                             |
| <b>Neutral</b>   | <b>Static-static</b> | <b>No Issues</b>                         | Respondents did not report changes in levels of gear conflict because there were no issues with creel-on-creel conflict on their grounds.                  | 5                             |
|                  |                      | <b>Conflict persists</b>                 | Respondents believe conflict persists. This may be because the limits are so high that nothing has changed or because some                                 | 4                             |

|                 |                      |                                              |                                                                                                                                                                                                                                                                                              |   |
|-----------------|----------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                 |                      |                                              | fishers are breaking the rules.                                                                                                                                                                                                                                                              |   |
|                 | <b>Static-mobile</b> | <b>No Issues</b>                             | Respondents did not report changes in the levels of gear conflict because there were no issues with mobile gear (e.g. there are no trawlers on their grounds) or fishers have a mutual understanding.                                                                                        | 7 |
|                 |                      | <b>Conflict persists</b>                     | Respondents believe conflict with mobile gear persists. This may be because the limits are so high that nothing has changed and creels are still at risk of being entangled by mobile gear vessels.                                                                                          | 3 |
| <b>Negative</b> | <b>Static-Static</b> | <b>More vessels West</b>                     | Respondents noticed more vessels on the west coast, possibly through displacement, but could also be new entrants to the fishery.                                                                                                                                                            | 3 |
|                 |                      | <b>More creels on the west side</b>          | Respondents had not noticed any more vessels but had noticed more creels off the west coast.                                                                                                                                                                                                 | 3 |
|                 |                      | <b>Continued issues with Vivier Crabbers</b> | Respondents noted conflict with vivier crab vessels which are often nomadic and not registered Scottish vessels, operating thousands of creels and can work and travel in rougher seas than smaller local vessels. There is concern that they are responsible for the decline in brown crab. | 2 |
|                 |                      | <b>Displacement</b>                          | Respondents noticed that effort may have been displaced because of the CLP.                                                                                                                                                                                                                  | 2 |
|                 |                      | <b>More vessels East</b>                     | Respondents noticed more creeling vessels coming onto their grounds in the pilot area, bringing more creels and taking up space on the grounds.                                                                                                                                              | 1 |

|  |                      |                                     |                                                                                      |   |
|--|----------------------|-------------------------------------|--------------------------------------------------------------------------------------|---|
|  |                      | <b>More creels on the east side</b> | Respondents had noticed more creels off the east coast.                              | 1 |
|  | <b>Static-mobile</b> | <b>Trawlers inshore</b>             | Respondents noticed fishing go down when the 3nm limit was removed in the early 80s. | 1 |

In terms of relationships with mobile gear fishers, they remain largely unchanged on account of the CLP. Three pilot participants reported that they have good relationships with the mobile gear fishers and a further two said that their relationships with mobile gear fishers had improved but not necessarily because of the CLP. Improvements in communications between the two sectors had previously been made to specifically avoid conflicts. Of these five, four are from the Isles of Harris, Lewis and Scalpay.

Of the interviewees, three commented on changes to their relationships with Marine Scotland, all of whom were pilot participants (n=26). An interviewee thought their relationship with Marine Scotland had improved and a further two participants expressed a desire for Marine Scotland to do more by way of policing. There was no mention of any changes to relationships with the wider community because of the CLP, however, some fishers acknowledged that the inshore fishery around the Hebrides is crucial for the sustainability of their island communities.

Of the interview respondents, 13 also specifically mentioned their conflict with vivier crabbing vessels. The majority (seven fishers) were from Harris Lewis and Scalpay, three fishers were from the Uists and Benbecula and the remaining three were from Barra and Vatersay. Before the CLP began, respondents either experienced direct gear conflict with vivier crabbers setting their mile-long strings over the top of their own (or vice versa as floats cannot be seen a mile away) or indirect conflict over crab stock. Three interview respondents felt that the crab stocks had been “decimated” by the vivier crabbers. The pilot has helped exclude vivier vessels that fished the area before the pilot. Interviewees reported that they were either displaced to the west of the Outer Hebrides, pulled out of the industry, consolidated with other vivier vessels, or moved their creels out of the pilot area. Concern was still expressed by interviewees about the lack of regulations on vivier vessels fishing out to the west. Some of the resentment also appears to be because many of the vessels are seen to be “foreign”, registered in Northern Ireland. Several fishers are concerned by the impact the vivier crabbers have on the local community.

“It’s really disheartening when a large vivier boat comes in and decimates the grounds. It leaves nothing for us locals.” – Interviewee 24

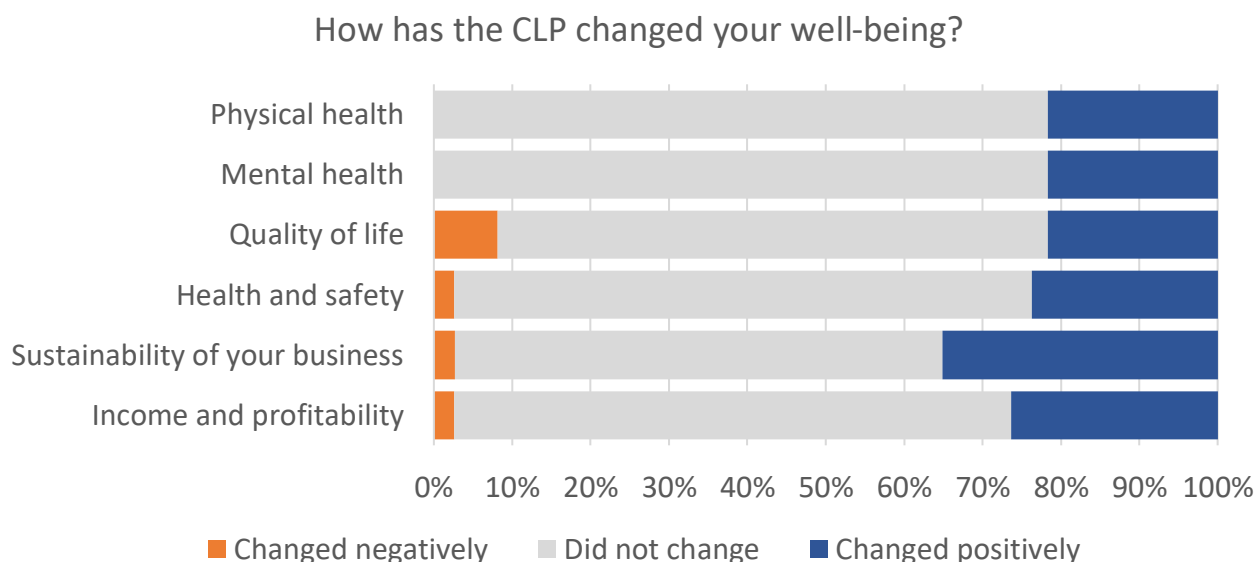
“They are directly impacting our future. They can go elsewhere, and they leave our small communities with nothing left.” – Interviewee 3

A fisher expressed some sympathy towards the predicaments faced by vivier crabbers, believing that they have significant loans to service and are forced into more intensive fishing to make ends meet. Two respondents suggested that the decline in crab was helping to put vivier vessels out of business. Some agree that vivier vessels are less of a

problem now than before the pilot began, however, they still were worried about vivier vessels coming back onto their grounds and their activities not being policed.

### Well-being

Survey respondents were able to select whether they had noticed any positive or negative changes to six different indices of well-being. These included income and profitability, business sustainability, health and safety, quality of life, mental health and physical health. The large majority of survey respondents did not notice any changes for any of the well-being indices, however, positive change was noted in all 6 indices by at least 20% of survey respondents. A minority noted a negative change in income, business sustainability, health and safety and quality of life (Figure 7). The positive responses were isolated and Fisher's Exact Tests were done to determine if there was a relationship between indices of positive change and location, years of fishing or target species. There was no relationship found for either location, years fishing or target species (Fisher's Exact Test:  $p = 0.94, 0.79$  and  $1.00$  respectively|  $n$ =minimum 8 and maximum 13).



**Figure 7)** Changes in well-being noticed by fishers as a result of the CLP. Indicators of well-being included income and profitability ( $n=38$ ), business sustainability ( $n=37$ ), health and safety ( $n=38$ ), quality of life ( $n=37$ ), mental health ( $n=37$ ) and physical health ( $n=37$ ).

Of the interview respondents, the majority also did not report any changes to their well-being. Four interviewees reported less stress and better mental health as a result of the CLP. All four fished different mixes of shellfish, however, they all had *Nephrops* in common. Another fisher, targeting crab and lobster hadn't noticed any changes in well-being personally, though they assumed that those targeting *Nephrops* would have improved well-being. A fisher who said that though their well-being was better at the time of survey, they live in fear of larger vessels coming back and decimating stocks. A respondent also commented saying that often it is the lack of ability to diversify that can negatively change well-being outcomes. If stocks begin to deplete, that can lead to poor

mental health and high stress as they have no alternative target species as sources of income.

### **Health and Safety**

Only interview respondents were asked questions about how the CLP may have impacted their health and safety. Of the interviewees, three fishers reckoned the CLP had made fishing safer because they either do not have to work as hard for the same returns or because there is less gear conflict, leading to less health and safety risk. No respondents argued that the CLP had made health and safety worse. In terms of how satisfied interviewees felt about their health and safety, the majority noted no difference in their levels of satisfaction. Four interviewees felt that they were more satisfied with their health and safety now compared to before the CLP. All four had *Nephrops* in their fisheries. The reasons given were less risk through less work and less time at sea, and noticeably fewer entanglements of gear.

“We always used to get entangled with other vessel’s gear which is incredibly dangerous. Now it’s very unusual.” – Interviewee 28

No respondents said that they were less satisfied with their health and safety.

When asked if there would be a benefit to their health and safety by reducing creel numbers, twelve interviewees (46%, n=26) said that reducing creel numbers would benefit their health and safety. Of those twelve, three said that there is less personal risk through spending less time at sea. It was pointed out by five respondents that hauling fewer creels meant less physical ‘wear and tear’ on their bodies. A respondent valued less physical work as they find that age can make the physical side of hauling creels more challenging. Four interviewees said that having fewer creels would lead to less fatigue with two respondents highlighting that mistakes can happen when fishers get negligent or overtired.

