




PROJECT UK

DELIVERING FISHERY IMPROVEMENTS IN THE NORTH EAST ATLANTIC

Project UK: Round 2 UK Nephrops

Year 4 report

May 2023

POSEIDON

AQUATIC RESOURCE MANAGEMENT

Report Information

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1. Introduction

1.1 Introduction

Project UK includes 12 fisheries, through eight Fishery Improvement Projects (FIPs). These fisheries were selected by the supply chain because they bring commercial, economic, and cultural benefits to UK communities. As part of Project UK, these FIPs address 61 individual actions. These actions address multiple milestones across a five-year period, representing best practice in working towards an environmentally sustainable future.

The first round of FIPs[1] to participate in Project UK (Channel scallop, monkfish, plaice & lemon sole, and crab & lobster) were launched in 2017, the second round of FIPs were launched in 2019 for nephrops and wider UK scallops. So far, these fisheries have made demonstrable progress against their Action Plans, focusing on developing and documenting progress in stock assessment, fisheries data and mitigating environmental impacts.

The UK nephrops FIP comes to its five year end in April 2024. This report forms the Annual Review for the end of year 4 and will document the position of the FIP with respect to individual Performance Indicators (PI) and scoring guideposts (SG) of the current (version 2.1) MSC Fisheries Standard.

The **Marine Stewardship Council** (MSC) has contracted **Poseidon Aquatic Resource Management Ltd** to provide technical advice to the FIPS and conduct annual benchmarking of progress against the action plans. This contract also covers this review and action plan update.

1.2 Structure of the report

This report has been divided into three main parts:

1. **Annual review**: this assesses what progress has been made over the past year in addressing the actions in this FIP up to the end of year four in the five year FIP timescale.
2. **Benchmark**: this provides the scoring of the FIP at the end of year 4 to demonstrate where PI scores have changed within the categories of <60, 60-79 and ≥80.
3. **Revised pre-assessment**: this section documents the position of the FIP UK scallop fishery with respect to individual Performance Indicators (PI) and scoring guideposts (SG) of the (version 2.1) MSC Fisheries Standard.

1.3 Scope of the FIP

The nephrops Functional Unit (FU) stock assessment areas included within this FIP are presented in Figure 1.

2. Annual Review end of Year 4

This section presents the annual review for the UK nephrops FIP based on work progressed during year 4.

[1] Following the success of Round 1, the Round 2 UK scallop and Nephrops FIPs were launched in 2019. Each includes three fishery areas around the UK (North Sea, West of Scotland, and Irish Sea), and so operate on a larger scale than Round 1 FIPs.

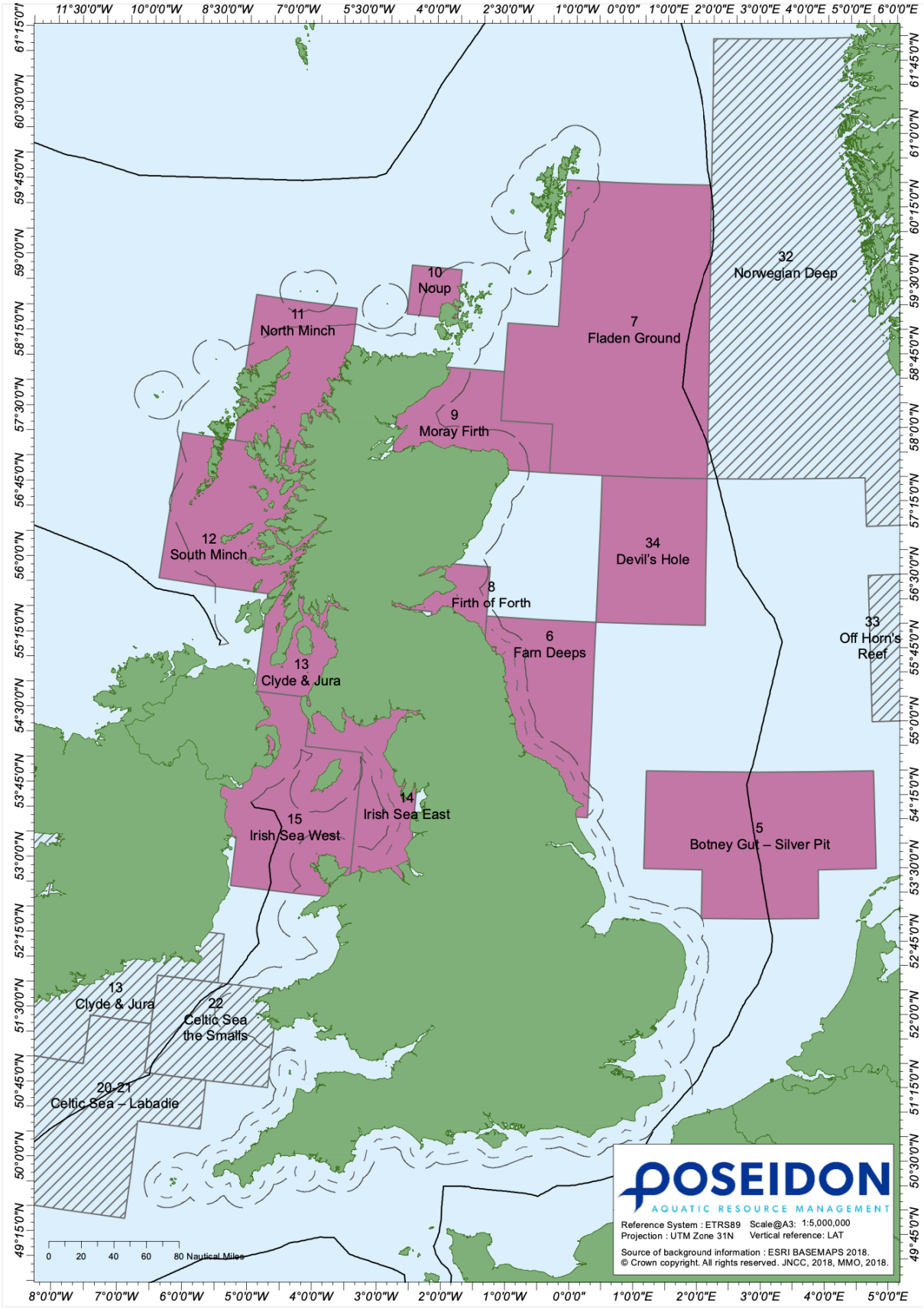

Figure 1: UK Nephrops Functional Units included in the FIP.

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Overview

Fishery name: UK North Sea, West of Scotland and Irish Sea Nephrops (*Nephrops norvegicus*)		**Start date:** 01 May 2019
Fishery location: **North Sea** Functional Units (FUs): 5 Botney Gut - Silver Pit, 6 Farn Deeps, 7 Fladen Ground, 8 Firth of Forth, 9 Moray Firth, 10 Noup, 34 Devil's Hole. **West of Scotland** FUs: 11 North Minch, 12 South Minch, 13 Firth of Clyde + Sound of Jura. **Irish Sea** FUs: 14 Irish Sea East, 15 Irish Sea West.	**Fishing methods:** Demersal trawl Creel **UoA vessels**: all UK vessels	**Annual reviews:** End Year 1: April 2020 — Completed 14 April 2020 End Year 2: April 2021 — Completed 21 May 2021 End Year 3: April 2022 — Completed 14 April 2022 End Year 4: April 2023 — **Completed 22 May 2023** End Year 5: April 2024
Project leaders: Project UK Fisheries Improvements – Stage 2		**Improvements recommended by:** POSEIDON AQUATIC RESOURCE MANAGEMENT

Overview of the Action Plan:

This Action Plan is undertaken as part of Project UK Round 2 and is applicable to UK nephrops demersal trawl and creel fisheries in the North Sea, West of Scotland and Irish Sea, across specified nephrops Functional Units (FUs). It is informed by an MSC pre-assessment (completed in May 2019), quarterly steering group meetings and end of Year 1, 2 & 3 review processes. Actions and milestones have been completed for the MSC performance indicators (PIs) that fail to reach Scoring Guideposts (SG) 60 and/or 80. The Action Plan highlights an ambitious set of actions designed to raise the scores over a defined period to a point at which the fishery could enter MSC assessment. The focus of this current action plan is outlined below for each MSC Principle.

Principle 1 (target stock):

- **management at Functional Unit (FU) level**, that is responsive to the state of each FU stock,
- development of biomass **limit reference points** for all FUs,
- development of MSY proxy reference points for biomass and harvest rate for specific FUs,
- development of **harvest control rules** for each FU that utilises a technical measures toolbox.

Principle 2 (ecosystem):

- understanding the catch composition, including quantity and species of bait used in the creel UoA,
- interactions with ETP species & additional management requirements in an **ETP Strategy**.
- assessment of commonly encountered and VME habitats impacts,
- development of a **Habitat Management Plan,**
- introduction of vessel monitoring systems on all vessels to accurately / reliably record the footprint of the fishery.

Principle 3 (management):

- focused on requirements for monitoring and control, specifically risks of non-compliance associated with the nephrops fishery in relation to the landing obligation.
- development of Fisheries Management Plan, linked to P1 Harvest Strategy.

Colour code in tables below: Principle 1 | Principle 2 | Principle 3

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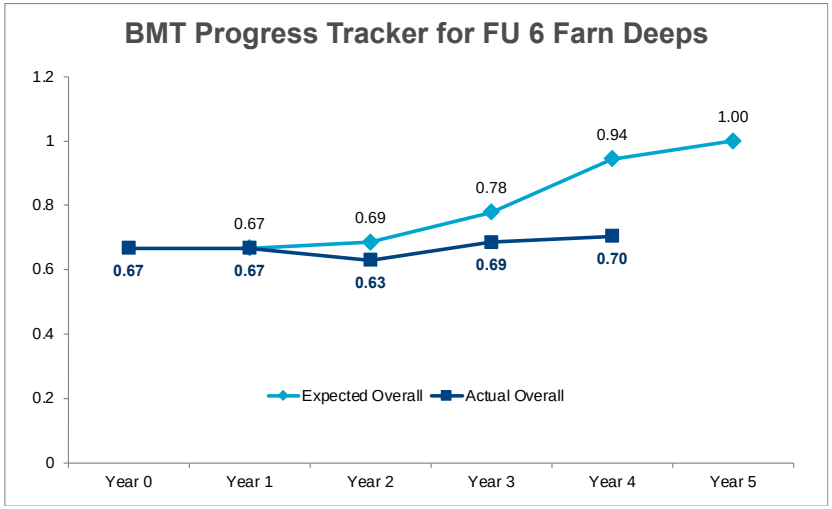
Annual Review (end of year 4)

This section summarises the annual review process at the end of year 4 in a five year Fisheries Improvement Project (FIP) for the UK North Sea, West of Scotland and Irish Sea nephrops demersal trawl and creel fisheries.

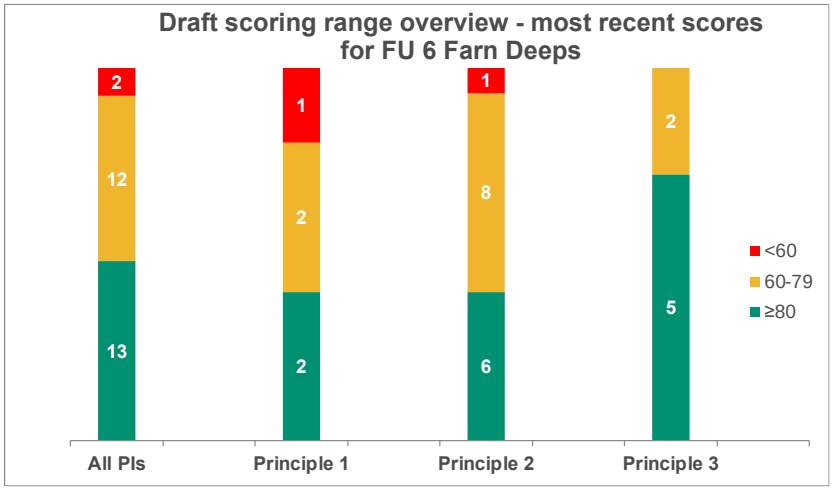
Main Findings

A number of actions in the UK nephrops FIP have made significant progress during year 4, and there have been some score changes, including an improved score for a Principle 3 PI across all UoAs and decreased scores for Principle 1 and Principle 2 PIs for certain stocks. Key findings are as follows:

- Principle 1: the stock status PI (1.1.1) was reduced to 60-79 for FU9 (Moray Firth) due to a fall in the abundance by 40% and uncertainty as to whether the stock is fluctuating around MSY; and for FU13 (Clyde and Jura) due to high harvest rate, well above F_{MSY}.
- Principle 2: the outcome status for main primary species of West of Scotland cod stock fell to <60 due to evidence of catch scenarios concluding an overall decrease in SSB, together with current fishing levels above F_{MSY}.
- Principle 3: the decision making PI improved to **≥ 80** the procedures within the Trade and Cooperation Agreement being established for annual negotiations for TACs at ICES Division level. In addition, Marine Scotland have provided information on the fishery's performance and management action.



Significant progress continues in the establishment of Nephrops Management Groups for the North Sea, West of Scotland and Irish Sea, which have all begun the process of discussing potential approaches to developing harvest control rules from a toolbox of technical measures. This has resulted in the development of a Harvest Strategy Management Flowchart (see Figure 4), which details the steps to be taken upon reviewing published ICES stock assessments and advice at Functional Unit level, including consideration of remedial measures should the abundance be below pre-determined reference points.



A habitat post-doctoral study was completed in 2023 to inform the assessment of habitat outcome status utilising the Benthic Impact Tool to calculate Relative Benthic Status and determine the impact of the trawl (TR1 and TR2) and creel UoAs on commonly encountered habitats and VMEs. The creel component scored **≥ 80** for all habitat types; while there remains uncertainty for the trawl UoAs, specifically in relation to interaction with VMEs and therefore no score increases were justified for the habitats performance indicators.

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Table 1: Action Plan

Standard requirement	Lead & partners	Timescale / milestones	Progress	Revised milestone
Action 1: Stock status **Overview:** [FU 6, 9, 13, 34] Reduce harvest rates in FUs to levels below the Fmsy proxy to ensure that stock biomass is rebuilt to a level consistent with MSY. **Performance indicator** 1.1.1Stock status **60-79** Requirement at SG80: (a) It is highly likely that the stock is above the PRI (b) The stock is at or fluctuating around a level consistent with MSY.	Action lead: Steering Group (SG) Resources: Harvest Strategy Development Project	**1a.** Yr. 2-5 – Review harvest ratio relative to HR_{MSY} and abundance relative to MSY $B_{trigger}$ for all FUs annually. For FU6 maintain HR below 8.12%. For FU34 maintain HR below 7.5%.	**Behind target** **Update for end of Year 4** A summary is provided of nephrops stock status as of April 2023 based on information from the latest ICES advice (Oct 2022) (see Figure 2). Based on this review of stock status the following stocks score between 60-79: Farn Deeps (FU 6), Moray Firth (FU 9), Firth of Clyde and Sound of Jura (FU 13) and Devil's Hole (FU 34); all other stocks are ≥80. Farn Deeps (FU6): Catches have been generally higher than the level advised by ICES, highlighting the issue that current management arrangements are not sufficient to contain the fishery within the sustainable limits determined by ICES. Catches in 2021 (2022 + 419 discards) were just above upper limit of ICES catch advice (2310 tonnes). HR increased from 9.1% to 11.9% and is above F_{MSY}. Abundance is just above MSY $B_{trigger}$, but following a downward trend since 2019. [Farn Deeps graphs shown below]  Moray Firth (FU 9): Significant drop in stock abundance from 658 million individuals to 396 in an annual period (drop of 40%) and on downward trend towards $MSYB_{trigger}$, although remains above $MSYB_{trigger}$. Highly likely above PRI, but not likely to be fluctuating around MSY. Landings in 2021 were above advice (landings= 1221; advice = 1180). Harvest rate remains well below F_{MSY}. Firth of Clyde and Sound of Jura (FU 13): F increase to above FMSY, but has been below previously. Firth of Clyde abundance has increased from 1414 to 1665. Sound of Jura abundance has decreased from 310 to 241. MSS note concern around harvest rate being above FMSY. FU13 seen stock relatively high in terms of abundance, fluctuations in terms of fishing amounts and landings – 2021 landings increased. Advice for 2023 has increased for Clyde, but decreased for Jura. Overall, high harvest rates put this FU into the 60-79 category. Devil's Hole (FU 34): Catches in 2016 & 2017 well above ICES advice. Catches in 2019 over double ICES advice. Catches in 2020 and 2021 remain above advice. HR is just below 7.5%.	Revised to Yr. 2-5 to ensure continual monitoring throughout FIP.
		1b. Yr2 - Maintain harvest ratio below 7.5% in FU34 and below 8.12% in FU6.	**Complete** See 1a	