“It’s easy to become sloppy. I nearly took a creel to the face once because I wasn’t paying attention at a crucial moment.” – Interviewee 8

A respondent also thought that having fewer creels would improve health and safety through reduced levels of stress. Eight respondents said that they do not expect health and safety to improve because of reduced creel numbers. Since many are fishing under the limit anyway, they have not needed to alter their operational patterns in this way. Creels may also be worked differently, for example, double hauling. This would not reduce the workload despite having fewer creels. Two respondents expressed the benefits of reduced creel numbers but were pessimistic, feeling that fishers would be unwilling to take the hit of reduced creels for the sake of health and safety. No respondents thought that there would be more risk to their health and safety through reduced creel numbers.

## Economic Implications

### Key findings

- Though respondents largely noticed no changes to their income or expenditure approximately a quarter noticed an increase in income which they attributed to CLP through more catch of better quality, and higher market prices of *Nephrops*.
- Several fishers commented on market prices and operational costs; the changes of which are largely unattributable to the CLP, however, increasing market price for *Nephrops* and some changes fuel or bait costs may have foundation in the CLP.
- Anecdotal evidence suggests that lobster and particularly crab stocks may have been declining and that *Nephrops* stocks may have been increasing as a result of the CLP, though many attribute the changes to natural population fluctuation, presence of fewer trawlers and seasonal variation.
- Ultimately, stock statuses of lobster and crab in the Outer Hebrides are unknown.

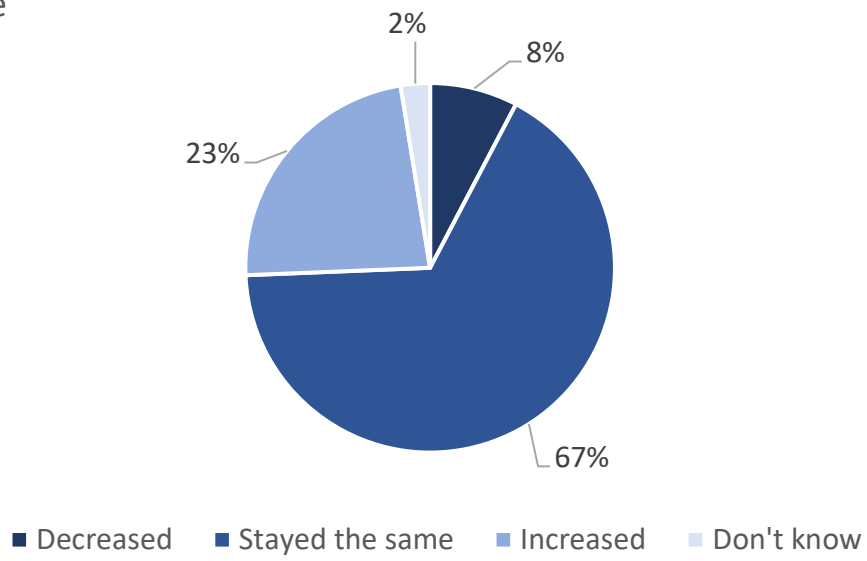
The following section explores some of the economic implications of the CLP.

Researchers investigated changes to income and expenditure observed by fishers and the reasons they gave for the changes observed. Focus is then drawn to changes in market prices, operational costs and any changes to shellfish stocks and landings that had been noticed throughout the CLP period. It was difficult for both fishers and researchers to separate the impacts of the CLP from the impacts of wider economic climate on the local economy. Results should be interpreted with caution.

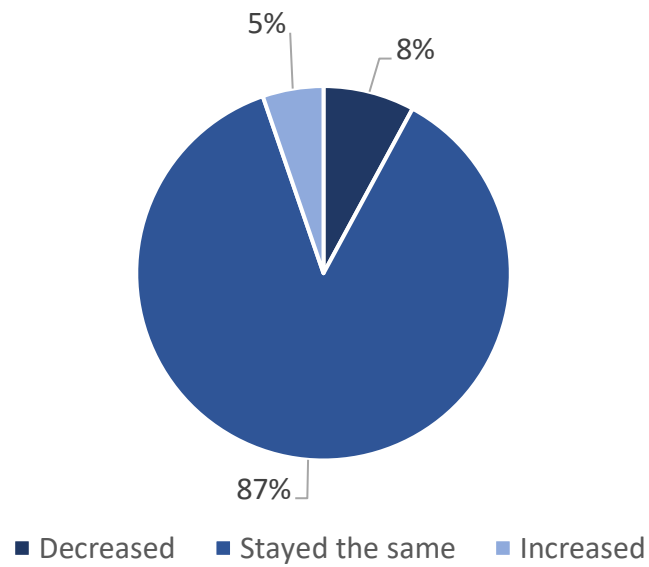
### Income and Expenditure

Survey respondents largely reported no changes to their income or expenditure (Figure 8), however, nine (23%) respondents did notice an increase in income and a further three respondents noticed a decrease (n=39). Conversely, two respondents noticed an increase in expenditure and a further three noticed a decrease in their expenditure as a result of the CLP (n=38). Of those who noticed a decrease in income, one was not a pilot participant. This respondent also reported a decrease in expenditure. All other non-participants said that their finances had stayed the same. There was one pilot participant that felt their income had reduced and expenditures increased. They felt other vessels coming onto their grounds were compromising their lobster fishing and were investing in new gear, increasing their overheads. Survey respondents were allowed to expand on the reasons, which have been coded and are presented in Table 7.

A) Income



B) Expenditure



**Figure 8)** Perceived changes in income **(A)** (n=39) and expenditure **(B)** (n=38) as a result of the CLP.

**Table 7) Changes to income and expenditure as a result of the CLP and the reasons associated with those changes. (n=15).**

| <b>Income/<br/>Expenditure</b> | <b>Change</b>          | <b>Code</b>                     | <b>Description</b>                                                                                                                                             | <b>Number of<br/>respondents</b> |
|--------------------------------|------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>Income</b>                  | <b>Increase</b>        | <b>Better stocks</b>            | Respondents said that their income had increased because the <i>Nephrops</i> stocks had improved.                                                              | 2                                |
|                                |                        | <b>Fishing more efficiently</b> | Respondents said that their income had increased because they could fish fewer creels for the same returns.                                                    | 2                                |
|                                |                        | <b>Less competition</b>         | Respondents said that their income had increased because bad weather meant fewer vessels were on the grounds.                                                  | 1                                |
|                                |                        | <b>Less gear</b>                | Respondents said that their income had increased because there are fewer creels on the grounds.                                                                | 1                                |
|                                | <b>Stayed the same</b> | <b>No operational change</b>    | Respondents said that their income had stayed the same as they have not had to alter their operational patterns as they were already fishing below the limits. | 5                                |
|                                |                        | <b>Current economic climate</b> | Respondents said that their income has stayed the same because of the current cost of living crisis counters any benefit to income from the CLP.               | 1                                |
|                                |                        | <b>Limit is too high</b>        | Respondent said that their income had stayed the same because the creel limits are still set too high.                                                         | 1                                |
|                                |                        | <b>Poor stocks</b>              | Respondents said that their income had stayed the same because of declining crab stocks.                                                                       | 1                                |
|                                |                        | <b>Too early</b>                | Respondents said that their income had stayed the same because it was too soon to tell if the CLP has made a marked difference to the fishing economy.         | 1                                |



|                    |                        |                                 |                                                                                                                                                                                 |   |
|--------------------|------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                    | <b>Decrease</b>        | <b>More competition</b>         | Respondents said that their income had decreased because there have been other vessels coming onto their grounds.                                                               | 1 |
| <b>Expenditure</b> | <b>Increase</b>        | <b>Current economic climate</b> | Respondents said that their expenditure had increased because of the rising cost of living, particularly after BREXIT.                                                          | 1 |
|                    |                        | <b>Investing in new gear</b>    | Respondent said that their expenditure had increased because they annually invest in new gear to ensure that it is fishing economically.                                        | 1 |
|                    | <b>Stayed the same</b> | <b>No operational change</b>    | Respondents said that their expenditure had stayed the same as they have not had to alter their operational patterns as they were already fishing below the limits.             | 1 |
|                    |                        | <b>Current economic climate</b> | Respondents said that their expenditures had stayed the same because of the rising cost of living.                                                                              | 2 |
|                    |                        | <b>Too early</b>                | Respondents said that their expenditure had stayed the same because it was too soon to tell if the CLP has made a marked difference to the fishing economy.                     | 1 |
|                    | <b>Decrease</b>        | <b>Less gear</b>                | Respondents said that their expenditure had decreased because they fish less gear meaning lower bait costs, less gear loss and less fuel because less gear means a shorter day. | 1 |

Interviewees were asked if the CLP impacted them economically in terms of income or expenditure. Of the 28 interviewees, seven (25%) said that they believed the CLP had in some way impacted them economically. Of these seven interviewees, six (21%) felt that the CLP had benefited them economically, giving higher catch, better quality, lower overheads and higher market prices on *Nephrops* at the time of interview. A sole respondent believed that they wouldn't be landing as many *Nephrops* because they are hauling fewer creels.

### **Market Prices**

Some interviewees mentioned changing market prices. Two respondents said that the crab market opening up recently in China has led to better prices for brown crab.

Consequently, there is now more competition on the grounds over crab. Three interviewees remarked on the rising prices for *Nephrops*, saying that it is supply and demand, larger individuals being caught or less bruised individuals. Conversely, three participants commented on the problem of inflation and were dissatisfied with market prices not rising to compensate. A respondent also stated that markets and the economy were one of his biggest concerns as a creel fisher.

### **Operational Costs**

Operational costs include fuel, gear and bait. Interview results suggested that there is increasing concern over the cost of fuel amongst the inshore fleet. Some fishers reported in their interviews that they have noticed vessels that would normally transition to the west side of the Hebrides had decided to stay east over the summer months. Whilst they speculate that the reason is that the *Nephrops* grounds are producing a good yield, it also cannot be ruled out that instead, the desire to stay put in the Minch on the east side is also in part to do with fuel costs, where the profits gained from targeting lobster in the summer would be impacted by the cost of extra fuel.

A total of nine interviewees are concerned about the rise in gear costs. Several interviewees commented on the costs of creels having dramatically increased, though likely not as a result of the CLP.

*“The last time we bought creels they were about £80 each - £67 plus VAT. In a short space of time, it’s increased to about £84 without the VAT and close to £100 once that’s added.”* – Interviewee 14

At the time of interview, the cost of a crab/ lobster creel was reported to be roughly £100 (Including VAT), though the driver for increasing creel prices was thought to be the high price of steel. Two interviewees reported that their bait costs are down due to fishing fewer creels.

### **Shellfish stocks and landings**

Interviewees were asked if they had noticed any changes in shellfish stocks since the CLP was initiated and whether they believe, from their personal experience, that the CLP had worked to improve their landings. Responses to both questions were variable. In terms of shellfish stocks, the majority of interviewees said that stocks were much the same with some referencing seasonal variation or naturally fluctuating populations as the reason for any changes. Two respondents felt that it was too early on in the CLP to make any assumptions about its effect on stocks.

For those six that said stocks are reducing, five mentioned declining crab stocks. It appears that this has been an ongoing problem before the CLP was initiated with a couple of fishers claiming the vivier vessels are the cause of the decline. Of the eight interviewees that believe stocks to be increasing or doing well, six referred to *Nephrops* stocks, one was non-specific and one thought lobster stocks would be improving as bad weather was keeping fishers ashore. Another fisher noted that lobster stocks should be improving as the minimum landing size (MLS) was increased a few years prior. For those that felt *Nephrops* stocks were improving, there was some skepticism over whether creel limitation was the driver behind the change. Fewer trawlers, seasonal variation and fewer vessels were also given as possible reasons for the improvement. Another fisher felt that they are not seeing so many large *Nephrops*.

The yield of lobster landings off the west of the Outer Hebrides was thought to be lower by one interviewee and another interviewee suspects that fishing fewer creels would lead to reduced catch. Two further interviewees noticed numerically that their catches have decreased. Both of these respondents fish for lobster and crab.

*“Now we’re catching 800 kgs on a good day. Sometimes only half a ton, even though we have increased our fishing effort. We used to catch 1.5 tons in a day regularly.”*

– Interviewee 14

The majority, however, believed that their landings have remained constant or improved. There were ten respondents that hadn’t noticed any changes to their landings since the CLP was initiated or thought that it was too soon into the pilot to identify changes. Eleven respondents reported that landings had increased with the majority referencing catches of *Nephrops*. Many commented on the improved quality of their *Nephrops* landings with less bruising, larger individuals and less effort for the same returns.

## Processors Opinions

From the series of twenty-eight interviews conducted, two were from owners of processing facilities, interviewed with an adapted version of the semi-structured interview questions that had been tailored for their context to see how the CLP may have impacted their business. For the sake of anonymity, the names of the processing plants have not been disclosed. Both processors had very different responses:

### Processor One

Processor One transports lots of different fish, predominantly trawl-caught, across the UK and exports to Europe. All their *Nephrops* are caught in trawls though they buy lobster and crab seasonally for visitors to their shop. They host over thirty employees though are still operating at half capacity because of Brexit and changes in legislation. Processor One had not noticed any changes to the quantity or quality of trawl-caught *Nephrops*, nor had they observed any changes in their operational patterns or economics as a result of the CLP. They had heard anecdotally that crabs are scarce though their main concern was around changes in legislation because of Brexit, particularly as Europe is the main beneficiary of their business.

### Processor Two

The target species for this processor are lobster, brown and velvet crab, *Nephrops*, crayfish, cockles and winkles. Processor Two exports the majority of catch to Spain, employing a smaller number of casual and full-time employees. They had noticed an improvement in the quality and quantity of *Nephrops* and attributed that to having less effort on the grounds, however, they are concerned about policing, not for the creel limits, but for the landing of individuals below MLS. Processor Two believes that the improvement in *Nephrops* landings has benefitted their economic situation and enables them to meet demands. They are predominantly concerned with rising costs, both for their fishers with rising creel prices, but also running costs of their operations, such as the of running the freezers. Processor Two would like to see the pilot extended to the other side of the Outer Hebrides to prevent people from displacing their fishing effort to the west.

### **Other concerns**

Fishers that were involved in the interviews were asked what their biggest concern was as a fisher at the time of interview to see if the CLP could help to address some of those concerns. Their responses have been coded and can be found in Table 8. The concern that arose most frequently was that of bad weather, preventing fishers from going to sea, followed by other fishers' tendency to be greedy and oppose sustainability.

## Discussion

The CLP was introduced in November 2020 and concluded in October 2022. Before concluding, researchers investigated the impacts that the CLP has had on fishers to assess whether the pilot had been successful in meeting its aims to reduce effort, reverse declining shellfish stocks, modernise the inshore fleet and examine local-scale fisheries management through the OHRIFG. Using a combination of interviews and an online survey, the socio-economic and operational changes to inshore fishers affected by the Outer Hebrides Creel Limitation Pilot (CLP) have been researched and evaluated using qualitative methodologies. Specifically, researchers investigated the impact of creel limitation on personal fishing activities, gear conflict, well-being, health and safety, income and expenditure. The opportunity for fishers to provide feedback on the implementation process was also given to enable policymakers to improve their methodology should the pilot be extended or trialled elsewhere. The results section above detailed the report findings; in this section, the results and their significance are discussed in more detail.

### Feedback on implementation

From the investigations on the implementation process, it appears that the vast majority of respondents were interested in the CLP, including participants, non-participants and processors. The primary reason given was to reduce the fishing effort to see improved fishing efficiency and also to encourage responsible and sustainable management of the fishery. Several interviewees pointed out that inshore fishers in the Outer Hebrides have been wanting to see such a scheme for many years and so have been keen to make the most of the proposals. However, it is possible that this could be an artefact of interested participants being the ones that agreed to answer a survey or interview.

The consultation process appears to have been done effectively with over half of the respondents attending consultation events and three-quarters of those said that they felt their opinions and concerns were listened to. Credit for this goes, in part, to Duncan MacInnes, the secretariat and acting chair of the OHRIFG and the secretary of WIFA. Several fishers spoke highly of his involvement in organising meetings and keeping them informed:

*“Duncan is on it. I can’t find fault with what he does. He works hard to keep us informed and makes sure people have the chance to be involved. I think that it was done well.”*

– Interviewee 16

Having an informed and interested liaison is clearly a valuable component of the consultation process. A respondent also informed researchers of an excursion taken to see another creel limit scheme in place in Northumberland, which helped alleviate concerns in advance of the CLP.

### Feedback on Operational Patterns

Less than a quarter of respondents had made any changes to their operational patterns and those that did were most likely to reduce their creel numbers. If the majority of CLP participants did not change their operating patterns, this suggests that the limits given were generally higher than the average fisher would use for their size of vessel. There are both benefits and drawbacks to this stance on creel limits. The high limits have allowed many to maintain their tried and tested operational patterns with minimal fuss;

the upside being that the imposed creel limits would be met with minimal resistance by the small-scale fleet. The limits would disproportionately affect vivier crabbing vessels that fish above the creel limit, forcing them out of the pilot area.

However, these limits are unlikely to have made any significant impact on the number of creels placed on the grounds by small-scale fishers and consequently to their fishing effort, gear conflict or shellfish stocks, particularly in areas where vivier boats were not fishing. The other worry was that fishers would see the limit as a target and purchase more creels to get up to the maximum that they were allowed. Though this was suspected by some, no evidence of this was found as none of the respondents had increased their own creel numbers to meet the limit.

The largest change to operational patterns was that of reducing creel numbers. The hypothesised drivers for this change were location, target species and vessel size, all of which may have some bearing on the change. No respondents from Barra and Vatersay reduced their creel numbers. It is unclear whether this is true to life or due to the smaller sample of fishers emerging from the southern islands. All fishers that reduced their creel numbers target *Nephrops* amongst other species. As the pilot area is predominantly *Nephrops* grounds, the reductions could be either because fishers are actively fishing within the pilot area and have therefore reduced creel numbers out of necessity, or because they have mixed fisheries. Some fishers have had to take in some creels of one kind to allow for the shooting of creels of a different kind.

*“We work Nephrops and then lobsters in the summer. With the limits as they are, we have to decide whether it’s more economical to leave the Nephrops gear out or take 100 in to put out the lobster creels. I would prefer an extra 100 creels for Nephrops to eliminate the problem.”* – Interviewee 21

There are several different types of creel a fisher can choose from, depending on the target species. Generally, *Nephrops* are caught using industry-standard D-shaped *Nephrops* creels, whereas crab and lobster are caught using industry-standard D-shaped lobster/ crab creels or parlour creels. *Nephrops* fishers deploy over twice as many creels on average compared with crab and lobster fishers. The average *Nephrops* vessel has a deployed capacity of 926 creels and the average crab/ lobster vessel has a deployed capacity of 455 creels on the east coast and 294 creels on the west coast (Marine Scotland, 2017b). This adds additional complexity to the settlement of the limits, should they be re-adjusted. With vessel size, it appears to be mostly mid-sized vessels between 8 and 12m that have reduced their creel numbers. Smaller vessels are physically restricted to the number of creels they can fit onboard and therefore appear less likely to be using the limit. Very few larger vessels (12m +) responded to the survey or interviews, so the sample size is inconclusive.

Many respondents were dissatisfied with the creel limits for the pilot. Over half of those asked felt that the limit was set too high. If the pilot is to be extended, this suggests that the limits need revisiting. The vast majority (87% and 73% of survey and interview respondents respectively) said that they would be accepting of a lower creel limit, particularly if scientific evidence can demonstrate fishing to be more sustainable. Whilst it is unclear how the limits were originally decided, setting the creel limits presents a difficult

task with many factors to consider, such as vessel length, target species, creel type and the number of crew.

A small cohort agrees that the limit should be set at 1,000 creels regardless of vessel size. All fishers that held this view were from Harris, Lewis and Scalpay and fished in vessels ranging from <8m up to 12m. Some fishers felt that smaller vessels were disadvantaged. Not only do they have a lower creel limit, but they are also unable to fish in rougher seas under poorer weather conditions, feeling that larger vessels are given an unfair advantage:

*“There are 1000 creels between the smallest and largest limits. The little boats can only go out for 2 or 3 days a week [because of the weather] so they are hauling less than 2,500 creels per week. Someone with a larger vessel can go out every day with 1,800 creels. They can haul nearly 13,000 creels per week. It doesn’t sound like a conservation measure to me.”* – Interviewee 25

The idea of limiting all vessels to 1,000 creels is believed to even out the disparity. A fisher argued that management would also be simplified. Though this idea has some support in the north, the idea may not be entirely equitable and more difficult to accommodate with additional crew or different target species. A fixed creel limit for vessels of all sizes may inhibit a fisher’s ability to diversify their fishery in the event of depleting stocks. Some of this may be navigable with different hauling regimes, e.g. double hauling, though this undermines the goal of reducing effort as it did with fishers in the South Australian rock lobster fishery, employing ‘input substitution’ in Staniford’s (1987) study. Ultimately fishing effort, however defined, must be linked to the sustainability of the stock.