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Standard requirement	Lead & partners	Timescale / milestones	Progress	Revised milestone
		1c. Yr3 - Continue to maintain harvest ratio below 7.5% in FU34 and below 8.12% in FU6, and demonstrate that stock is at or fluctuating around a level consistent with MSY in FU34 and that stock abundance remains above $MSYB_{trigger}$ in FU6.	**Complete** See 1a	
		1d. Consideration of nephrops landed from areas outside Functional Units in the North Sea, West of Scotland and Irish Sea.	**Complete** ICES provide advice for nephrops outside FUs, indicating that just under 900 tonnes of nephrops landed outside FUs in the North Sea (724 tonnes) and West of Scotland (173 tonnes), representing 3% of total landings of the FU's included in this FIP. This equates to 6% of landings from North Sea and 2% of landings from WoS. ICES advice is not provided for landings of nephrops outside FUs in the Irish Sea. Stock status reference points are not available for nephrops outside FU's and therefore an RBF approach is expected to be required. The results of a Productivity Susceptibility Analysis (PSA) are presented in Figure 3 with key findings below: ○ Demersal trawl scores 60-79: this is largely based on a score of '2' for encounterability, which is based on a medium overlap with fishing gear due to nephrops inhabiting burrowed mud and therefore not always accessible to the fishing gear. ○ Creel scores ≥80: this is due to an encounterability score of '2' and selectivity of '1'	
Action 2: Harvest Strategy **Overview:** [all FUs] The harvest strategy is at a stock level and can be responsive to changes in the state of that stock. **Performance indicator** 1.2.1 Harvest strategy **<60** Requirement at SG80: (a) **SG60:** The harvest strategy is expected to achieve stock management objectives **SG 80:** The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together	Action lead: SWFPA Resources: Harvest Strategy Development Project	**2a.** Yr1 - Assess the options and scope of the current harvest strategy, in accordance with the North Sea and North West Waters Multi-Annual Plans (MAPs). Assess its ability to continue to deliver management objectives that achieve a stock at or fluctuating around MSY. Investigate rebuilding plans and strategy.	**Complete** The Harvest Strategy Development (HSD) project highlighted three key issues identified at pre-assessment: B limit reference points need to be defined; annual TACs are set at ICES division level, not by FU; and lack of evidence that requirements on discarding have been implemented. Overall the report recommended that technical measures are developed; these can offer flexibility to fishermen and appear to be the only way to move forward at this time; however they can be complex and have indirect consequences as well as risk decreasing fishing efficiency. The report reiterated that the options of TAC by FU and Days at Sea have been ruled out based on the understanding that these are unworkable for industry. Moving forward, management groups need to be established to discuss and agree technical measures (that would be implemented if trigger points are reached). The Steering Group agreed that a regional approach to management is required due to the large area covered by the FIP and the differing challenges faced by each Functional Unit. This Management Focus Group will support the development of regional management.	
	Action lead: MSS Partners: Cefas, AFBI	**2b.** Yr. 1 - Investigate whether there is any discarding of nephrops above the MCRS.	**Complete** MSS provided Nephrops discard rates (by weight) above and below MCRS in 2018 for North Sea (FUs 7, 8, 9) and WoS (FUs 11, 12, 13). Note: higher than average discard rate of neprhops >MCRS in FU 8 (Firth of Forth) The latest ICES report contains details on MCRS for the Irish Sea. The 2019 ICES assessment showed	

Standard requirement	Lead & partners	Timescale / milestones	Progress	Revised milestone
towards achieving stock management objectives. (b) The harvest strategy may not be fully tested but there is evidence that it is achieving its objectives. (f) Regular review of alternative measures of minimising mortality of unwanted catch.			landings profiles for Irish Sea Functional Units and indicated that there are discards of Nephrops above MCRS. The next report produced by the ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK) will provide a size range of discards for FU6. The fishery in FU5 is self-sampled by Dutch industry, who have their own minimum landing size with estimates of discarding around 60-70%.	
	Action lead: TBC	**2c.** Yr. 2-3 – Establish Management Working Groups for UK regions each covering one or more FU.	**Complete** Significant work has been undertaken to establish Nephrops Regional Management Groups for the North Sea, Irish Sea and West of Scotland. Meeting have been held for each region with potential approaches to management and appropriateness of technical measures at a FU level discussed.	Milestone added in v1.8 Timescale updated v3.1 to Yr2-3
	Action lead: 2c 2d Whitby Seafoods Action lead 2d: Seafish	**2d.** Yr2-4 – Develop and formalise harvest strategy. Present rebuilding plans and demonstrate that it is highly unlikely that the Fmsy for an individual FU will be exceeded.	**Progressing** **Update for end of Year 4** A Management Flowchart has been developed by the FIP Steering Group to define the steps taken should FU reference points be reached. The flowchart is shown in Figure 4. It is understood that North Sea and Western Waters MAPs no longer apply directly to the UK, but an amended version of the MAPs has been retained in UK domestic legislation. These are expected to be replaced by Fisheries Management Plans under the Fisheries Act 2020. Two nephrops Fisheries Management Plans (FMP) are listed in the Joint Fisheries Statement published in December 2022 with a timetable for delivery from 2022 to 2024; Marine Scotland is the coordinating authority, with DAERA, Defra and Welsh Government providing support as Joint Authorities. The two nephrops FMPs are as follows: • North Sea Nephrops FMP • West Coast of Scotland Nephrops FMP The Steering Group agree that engagement in this FIP from Defra, Daera, and Marine Scotland Policy officials is crucial to the success of adopting additional management measures in the UK Nephrops fishery; increased legislative involvement will ensure that plans are implementable and enforceable.	Updated timeline in v1.8
		2d. Yr. 2 - Consider options for alternative measures to minimise mortality of unwanted catch.	**Complete** Seafish have undertaken a thorough review of alternative measures, including both an excel database of studies and comprehensive written report. This process included significant input from the steering group on recent /current trials and studies, as well as technical measures & national legislation (for example, regulations on square mesh panels). This process aligned with the work undertaken by the lemon sole and plaice FIP.	
		2e. Yr5 – Continue to monitor effectiveness of harvest strategy. Agree and list rebuilding strategies.	This action has not yet commenced.	Timeline changed v5.1
		2f. Yr5 - Carry out new review of alternative measures to	This action has not yet commenced.	Timeline changed in

Standard requirement	Lead & partners	Timescale / milestones	Progress	Revised milestone
		minimise mortality of unwanted catch.		v3.1
Action 3: HCR **Overview:** [all FUs] Develop limit reference point (Blim) and define explicitly what action should be taken if stock abundance drops significantly below MSYBtrigger and towards Blim, and if stock abundance drops below Blim. Ensure that catches do not exceed the levels advised by ICES. **Performance indicator** 1.2.2 Harvest control rules and tools **60-79** Requirement at SG80: (a) Well-defined HCRs are in place, (wrt PRI and MSY). (b) HCRs are likely to be robust to the main uncertainties (c) available evidence indicates that tools in use are effective.	Action lead: Cefas Action partners: MSS Resources: Harvest Strategy Development Project	**3a.** Yr1-5 – Consider options for defining Blim and how exploitation rates should vary dependent on the estimate of stock status in relation to stock abundance reference points. Ensure that catches do not exceed the levels advised by ICES.	**Progressing** **Update for end of Year 4** During Year 4 the FIP has been exploring and encouraging the joint UK administrators to submit a joint request to ICES to define B_{lim} and B_{MSY} for nephrops FUs. This is required because the reference points cited in the Multi Annual management plans and in the management flowchart (Figure 4) are not defined (i.e. B_{lim} and B_{MSY}). The FIP steering group have verbally agreed that $MSYB_{trigger}$ (which is defined for most FUs) is more appropriate as B_{lim} because it is (as a general rule) defined as the lowest level of abundance monitored on the timeseries of UWTV surveys. However, using $MSYB_{trigger}$ as the limit reference point is not adopted within ICES stock assessments, including as part of catch advice determination. Marine Scotland are concerned that if $MSYB_{trigger}$ is adopted as B_{lim}, then the resulting ICES catch advice would be lower, and so MS have requested that the economic effect is considered before the request to define B_{lim} and B_{MSY} for nephrops FUs is made to ICES. At the end of Year 4, a joint request to ICES has not been made and it remains to be agreed whether the request should go forward. **Discussion and outcomes from Years 1 to 3** The potential of using a buffer score ('Bbuff') to build in a precautionary approach before Blim is reached was discussed. This would help avoid issues where a data delay could have negative impacts on the stock (North Sea Advisory Council, 2015). The ICES workshop on methodologies for nephrops reference points (WKNephrops) was held in Nov 2019 to evaluate reference point estimation methods for stocks with UWTV surveys. The workshop had the following objectives (ICES, 2019): a) Review the methodology and performance of the current approaches to estimating reference points for Category 1 Nephrops stocks. b) Based on a) develop a standard method and apply this method to estimate reference points (MSY, ranges, precautionary and limit) for fishing pressure and stock size for all Nephrops stocks which have sufficient data. c) Evaluate the utility of other modelling frameworks to assess and provide reference points for Nephrops stocks (e.g. length based models, VPA type models and production models). **WKNEP ICES methodologies for nephrops reference points (ICES, 2020)** The workshop found that "there is still much work to do in relation to the assessment and derivation of reference points on Nephrops stocks. The move toward dynamic length-based models integrating the UWTV surveys is desirable and may help address the reference point issue." In relation to discard data and use of this data within modelling, it was deduced that for stocks where FMAX is used as the FMSY proxy and which have a high discard percentage, FMSY may need to be re-estimated using the best available estimate of discard survival. Overall, the workshop concluded that further work is need before new reference points can be	Timeline changed in v3.1 and v5.1

Standard requirement	Lead & partners	Timescale / milestones	Progress	Revised milestone
			proposed and agreed. **Biomass reference points** It was agreed at the SG meeting on 19 October 2020, that based on transferrable learnings from the Joint Demersal assessment, it is appropriate to consider $MSYB_{trigger}$ as a limit reference point, as it represents the lowest abundance measured in the timeseries of UWTV surveys undertaken for (most) FU stocks. Therefore it is considered appropriate that $MSYB_{trigger}$ is a proxy for B_{lim}. The action therefore changes focus to defining B_{MSY} or an appropriate proxy for B_{MSY}. Extract from MSC interpretation log on B_{MSY} and ICES assessed stocks (MSC, 2018): *MSC recommends that to achieve an assumed status of B_{MSY}, F should have been at or below F_{MSY} for at least 1 Generation Time (GT) from a starting point close to B_{pa} or $B_{trigger}$, and 2 generation times from a starting point close to B_{lim} (Carruthers and Agnew 2016)* *An 80 score may also be met where stock size is very substantially higher than B_{pa}, for instance greater than 2 x B_{pa} ($B_{trigger}$) (Froese et al, 2014), irrespective of the above F proxies.*	
	Action lead: TBC	**3b.** Yr5 – Consult on options for defining Blim and for formalising more explicit HCRs for when stock abundance drops below both MSYBtrigger and Blim. Ensure that catches do not exceed the levels advised by ICES.	**Update for end of Year 4** See progress under 3a relative to reference points. See progress under 2d for management flowchart. The options for harvest control rules have been discussed at Regional Management Working Groups. Potential options for management scenarios have been developed and will be explored further during Year 5 including through a modelling exercise that will utilise available datasets.	Timeline changed in v3.1 and v5.1
		3c. Yr5 – Define Blim for stocks and implement more explicit HCRs for when stock abundance drops below both MSYBtrigger and Blim. Ensure that catches do not exceed the levels advised by ICES.	This action has not yet commenced.	Timeline changed in v3.1 and v5.1
Action 4: Information **Overview:** [FU 5, 10 & 34] Development of regular estimate of stock abundance through TV burrow count surveys in FUs 5, 10 and 34. **Performance indicator** 1.2.3 Information and monitoring	Action lead: MSS Partners: Cefas	**4a.** Yr1 – Determine timescale for implementing regular TV surveys in all FUs.	**Complete** All Scottish FUs are planned to be surveyed on an annual basis. Data-limited FUs (10 & 34) are dropped if there are time-constrains or any issues during the surveys (for example weather, problems with the ship or equipment, any staff issues). In 2019 MSS successfully surveyed all FUs (including FU 10 and 34). It is understood that FU10 and 34 are surveyed as often as possible but Covid-19 was impacting AFBI's ability to do so this year. The use of catch per unit effort (CPUE) is discussed. Paul Medley (P1 adviser) recommends use of CPUE as an additional means to monitor FUs. This could be more important for FUs with irregular UWTV surveys. Cefas cautioned against using a CPUE as a proxy indicator for Nephrops as catch rate data is hugely variable and depends on factors such as sunlight, oxygen, absence/presence of	

Standard requirement	Lead & partners	Timescale / milestones	Progress	Revised milestone
FU 5: **60-79** FU 10 & 34: **≥ 80** <u>Requirement at SG80:</u> (b) Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule.			predators and spawning cycles. Using CPUE as a proxy under such circumstances is likely to produce inaccurate estimates of Nephrops abundance, which could have significant consequences for managing the stocks. It is noted that landings outside designated Functional Units have increased recently: • Landings outside FUs in North Sea were 724 tonnes + 567 tonnes discards, ICES advice was 376 tonnes. • Landings outside FUs in West of Scotland were 173 tonnes, ICES advice was 261 tonnes.	
		4b. Yr2 – As a priority, instigate regular TV surveys in FU5 (last survey in 2012).	**Not complete and no further action possible** Surveying FU5 is undertaken by Cefas. FU5 was not surveyed in 2019 and was last surveyed in 2012. It is unknown why this FU appears of lower importance for regular survey, it could be based on catch levels or that it is shared between UK and other EEZ. Cefas explained that there is no funding available to survey FU5 on a regular basis and this is unlikely to change. This action is outside FIP control and cannot be taken further based on funding requirements. The score for FU5 remains at 60-79.	
		4c. Yr3 - Instigate regular TV surveys in FU10 (last survey in 2014) and in FU34 (last survey in 2017).	**Complete.** For FU's 5 (Botney Gut), 10 (Noup) and 34 (Devil's Hole) 1.2.3 scoring issue b was not met in the pre-assessment [Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.] This was due to a lack of annual UWTV survey to monitor abundance. FU's 10 and 34 have now recently been surveyed (in 2019), with an updated ICES stock assessment for 2021. Marine Scotland Science confirm that it is their intention to survey FU 10 and 34 this year (although these FU's are the lowest priority due to catch rates and may be missed if surveys are delayed due to weather etc). It is considered that: ○ With these recent surveys and monitoring of abundance, it is appropriate that FU's 10 and 34 can meet SG80 for 1.2.3. ○ FU 5 has not been surveyed since 2012, with no plans or budget for future surveys. So this remains at SG60. A watching brief should be maintained on the frequency of UWTV surveys on these FU's.	Score changed for FU 10 & 34 in v4.1
<u>Action 5: Assessment</u> **Overview:** [FU 5, 10 & 34] Development of stock abundance and harvest ratio reference points for FUs 5, 10 and 34.	Action lead: MSS and Cefas	**5a**. Yr1-3 – Review data requirements for developing harvest ratio reference points for FUs 5, 10 and 34. Use 7.5% harvest ratio as reference point until better estimate is available.	**Progressing** **Update for end of Year 4** There is no change for FU5 (ICES, 2022). For FU 10 and FU 34, a sensitivity analysis of harvest rates has been undertaken by ICES (2022) for a range of potential densities, assuming the fishery selection pattern does not change. The harvest rate in 2021 for FU10 was calculated at 0.65%, and for FU34 was calculated at 7.4%; the F_{MSY} proxy for both these stocks remains set as the lower bound North Sea F_{MSY} of 7.5%.	Timeline updated in V3.1
		5b. Yr2-4 – Evaluate whether there are sufficient data to develop harvest ratio reference		