If catch and landings per unit effort can be recorded with sufficient sensitivity and resolution to detect potentially detrimental levels of fishing effort, then appropriate reductions in effort can be introduced dynamically in response. Alternatively, up-to-date stock assessments can be used to set limits on how much of a particular species is landed and this is controlled through quota allocation. At present, limiting the number of creels represents a pragmatic response to rapidly increasing numbers of creels being deployed. In the absence of other enforceable criteria such as the number of creels deployed and in the water at any one time, there is room to increase effort. Similarly, without limits on soak time, effort can potentially increase. The ability to track vessels and estimate creel numbers and soak time could open up the potential to manage effort based on “creel days” rather than an absolute number of creels per vessel but this would still need to balance effort distribution between the fleet and most importantly the biological sustainability of the stock.

## **Feedback on Social Implications**

### **Gear Conflict**

Gear conflict presents a complex picture in the Outer Hebrides. It was hypothesised that location may influence which fishers had observed changing conflict as well as the number of years fishing. It was thought that fishers that had been fishing for longer in an area may be more attuned to the subtleties of conflict change. However, whether it was the small sample sizes or lack of connection, no link was found to suggest where conflict changes might be felt most strongly. Survey respondents participating in the CLP,



generally, reported that either they did not have any conflict or there were no changes in levels of conflict inside the pilot area. The exception to this was in the circumstance of having creels placed on the grounds which would prevent them from fishing in a particular area. Here, the majority of CLP participants thought that there were fewer instances of this happening and a smaller percentage thought that instances of creels holding grounds had increased inside the pilot area. There appears to be no clear reasoning as to why ground holding would increase inside the pilot area. This could be explored if more data were available.

For those that noticed a change in gear conflict outside the pilot area, it appears that, from what limited data were available, there may well be an increase in gear holding the grounds. There are no clear patterns to connect the fishers that responded this way; however, this suggests that there may have been a degree of displacement resulting from the CLP, whereby fishers that would usually fish inside the pilot area (including vivier crabbing vessels) had moved creels outside the pilot area into other's fishing grounds. This would explain the reduction of ground holding inside the pilot area and the increase outside the area.

For those that noted more ground holding inside the pilot area, it is possible that the gear limitation attracted new vessels to the area which could explain why more creels have appeared within the restricted area.

*"I have seen 3 new vessels on my grounds inside the pilot area since the creel limit started. I have reduced my creel numbers according to the limit, but there are about 2,000 more creels on my grounds from the new vessels."* – Interviewee 21

The number of derogations to fish within the pilot area appears to have been uncapped. New entrants were encouraged to contact their local fisheries offices on the Marine Scotland flyer to get application forms for the derogations (Marine Scotland, 2020b). Fishing effort and consequently gear conflict and shellfish stocks will likely not improve if the effort in terms of the number of vessels is not also controlled.

Conflict between static and mobile gear fishers was also mixed. An interviewee recalled their story of losing creels to scallop dredges:

*"We used to have conflict with scallop dredges. I remember one time when we were fishing crabs, we lost about £12,000 worth of gear because it was towed by a scalloper."* – Interviewee 20

On the whole, it appears that conflict with mobile gear fishers has not increased inside the pilot area with many saying they did not have any conflict or that it had not changed. One creel fisher said that they had noticed more conflict outside the pilot area. Like the above, this could be because of creels that have been displaced outside the pilot area and are now obstructing different mobile gear grounds. The one mobile gear fisher that responded to the survey thought that conflict was the same inside the pilot area, but better outside the pilot area. It is unclear why this would be the case. It is possible that fishers with derogations outwith the pilot area also reduced their creel numbers in some places or have moved their operations to within the pilot area.

None of the comments made by interviewees suggests that changes in static-mobile gear conflict were to do with the CLP. Instead, it appears that there may well be fewer trawlers

operating either because it was no longer economic or because of retirements. Relationships between static and mobile gear fishers may, however, have been improved because of the CLP. Two static gear fishers felt that the gear limitations had reduced the amount of static gear (and therefore opportunity for entanglements) on the grounds. Several fishers reported no problems with mobile gear fishers and two respondents had reported better communication with mobile gear fishers in their areas, coinciding with, but not caused by the CLP. If static gear effort is further reduced and mobile gear vessels do not increase their effort in response, further benefits to remaining areas of unchanged conflict and static-mobile gear relations might be realised. Endeavours to further improve communications could also prove invaluable in minimising the loss of static gear and the risk of entanglement.

Though many vivier vessels are no longer working the grounds intensively within the pilot area, many fishers still harbour negative sentiments towards their operations. Vivier crabbers are generally larger vessels reported to use several thousands of creels, with the ability to retain large numbers of live crab onboard. As such, they can fish in rougher weather and stay at sea for several days at a time, unlike the vast majority of the local inshore static gear fleet. Concern over vivier crabbers was not limited to a specific area but was widespread across the Outer Hebrides. When the pilot began, vivier vessels still wanting to operate large numbers of creels would have been displaced to the west. These vessels remain problematic because of conflict over crab stocks as much as space on the grounds. This may, however, help promote the recovery of crab stocks in the east, though no reports of this were noted as of yet.

It appears many of these vivier vessels are not locally registered Scottish vessels; their unsustainable approach to fishing may affect the small island communities for which creel fishing is a form of subsistence. This is, in part, why many fishers would like to see the CLP extended to the west coast of the Outer Hebrides. With the creel limits set relatively high for the average small-scale vessel, and the likelihood of foreign vessel owners not being present at OHRIFG consultation meetings, it is suggestive that removing vivier crabbers from fishing grounds was perhaps the desired outcome. No vivier crabbers responded to this study which represents a limitation on the socio-economic investigations.

The question remains as to what happens with vivier vessels now that the CLP has come to an end. A fisher spoke of “*living in fear*” of the large vessels coming back onto their grounds or beginning to target lobster as crab stocks decline. Whilst management at a local scale is appropriate for localised issues such as that of gear conflict in the inshore fishery, it is not well equipped to deal with larger-scale conflicts brought by overseas vessels. Creating a dialogue with vivier vessel owners is necessary to ensure fair outcomes for all, particularly if the CLP is to be geographically extended.

### **Well-being**

As with other areas of investigation, it appears that responses to questioning on personal well-being were mixed. The vast majority of fishers did not notice any changes to any of the aspects of well-being, however, a subset felt that their well-being had changed for the better across all the categories that they were questioned on. There did not appear to be any obvious relationships between positive changes in well-being and locations, years of fishing or target species. This suggests that the positive benefits were relatively

widespread across the fishing community. This may have been different if a comparison of those fishing inside and outside the pilot area was made.

A small minority of respondents felt that their well-being had become worse throughout the pilot in terms of profitability, business sustainability, health and safety, and quality of life. Survey respondents were unable to give their reasoning for this and no interviewees said that their well-being had been negatively affected; the reasoning can only be speculated. An interviewee suggested that it might be because of the inability to diversify their fisheries that could lead to additional stress, however, the downturn in well-being could also be because of the current economic climate, rather than a direct result of the CLP.

### **Health and Safety**

The impacts of the CLP on health and safety are seemingly negligible or improved with all fishers noting either no change in their levels of satisfaction or improved satisfaction at the time of interview. It was also widely recognised that reducing creel numbers would likely benefit health and safety, reducing physical wear and tear, and levels of fatigue. Fishing is a notoriously dangerous industry; an interviewee shared about the incident in 2016 where a vivier crabbing vessel, the *Louisa*, foundered off the coast of the Ilse of Mingulay in the Outer Hebrides with the loss of three crew. Whilst many failings were found to have added to the disaster, fatigue to the point of compromising the safety of the crew was found to be a contributing factor (MAIB, 2017). Because of the work ethic aboard the vessel, machinery was not shut down properly when the crew retired for the evening, fashioning the conditions leading to the incident. Reducing the workload of fishers by reducing creel limits and therefore, fatigue, may well save lives in the long term, so long as fishers do not increase their effort through double hauling or the owning of multiple vessels. If a creel limitation can generate the same returns for reduced effort, this can be considered a triumph for health and safety, reducing the risks to fishers that come with fatigue-induced negligence.

## **Feedback on Economic Implications**

### **Income and Expenditure**

The majority of fishers did not notice any changes to their income or expenditure as a result of the CLP. This should in part, be viewed as a positive outcome; the concern that reduced creel numbers may lead to reduced catches in this context has not been realised. This may be because the limits were set so high and only on the east so that for many, business was as usual. However, when this is overlayed with the current economic backdrop of rising operational costs to fuel and gear, this is at the least, not bad. Some improvements were also noted by several fishers, including directly reduced overheads such as fuel and bait because of using fewer creels. The market prices for *Nephrops* were also reported to be better because fishers were catching better quality animals of larger size with less bruising. A small minority reported worsening economic situations. The only reason given is that one fisher noticed more vessels on their grounds within the pilot area, which they believed to be a result of the CLP, creating more competition over the stock in that area. As referenced earlier, if effort is only capped through creel numbers and not through vessel numbers, the effort may not be reduced in certain areas, undermining the possible benefits.

## Shellfish Stocks

Though respondents were asked specifically to feedback on the economic impacts of the CLP only, some felt that the current economic climate post-Brexit, COVID-19 and the conflict in Ukraine may have overshadowed any positive economic benefits to the CLP. Realistically, this is incredibly difficult to separate and would need a thorough economic and stock assessment to confirm. For example, though several felt that *Nephrops* stocks were improved since the beginning of the creel limitation, it is not impossible that the driver for healthier stocks was not the reduced fishing pressure from the creel limits, but from vessels being kept ashore due to supply chain issues in the COVID-19 pandemic or because of unusually bad weather. Natural variation in stock may also be part of the reason.

The latest stock assessments for *Nephrops* done by the International Council for the Exploration of the Sea (ICES) suggest in the west of Scotland, north and south Minch, that fishing mortality is currently below Maximum Sustainable Yield ( $F_{MSY}$ ) (ICES, 2022a, 2022b). This agrees with the reports from the fishers that stocks seem relatively healthy at the point of survey. The latest crab and lobster stock assessments, however, were last done seven years ago in 2015. Stocks of brown crab, velvet crab and European lobster in the Outer Hebrides were all deemed to have 'some concerns' with fishing mortality being above  $F_{MSY}$  for either males or females. Population trends were thought to be stable for lobster and velvet crab and increasing for brown crab (Marine Scotland, 2020a). This doesn't fit with the narrative given by fishers in the Outer Hebrides with several reporting declining crab stocks and expressing a good deal of concern over the longevity of the crab and lobster fishery, particularly with the threat of vivier vessels on their grounds. Thorough stock assessments are needed to ensure the fishery is being regulated appropriately and if necessary, interventions put in place. This could include setting a Total Allowable Catch (TACs) for brown crab in the Outer Hebrides.

## Limitations

This study was unsuccessful at determining the various drivers of change. There do not appear to be any specific patterns emerging around the number of years fishing, location, vessel length, fishery type or most surprisingly, participation in the CLP. This could be due to small sample sizes. A further reason that pilot participation may not have been a driver may be because of the researcher's unawareness of the fishery dynamics, with the *Nephrops* fishery being contained entirely within the pilot area. From speaking to fishers, researchers learnt that *Nephrops* are caught almost exclusively in the east along with some crab. Fishers in the west are targeting only crab and lobster, yet many crab and lobster fishers had derogations to fish within the pilot area. Many participants in the CLP were not reaping the benefits of the pilot area as *Nephrops* grounds. This might help to explain why there appear to be conflicting stock trends reported by fishers between crab, lobster and *Nephrops*. In terms of the investigation, asking respondents whether they fished to the east (inside the pilot area) or the west (outside the pilot area) of the Outer Hebrides, may have been more of a determining factor than pilot participation. Ideally, cross-referencing interviews and survey responses with spatial data would provide a more robust means of investigating the discrepancies in the socio-economic impacts of spatial management, such as the CLP.

## Management recommendations

Several prominent recommendations for improvement emerged from the investigation, which are detailed below as a combination of the fisher's suggestions and the researcher's interpretation. Together it is hoped that these recommendations should further improve the socio-economic outcomes for fishers partaking in the creel limitation scheme.

- Reassess the creel limits. Whilst creel limits are contentious, the majority agree that they need to be further reduced to make any substantial difference to the fisheries in terms of conflict and fishing effort. Incorporated into the discussions should be whether species-specific creel limits are needed to ensure the different stocks with different recruitment are not homogenised. With reduced creel numbers, some fishers may attempt to find loopholes by double hauling or fishing outside the limitation area, undermining the purpose of these measures.
- Extend the pilot area. Many fishers would like to see the pilot area extended to the west of the Outer Hebrides so that the benefits can also be felt by fishers targeting crab and lobster, rather than just *Nephrops*. To accommodate this, the pilot would also need to be temporally extended.
- Stock assessments for brown crab, velvet swimming crab and European lobster. Stock assessments should be updated, particularly as reports of declining brown crab are contradictory to the latest stock assessments from 2015.
- Track all vessels. At present, only a proportion of the CLP vessels are tracked and those involved in trawling for *Nephrops* are not taken into account.
- Responsive policing by Marine Scotland. Some fishers would like to see some reprimand for those that get caught flaunting the terms of the derogations. Marine Scotland having a more proactive role in policing may help to create better relationships with fishers in the long term and should help towards the common goal of reducing effort and mitigating conflict.
- A cap on the overall effort. Limiting the effort in an area should not be a deterrent to new entrants but is a necessary constraint if overfishing is to be avoided.
- Continued local-scale co-management. The framework for co-management by the OHRIFG alongside Marine Scotland has shown promise in agreeing on the pilot and seeing it through to completion. The localised co-management can now be streamlined to determine the next steps of this project going forward. Issues beyond a localised approach, such as the conflict caused by foreign vivier crab vessels, may require some intervention to ensure fair outcomes for all if the pilot is to be extended both temporally and geographically.
- The long-term monitoring of creel limitation needs to be embedded in data collection with respect to both tracking, to provide appropriate and timely effort metrics, and linked to a more robust collection of both catch and landings data that can be attributed more directly to effort.

## Conclusion

Due to the unfortunate timing of the CLP, the socio-economic impacts have been difficult to interpret against a backdrop of COVID, Brexit and more recently, the cost-of-living crisis. However, the results of this qualitative socio-economic study suggest movement in

the right direction with fishers noticing either a small improvement or no decline in circumstances. Many fishers agree that the pilot represents an optimistic, albeit imperfect starting point, believing that the creel limits need to be reassessed and reduced. It is hoped that with a re-evaluation of the creel limits and limitation area, the positive impacts on conflict, well-being, economic situation and operational patterns may be experienced more keenly by a larger proportion of fishers. To ensure that any benefits accrued from this pilot are a true reflection of the socio-economic impacts, it is recommended that the pilot be extended both in time and area. This small-scale co-management in the form of a creel limitation at a localised level shows promise though thought must be given to the issues beyond a localised jurisdiction, such as that of foreign vessels.

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## Appendix 1 – Online Survey

A copy of the online survey has been attached along with the Interview sheets for fishers and processors....

## Western Isles Creel Limitation Pilot Socio-economic Survey

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### Start of Block: Block 1: Consent-About

Many thanks for agreeing to participate in our Creel Limitation Pilot Survey. It will take under 15 minutes to complete. We recommend taking this survey on a laptop but it is also compatible with tablets and smartphones.

We invite you to participate in a research project which seeks to gather your feedback on the implementation of the Outer Hebrides Creel Limitation Pilot (OHCLP) and the Outer Hebrides Early Adopters Pilot (OHEAP also known as the Western Isles Early Adopters Trial or WIEAT), ongoing since November 2020.

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Because this survey is being conducted through the University of St Andrews we must provide you with the following information; please read and download the Participant Information Sheet for your records. If there is anything you do not understand please contact us at: [fjs8@st-andrews.ac.uk](mailto:fjs8@st-andrews.ac.uk) and we will be happy to explain.

[Creel limitation survey participant information](#)

### **Consent**

The University of St Andrews attaches high priority to the ethical conduct of research. Your consent confirms that you have read the participant information provided, had the chance to ask any outstanding questions and are willing to participate in this study, however, this does not commit you to anything you do not wish to do and you are free to withdraw your participation at any time before 17th September 2022.

By checking this box below, you agree that you:

- Have read and understood the participant information.
- Have had the opportunity to ask questions and had them satisfactorily answered.
- Understand that you may withdraw from the study without explanation any time before the 17th of September 2022 when the data is anonymised.
- Understand how your data will be used, stored and shared as detailed in the participant information.



Do you consent to taking part in this research? Please select to proceed.

Yes, I consent to taking part ☐

---

Home Port: \_\_\_\_\_

Plate Number: \_\_\_\_\_

How many years have you been fishing in the area? \_\_\_\_\_

What species do you target?

European lobster ☐

Spider crab ☐

Brown crab ☐

Wrasse ☐

Nephrops ☐

Crayfish ☐

Velvet swimming crab ☐

Other: \_\_\_\_\_

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Are you currently taking part in the Outer Hebrides Creel Limitation Pilot that began in November 2020?

Yes ☐

No ☐

This survey is exclusively interested in how the Creel Limitation Pilot has impacted you and your fishing practices. Please try to answer the questions to explain how just the Creel Limitation Pilot may have impacted you.

Many thanks.

**End of Block: Block 1: Consent-About**

---

## Start of Block: Block 2: ActivityChanges

The next few questions are about possible changes to your fishing activity.

Have you changed your fishing activities because of the Creel Limitation Pilot? (For example: the number of creels you fish, time spent at sea, soak times and fishing locations.)

Yes ☐

No ☐

### Display This Question:

If The next few questions are about possible changes to your fishing activity.  
Have you changed your... = Yes

Where did you fish before the Creel Limitation Pilot and where do you fish now? Please select one answer per row.

|                                   | Inside the pilot area | Outside the pilot area | Both equally | Mostly inside the pilot area | Mostly outside the pilot area |
|-----------------------------------|-----------------------|------------------------|--------------|------------------------------|-------------------------------|
| Before the Creel Limitation Pilot |                       |                        |              |                              |                               |
| No                                |                       |                        |              |                              |                               |

### Display This Question:

If The next few questions are about possible changes to your fishing activity.  
Have you changed your... = Yes

Has the distance you travel to your fishing grounds changed because of the Creel Limitation Pilot?

Yes, increased by more than 10 km ☐

Yes, increased by 1-10 km ☐

No change ☐

Yes, decreased by 1-10 km ☐

Yes, decreased by more than 10 km ☐

Don't know ☐

**Display This Question:**

**If The next few questions are about possible changes to your fishing activity.  
Have you changed your... = Yes**

Have you changed the number of days you fish per week because of the Creel Limitation Pilot?

- Yes, increased by more than 2 days ☐
  - Yes, increased between 1-2 days ☐
  - No change ☐
  - Yes, decreased by more than 2 days ☐
  - Yes, decreased between 1-2 days ☐
  - Don't know ☐
- 

**Display This Question:**

**If The next few questions are about possible changes to your fishing activity.  
Have you changed your... = Yes**

Have you changed the amount of time you spend at sea per trip because of the Creel Limitation Pilot?

- Yes, increased by more than 2 hours ☐
  - Yes, increased between 0-2 hours ☐
  - No change ☐
  - Yes, decreased between 0-2 hours ☐
  - Yes, decreased by more than 2 hours ☐
  - Don't know ☐
- 

**Display This Question:**

**If The next few questions are about possible changes to your fishing activity.  
Have you changed your... = Yes**

Have you changed the TOTAL number of creels that you use due to the Creel Limitation Pilot?

- Yes, increased by more than 50 creels ☐
- Yes, increased by up to 50 creels ☐
- No change ☐
- Yes, decreased by up to 50 creels ☐
- Yes, decreased by more than 50 creels ☐
- Don't know ☐

**Display This Question:**

**If The next few questions are about possible changes to your fishing activity.  
Have you changed your... = Yes**

- Yes, increased by more than 1 week ☐
- Yes, increased by up to 1 week ☐
- No change ☐
- Yes, decreased by up to 1 week ☐
- Yes, decreased by more than 1 week ☐
- Don't know ☐

**Display This Question:**

**If The next few questions are about possible changes to your fishing activity.  
Have you changed your... = Yes**

Do you feel that the creel limits were too conservative, not conservative enough or just right?