Standard requirement	Lead & partners	Timescale / milestones	Progress	Revised milestone
Performance indicator 1.2.4 Assessment of stock status **60-79** <u>Requirement at SG80:</u> (b) The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.		points.	**Discussion and outcomes from Years 1 to 3**	
		5c. Yr3-4 – If sufficient data are available, develop harvest ratio reference point for FUs 5, 10 and 34.	The ICES WKNephrops held a workshop in Nov 2019, which included the following objective: For Nephrops stocks which are more data-limited propose a consistent methodology to determine stock status and provide catch advice taking into account available data and knowledge from other areas. The findings of ICES WKNephrops workshop are provided in milestone 3a. Transferrable learning from SFSAG North Sea Neprhops trawl fishery is provided in milestone 1a.	
		5d. Yr5 – Determine stock abundance reference point for FUs 5, 10 and 34 based upon time series of TV abundance estimates.	This action has not yet commenced.	Timeline updated in V3.1

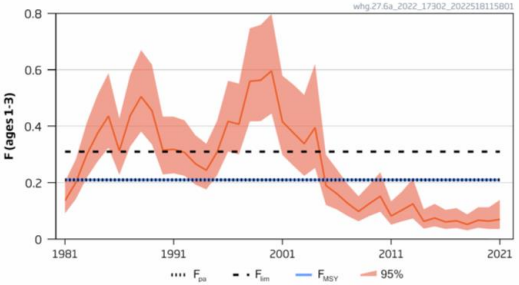
Standard requirement	Lead & partners	Timescale / milestones	Progress	Revised milestone
<u>Action 6: Primary spp</u> **Overview:** Information on the nature and scale of effect of this fishery on primary species stocks needs to be assessed. Based on this, appropriate management measures need to be developed. **Performance indicator:** <u>Trawl</u> **2.1.1:** North Sea FUs (5-10, 34): **60-79** WoS FUs (11-13): **60-79** [moved from <60 in v3.2] Irish Sea FUs (14-15): **<60** **2.1.2:** North Sea FUs (5-10, 34): **≥ 80** WoS FUs (11-13): **≥ 80** [moved from <60 in v3.2]	Action lead: MSS Partner: Poseidon	**6a.** Yr. 1 - Collate and analyse catch composition for each FU with regular review, to confirm categorisation of main & minor for each FU. MSS to liaise with AFBI and Cefas regarding data.	**Complete** Cefas have provided total catch data, including landings (based on iFISH database) and discards (based on observer coverage) at Functional Unit level for the following gear: demersal trawl TR2 (70-99mm); demersal trawl TR 1 (≥100mm); and pots & creels. This dataset has allowed accurate profiling of main and minor primary and secondary species. The pot & creel data remains complicated in that landings are recorded as generic 'pot' gear, rather than specifying the target species (i.e. nephrops, whelk, crab or lobster). However, the Cefas data is at FU level, which does provide some further context. Nevertheless, lobster and crab species remain significant within the catch data. The Steering Group note that certain FUs have large creel components that interact with other species including cod. More information on nephrops targeted creel catch composition may be available if iFISH data can be analysed at trip level.	
	Action lead: WoSPO, CIFA	**6b.** Yr. 1 – Establish bait species used within creel fishery and determine outcome status.	**Complete** Most commonly cited bait used by the creel sector targeting nephrops is herring – this is purchased as frozen blocks. Other bait used is unwanted cuttings (head, fins, tails, carcasses) of gurnard and plaice, which have been landed and recorded via Registration of Buyers and Sellers (i.e. are included within iFISH database and subject to management for these species e.g. quota, MCRS etc). Conclusion: bait species are herring (main), gurnard (minor) and plaice	

Irish Sea FUs (14-15): **60-79** Requirement at SG80: 2.1.1 (a) Outcome status: Main primary species are highly likely to be above biologically based limits, or if below there is evidence of recover or a demonstrably effective partial strategy. 2.1.2 (a) Management: A partial strategy is in place for the UoA. (b) objective basis for confidence it will work (e) Regular review of effectiveness and practicality of alternative measures to minimise mortality of unwanted catch			(minor).	
	Action lead: SG Partner: Poseidon	**6c.** Yr. 2 and annually thereafter - Review status of whiting and cod in 4, 6a and 7a. (annual review)	**On target** It is agreed by the Steering Group that both TR1 and TR2 are included in the assessment for nephrops trawl. **Update for end of Year 4** The status of whiting and cod is reviewed below.	

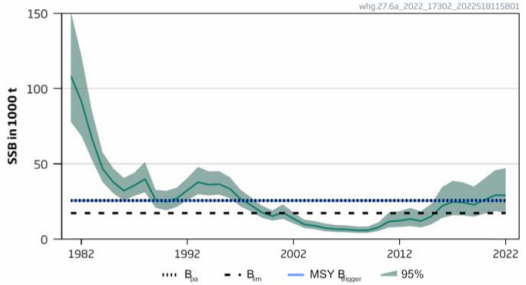
Whiting stock status update

West of Scotland (6a) In June 2022

F



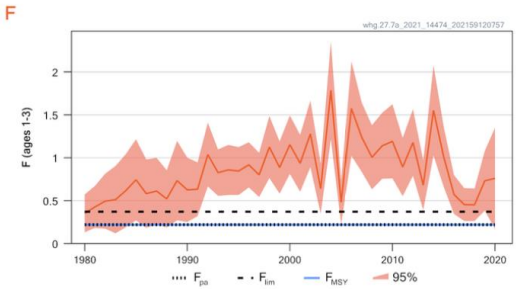
SSB



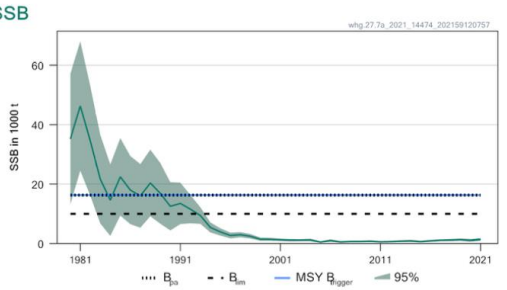
- F is below FMSY and SSB is above MSY Btrigger, Bpa, and Blim
- Stock benchmarked in 2021 and has moved from Category 5 to category 1.
- From zero catch advice in 2021 to 4114 tonnes in 2022. 2022 TAC set under advice; decrease observed in discards from 2019-2021 (due to TAC).
- Score remains at SG80.

Irish Sea (7a) June 2021:

F



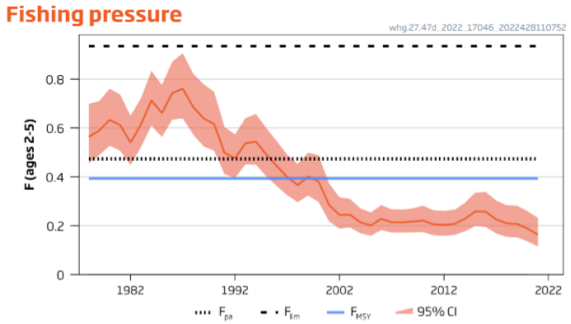
SSB

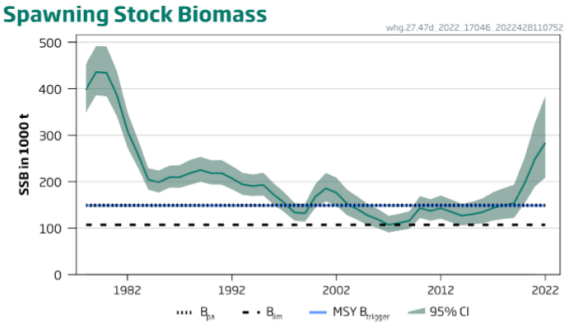


- SSB extremely low, remains well below Blim. (<60)
- ICES advice is for zero catches in 2022 and 2023.
- ICES technical service (2022): For whiting in Division 7.a, forecasted bycatch levels in 2023 are 1125 tonnes, using a model of whiting bycatch in the Nephrops fishery and assuming 8476 tonnes of Nephrops catches in 2023. This is expected to result in a 1% increase in SSB in 2024.

- F remains well above Flim; Score remains <60

North Sea (4) Jan 2022:

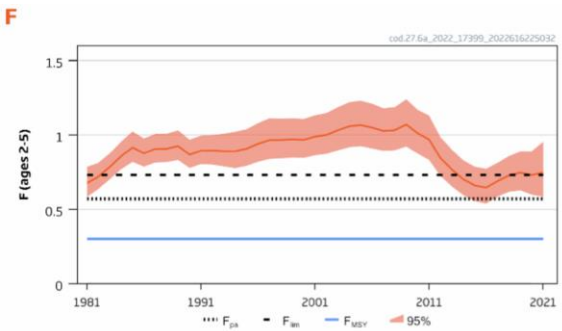


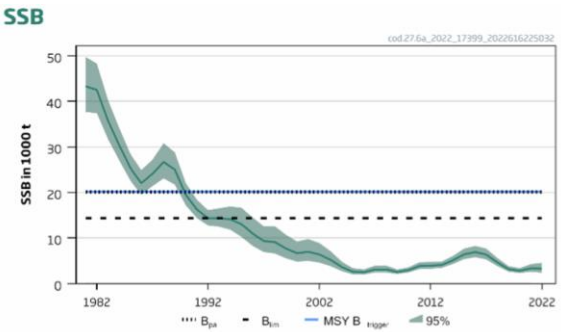


- Assessment was inter-benchmarked in 2021 and revised in 2022. Revised assessment shows improved situation for the stock biomass and lower fishing pressure relative to ref points.
- SSB above MSY Btrigger and well above Blim. F well below Fmsy, Fpa and Flim. (Score remains at SG**80**)

Cod stock status update

West of Scotland (6a) 2022:

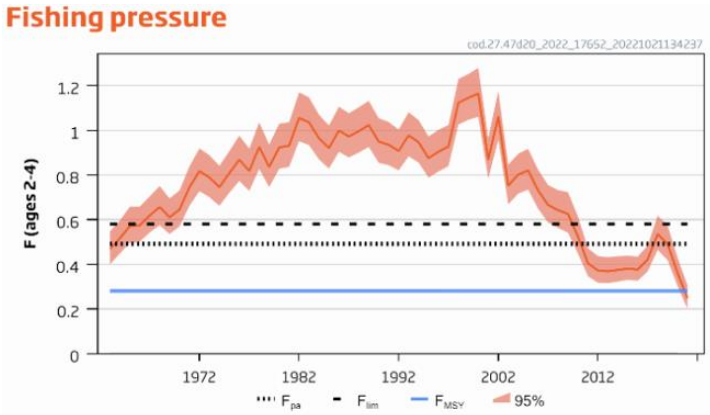


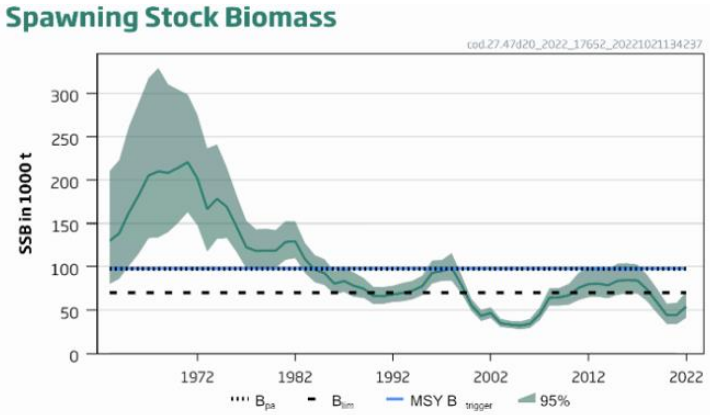


- Fishing pressure on the stock is above FMSY, Fpa and Flim; spawning-stock size is below MSY Btrigger, Bpa, and Blim
- ICES advice is for zero catch for 2023 and 2024.
- In the 2022 Annual Review it was concluded that additional management through the Sea Fish Prohibition on Fishing Firth of Clyde Order 2022 – which implemented a spatial seasonal closure for all fishing gears from 14 Feb to 30 Apr (11 weeks) to protect cod spawning, were expected to ensure that the fishery does not hinder recovery. However, in the 2023 Annual Review it is noted that evidence is not available of either recovery of the stock or of this strategy being effective, and as such the score of 60-79 is awarded in 2023 for management PI (2.1.2).
- To inform stock status, an update from ICES Technical Service (2022) paper on catch scenarios finds that: For cod in Division 6.a, catches in 2023 are estimated to be between 1642 tonnes and 2562 tonnes, assuming fishing mortality on cod does not change or increases by the same proportion as the change advised for haddock. Under the scenario resulting in lower catch, spawning-stock biomass (SSB) in 2024 is expected to decrease by 5.6% while the higher catch option is expected to result in a decrease in SSB of 44%. This demonstrates that catches of cod in the West of Scotland will not allow the SSB to recover.

- Based on the evidence of catch scenarios concluding decrease in SSB, together with fishing above FMSY, the score is reduced to **<60**

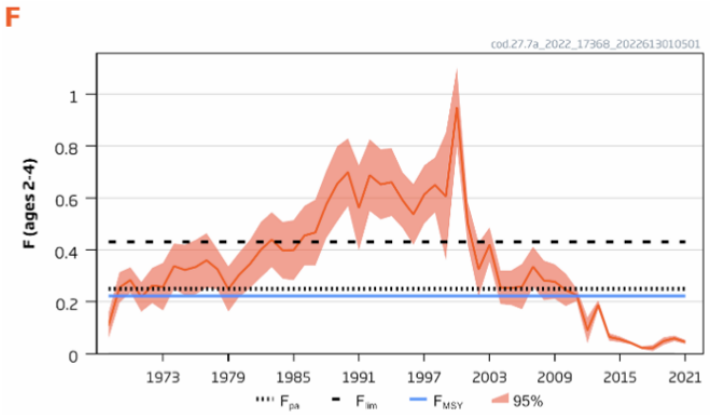
North Sea (4) Nov 2022:

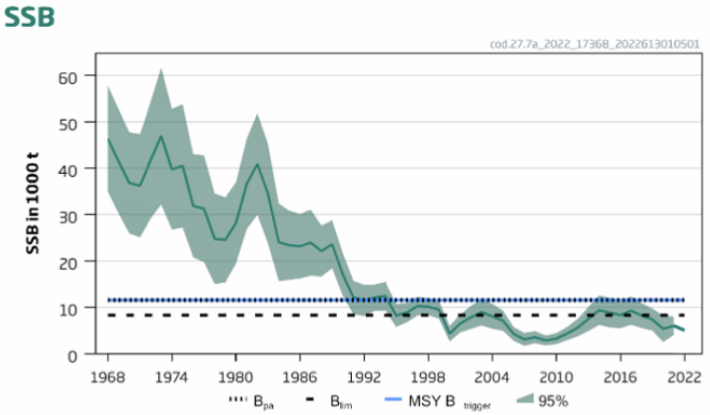




- The stock is currently below Blim; fishing pressure has dropped significantly and is below FMSY (noting that it was above Flim in the June 2020 assessment)
- TAC set for 2023 at 21,652 tonnes, ICES advised catches no more than 26,008 tonnes. Modelling shows catch of 22,523 tonnes (F=F2022) would result in 29% growth in SSB (ICES, 2022).
- The TAC is therefore expected to ensure that the UoA does not hinder recovery of the North Sea cod stock and therefore SG60 is met for 2.1.1 and the score remains **60-79.**
- The trend in SBB is not considered to evidence this recovery yet, but it is promising.
- The significant drop in fishing pressure is evidence that management is being implemented and it is appropriate for the 2.1.2 score to remain at **80**.

Irish Sea (7a) Oct 2022:





- Fishing pressure on the stock is below FMSY, and spawning-stock size is below MSY Btrigger, Bpa, and Blim.
- Cod in the Irish Sea has been benchmarked in 2022 as a category 1 stock now providing zero catch advice.
- TAC for 2023 set at 165 tonnes (modelling shows this will result in an increase of SBB of approximately 6.15%)
- Fishing mortality experienced by the stock is lower than FMSY, so rationale that measures in place to ensure the UoA does not hinder recovery.
- The score has therefore increased to **60-79**
- (2.1.2): In terms of management, the TAC is for bycatches only, no targeted fishery for cod. Fishing mortality is currently well below FMSY and has been below FMSY since 2012. There is also regular review of alternative measures. The management PI (2.1.2) score has therefore increased to **80**.

Summary of scores for whiting and cod as of **end of Year 4 (2023)**

		West of Scotland	Irish Sea	North Sea
Whiting	2.1.1	**80**	<60	**80**
	2.1.2	**80**	60-79	**80**
Cod	2.1.1	<60 (previously 60-79)	60-79 (previously <60)	60-79
	2.1.2	60-79 (previously 80)	**80** (previously 60-79)	**80**

6d. Yr. 2-3 - Review implementation of landing obligation within nephrops trawl fisheries and with respect to above main primary species stocks.	**Progressing** For both the North Sea and North West Waters, a de minimis exemption to allow vessels to discard a limited amount of Nephrops below MCRS has been agreed by Member States and the Commission (Marine Scotland, 2019[2]). In both the North Sea and North West Waters, Member States and the Commission have also agreed a high survivability exemption for nephrops caught with pots, traps and creels which will allow those nephrops to be returned to the sea as they are highly likely to survive the capture process. For all primary species subject to quota and caught by nephrops trawl, unless there is a derogation, these species count towards the LO. Fish caught in nephrops creels can be returned to sea, based on high survivability. There remains a need to fully understand any issues arising from the implementation of the landing obligation specifically from the perspective of UK fisheries administrations.	Changed timeline to Yr2-3 in V3.1
6e. Yr. 2 and annually thereafter - Review management of whiting in ICES Divisions 6a (West of Scotland) and 7a (Irish Sea) and cod in 6a (annual review). E.g., including comparison of TAC levels with ICES assessment catch scenarios to determine whether catch	**Complete** See 6c.	

[2] https://www2.gov.scot/Topics/marine/Sea-Fisheries/discards/demersal

		rates are hindering recovery.		
	Action lead: Seafish	**6f.** Yr. 2 – Review effectiveness and practicality of current and alternative measures to minimize mortality of unwanted catch, including undersize fish.	**Complete** See 2d.	
	Action lead: SG	**6g.** Yr. 2 - Establish process for regular review of alternative measures and the associated effectiveness and practicality of such measures.	**Complete** It is agreed that the Steering Group will table an annual agenda item to review alternative measures and practicality of implementation.	
	Action lead: TBC	**6h.** Yr. 3-4 - Implement alternative measures where they are found to be more appropriate.	**Complete** As per 6g.	
Action 7: Secondary species **Overview:** Obtain accurate profile of catch to determine main and minor secondary species and inform management needs. **Performance indicator:** Creel: **2.2.1: ≥ 80 (**moved from 60-79 to ≥ 80 in v3.1) Trawl **2.2.2: ≥ 80 (**moved from 60-79 to ≥ 80 in v3.1) Creel: **2.2.2: ≥ 80 (**moved from 60-79 to ≥ 80 in v5.1) Requirement at SG80: 2.2.1. Outcome status: Main secondary species are highly likely to be above biologically based limits. 2.2.2. Management: A partial strategy is in place for main secondary species Regular review of alternative measures to minimise mortality of unwanted catch.	Action lead: MS Policy Partner: Poseidon Stakeholder: SCFF	**7a.** Yr. 1-2 – Accurately profile catch composition of creel nephrops fishery. For example, review catch data to determine if catch composition specific to nephrops creel can be determined (i.e. separate from crab & lobster creels and whelk pots). Based on this data review categorisation of main & minor for each FU.	**Complete** As per update provided in action 6a.	Updated to Yr1-2 due to obtaining catch data
		7b. Yr. 2 and annually thereafter - Review status of main secondary species.	**Complete** A PSA has been completed for creel and demersal trawl UoAs.	
		7c. Yr. 3 - Review management of main secondary species ensuring it is appropriate to the stock status and species type.	**Complete** Productivity and Susceptibility Analysis (PSA) for secondary species in TR1 and TR2 gear UoAs (based on Cefas data) has been undertaken. The additional species were all categorised as low to medium risk. An action remains to document the management plans for these species in the Fishery Management Plan (FMP) and assess whether any additional management needs to be implemented. A table of management measures for primary and secondary species that interact with the Nephrops fishery has been developed, based on the list of species provided by Poseidon. This demonstrates that there is partial management strategy in place. A brief summary of the assessment and management information for primary and secondary species, by region, is as follows: North Sea A full assessment is available for cod, haddock and whiting (primary species), and for plaice and saithe (secondary species). A data limited assessment is available for anglerfish, lemon sole and cuckoo ray (secondary species). West of Scotland A full assessment is available for cod, haddock and whiting (primary species), and for megrim (secondary species). A data limited assessment is available for	Timeline updated in V3.1

			anglerfish and thornback ray (secondary species). Irish Sea A full assessment is available for haddock, hake and whiting (primary species). A data limited assessment is available for cod (primary species). A full assessment is available for plaice (secondary species), and a data limited assessment is available for thornback ray, spotted ray and lesser spotted dogfish (secondary species). Creel UoAs Species associated with creel include whelk, lobster, brown crab and velvet swimmer crab, although the quantities of these species taken in the nephrops targeted creel fishery is understood to be low given the fishing grounds targeted. These species are principally managed via minimum landing sizes.	
		7d. Yr. 2 - Review effectiveness and practicality of current and alternative measures to minimize mortality of unwanted catch, including undersize fish and shellfish.	**Complete** See 2d.	
		7e. Yr. 2 - Establish process for regular review of alternative measures and the associated effectiveness and practicality of such measures.	**Complete** See 6g.	
		7f. Yr. 3-4 - Implement alternative measures where they are found to be more appropriate.	**Complete** See 6g.	
Action 8: ETP species **Overview:** Overlap of UoA on ETP species and associated risk, as well as appropriate management. **Performance indicator:** Trawl **2.3.1: <60** Creel **2.3.1: 60-79** Trawl & Creel **2.3.2: 60-79** **2.3.3: 60-79** Requirement at SG80: 2.3.1. Outcome status: Combined effects of MSC UoAs on ETP species are highly likely to be within set national / international limits. Known direct effects of the	Action lead: LINK Partner: SNH Stakeholder: Poseidon	**8a.** Yr. 1 – Source available shape files for ETP species distribution (note that reference to ETP species includes relevant PMFs).	**Complete** ETP shape files have been provided to master's student taking this task forward.	
		8b. Yr. 1. GIS-based risk assessment. Listing of potential ETPs interacting with creel and trawl UoAs, and then mapping of ETP distribution overlap with UoA creel and trawling effort.	**Complete** The environmental sub-group has progressed this action. The list of ETPs provided in the pre-assessment has been reviewed and expanded by WWF, who then circulated to DAERA, SNH and JNCC. Good feedback on the comprehensive list and also which ETP species might interact with the fishery. This task is being informed by a master's student project with funding support from Fishmongers' Hall. A number of current projects could inform this task: • Aberdeen University is looking at the spatial overlap of this fishery with elasmobranchs. • Marine Protected Area Management and Monitoring (MARPAMM) projects being conducted in the Irish sea. • Spurdog trial through Cefas looking at 6 months of recorded data – focused on survivability as this species is becoming a chock species. Although this has been paused. The masters ETP risk analysis project was completed: • A final risk analysis score for the ETP species that were taken	

UoA are highly likely to not hinder recovery of ETP species.
 	
2.3.2. Management: There is a strategy in place, with objective basis for confidence that it will work and regular review of potential effectiveness and practicality of alternative measures to minimise mortality
 	
2.3.3. Information: Some quantitative information is adequate to assess UoA related mortality of ETP species
			forward for analysis was produced through combining the scores of encounterability, aerial overlap and reported bycatch frequency.
			• Six species were indicated as high risk with the trawl. They are: porbeagle, spurdog, starry ray and tope, white skate and white cluster anemone.
			• For creel gear, humpback and minke whale were considered most at risk of entanglement – based on literature review - but did not have final scores due to absence of creel data.
			
			Conclusions and recommendations were as follows:
			
			• It was found that trawling posed a significant risk to ETP species.
			• It was recommended to improve elasmobranch interaction records and best practice through consultation with: ICES Working Group on Elasmobranch Fishes (WGEF), Shark Trust UK and CEFAS
			• To improve the results of the study the following is recommended:
			  • Conducting habitat suitability analysis to get a more accurate portrayal of where ETP species may actually inhabit.
			  • Having greater industry consultation to 'ground-truth' some of the results.
			  • Greater data of ETP interaction in the creel sector	

	Action lead: TBC	**8c.** Yr. 2 - Development of fishery dependant recording protocol, to record, analyse and monitor ETP interactions and outcomes (e.g. returned alive) for trawl and creel UoAs.	**Complete** A small amount of funding has been secured for this by SWFPA through the North Connect Fund. Poseidon developed an ETP interaction log, based on reviewing existing recording protocols in practise for the SFSAG MSC certified fisheries and the Danish Fisheries Producer Organisation Vessel Diary (designed specifically to record ETP species interactions).	
		8d. Yr. 3-4 - Development of options for management approaches for reducing ETP interactions and impacts, if necessary.	**Update for end of Year 4** The UK Government launched a "Marine wildlife bycatch mitigation initiative" in August 2022. See: https://www.gov.uk/government/publications/marine-wildlife-bycatch-mitigation-initiative Management measures related to Marine Protected Areas are in a process of staged development and implementation, which is expected to be completed for all MPAs by end of 2024. Highly Protected Marine Areas (HPMAs) form part of the MPA network, and will be no take zones. The first three HPMAs in English waters are expected to come into force by 6 July 2023 (including: North East of Farnes Deep, Allonby Bay in the Solway Firth and Dolphin Head in the English Channel). For Scotland, 10% of Scottish seas are proposed to be HPMAs, with work commencing in 2023 to determine site selection, with designation expected in 2026. The Scottish Entanglement Alliance have recommended a creel set-up to reduce the risk of entanglement as follows:	

			• Set riser length to water depth; • Use a weighted rope on the riser; • Minimise soak time; • Only set creels when actively fishing; and • Immediately report all incidents of entanglement. The implementation of these steps within the creel fishery is not known. MarPAMM: Marine Protected Area Management and Monitoring MarPAMM seabed experts from the Agri-Food and Biosciences Institute, Marine Scotland and Ulster University have produced predictive distribution models for ocean quahog, fan mussel, horse mussel, flapper skate, sea fan, sea pen and maerl, with information available here. The MarPAMM project will deliver four regional MPA plans with the objective to achieve a managed network of MPAs for the following regions: • Argyll region, Scotland • Co Down – Co Louth region, NI/RoI cross-border • North Coast – North Channel region, NI/RoI cross-border • Outer Hebrides region, Scotland In addition two site based MPA management plans are being developed for: • Murlough SAC, in Northern Ireland and; • Carlingford Logh SPA, NI/RoI The plans were expected to be completed in 2022, but are not yet available.	
		8e. Yr. 2 - Establish a protocol / process for undertaking a regular review of alternative measures to minimise UoA related ETP mortality. Undertake review and document effectiveness and practicality of alternative measures.	**Complete** See 2d.	
		8f. Yr. 4-5 - Implementation of recording protocol and pilot projects for ETP management approaches.	**Behind target** **Update for end of Year 4** The Clean Catch App has not yet been trialled or implemented by the nephrops fishery. The ETP species list is being reviewed and prioritised for species to include in a wheelhouse guide to aid identification of ETP species. It is noted that many experts voluntarily get involved with verifying species from images submitted to iRecord, iNaturalist recording tools. A PhD working with Artificial Intelligence to monitor bycatch is also noted. The alternative measures report has been updated to include observations of creel bycatch and ghost gear in several Scottish lochs and the Western Isles, including a summary of interviews with fishermen on large animal entanglement. A high-level summary of the invertebrate, fish, mammal and crustacea bycatch has been added to report, as well as bycatch mitigation techniques. The cause, effect and mitigation of ghost fishing has been	V5.1 timeline updated

			updated, with minimal impact reported. The Scottish Entanglement Alliance has produced a comprehensive report on mitigation measures.	
		8g. Yr. 4-5 - Mainstreaming of ETP management approaches and introduction of a risk-monitoring system.	This action has not yet commenced.	V5.1 timeline updated

Action 9: Habitats
 	
Overview: The spatial scale, intensity and impact on commonly encountered and VMEs, needs to be quantified within the UoA. Based on this, appropriate management approaches need to be developed.
 	
Performance indicator:
 	
Trawl
 	
2.4.1: 60-79
 	
Trawl & Creel
 	
2.4.2: 60-79
 	
2.4.3: 60-79
 	
Requirement at SG80:
 	
2.4.1. Outcome status: The UoA is highly unlikely to reduce structure and function of commonly encountered habitats and VMEs to a point where there would be serious harm.
 	
2.4.2. Management: There is a partial strategy in place to achieve Habitat Outcome 80 level. There is some
	Action lead: Seafish
	
	Partners: MSS, SNH
	
	Stakeholder: Poseidon
		9a. Yr. 1 – Review overlaps of trawl and creel fisheries (footprint analysis) and vulnerability of commonly encountered habitats and VMEs, including Scottish PMF habitats and UK MPA network habitat features.	**Progressing**
			
			Update for end of Year 4
			
			Whitton and Hiddink (2022) completed the habitats study titled: Determining the impact on seabed habitats of fishing for nephrops with trawls and creels around the UK. Both TR1 (mesh size ≥100mm, typically targeting whitefish as well as nephrops) and TR2 (mesh size ≥70mm and <100mm typically targeting nephrops) gear is included in the assessment.
			
			The study used the MSC Benthic Impact Tool (BIT) to calculate the relative benthic status and recovery of habitats with the following conclusions:
			
			Commonly encountered habitats (circalittoral mud):
			
			• TR2 and TR1 reach SG80 or SG100 at all areas studies (Celtic Sea, West of Scotland and North Sea)
			• Creel reach SG100 throughout all areas
			
			Vulnerable Marine Ecosystems (as defined in the VME master list developed for the FIP)
			
			• The VME habitats assessment used two depletion scenarios which could be considered as:
			  - Low depletion: 0.06 for trawling and 0.14 for creels
			  - High depletion: 0.5 for all gears
			• The VME habitats assessment used two occurrence levels for VME records:
			  - All VME records (including certain and uncertain records)
			  - Certain VME records only
			• Creel reached SG100 for all scenarios.
			• A summary of the results for TR2 and TR1 are provided below, (SpBMC: sea pens and burrowing megafauna communities)
				-

	Action lead: SG Resources: master's student	**9b.** Yr. 2-3– Assessment of nephrops trawl impact on habitats, including analysis via Bangor University habitat assessment tool		Timeline updated in V3.1
		9c. Yr. 3-4 – Review VMEs based on knowledge of the historical extent and distribution.		Timeline updated in V3.1

quantitative evidence that management is being implemented and UoA complies with VME related management.

VME Records	All		Certain only	
Depletion level	0.06	0.5	0.06	0.5
TR2	Celtic: <60 SpBMC	Celtic: <60 SpBMC	Celtic: ≥80	Celtic: ≥80
	WoS: 60-79 SpBMC	WoS: <60 SpBMC	WoS: 60-79 SpBMC	WoS: <60 SpBMC & Modiolus
	NS: ≥80	NS: 60-79 SpBMC	NS: ≥80	NS: ≥80
TR1	Celtic: ≥80	Celtic: ≥80	Celtic: ≥80	Celtic: ≥80
	WoS: ≥80	WoS: ≥80	WoS: ≥80	WoS: ≥80
	NS: ≥80	NS: 60-79 SpBMC	NS: ≥80	NS: ≥80

- Whitton and Hiddink (2022) concluded that for TR2 trawling 'Sea-pen and burrowing megafauna communities' and 'Modiolus modiolus horse mussel beds' did have assessment with suggested scores not reaching SG60 under different combinations of VME data layer and depletion values for the Celtic and West of Scotland assessment areas. This showed that the VME assessment is sensitive to the habitat layer and the depletion values used, both of which have uncertainty in the assessments conducted and merit future refinement and quantification.

Overall, the post-doc work demonstrates that for both trawl gears (TR1 and TR2) there is uncertainty with the habitat score relative to VME interaction and therefore an increase to SG80 is not warranted.