- Too conservative ☐
- Not conservative enough ☐
- Just right ☐
- Don't know ☐

**Display This Question:**

**If The next few questions are about possible changes to your fishing activity.  
Have you changed your... = Yes**

Since November 2020, do you think your EXPECTED landings per trip have increased, decreased or stayed the same because of the Creel Limitation Pilot?

- Increased ☐
- Decreased ☐
- Stayed the same ☐
- Don't know ☐

**Display This Question:**

**If The next few questions are about possible changes to your fishing activity.  
Have you changed your... = Yes**

Has policing (including by other fishers) of the creel restrictions increased, decreased or stayed the same?

- Increased ☐
- Decreased ☐
- Stayed the same ☐
- Don't know ☐

Do you believe others have changed their fishing activities because of the Creel Limitation Pilot?

- Yes, they definitely have ☐
- Some have, some haven't ☐
- No, they definitely haven't ☐
- Don't know ☐

---

**Display This Question:**

**If Do you believe others have changed their fishing activities because of the Creel Limitation Pilot? = Yes, they definitely have  
Or Do you believe others have changed their fishing activities because of the Creel Limitation Pilot? = Some have, some haven't**

In what ways have they changed their fishing activities because of the Creel Limitation Pilot? Please explain. (Optional)

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**End of Block: Block 2: Activity Changes**

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**Start of Block: Block 3: GearConflict-HealthSafety-Wellbeing**

**Display This Question:**

**If The next few questions are about possible changes to your fishing activity.  
Have you changed your... = Yes**

**The next questions are about gear conflict INSIDE the Creel Limitation Pilot area  
whether deliberate or not.**

Has the Creel Limitation Pilot affected your levels of conflict with other creel fishers  
INSIDE the pilot area?

Yes ☐

No ☐

Prefer not to say ☐

---

**Display This Question:**

**If The next questions are about gear conflict INSIDE the Creel Limitation Pilot area  
whether deliber... = Yes**

How has gear conflict changed INSIDE the pilot area because of the Creel Limitation  
Pilot? Please select one option per row.

|                                                     | More conflict | Same amount | Less conflict | No conflict | Don't know | Prefer not to say |
|-----------------------------------------------------|---------------|-------------|---------------|-------------|------------|-------------------|
| Creels placed to prevent you fishing                |               |             |               |             |            |                   |
| Other creel fishers moving your gear                |               |             |               |             |            |                   |
| Other creel fishers removing catch from your creels |               |             |               |             |            |                   |
| Gear lost through mobile fishing                    |               |             |               |             |            |                   |

#### Display This Question:

**If Are you currently taking part in the Outer Hebrides Creel Limitation Pilot that began in November... = No**

**The next questions are about gear conflict because of the Creel Limitation Pilot, whether deliberate or not.**

Do you fish outside of the Creel Limitation Pilot area with mobile gear or static gear?

- Mobile gear ☐
- Static gear ☐
- Both ☐
- Prefer not to say ☐

**The next questions are about gear conflict OUTSIDE the Creel Limitation Pilot area whether deliberate or not.**

Has the Creel Limitation Pilot affected your levels of conflict with other fishers OUTSIDE the pilot area?

Yes ☐

No ☐

Prefer not to say ☐

---



**Display This Question:**

**If The next questions are about gear conflict OUTSIDE the Creel Limitation Pilot area whether delibe... = Yes**

How has gear conflict changed OUTSIDE the pilot area because of the Creel Limitation Pilot? Please select one option per row.

|                                                     | More conflict | Same amount | Less conflict | No conflict | Don't know | Prefer not to say |
|-----------------------------------------------------|---------------|-------------|---------------|-------------|------------|-------------------|
| Creels placed to prevent you fishing                |               |             |               |             |            |                   |
| Other creel fishers moving your gear                |               |             |               |             |            |                   |
| Other creel fishers removing catch from your creels |               |             |               |             |            |                   |
| Gear lost through mobile fishing                    |               |             |               |             |            |                   |

**Display This Question:**

**If The next questions are about gear conflict because of the Creel Limitation Pilot, whether deliber... = Static gear**

**Or The next questions are about gear conflict because of the Creel Limitation Pilot, whether deliber... = Both**

Are you losing static gear to mobile gear fishers?

- Yes, regularly ☐
- Sometimes ☐
- No, never ☐
- Don't know ☐
- Prefer not to say ☐

**Display This Question:**

**If The next questions are about gear conflict because of the Creel Limitation Pilot, whether deliber... = Static gear**

**Or The next questions are about gear conflict because of the Creel Limitation Pilot, whether deliber... = Both**

As a static gear fisher, do you have more, less or the same amount of conflict with mobile gear fishers OUTSIDE the pilot area now that the Creel Limitation Pilot is in place?

- More conflict ☐
- Less Conflict ☐
- The same amount of conflict ☐
- No conflict ☐
- Don't know ☐
- Prefer not to say ☐

**Display This Question:**

**If The next questions are about gear conflict because of the Creel Limitation Pilot, whether deliber... = Mobile gear**

**Or The next questions are about gear conflict because of the Creel Limitation Pilot, whether deliber... = Both**

As a mobile gear fisher, do you have more, less or the same amount of conflict with static gear fishers inside and outside of the pilot area now that the Creel Limitation Pilot is in place? Please select one option per row.

|                              | More<br>conflict | Same<br>amount | Less<br>conflict | No conflict | Don't<br>know | Prefer not<br>to say |
|------------------------------|------------------|----------------|------------------|-------------|---------------|----------------------|
| INSIDE<br>the pilot<br>area  |                  |                |                  |             |               |                      |
| OUTSIDE<br>the pilot<br>area |                  |                |                  |             |               |                      |

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### Well-being

Well-being is increasingly important in the way policy makers make decisions; therefore, we would be interested to know if you think the creel limitation trial has any implications in terms of your economic and social well-being and that of the wider community.

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How has the Creel Limitation Pilot changed your wellbeing in the following areas: Please select one option per row.

|                                                                  | Changed negatively | Did not change | Changed positive |
|------------------------------------------------------------------|--------------------|----------------|------------------|
| Income and profitability                                         |                    |                |                  |
| Sustainability of your business                                  |                    |                |                  |
| Health and safety                                                |                    |                |                  |
| Quality of life (e.g. levels of stress, work-life balance, etc.) |                    |                |                  |
| Mental health                                                    |                    |                |                  |
| Physical health                                                  |                    |                |                  |

### End of Block: Block 3: GearConflict-HealthSafety-Wellbeing

---

### Start of Block: Block 4: Economics-AdoptionFeedback-PrizeDraw

The next few questions are about your economic situation. Please note that we will not be asking you to provide any numbers.

Has your income changed as a result of the Creel Limitation Pilot?

- Increased ☐
  - Decreased ☐
  - Stayed the same ☐
  - Don't know ☐
- 

Would you like to provide any further information? (Optional)

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Has your expenditure changed as a result of the Creel Limitation Pilot?

Increased ☐

Decreased ☐

Stayed the same ☐

Don't know ☐

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Would you like to provide any further information? (Optional)

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**The next few questions are about your feedback on the consultation, preparation and implementation of the Creel Limitation Pilot.**

Did you complete a Marine Scotland Consultation Response for the Creel Limitation Pilot?

Yes ☐

No ☐

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Did you attend a consultation event when the proposal for the Creel Limitation Pilot was first brought to your attention?

Yes ☐

No ☐

**Display This Question:**

**If Did you attend a consultation event when the proposal for the Creel Limitation Pilot was first br... = Yes**

Did you feel that your views and opinions were heard and acted upon?

Yes ☐

No ☐

Was there anything that could have been done differently at: (Optional)

- Consultation (e.g. Marine Scotland consultation events)?
- Preparation (e.g. Information provided about upcoming change)?
- Implementation (e.g. Beginning the pilot)?

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**Display This Question:**

**If Are you currently taking part in the Outer Hebrides Creel Limitation Pilot that began in November... = Yes**

Why did you support the Creel Limitation Pilot? Please drag and drop the options into your preferred order with 1 being most important and 6 being the least important.

Increase catch per unit effort rates\_\_\_\_\_

Reduce gear conflict between static and mobile gear vessels\_\_\_\_\_

Prevent gear being placed on the ground to prevent others from fishing\_\_\_\_\_

Improve health and safety\_\_\_\_\_

Encourage responsible management of the fishery\_\_\_\_\_

Other (Please specify): \_\_\_\_\_

**Display This Question:**

**If Are you currently taking part in the Outer Hebrides Creel Limitation Pilot that began in November... = No**

Did you support the creel limitation pilot when it was being introduced in November of 2020?

Yes ☐

No ☐

**Display This Question:**

**If Did you support the creel limitation pilot when it was being introduced in November of 2020? = Yes**

Why did you support the Creel Limitation Pilot? Please drag and drop the options into your preferred order with 1 being most important and 6 being the least important.

Increase catch per unit effort rates \_\_\_\_\_

Reduce gear conflict between static and mobile gear vessels \_\_\_\_\_

Prevent gear being placed on the ground to prevent others from fishing \_\_\_\_\_

Improve health and safety \_\_\_\_\_

Encourage responsible management of the fishery \_\_\_\_\_

Other (Please specify): \_\_\_\_\_

**Display This Question:**

**If Did you support the creel limitation pilot when it was being introduced in November of 2020? = No**

Why did you not support the Creel Limitation Pilot? Please explain. (Optional)

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Would you be prepared to accept a lower total number of creels in the water at any one time?

Yes ☐

No ☐

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Many thanks for your participation in our survey. Your input is much appreciated, and we hope to be able to share the results of this project with you early next year.

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If you wish to discuss the impacts of the creel limitation pilot further, please consider signing up to an interview with the researchers. To sign up, please enter your name and email address or phone number into the box below and a member of the research team will get in touch with you to schedule an online or telephone interview.