Discussion and outcomes from Years 1 to 3

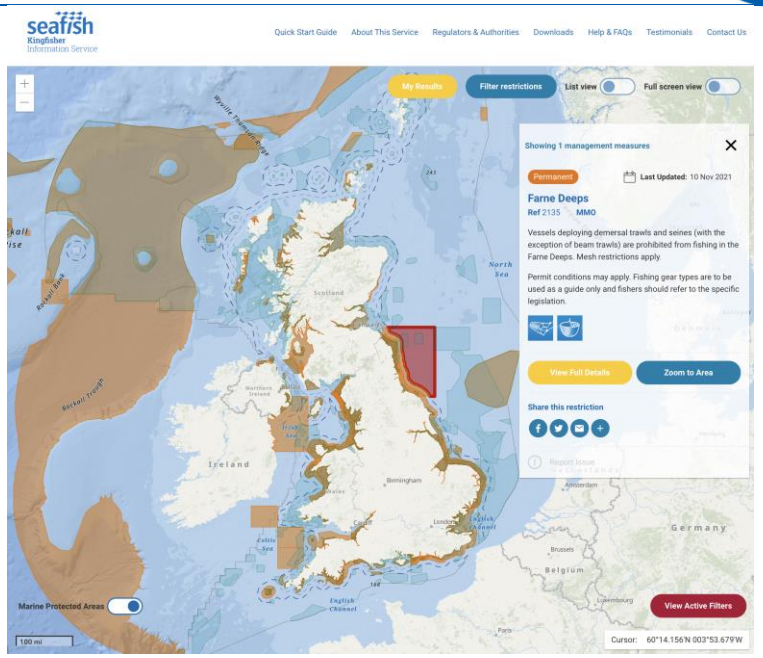
The environmental sub-group (ESG) agreed that burrowed mud would be considered a commonly encountered habitat when burrowed mud is not designated in a protected area, and is not associated with specific VMEs. Burrowed mud will be considered a VME if VME features are present, as designated by OSPAR and Priority Marine Feature (PMF) definitions:

- Where there are sea pens and burrowing megafauna
- Volcano worm
- Firework anemone
- Burrowing heart urchins
- Mud burrowing amphipod
- Tall sea pens and Northern sea fan and sponge communities

A recent master's project looked at habitat interactions with Nephrops gear, and comments showed:

- there are designated marine protected areas (MPAs) for burrowed mud features that do not have management measure in place [this could warrant voluntary measures being implemented in areas of priority].
- a need to better understand the impacts of creel and trawl gears on burrowed mud, and the recoverability of VMEs and commonly encountered habitats in the UoA.

			• clarification on the historical extent of VMEs, this is based on United Nations General Assembly resolution 61/106 in 2006. If damage to VMEs occurred before 2006 the fishery would not be held accountable for historical damage, but further damage is not acceptable. If a VME is identified after 2006 then this is deemed to be its unimpacted state and vessels should avoid further damage. If fishery impact occurred after 2006 then the unimpacted level is the idealised expected recovery state (set in 2006) or whenever the VME has been identified. It is noted that the Bangor Habitat Assessment tool allows users to insert known fishing data to calculate whether commonly encountered habitats would recover within five years to 80% of its unimpacted state, as set out in the MSC Standard. The Steering Group discussed scope of the research needed to address this action and agreed it would be more appropriate to do this at a PhD or post doc level. WWF commented that a fishery impacting VMEs prior to 2006 and continued doing so to present day would lack proper accountability of the damage their activities had caused if the unimpacted reference point was 're-set' in 2006. The interpretation log from MSC on this point is available here NatureScot offered to research the status of the designation for 'other burrowed mud', and how it should be managed.	
	Action lead: MSS Partners: UK FAs	**9d.** Yr. 2-3 - Review status of management measures development and implementation within UK MPA network.	**Progressing** **Update for end of Year 4** Seafish Kingfisher Information Service launched the UK Fishing Restrictions mapping tool, available at: https://kingfisherrestrictions.org This mapping tool allows selection of gear type (i.e. demersal trawl) to map all spatial management measures specific to this fishery, together with MPA locations. This can be viewed on board vessels on plotters by importing positional data from the Kingfisher resource. An example is shown below for demersal otter trawl restrictions.	Re-ordered v2.3. Updated timescale in V3.1

			 In terms of management jurisdictions, Nature Scot are responsible for Scottish territorial waters. Offshore waters are within the remit of JNCC. English territorial waters are in the remit of Natural England and IFCAs. NatureScot updates on MPA protection measures are available here. Action: • Environmental sub-group to review post-doctoral habitat work and confirm the appropriateness of current management in place within MPAs.	
	Action lead: SG	**9e.** Yr. 2-4 - Development of a Habitat Management Plan including development of options for management approaches to manage habitat interactions and impacts.	This action has not yet commenced.	Updated timescale to Yr2-3 (v1.8) Updated timescale in V3.1
	Action lead: MS	**9f.** Yr2-4 - Introduction of inshore-VMS (i-VMS), or equivalent, on all vessels <12m in length.	**On target** This action is being delivered through Marine Scotland commitment for Remote Electronic Monitoring and through the inshore modernisation programme.	Updated timescale to Yr2-3 (v1.8). Updated timescale in

			Implementation of REM and iVMS has occurred throughout 2022. Action • To seek iVMS outputs for fishery footprint mapping	V3.2
	Action lead: TBC	**9g.** Yr. 4-5 - Implementation of habitat management approaches, where required. Recording and analysis of all nephrops trawl VMS data.	This action has not yet commenced.	Updated timescale in V3.2 & V5.1
		9h. Yr. 4-5 – Update footprint of fishery when i-VMS is available.	This action has not yet commenced.	Updated timescale in V3.2
		9i. Yr. 4-5 - GIS reporting on extent and intensity of fishing for all vessel lengths. Mainstreaming of habitat management approaches and introduction of the risk-monitoring system.	This action has not yet commenced.	Updated timescale in V3.2
Action 10: Ecosystem **Overview:** In the medium term (3-5 years) this will be informed by Actions 6 to 9. In the short-term there is opportunity to conduct a Scale Intensity Consequence Analysis (SICA) analysis. **Performance indicator:** Trawl **2.5.1:** **60-79** Trawl **2.5.2:** **60-79** Requirement at SG80: 2.5.1. Outcome: The UoA is highly unlikely to cause serious or irreversible harm. 2.5.2. Management: There is a partial strategy in place.	Action lead: Seafish Partners: LINK, SNH, WWF Stakeholders: Poseidon	**10a.** Yr. 1 – Review available data / information available on ecosystem interaction, including relevant to Actions 6 to 9.	**Complete** A dropbox library for the Environment Sub-group has been created. A number of sources were provided during the SICA workshop.	
		10b. Yr. 1-2 - Constitute expert group and conduct SICA analysis to determine main ecosystems and ecosystem services impacted by nephrops trawling across the UoAs under assessment.	**Complete** A SICA workshop with an expert group on nephrops demersal trawl ecosystem impacts was held through a virtual, interactive workshop. The findings will inform action 10c.	
		10c. Yr. 3 - Identify and recommend further research and management actions that reduce disruption to the ecosystem and ecosystem services to acceptable levels. This may be aligned with actions 2, and 6 to 9.	The SICA concluded that "Overall, the SICA for ecosystem outcome status (2.5.1) meets SG60 requirements for TR1 and TR2 trawl gear targeting nephrops in the Western region and Greater North Sea, which aligns with the pre-assessment findings. Based on the fishing gear interaction with the habitat being most likely to cause effect on the ecosystem, it is recommended that ecosystem management is aligned with habitat management measures being reviewed and developed within the Action Plan." This milestone will therefore be linked with Action 9: habitats. A discussion related to Scottish oyster restoration projects occurring near fisheries and relevance of oysters as PMFs concluded that oysters will not be a PMF, but consideration for local management could be needed. It is also noted that interaction between oysters and the Nephrops fishery may be limited due to differences in habitat preferences, but may be a concern for scallop grounds.	

		10d. Yr. 4-5 - Implement management measures as appropriate.	This action has not yet commenced.	
Action 11: Compliance **Overview:** Focused on compliance with landing obligation and enforcement within MPAs **Performance indicator:** 3.2.3 Compliance and enforcement **60-79** Requirement at SG80: (a) The monitoring, control and surveillance system has been implemented and demonstrated an ability to enforce relevant management measures, strategies and/or rules.	Action lead: SG Partners: UK FAs	**11a**. Yr1-3 – Review the risks of non-compliance associated with the nephrops fishery (including in relation to the Landing Obligation) **11b.** Yr. 1-3 – Work with the industry to establish an appropriate system for monitoring within MPAs and other closed areas for all vessels. **11c.** Yr. 2-3 – Consult with Fisheries Control Agencies and wider stakeholders on proposed monitoring system. **11d.** Yr. 2-4 – Implement monitoring system. **11e.** Yr2-3 – Provide evidence of measures in place to enforce management measures related to the Landing Obligation. **11f.** Yr3 – Provide evidence of compliance (or lack of systematic non-compliance) within the nephrops fishery, including relative to Landing Obligation and closed areas / MPAs.	**Progressing** **Update for end of Year 4** This action requires that the fishery can demonstrate that it complies with national and international legislation and that an ability to enforce management measures is demonstrated. Marine Scotland Compliance maintains a record of all non-compliances and can provide an anonymised record of such offences. Marine Scotland report statistics from marine and fisheries compliance, available here, with summarised extracts for the period 26 May 2020 to 30 June 2022 as follows: • 1 fixed penalty notice for breach of an Historic MPA • 5 fixed penalty notices for breach of the landing obligation • 9 fixed penalty notices for discarding / failure to record discards. • 8 fixed penalty notices for fishing in a prohibited area • 1 fixed penalty notice for fishing with multiple trawls • 12 fixed penalty notices for fishing with illegal SMP /without a Square Mesh Panel In addition to the above, Marine Scotland have provided the FIP with a record specific to compliance activities on the landing obligation, reporting 17 recorded instances of a breach of the landing obligation from 2018 to 2022, with 1 record in each year from 2018 to 2020, 8 records in 2021 and 6 records in 2022. Of these instances, 3 received a warning letter and 6 received fixed penalty notices. The above evidence demonstrates specific cases where management measures related to the landing obligation and fishing within prohibited areas (such as MPAs) were enforced. Marine Scotland do recognise the complexity of implementing the landing obligation. It is noted that SFF have started a self-sampling scheme that complements the surveys conducted by Marine Scotland, which will be operating on Scottish vessels, including on some Nephrops trawls. The existing SFSAG MSC certificate includes a condition related to 3.2.3, which would be harmonised across this fishery if it were to enter assessment.	Update timescale in V3.1
Action 12: Fishery objectives **Overview:** Review implications of UK exit from EU.	Action lead: SG Partners: UK FAs	**12a.** Yr. 3-4 – Review how the UK exit from EU and the Fisheries Bill effect the legal framework and fishery objectives with specific focus on precautionary approach and MSY.	**Complete** The UK Fisheries Act (2020) (23 Nov 2020) sets out fisheries objectives as follows — (a) the sustainability objective, (b) the precautionary objective,	Added v2.2

Performance indicator: 3.2.1 Fishery specific objectives **60-79** <u>Requirement at SG80:</u> Short and long-term objectives which are consistent with achieving P1 & P2 outcomes are explicit within the fishery specific management system			(c) the ecosystem objective, (d) the scientific evidence objective, (e) the bycatch objective, (f) the equal access objective, (g) the national benefit objective, and (h) the climate change objective. The Joint Fishery Statement confirms delivery of Nephrops FMPs for the North Sea and West of Scotland by 2024, but no further details are available as yet. Specific HCRs are currently not implementable because they relate to reference points that are not yet defined.	
<u>Cross - cutting</u>	Action lead: Whitby Seafoods Partners: Young's Seafoods	**Development of Fishery Management Plan**	It is agreed by the steering group that Whitby Seafoods will lead development of the FMP, with support from Young's Seafoods, the Secretariat and Poseidon. Sections of the FMP will be allocated to the relevant steering group members to draft. The progress and status of the FMP can be summarised as follows: • All sections have content, and the document is now 85 pages. • Section 4 (harvest control rules, HCR, and harvest strategy) is lacking sufficient information; this will be updated with the outcomes from the regional management groups. • Section 6 (stock assessments) has recently had additional input from CMe, EB and Mathieu Lundy on ICES advice and methodologies. • MP, AH and Andrew Brown have contributed to Section 3 (management structure) and EW, Marine Scotland Science and Daera will be approached for further input. • Section 5 (ecosystem management strategies) requires further input from eNGOs and statutory bodies.	Added v2.3

Project UK: UK Nephrops Action Plan

Version: 5.1

Date: 22 May 2023

Functional Unit	Harvest rate			Abundance			Stock status		ICES landings		Overfishing?
	HR 2021	EU MAP FMSY (HRMSY)	F/Fmsy (%) [HR/HRMSY (%)]	Abundance (millions) [no. indiv]	MSY Btrigger (millions)	SSB/MSYBtrig (%) [abundance/Blim]	1.1.1	Justification	Landings (Tonnes)	% of these FU's	
5 Botney Gut - Silver Pit	✗	7.5			✗		≥80	While HR is not known, landings have remained below the catch advice from 2019 to 2021. The precautionary buffer of 20% has been applied.	1,067	3%	N
6 Farn Deeps	11.9	8.12	147%	878	858	102%	60-79	There is a 17% decrease in advice relative to 2022 due to decreased stock abundance. Significant reduction in catches from 2019 to 2020 (reduced by 44%). Catches in 2021 remain at a similar level to catches in 2020 Stock size currently just above MSYB trigger, but recently below (2009-2010 and 2012-2016) and in a downward trend. Long term trend of F being above Fmsy. HR increased from 2020 to 2021.	2,022	6%	Y
7 Fladen Ground	4.7	7.5	63%	5,550	2,767	201%	≥80	Well above MSY Btrigger (but below in 2015). F is well below Fmsy. Highly likely to be above PRI.	9,559	29%	N
8 Firth of Forth	10.8	16.3	66%	837	292	287%	≥80	Well above MSY Btrigger (across whole time series), also above 2*MSYBtrig. F fluctuating around FMSY and recently below FMSY. Catches in 2021 similar level as 2020. Note no UWTV survey in 2022. Landings well below advice level.	1,820	6%	N
9 Moray Firth	6.4	11.8	54%	396	262	151%	60-79	Significant drop in stock abundance from 658 million individuals to 396 in an annual period (drop of 40%) and on downward trend towards MSYBtrigger, although remains above MSYBtrigger. Highly likely above PRI, but not likely to be fluctuating around MSY. Landings in 2021 were above advice (landings= 1221; advice = 1180). Harvest rate remains well below FMSY.	1,221	4%	?
10 Noup	0.65	7.5	9%		✗		≥80	HR is currently below 1%	14	0.04%	N
34 Devil's Hole	7.4	7.5	99%	508	✗		60-79	Catches in 2016 & 2017 well above ICES advice. Catches in 2019 over double ICES advice. Catches in 2020 and 2021 remain above advice. HR is just below 7.5%	875	3%	Y
11 North Minch	4.6	10.8	43%	1,346	540	249%	≥80	Well above MSY Btrigger (across whole time series), well above MSYBtrigger*2. F below FMSY since 2013 and at its lowest level in 2020.	2,073	6%	N
12 South Minch	7.5	11.7	64%	1,677	1,020	164%	≥80	Fluctuating above MSY Btrigger (across whole time series). Above MSYBtrigger in 2021 assessment, although below 2*MSYBtrigger, so may not be fluctuating at a level consisten with MSY. 2022 assessment saw an increase in abundance. Landings have remained well below ICES catch advice since 2007. (ICES advice in 2021 5916 and landings 2696). Maintain watchiing brief for next assessment F below FMSY since 2013 and increased in 2021, but remains well below FMSY.	1,976	6%	N
13 Firth of Clyde + Sound of Jura [Firth of Clyde]	21	15.1	139%	1,665	580	287%	60-79	F increase to above FMSY, but has been below previously. Firth of Clyde abundance has increased from 1414 to 1665. Sound of Jura abundance has decreased from 310 to 241. MSS note concern around harvest rate being above FMSY. FU13 seen stock relatively high in tems of abundance, fluctuations in terms of fishing amounts and landings – 2021 landings increased. Advice for 2023 has increased for Clyde, but decreased for Jura. Overall, high harvest rates put this FU into the 60-79 category.	4,995	15%	Y
13 Firth of Clyde + Sound of Jura [Sound of Jura]	21	12	175%	241	160	151%					
14 Irish Sea East	2.6	11	24%	386	350	110%	≥80	Abundance fluctuating above MSY Btrigger since 2010, but not 2*MSYBtrigger F well below FMSY and landings well below ICES catch advice.	519	2%	N
15 Irish Sea West	12.4	18.2	68%	4,498	3,000	150%	≥80	Well above MSY Btrigger (across whole time series), but not 2*MSYBtrigger F fluctuating around and below FMSY since 2016. Landings consistently below advice.	6,779	21%	N

Figure 2: UK Nephrops Functional Units stock status review

							Productivity Scores [1-3]									Susceptibility Scores [1-3]						Cumulative only						
Scoring element	First of each scoring element	Family name	Scientific name	Common name	Species type	Fishery descriptor	Average age at maturity	Average max age	Fecundity	Average max size	Average size at Maturity	Reproductive strategy	Trophic level	Density Dependance	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	PSA Score	Catch (tons)	Weighting	Weighted Total	Weighted PSA Score	MSC PSA-derived score	Risk Category Name	MSC scoring guidepost
1	First	Nephropidae	Nephrops norvegicus	Norway lobster	Invertebrate	Demersal trawl	1	2	2			2	3	2	2.00	3	2	3	3	2.33	3.07					65	Med	60-79
2	First	Nephropidae	Nephrops norvegicus	Norway lobster	Invertebrate	Creel	1	2	2			2	3	2	2.00	3	2	1	3	1.43	2.46					85	Low	≥80

Figure 3: Nephrops PSA

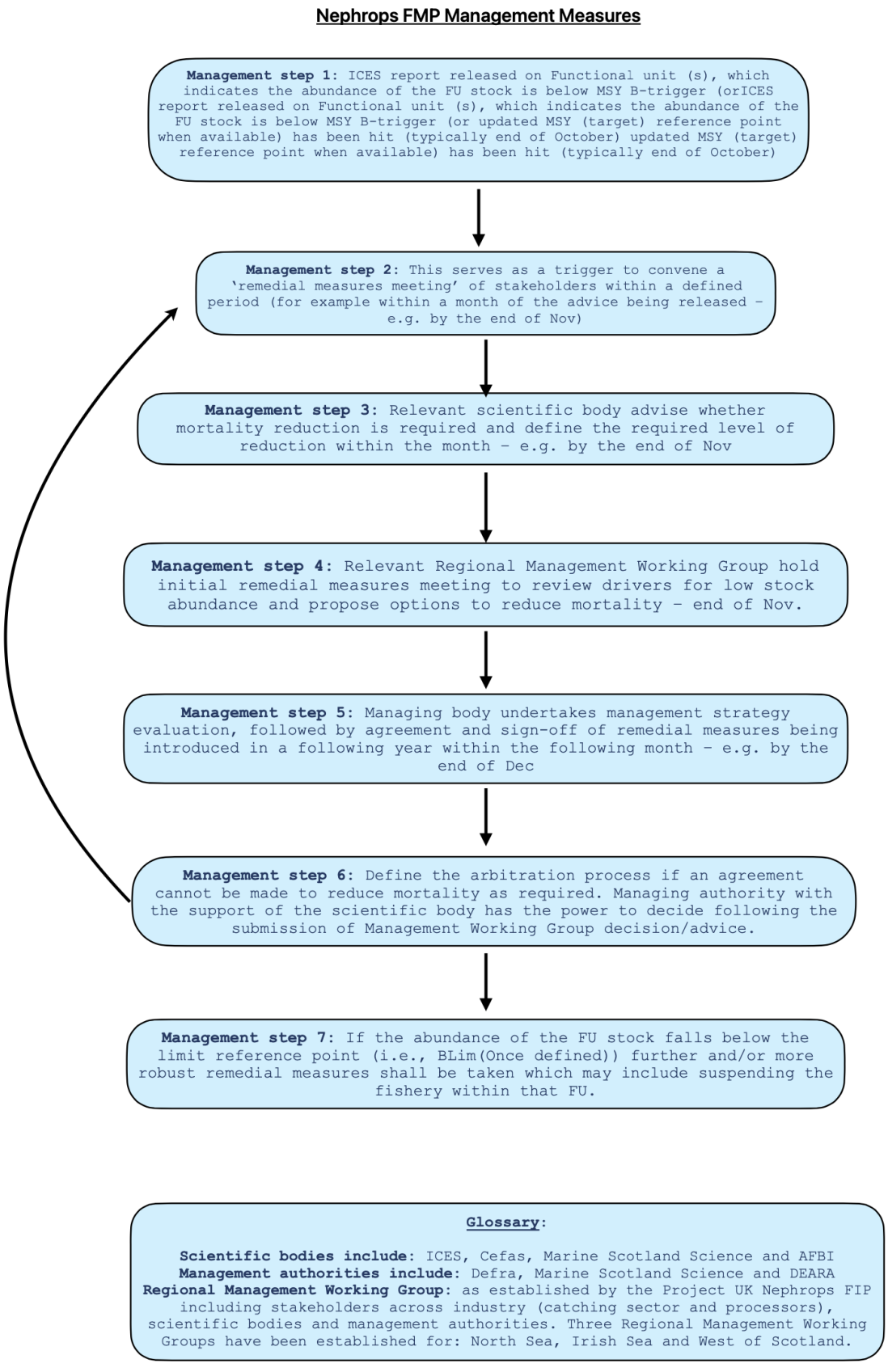


Figure 4: Nephrops Harvest Strategy Management Flowchart

3. Year 4 Benchmark

The UoAs and nephrops Functional Units are listed below:

UoA	Gear	Stock Area	ICES Division
1	Creel	FU 6 Farn Deeps	4
2		FU 34 Devil's Hole	4
3		FU 5 & FU 10	4
4		FUs: 7, 8, 9, 11, 12, 13, 14, 15	4, 6a, 7a
5	TR1 & TR2 demersal trawl	FU 5 Botney Gut - Silver Pit	4
6		FU 6 Farn Deeps	4
7		FU 7 Fladen Ground	4
8		FU 8 Firth of Forth	4
9		FU 9 Moray Firth	4
10		FU 10 Noup	4
11		FU 11 North Minch	6a
12		FU 12 South Minch	6a
13		FU 13 Clyde & Jura	6a
14		FU 14 Irish Sea East	7a
15		FU 15 Irish Sea West	7a
16		FU 34 Devil's Hole	4

3.1.1 Creel (UoAs 1-4)

Principle	Component	Performance Indicator	Pre-Assessment Year 0	Actual Year 1	Actual Year 2	Actual Year 3	Actual Year 4	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
1	Outcome	1.1.1 Stock status	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	---	---	---	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80	≥80
		1.2.2 Harvest control rules and tools	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.3 Information and monitoring	60-79	60-79	60-79	≥80	≥80	60-79	60-79	≥80	≥80	≥80
		1.2.4 Assessment of stock status	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
2	Primary species	2.1.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.1.2 Management	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.2 Management	60-79	60-79	60-79	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.5.2 Management	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.5.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	≥80	60-79	60-79	60-79	≥80	≥80	≥80	≥80	≥80
		3.2.2 Decision making processes	≥80	≥80	60-79	60-79	≥80	≥80	≥80	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			14	14	11	15	16	14	14	18	24	27
Total number of PIs 60-79			12	12	15	11	10	12	13	9	3	
Total number of PIs less than 60			1	1	1	1	1	1				
Overall BMT Index			**0.74**	**0.74**	**0.69**	**0.76**	**0.78**	**0.74**	**0.76**	**0.83**	**0.94**	**1.00**

3.1.2 FU5 Botney Gut

Principle	Component	Performance Indicator	Pre-Assessment Year 0	Actual Year 1	Actual Year 2	Actual Year 3	Actual Year 4	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
1	Outcome	1.1.1 Stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	---	---	---	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80	≥80
		1.2.2 Harvest control rules and tools	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.3 Information and monitoring	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.4 Assessment of stock status	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
2	Primary species	2.1.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.1.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.2.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79	<60	<60	60-79	60-79	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	≥80	60-79	60-79	60-79	≥80	≥80	≥80	≥80	≥80
		3.2.2 Decision making processes	≥80	≥80	60-79	60-79	≥80	≥80	≥80	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			11	11	9	11	12	11	11	14	23	27
Total number of PIs 60-79			13	13	15	14	13	13	14	13	4	
Total number of PIs less than 60			3	3	3	2	2	3	2			
Overall BMT Index			**0.65**	**0.65**	**0.61**	**0.67**	**0.69**	**0.65**	**0.67**	**0.76**	**0.93**	**1.00**

3.1.3 FU 6 Farn Deeps

Principle	Component	Performance Indicator	Pre-Assessment Year 0	Actual Year 1	Actual Year 2	Actual Year 3	Actual Year 4	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
1	Outcome	1.1.1 Stock status	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	---	---	---	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80	≥80
		1.2.2 Harvest control rules and tools	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.3 Information and monitoring	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.2.4 Assessment of stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
2	Primary species	2.1.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.1.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.2.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79	<60	<60	60-79	60-79	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	≥80	60-79	60-79	60-79	≥80	≥80	≥80	≥80	≥80
		3.2.2 Decision making processes	≥80	≥80	60-79	60-79	≥80	≥80	≥80	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			12	12	10	12	13	12	12	15	24	27
Total number of PIs 60-79			12	12	14	13	12	12	13	12	3	
Total number of PIs less than 60			3	3	3	2	2	3	2			
Overall BMT Index			**0.67**	**0.67**	**0.63**	**0.69**	**0.70**	**0.67**	**0.69**	**0.78**	**0.94**	**1.00**

3.1.4 FU7 Fladen Ground and FU8 Firth of Forth

Principle	Component	Performance Indicator	Pre-Assessment Year 0	Actual Year 1	Actual Year 2	Actual Year 3	Actual Year 4	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
1	Outcome	1.1.1 Stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	---	---	---	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80	≥80
		1.2.2 Harvest control rules and tools	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.3 Information and monitoring	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.2.4 Assessment of stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
2	Primary species	2.1.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.1.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.2.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79	<60	<60	60-79	60-79	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	≥80	60-79	60-79	60-79	≥80	≥80	≥80	≥80	≥80
		3.2.2 Decision making processes	≥80	≥80	60-79	60-79	≥80	≥80	≥80	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			13	13	11	13	14	13	14	16	25	28
Total number of PIs 60-79			11	11	13	12	11	11	12	12	3	0
Total number of PIs less than 60			3	3	3	2	2	3	2	0	0	0
Overall BMT Index			**0.69**	**0.69**	**0.65**	**0.70**	**0.72**	**0.69**	**0.70**	**0.78**	**0.94**	**1.00**

3.1.5 FU 9 Moray Firth

Principle	Component	Performance Indicator	Pre-Assessment Year 0	Actual Year 1	Actual Year 2	Actual Year 3	Actual Year 4	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
1	Outcome	1.1.1 Stock status	≥80	≥80	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	---	---	---	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80	≥80
		1.2.2 Harvest control rules and tools	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.3 Information and monitoring	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.2.4 Assessment of stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
2	Primary species	2.1.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.1.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.2.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79	<60	<60	60-79	60-79	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilitie	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	≥80	60-79	60-79	60-79	≥80	≥80	≥80	≥80	≥80
		3.2.2 Decision making processes	≥80	≥80	60-79	60-79	≥80	≥80	≥80	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			3	6	9			7	9	12	18	25
Total number of PIs 60-79			19	18	18			16	16	14	10	3
Total number of PIs less than 60			6	4	1			5	3	2		
Overall BMT Index			**0.69**	**0.69**	**0.65**	**0.70**	**0.70**	**0.69**	**0.70**	**0.78**	**0.94**	**1.00**

3.1.6 FU10 Noup

Principle	Component	Performance Indicator	Pre-Assessment Year 0	Actual Year 1	Actual Year 2	Actual Year 3	Actual Year 4	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
1	Outcome	1.1.1 Stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	---	---	---	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80	≥80
		1.2.2 Harvest control rules and tools	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.3 Information and monitoring	60-79	60-79	60-79	≥80	≥80	60-79	60-79	≥80	≥80	≥80
		1.2.4 Assessment of stock status	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
2	Primary species	2.1.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.1.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.2.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79	<60	<60	60-79	60-79	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	≥80	60-79	60-79	60-79	≥80	≥80	≥80	≥80	≥80
		3.2.2 Decision making processes	≥80	≥80	60-79	60-79	≥80	≥80	≥80	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			11	11	9	12	13	11	11	14	23	27
Total number of PIs 60-79			13	13	15	13	12	13	14	13	4	0
Total number of PIs less than 60			3	3	3	2	2	3	2	0	0	
Overall BMT Index			**0.65**	**0.65**	**0.61**	**0.69**	**0.70**	**0.65**	**0.67**	**0.76**	**0.93**	**1.00**

3.1.7 FU34 Devil's Hole

Principle	Component	Performance Indicator	Pre-Assessment Year 0	Actual Year 1	Actual Year 2	Actual Year 3	Actual Year 4	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
1	Outcome	1.1.1 Stock status	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	---	---	---	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80	≥80
		1.2.2 Harvest control rules and tools	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.3 Information and monitoring	60-79	60-79	60-79	≥80	≥80	60-79	60-79	≥80	≥80	≥80
		1.2.4 Assessment of stock status	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
2	Primary species	2.1.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.1.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.2.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79	<60	<60	60-79	60-79	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	≥80	60-79	60-79	60-79	≥80	≥80	≥80	≥80	≥80
		3.2.2 Decision making processes	≥80	≥80	60-79	60-79	≥80	≥80	≥80	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			3	6	9			7	9	12	18	25
Total number of PIs 60-79			19	18	18			16	16	14	10	3
Total number of PIs less than 60			6	4	1			5	3	2		
Overall BMT Index			**0.63**	**0.63**	**0.59**	**0.67**	**0.69**	**0.63**	**0.65**	**0.76**	**0.93**	**1.00**

3.1.8 FU11 North Minch and FU12 South Minch

Principle	Component	Performance Indicator	Pre-Assessment Year 0	Actual Year 1	Actual Year 2	Actual Year 3	Actual Year 4	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
1	Outcome	1.1.1 Stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	---	---	---	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80	≥80
		1.2.2 Harvest control rules and tools	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.3 Information and monitoring	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.2.4 Assessment of stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
2	Primary species	2.1.1 Outcome	<60	<60	<60	60-79	<60	<60	<60	60-79	60-79	≥80
		2.1.2 Management	<60	<60	<60	60-79	60-79	<60	60-79	60-79	≥80	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.2.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79	<60	<60	60-79	60-79	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	≥80	60-79	60-79	60-79	≥80	≥80	≥80	≥80	≥80
		3.2.2 Decision making processes	≥80	≥80	60-79	60-79	≥80	≥80	≥80	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			3	6	9			7	9	12	18	25
Total number of PIs 60-79			19	18	18			16	16	14	10	3
Total number of PIs less than 60			6	4	1			5	3	2		
Overall BMT Index			**0.65**	**0.65**	**0.59**	**0.69**	**0.69**	**0.65**	**0.69**	**0.78**	**0.93**	**1.00**

3.1.9 FU13 Clyde and Jura

Principle	Component	Performance Indicator	Pre-Assessment Year 0	Actual Year 1	Actual Year 2	Actual Year 3	Actual Year 4	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
1	Outcome	1.1.1 Stock status	≥80	≥80	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	---	---	---	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80	≥80
		1.2.2 Harvest control rules and tools	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.3 Information and monitoring	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.2.4 Assessment of stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
2	Primary species	2.1.1 Outcome	<60	<60	<60	60-79	<60	<60	<60	60-79	60-79	≥80
		2.1.2 Management	<60	<60	<60	60-79	60-79	<60	60-79	60-79	≥80	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.2.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79	<60	<60	60-79	60-79	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	≥80	60-79	60-79	60-79	≥80	≥80	≥80	≥80	≥80
		3.2.2 Decision making processes	≥80	≥80	60-79	60-79	≥80	≥80	≥80	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			3	6	9			7	9	12	18	25
Total number of PIs 60-79			19	18	18			16	16	14	10	3
Total number of PIs less than 60			6	4	1			5	3	2		
Overall BMT Index			**0.65**	**0.65**	**0.59**	**0.69**	**0.67**	**0.65**	**0.69**	**0.78**	**0.93**	**1.00**

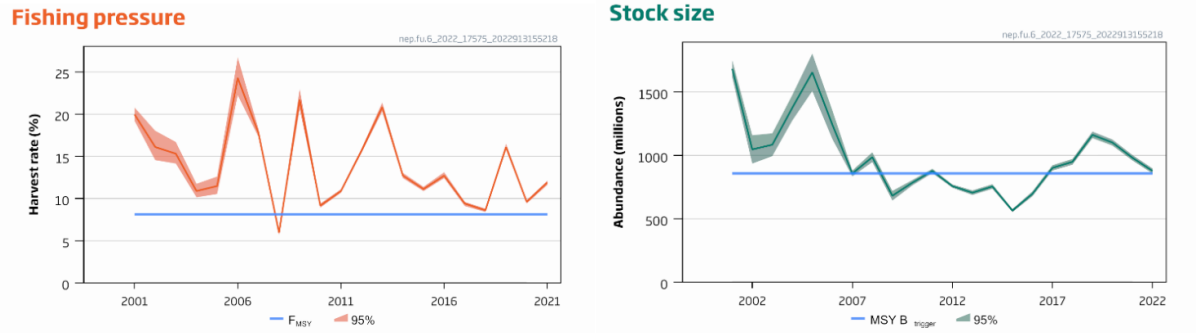
3.1.10 FU14 Irish Sea East and FU15 Irish Sea West