Name: \_\_\_\_\_

Email Address: \_\_\_\_\_

Mobile or Telephone Number: \_\_\_\_\_



**Display This Question:**

If you wish to discuss the impacts of the creel limitation pilot further, please consider signing up to an interview with the researchers. To sign up, please enter your name and email address or ph... Text Response Is Not Empty

Or If you wish to discuss the impacts of the creel limitation pilot further, please consider signing up to an interview with the researchers. To sign up, please enter your name and email address or ph... Text Response Is Not Empty

Or If you wish to discuss the impacts of the creel limitation pilot further, please consider signing up to an interview with the researchers. To sign up, please enter your name and email address or ph... Text Response Is Not Empty

**Prize Draw**

If you would like to be considered in the prize draw, please enter your contact details (name & email address or phone number) in the box below.

Name: \_\_\_\_\_

Email Address: \_\_\_\_\_

Mobile or Telephone Number: \_\_\_\_\_

**End of Block: Block 4: Economics-Adoption Feedback – Prize Draw**

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## Appendix 2 – Interview Questions for Fishers

Interviewer Name: \_\_\_\_\_

Interviewee Name: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Home Port: \_\_\_\_\_

Plate number: \_\_\_\_\_

OHCLP Participant:      YES              NO

USTAN Tracker:           YES              NO

Voice Recording File Name: \_\_\_\_\_

Voice Recording File Name: \_\_\_\_\_

**\* Anything in grey is a prompt for the interviewer to give\***

1. Welcome (introduce self, job role, purpose (feedback on the creel limitation pilot)).  
Thank the interviewee for participating.
2. **Show and explain the participant information sheet**  
We know that the industry has been badly impacted by Brexit, COVID-19 and now the increases in fuel prices so we are aware that it might be hard to determine which changes were due to what. If when answering these questions, you could focus specifically on how the Creel Limitation has made a difference as best as you can, that would be much appreciated.
3. **Show and explain consent form – is interviewee happy being recorded? – start voice recorder!**

**Start of interview:**

**Section 1: About interviewee (remember to fill boxes above!)**

- 1) How long have you been fishing in the area?
- 2) What species do you target and with what gear?
- 3) Are you currently taking part in the Outer Hebrides Creel Limitation Pilot that began in November 2020?

**Section 2: Changes to fishing activities**

- 4) Have your fishing activities changed as a result of the creel limitation pilot?

| Checklist for Interviewer     | Covered? |
|-------------------------------|----------|
| Fishing locations? Why?       |          |
| Distance change? By how much? |          |
| Creel numbers? By how much?   |          |
| Soak times? By how much?      |          |

|                          |  |
|--------------------------|--|
| Days/ week? By how much? |  |
| Time/ trip? By how much? |  |
| Other? Why?              |  |

- 5) Do you believe others have changed their fishing activities as a result of the creel limitation pilot? (Prompt: How about the Vivier crab vessels?)
- 6) Do you think that the creel limits are too conservative, not conservative enough or just right?
- 7) If there was evidence to suggest that lower creel limits were needed to make fishing more sustainable, would you accept it? Why/Why not?

### Section 3: Social Implications

- 8) Have you noticed any change in the levels of gear conflict as a result of the Creel Limitation Pilot?

| Checklist for Interviewer                         | Covered? |
|---------------------------------------------------|----------|
| Inside vs outside the pilot area?                 |          |
| Creels being placed on the grounds?               |          |
| Is it deliberate?                                 |          |
| Other fishers moving your gear?                   |          |
| Other fishers taking your catch from your creels? |          |
| Other                                             |          |

- 9) Can you tell me if relationships between fishers (static and mobile) have gotten better or worse because of the Creel Limitation Pilot? What has contributed to any changes in these relationships?

### Section 4: Economic implications

- 10) Do you think the Creel Limitation Pilot has had an impact on you economically? If so, how? (Income and expenditure, e.g., running costs or catch and landings?)
- 11) Have you noticed any changes in shellfish stocks since the Creel Limitation Pilot was initiated? (For example: quality, size of stock, abundance). Do you think this is a consequence of the Creel limitation Pilot?

### Section 5: Well-being

- 12) Have there been any changes to your well-being because of the Creel Limitation Pilot?

| Checklist for Interviewer       | Covered? |
|---------------------------------|----------|
| Sustainability of your business |          |
| Quality of life                 |          |
| Mental Health                   |          |
| Physical health                 |          |

- 13) Are there any health and safety implications from the Creel Limitation Pilot? (E.g. time at sea, exposure, number of creels on deck etc.)
- 14) Are you more or less satisfied with your health and safety now compared to before the creel limitation pilot?

- 15) Do you believe there would be a benefit to your health and safety by reducing creel numbers? Has it helped or exasperated any pre-existing medical conditions?

### **Section 5: Your thoughts and opinions**

- 16) Do you personally believe, from what you've experienced with the Creel Limitation Pilot that it is working to reduce gear conflict? Why?
- 17) Do you personally believe, from what you've experienced with the Creel Limitation Pilot that it is working to improve your landings? Why?
- 18) Has your relationship with other fishers, Marine Scotland or the wider community changed as a result of the Creel Limitation Pilot? How? Why do you think that is?
- 19) Is there anything that you would change about the pilot? Are there any aspects that didn't work very well or could be better?
- 20) What are your biggest concerns as a creel / mobile fisher at the moment and do you think Creel Limitation schemes might help alleviate some of those concerns?

### **Section 6: Implementation of the creel limitation pilot**

- 21) Is the Creel Limitation Pilot something that you were personally interested in? Why/ Why not?
- 22) Did you attend a consultation when the pilot was proposed? What opinions and concerns did you have?
- 23) What could have been done differently in the consultation, preparation and implementation of the Creel Limitation Pilot?
- 24) Is there anything else that I haven't asked you about the Creel Limitation Pilot that you wish to add or any questions that you would like to ask?

End of interview.

Thank the interviewee for participation.

Contact email address ([fjs8@st-andrews.ac.uk](mailto:fjs8@st-andrews.ac.uk))

**Would you like to enter our prize draw for one of two £50 amazon vouchers?**

**Name:** \_\_\_\_\_

**Email address:** \_\_\_\_\_

## Appendix 3 – Interview Questions for Seafood processors

Interviewer Name: \_\_\_\_\_

Interviewee Name: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Processor Name: \_\_\_\_\_

Location: \_\_\_\_\_

Voice Recording File Name: \_\_\_\_\_

**Anything in grey is a prompt for the interviewer to give\***

4. Welcome (introduce self, job role, purpose (feedback on the creel limitation pilot)).  
Thank the interviewee for participating.
5. **Show and explain the participant information sheet**  
If when answering these questions, you could focus specifically on how the Creel Limitation has made a difference as best as you can, that would be much appreciated.
6. **Show and explain consent form – is interviewee happy being recorded? – start voice recorder!**

**Start Of Interview:**

**Section 1: About interviewee (remember to fill in the boxes above!)**

- 1) What species do you process?
- 2) What is the destination of your product?
- 3) How many employees are there in your business?

**Section 2: Changes to processing activities**

- 4) Have you noticed any changes in your processing activities because of the Creel Limitation Pilot?

**Checklist for Interviewer**

Change in landings?

Change in quality of product?

Change in operations?

**Covered?**

|       |
|-------|
| _____ |
| _____ |
| _____ |

### **Section 3: Economic implications**

- 5) Do you think the Creel Limitation Pilot has had an impact on you economically? If so, how? (Income and expenditure, e.g., running costs or number of employees) Has this impacted the well-being of you and your employees?
- 6) Have you noticed any changes in shellfish stocks since the Creel Limitation Pilot was initiated? (For example: quality, size of stock, abundance). Do you think this is a consequence of the Creel limitation Pilot?

### **Section 4: Your thoughts and opinions**

- 7) What are your biggest concerns as a processor at the moment and do you think Creel Limitation schemes might help alleviate some of those concerns?
- 8) Were you invited to attend a consultation event when the pilot was proposed? Is this something you would like to have been included in?
- 9) Is there anything else that I haven't asked you about the Creel Limitation Pilot that you wish to add or any questions that you would like to ask?

End of interview.

Thanks for your participation.

Contact email address ([fjs8@st-andrews.ac.uk](mailto:fjs8@st-andrews.ac.uk))

**Would you like to enter our prize draw for one of two £50 amazon vouchers?**

**Name:** \_\_\_\_\_

**Email address:** \_\_\_\_\_

## Appendix 4 – Interview Codebook

Below is the Codebook of themes that arose during in the semi-structured interviews conducted between the 17<sup>th</sup> and 22<sup>nd</sup> of July 2022 (n=28). Each interviewee is documented in a file, hence the maximum number of files is 28. References are parts of interview transcripts that were highlighted under a specific code and are not reliable quantitative measures. Many statements given by interviewees have been coded both with the theme with which they relate and also with an attitude code to highlight the sentiment pertaining to that theme.

| Name                    | Description                                                                                                                                                                                                                                     | Files | References |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------|
| <b>Anecdotes</b>        |                                                                                                                                                                                                                                                 | 13    | 44         |
| <b>Attitude</b>         | The coding of any interesting anecdotes given by interviewees which are not necessarily relevant to the project hypotheses but still portray useful information and experiences regarding the Creel Limitation Pilot and more.                  | 28    | 620        |
| Negative                | Coding for negative sentiment or negative change reported by the interviewee.                                                                                                                                                                   | 28    | 171        |
| Neutral-Stayed the Same | Coding related to neutral sentiment or no change in circumstances as a result of the Creel Limitation Pilot, reported by interviewees.                                                                                                          | 27    | 181        |
| Positive                | Coding for positive sentiment or positive change reported by interviewees.                                                                                                                                                                      | 27    | 267        |
| <b>Consultation</b>     | Coding related to aspects of the consultation process for the Creel Limitation Pilot, focussing on personal interest and attendance to the consultation events. Any suggestions for improvement have been coded under 'Management Suggestions'. | 26    | 73         |
| CLP Interest            | Coding of comments related to the level of interest in the Creel Limitation Pilot when it was proposed.                                                                                                                                         | 25    | 36         |