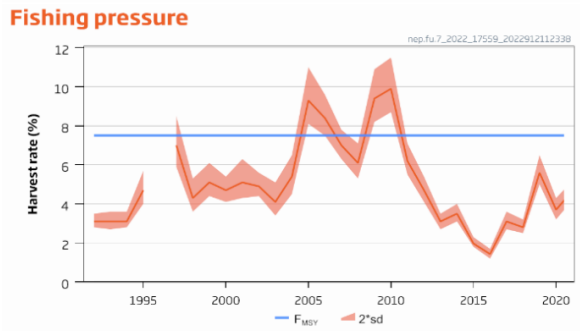
Principle	Component	Performance Indicator	Pre-Assessment Year 0	Actual Year 1	Actual Year 2	Actual Year 3	Actual Year 4	Expected Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5
1	Outcome	1.1.1 Stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.1.2 Stock rebuilding	---	---	---	---	---	---	---	---	---	---
	Management	1.2.1 Harvest Strategy	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80	≥80
		1.2.2 Harvest control rules and tools	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		1.2.3 Information and monitoring	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		1.2.4 Assessment of stock status	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
2	Primary species	2.1.1 Outcome	<60	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80
		2.1.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		2.2.2 Management	60-79	60-79	≥80	≥80	≥80	60-79	60-79	60-79	≥80	≥80
		2.2.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	ETP species	2.3.1 Outcome	<60	<60	<60	<60	<60	<60	<60	60-79	60-79	≥80
		2.3.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80
		2.3.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Habitats	2.4.1 Outcome	<60	<60	<60	60-79	60-79	<60	<60	60-79	60-79	≥80
		2.4.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.4.3 Information	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1 Outcome	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.2 Management	60-79	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80
		2.5.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
3	Governance and Policy	3.1.1 Legal and customary framework	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	60-79	≥80	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	≥80	60-79	60-79	60-79	≥80	≥80	≥80	≥80	≥80
		3.2.2 Decision making processes	≥80	≥80	60-79	60-79	≥80	≥80	≥80	≥80	≥80	≥80
		3.2.3 Compliance and enforcement	60-79	60-79	60-79	60-79	60-79	60-79	60-79	≥80	≥80	≥80
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80	≥80
Total number of PIs equal to or greater than 80			3	6	9			7	9	12	18	25
Total number of PIs 60-79			19	18	18			16	16	14	10	3
Total number of PIs less than 60			6	4	1			5	3	2		
Overall BMT Index			**0.67**	**0.67**	**0.61**	**0.67**	**0.69**	**0.67**	**0.69**	**0.78**	**0.93**	**1.00**

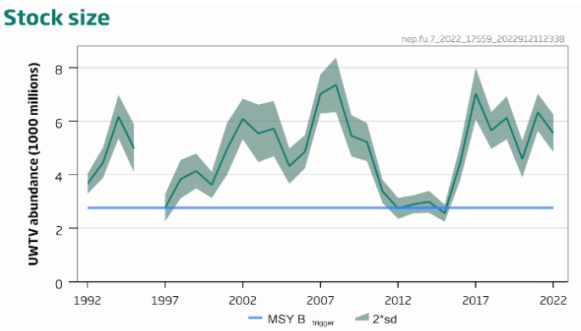
4. Revised pre-assessment

4.1 Summary of Performance Indicator level scores

4.1.1 Principle 1

Performance Indicator	Draft scoring range	Data deficient?	Issue	SG60	SG80
1.1.1 – Stock status [FU 5 Botney Gut - Silver Pit]	**≥80**	No	a	✓	✓
			b	-	✓
Rationale: While HR is not known, landings have remained below the catch advice from 2019 to 2021. The precautionary buffer of 20% has been applied. Advised catch for 2021 and 2022 was 1570 tonnes. Total catch was (1067 + 242 discards =) 1309 tonnes, which is lower than advice. Advised catch for 2023 and 2024 is 1256 tonnes, representing a -20% change due to application of a precautionary buffer. Discard rate is 20% (based on 2019-2021). No HR is available in the 2022 assessment. From 2019 to 2021 the total catch (landings + discards) has been below the ICES catch advice. ICES is aware of the EU multiannual management plan (MAP) that has been agreed for this stock (EU, 2018) and considers it to be precautionary when implemented at the functional unit level. There is no agreement with UK regarding this plan, and it is not used as the basis of the advice for this stock. For this stock it is not possible to estimate FMSY ranges, therefore ICES continues to give advice based on the ICES precautionary approach. Note: UK take approx. 1% of landings, with majority taken by Dutch, Belgian, German fleets.					
1.1.1 – Stock status [FU6 Farn Deeps]	**60 – 79**	No	a	✓	✗
			b	-	✗
Rationale: There is a 17% decrease in advice relative to 2022 due to decreased stock abundance. Significant reduction in catches from 2019 to 2020 (reduced by 44%). Catches in 2021 remain at a similar level to catches in 2020 Stock size currently just above MSYB trigger, but recently below (2009-2010 and 2012-2016) and in a downward trend. Long term trend of F being above Fmsy. HR increased from 2020 to 2021. 					
1.1.1 – Stock status [FU7 Fladen Ground]	**≥80**	No	a	✓	✓
			b	-	✓
Rationale: Stock size decreased slightly, but remains at approx. 2xMSYBtrigger. HR increased slightly, but remains well below Fmsy. The catch in FU 7 has been lower than advised in recent years, and if the difference is transferred to other FUs, this could result in non-precautionary exploitation of those FUs. However, noted that in 2021, the landings were around the level corresponding to ICES advice (landing=9559; advice=9579)"Well above MSY Btrigger (but below in 2015). F is well below Fmsy. Highly likely to be above PRI.					



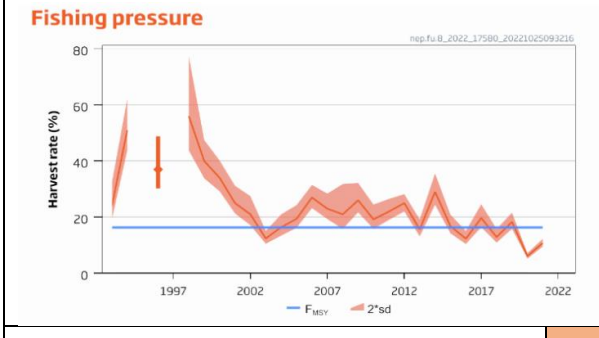


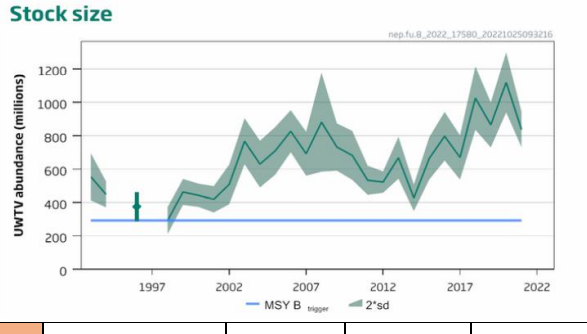
1.1.1 – Stock status [FU8 Firth of Forth]	**≥80**	No	a	✓	✓
			b	-	✓

Rationale: "Fishing pressure on the stock is below FMSY, and stock size is well above MSY Btrigger (and over 2xMSYBtrigger). No UWTV survey in 2022, so stock size assumed to be the same as 2021 UWTV survey.
Catches have slightly increased, and HR has therefore increased slightly (from 6.1% to 10.8%) and remains well below Fmsy (of 16.3%).
High level of discarding recorded in 2019, with 5.1% below MCRS. FU 8 firth of forth see pulses of recruitment – higher discard rate of newer individuals coming through the stock, so every 2nd or third year see incoming of small individuals.

Noted that "During 2016–2020 the EU landing obligation was applied to all catches of Norway lobster fisheries with exemptions for high survival. From 2021, the high survivability exemption has not been extended and was replaced by a de minimis exemption for vessels fishing with certain gears in UK waters of ICES Subarea 4 and Division 2.a. The new exemption applies to catches of Norway lobster below the minimum conservation reference size (MCRS), which shall not exceed 2% of the total annual catches of that species."

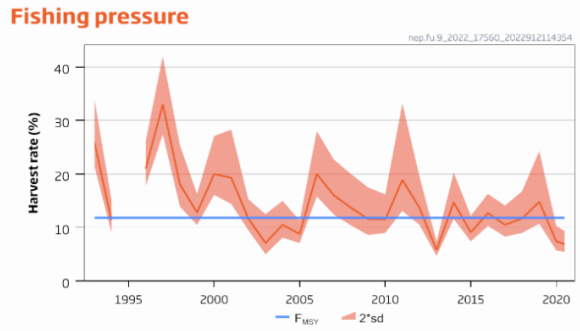
Overall, well above MSY Btrigger (across whole time series), also above 2*MSYBtrig.
F fluctuating around FMSY and recently below F_{MSY}.
Catches in 2021 similar level as 2020. Note no UWTV survey in 2022. Landings well below advice level.

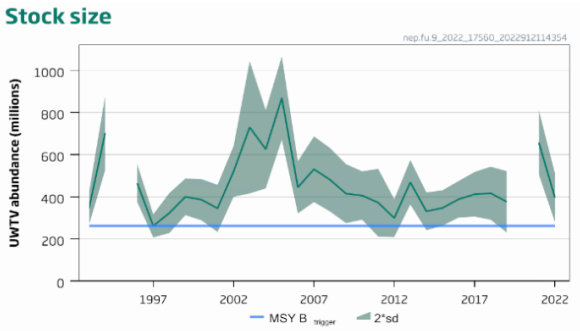




1.1.1 – Stock status [FU9 Moray Firth]	**60 – 79**	No	a	✓	✗
			b	-	✗

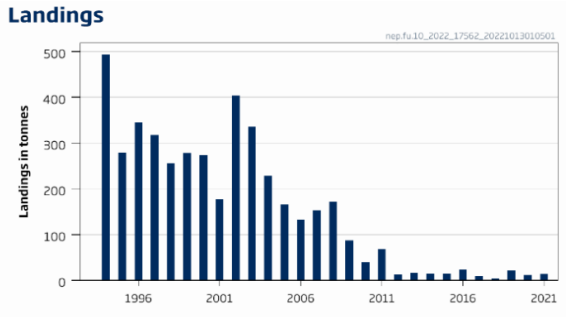
Rationale: Significant drop in stock abundance from 658 million individuals to 396 in an annual period (drop of 40%) and on downward trend towards MSYBtrigger, although remains above MSYBtrigger. Highly likely above PRI, but not likely to be fluctuating around MSY.
Landings in 2021 were above advice (landings= 1221; advice = 1180). Harvest rate remains well below FMSY.

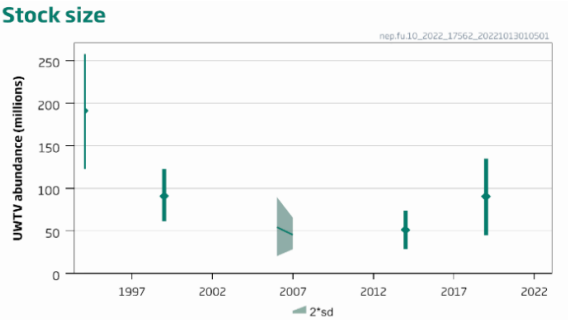




1.1.1 – Stock status [FU10 Noup]	**≥80**	No	a	✓	✓
			b	-	✓

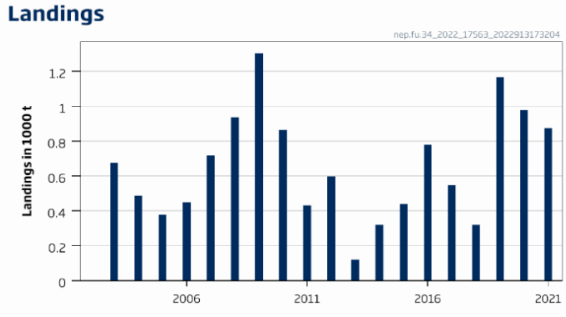
Rationale: HR is currently below 1%. Stock density in numbers m-2; stock density has dropped from 0.48 to 0.22. HR at 0.65 based on recent average landings (2019-2021) is well below 7.5% HRMSY.

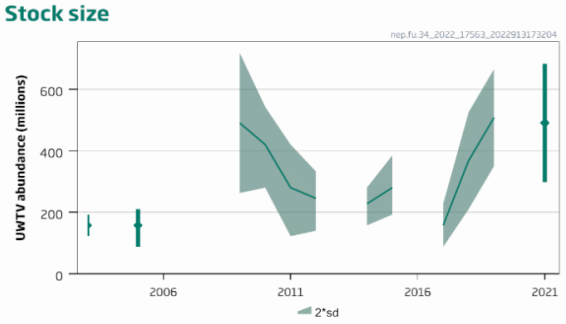




1.1.1 – Stock status [FU34 Devil's Hole]	**60 – 79**	No	a	✓	✗
			b	-	✗

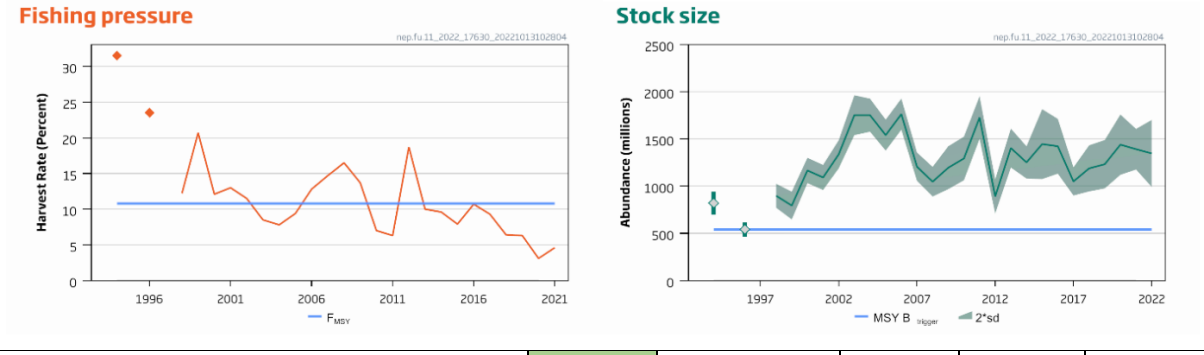
Rationale: Catches in 2016 & 2017 well above ICES advice. Catches in 2019 over double ICES advice. Catches in 2020 and 2021 remain above advice. HR is just below 7.5%.





1.1.1 – Stock status [FU11 North Minch]	**≥80**	No	a	✓	✓
			b	-	✓

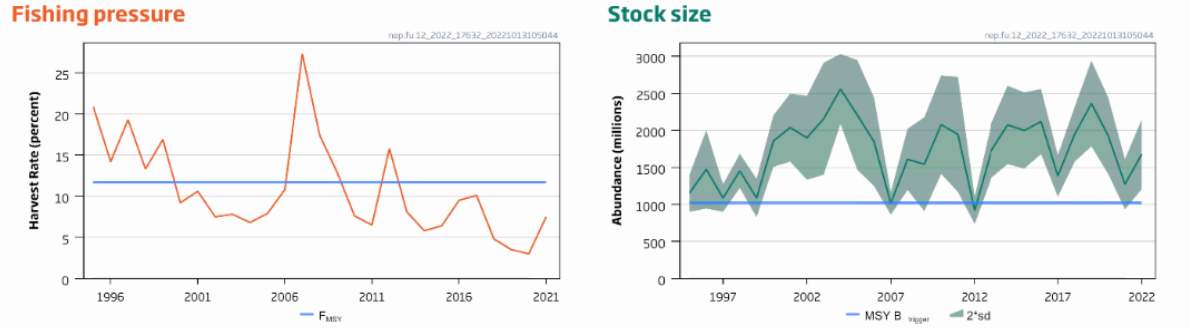
Rationale: Well above MSY Btrigger (across whole time series), well above MSYBtrigger*2.
F below FMSY since 2013 and at its lowest level in 2020.