|                         |                                                                                                                                                                   |    |     |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|
| Consultation Attendance | Coding of those that attended consultation events when the Pilot was proposed.                                                                                    | 26 | 34  |
| <b>Creel Limit</b>      | Coding relating to comments on the creel limits as set out by Marine Scotland in the Creel Limitation Pilot scheme.                                               | 27 | 108 |
| Accept lower limit      | Coding to identify all the interviewees that are willing to accept lower creel limits if evidence arises to suggest that this is advantageous for sustainability. | 20 | 23  |
| Just Right              | Coding to identify that the participant believed the creel limits to be about right.                                                                              | 7  | 8   |
| Not Conservative Enough | Coding to identify that the participant believed the creel limits to be too high.                                                                                 | 15 | 21  |
| Too Conservative        | Coding to identify that the participant believed the creel limits to be too low.                                                                                  | 2  | 3   |
| <b>Economics</b>        | Coding related to any economic issues or comments raised by interviewees.                                                                                         | 28 | 135 |
| Market Prices           | Coding related to comments on the current market prices or the change in market prices for shellfish.                                                             | 10 | 18  |
| Operational Costs       | Coding related to operational costs, including fuel, gear and bait.                                                                                               | 15 | 39  |
| <i>Bait Costs</i>       | All coding and comments related to the cost of bait.                                                                                                              | 2  | 2   |
| <i>Fuel Costs</i>       | Coding of specific comments relating to the cost of fuel, including speculation as to whether the fuel cost is impacting fishing locations.                       | 10 | 16  |
| <i>Gear Cost</i>        | Coding related to comments on the cost of gear.                                                                                                                   | 12 | 18  |
| <b>Gear Conflict</b>    | Coding related to any comments made regarding the theme of gear conflict by the interviewees.                                                                     | 26 | 131 |
| East-West               | Coding related to the geographic location of reports surrounding the presence or absence of gear conflict, noting that on the east of the Hebrides                | 17 | 29  |



|                          |                                                                                                                                                                                                                           |    |     |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|
|                          | lies the Creel Limitation Pilot Area and to the west, there is currently no creel limitation scheme in place.                                                                                                             |    |     |
| <i>East or Inside</i>    | Coding related to comments made about fishing on the east or inside the pilot area                                                                                                                                        | 11 | 13  |
| <i>West-Outside</i>      | Coding on comments related to fishing on the west or outside the pilot area.                                                                                                                                              | 7  | 12  |
| Static-Mobile            | Coding related to specific reports of gear conflict between static and mobile gear fishers (predominantly trawlers and dredges).                                                                                          | 10 | 18  |
| <i>Entanglements</i>     | Coding related to comments on entanglements of static gear, resulting in incidents or loss of gear.                                                                                                                       | 2  | 14  |
| <i>Fewer Trawlers</i>    | Coding related to comments made about fewer trawlers being present in the area.                                                                                                                                           | 4  | 5   |
| Static-Static            | Coding related to gear conflict between static gear fishers, predominantly consisting of conflict for space and stocks.                                                                                                   | 16 | 43  |
| <b>Health and Safety</b> | All coding related to the questions and comments from the interviews about health and safety.                                                                                                                             | 26 | 69  |
| CLP H&S Implications     | Responses to the question 'Are there any health and safety implications from the Creel Limitation Pilot?'                                                                                                                 | 22 | 22  |
| Reduced Creels           | Responses to the question 'Do you believe there would be a benefit to your health and safety by reducing creel numbers?'                                                                                                  | 21 | 23  |
| Satisfaction             | Responses to the question 'Are you more or less satisfied with your health and safety now compared to before the Creel Limitation Pilot? '                                                                                | 19 | 19  |
| <b>Management</b>        | Coding related to the management of the inshore fishery, including the comments made regarding the management and policing of the Creel Limitation Pilot. Included here are also suggestions for adjustment for the pilot | 23 | 164 |

|                               |                                                                                                                                         |    |     |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----|-----|
|                               | that can be aggregated and proposed to the management authority.                                                                        |    |     |
| Management suggestions        | Coding related to suggestions and recommendations given for the management of the Creel Limitation Pilot or the fishery going forwards. | 23 | 149 |
| <i>Management Area</i>        | Coding of the comments made regarding the extent or geography of the Creel Limitation Pilot Area                                        | 11 | 22  |
| <i>Policing</i>               | Coding related to comments on the policing of the Creel Limitation Pilot.                                                               | 7  | 10  |
| <i>Quota system</i>           | Coding of comments made suggesting a quota system as an alternative to a creel limitation.                                              | 1  | 1   |
| <i>Responsiveness</i>         | Coding of comments relating to the responsiveness of the management approach and adaptability to change.                                | 3  | 4   |
| <i>Species Fished</i>         | Coding of comments whereby fishers think different species and fisheries should be taken into account when setting the creel limits.    | 5  | 13  |
| <i>Suggestions for Creels</i> | Coding of recommendations for management specifically relating to creels                                                                | 17 | 33  |
| 1000 Creels Across the Board  | Coding for those interviewees that specifically shared the idea of a 1000 creel limit.                                                  | 6  | 11  |
| Creel Tagging                 | Coding of comments where fishers believe creels should be tagged.                                                                       | 2  | 2   |
| Crew Dependent                | Coding of comments where fishers want to see the number of crew accounted for in the creel limits.                                      | 1  | 1   |
| Lower limit                   | Coding of comments where fishers wanted to see the limits reduced further.                                                              | 11 | 18  |
| <i>Trial Date Extension</i>   | Coding of comments where fishers wished to see the pilot extended beyond the 31 <sup>st</sup> of October 2022                           | 5  | 6   |
| <i>Vessel Limit</i>           | Coding of comments where fishers are concerned about the number of vessels                                                              | 7  | 19  |

|                                 |                                                                                                                                                                                                                                                                        |    |    |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
|                                 | fishing in an area or moving into their areas if the pilot is successful.                                                                                                                                                                                              |    |    |
| <b>Operational Implications</b> | Coding concerning the shifts in operational patterns reported by interviewees. Only those that reported changes to their operating patterns have been coded. Included is a sub-branch for any changes an interviewee has perceived in the fishing practices of others. | 27 | 96 |
| Distance Travelled              | Coding related to changes in distance travelled as a result of the Creel Limitation Pilot.                                                                                                                                                                             | 4  | 7  |
| Other's Fishing Activities      | Coding related to the perceived changes in the operational activities of others as a result of the Creel Limitation Pilot.                                                                                                                                             | 26 | 52 |
| Personal Creel Numbers          | Coding related to changes in personal creel numbers as a result of the Creel Limitation Pilot.                                                                                                                                                                         | 10 | 22 |
| Soak Times                      | Coding related to changes in soak times as a result of the Creel Limitation Pilot.                                                                                                                                                                                     | 3  | 4  |
| Trip Time                       | Coding related to changes in trip times as a result of the Creel Limitation Pilot.                                                                                                                                                                                     | 4  | 4  |
| <b>Other concerns</b>           | Coding for other concerns noted by interviewees. Participants were asked specifically what their biggest concerns were and where these did not specifically relate to the creel limitation, these were noted here.                                                     | 19 | 79 |
| Aquaculture                     | Coding related to changes and expansion in the aquaculture sector as a concern because it encroaches on fishing grounds.                                                                                                                                               | 1  | 6  |
| Bad Weather                     | Coding related to concern over bad weather, preventing fishing vessels from going to sea.                                                                                                                                                                              | 5  | 9  |
| BREXIT                          | Coding related to ongoing concern over the separation of the United Kingdom from Europe and its implications.                                                                                                                                                          | 1  | 6  |
| Creel Storage                   | Coding related to issues raised of storing creels because the limits stipulated that                                                                                                                                                                                   | 3  | 3  |

|                          |                                                                                                                                                                                                                                             |   |   |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|
|                          | some of their creels had to be taken ashore.                                                                                                                                                                                                |   |   |
| Crew                     | Coding related to issues in finding crew.                                                                                                                                                                                                   | 2 | 2 |
| Greed                    | Coding related to concern over greed in the fishing industry and the undermining of sustainability                                                                                                                                          | 4 | 5 |
| Hobby Fishermen          | Coding of concerns over hobby fishermen.                                                                                                                                                                                                    | 1 | 7 |
| Illegal Activity         | Coding of concern over illegal activities such as selling catch directly to hotels.                                                                                                                                                         | 1 | 1 |
| Inability to Diversify   | Coding of concern at fishers being unable to diversify their fisheries if stocks decline.                                                                                                                                                   | 2 | 4 |
| Industry Pollution       | Coding of concern about marine pollution caused by the creeling sector.                                                                                                                                                                     | 1 | 2 |
| Inefficiency             | Coding of concern that other fishers are fishing high numbers of creels inefficiently rather than fewer more efficiently.                                                                                                                   | 1 | 1 |
| Landing Berried Lobsters | Coding of concern over the landing of berried female lobsters. This is currently legal in Scotland.                                                                                                                                         | 1 | 3 |
| Marine Protected Areas   | Coding of comments concerning the creation of new Marine Protected Areas taking up valuable fishing grounds.                                                                                                                                | 1 | 3 |
| MCA                      | Coding of concern about the Maritime & Coastguard Agency (MCA) particularly over their new regulations for vessels 15m and under and vessel inspections.                                                                                    | 3 | 6 |
| Next Generation          | Coding of concern related to the next generation, either with the lack of new entrants and stability for young fishers or shifting perspectives where younger fishers are unaware of what healthy stocks looked like many years previously. | 4 | 6 |
| Technology               | Coding of concern that new technologies may undermine sustainability.                                                                                                                                                                       | 2 | 5 |

|                                |                                                                                                                                                                                         |    |    |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| <b>Relationships</b>           | Coding of comments given by interviewees specifically relating to relationships with other fishers, Marine Scotland and the wider community.                                            | 26 | 78 |
| Marine Scotland                | Coding related to the relationship held with Marine Scotland.                                                                                                                           | 3  | 3  |
| Static-Mobile                  | Coding related to the relationships held between static and mobile gear fishers.                                                                                                        | 7  | 11 |
| <b>Shellfish Stocks</b>        | Coding of comments on interviewee's perception of shellfish stocks around the Western Isles. Some overlap with landings as they are not mutually exclusive.                             | 25 | 53 |
| Landings                       | Coding related to all comments concerning catch and landings. There is some overlap with Shellfish stocks as the status of one is potentially indicative of the status of the other.    | 27 | 49 |
| <b>Vivier Crabbing Vessels</b> | Vivier crabbing vessels were a concern for the majority of interviewees. Coding here is related to comments and concerns made regarding the vivier crabbing boats in the Western Isles. | 14 | 33 |
| <b>Well-being</b>              | Coding on comments relating to personal well-being. Included are comments made on health and safety.                                                                                    | 23 | 33 |



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The Scottish Government  
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Edinburgh  
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ISBN: 978-1-83521-136-6 (web only)

Published by The Scottish Government, August 2023

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA  
PPDAS1296304 (08/23)