1.1.1 – Stock status [FU12 South Minch]	**≥80**	No	a	✓	✓
			b	-	✓

Rationale: Fluctuating above MSY Btrigger (across whole time series). Above MSYBtrigger in 2021 assessment, although below 2*MSYBtrigger, so may not be fluctuating at a level consistent with MSY. 2022 assessment saw an increase in abundance. Landings have remained well below ICES catch advice since 2007. (ICES advice in 2021 5916 and landings 2696). Maintain watching brief for next assessment

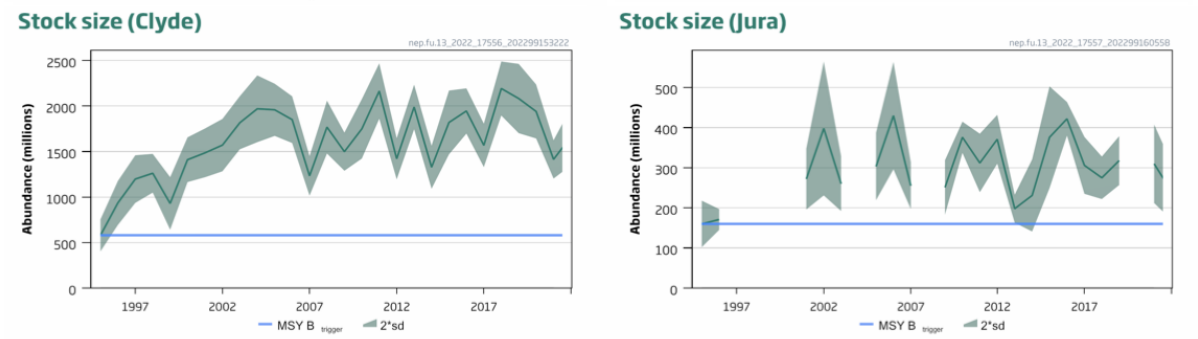
F below FMSY since 2013 and increased in 2021, but remains well below FMSY.



1.1.1 – Stock status [FU13 Firth of Clyde + Sound of Jura]	**60 – 79**	No	a	✓	✗
			b	-	✗

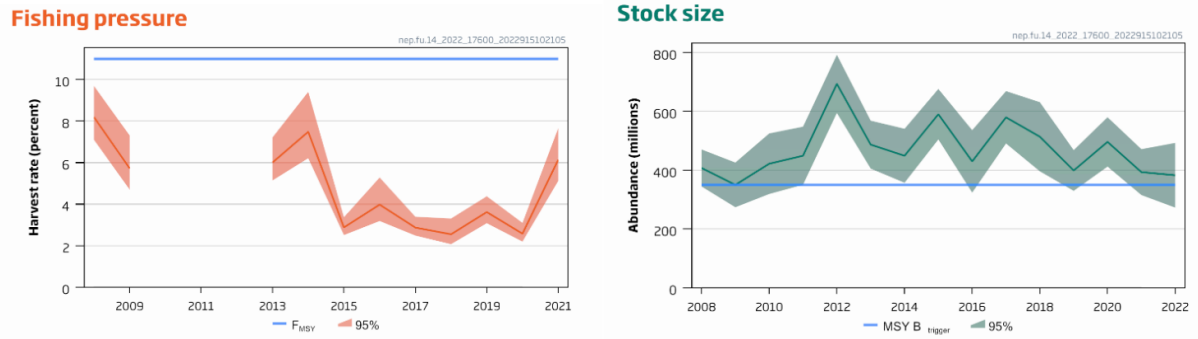
Rationale: F increase to above FMSY, but has been below previously.

Firth of Clyde abundance has increased from 1414 to 1665. Sound of Jura abundance has decreased from 310 to 241. MSS note concern around harvest rate being above FMSY. FU13 seen stock relatively high in terms of abundance, fluctuations in terms of fishing amounts and landings – 2021 landings increased. Advice for 2023 has increased for Clyde, but decreased for Jura. Overall, high harvest rates put this FU into the 60-79 category.



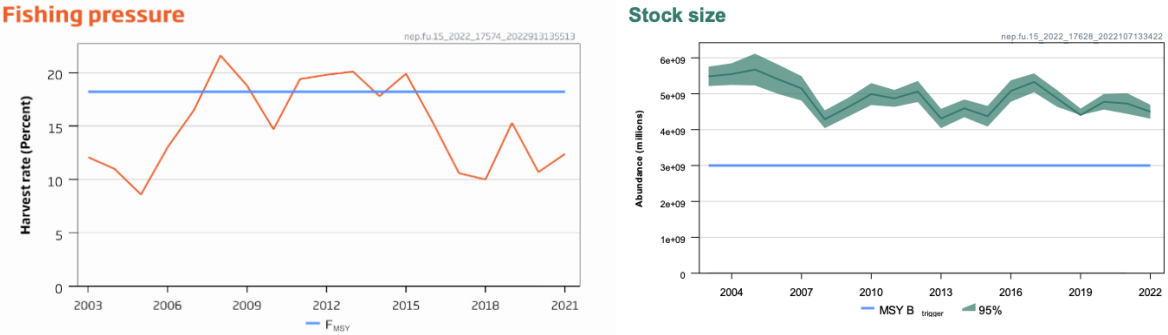
1.1.1 – Stock status [FU14 Irish Sea East]	**≥80**	No	a	✓	✓
			b	-	✓

Rationale: Abundance fluctuating above MSY Btrigger since 2010, but not 2*MSYBtrigger
F well below FMSY and landings well below ICES catch advice.



1.1.1 – Stock status [FU15 Irish Sea West]	**≥80**	No	a	✓	✓
			b	-	✓

Rationale: Well above MSY Btrigger (across whole time series), but not 2*MSYBtrigger
F fluctuating around and below FMSY since 2016.
Landings consistently below advice.



1.1.2 – Stock rebuilding	**≥80**	No	a	✓	-
			b	✓	✓

Rationale: The results remain the same as the 2019 pre-assessment. In summary, the rebuilding strategy is to set TACs based on a harvest rate equivalent to fishing at Fmsy, and therefore the stock should be rebuilt to MSY within two generations. The stock could be rebuilt at a faster rate if the TAC was set at a lower level than that equivalent to Fmsy.
There are monitoring strategies in place in both UoCs to determine whether the stock is being rebuilt.

1.2.1 – Harvest Strategy	**<60**	No	a	×	×
			b	✓	×
			c	✓	-
			d	-	-
			e	N/A	N/A
			f	✓	✓

Rationale: For scoring issue a, there is a mismatch between the scale at which stocks are assessed and catch advice is provided (Functional Unit level) and the much wider scale at which TACs are set (e.g. North Sea). This mismatch could lead to uneven exploitation patterns across the various FUs resulting potentially in over-exploitation within an individual FU even though annual TACs had not been exceeded. The harvest strategy cannot therefore be expected to achieve stock management objectives reflected in PI 1.1.1, and therefore the SG60 is not met currently for scoring issue (a).
A management flowchart has been developed by the FIP to implement steps to determine remedial measures, should they be required at FU level. However, this management flowchart is not yet implemented and the reference points that it stipulates are not yet defined. SG60 is not met.

For issue b, Assuming that there is little movement of fishing effort between UoCs and therefore the harvest strategy is likely to work for most UoCs, there is some justification for the fishery meeting SG60b. Whilst for most of the UoCs, the harvest strategy appears to be maintaining stocks at target levels, there is evidence for Farn Deeps (FU6) and Devil's Hole (FU34) that TACs have been exceeded and the stocks are below levels expected if the harvest strategy was working. The harvest strategy has not been fully evaluated through, for example, a management strategy evaluation (MSE).

For issue c, there is a comprehensive monitoring programme in place including vessel log books, VMS, catch sampling, fishery-independent TV surveys and monitoring of landings.

For issue d, the FIP has undertaken a desk based exercise to document all of the alternative measures and gear trials undertaken within the TR1 and TR2 trawl gear, as well as creels. This review is updated regularly by the Steering Group.

1.2.2 – Harvest control rules and tools	**60 – 79**	No	a	✓	×
			b	-	×
			c	✓	×

Rationale: The results remain the same as the 2019 pre-assessment. In summary, the key harvest control rule is that the TAC is adjusted annually based on the stock abundance estimate derived from the annual underwater TV surveys and the target harvest ratio equivalent to the Fmsy proxy estimated from the yield-per-recruit model. By maintaining the TAC at a level equivalent to fishing at Fmsy, the harvest control rule is designed to ensure that the stock fluctuates around Bmsy which is well above the level at which recruitment would be impaired. However ICES advice has not previously been based upon a reduction in exploitation rate should abundance drop below MSYBtrigger and for all Nephrops stocks there is no formally defined limit reference point such as Blim.
Steps have been taken by the FIP to encourage a joint request from all UK fisheries administrators to ICES to define Blim and Bmsy for all nephrops FUs. This request has not yet been submitted.

1.2.3 – Information and monitoring [All FUs, except FU5]	**≥80**	No	a	✓	✓
			b	✓	✓
			c	-	✓

Rationale: UWTV stock assessments are undertaken annually, stock structure (stock assessment areas defined), productivity known (biomass estimated), fleet composition known, based on fishing licences. Other data includes UK MMO iFISH database of landings by ICES rectangle and by port of landing; VMS data.

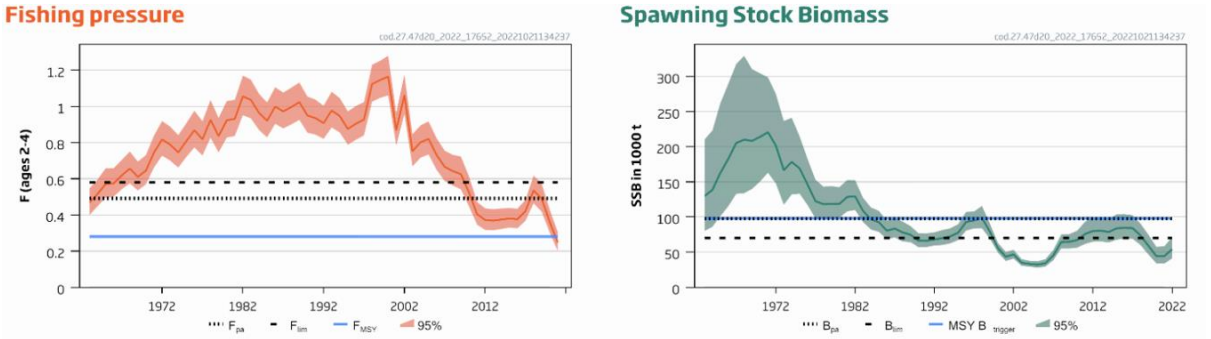
1.2.3 – Information and monitoring [FU 5 Botney Gut - Silver Pit]	**≥80**	No	a	✓	✓
			b	✓	×
			c	-	✓

Rationale: The latest UWTV survey was undertaken in 2012 for FU5, with no clear indication of when a new UWTV survey will take place.

1.2.4 – Assessment of stock status [All FUs, except FU5, 10 & 34]	**≥80**	No	a	-	✓
			b	✓	✓
			c	✓	✓
			d	-	-

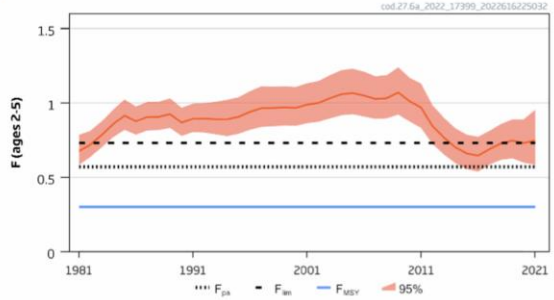
			e	-	✓
Rationale: UWTV surveys; robust data on removals via Registration of Buyers & Sellers and iFISH database; FMSY and MSY Btrigger reference points available.					
1.2.4 – Assessment of stock status [FUs 5, 10 & 34]	**60 – 79**	No	a	-	✓
			b	✓	✕
			c	✓	✓
			d	-	-
			e	-	✓
Rationale: Sporadic UWTV surveys; robust data on removals via Registration of Buyers & Sellers and iFISH database; reference point for FMSY is not defined and lower bound average from North Sea FUs is used (7.5%) in the absence of FU specific reference points.					

4.1.2 Principle 2

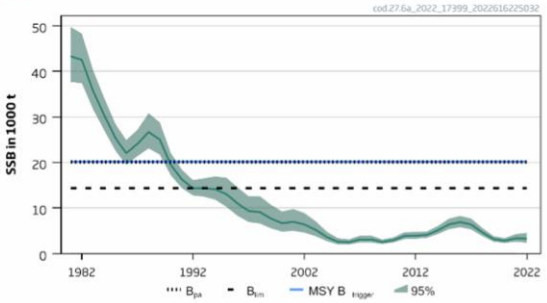
Performance Indicator	Draft scoring range	Data deficient?	Issue	SG60	SG80
2.1.1 – Primary Outcome [North Sea FUs]	**60 – 79**	No	a	✓	✕
			b	-	-
Rationale: Scores 60-79 due to North Sea cod element. Findings from ICES stock assessment for cod in the North Sea (4) Nov 2022:  • The stock is currently below Blim; fishing pressure has dropped significantly and is below FMSY (noting that it was above Flim in the June 2020 assessment) • TAC set for 2023 at 21,652 tonnes, ICES advised catches no more than 26,008 tonnes. Modelling shows catch of 22,523 tonnes (F=F2022) would result in 29% growth in SSB (ICES, 2022). • The TAC is therefore expected to ensure that the UoA does not hinder recovery of the North Sea cod stock and therefore SG60 is met for 2.1.1 and the score remains 60-79. • The trend in SBB is not considered to evidence this recovery yet, but it is promising.					
2.1.1 – Primary Outcome [West of Scotland and Irish Sea FUs]	**<60**	No	a	✕	✕
			b	-	-

Rationale: Scores <60 due to West of Scotland cod element and Irish Sea whiting element.
Findings from ICES stock assessment for West of Scotland cod (6a) 2022:

F



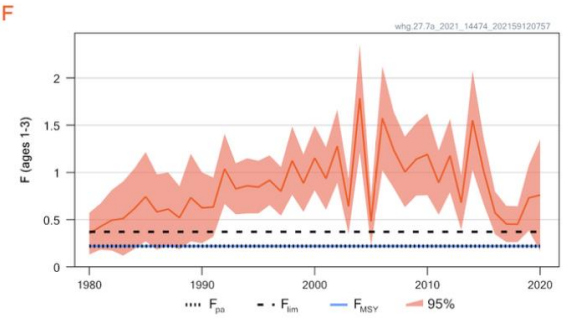
SSB



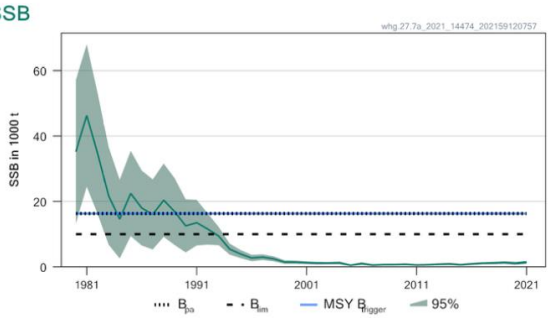
• Fishing pressure on the stock is above FMSY, Fpa and Flim; spawning-stock size is below MSY Btrigger, Bpa, and Blim
• ICES advice is for zero catch for 2023 and 2024.
• In the 2022 Annual Review it was concluded that additional management through the Sea Fish Prohibition on Fishing Firth of Clyde Order 2022 – which implemented a spatial seasonal closure for all fishing gears from 14 Feb to 30 Apr (11 weeks) to protect cod spawning, were expected to ensure that the fishery does not hinder recovery. However, it was noted that evidence is not available of either recovery of the stock or of this strategy being effective, as such the score of 60-79 was awarded in 2022.
• Update from ICES Technical Service (2022) paper on catch scenarios finds that: For cod in Division 6.a, catches in 2023 are estimated to be between 1642 tonnes and 2562 tonnes, assuming fishing mortality on cod does not change or increases by the same proportion as the change advised for haddock. Under the scenario resulting in lower catch, spawning-stock biomass (SSB) in 2024 is expected to decrease by 5.6% while the higher catch option is expected to result in a decrease in SSB of 44%.
• Based on the evidence of catch scenarios concluding decrease in SSB, together with fishing above FMSY, the score is reduced to <60

Findings from ICES stock assessment for Irish Sea whiting (7a) June 2021:

F



SSB



• SSB extremely low, remains well below Blim. (<60)
• ICES advice is for zero catches in 2022 and 2023.
• ICES technical service (2022): For whiting in Division 7.a, forecasted bycatch levels in 2023 are 1125 tonnes, using a model of whiting bycatch in the Nephrops fishery and assuming 8476 tonnes of Nephrops catches in 2023. This is expected to result in a 1% increase in SSB in 2024.
• F remains well above Flim; Score remains <60.

2.1.2 – Primary Management [North Sea FUs]	**≥80**	No	a	✓	✓
			b	✓	✓
			c	-	✓
			d	N/A	N/A
			e	✓	✓

Rationale: Scores 80 due to North Sea cod element.
In terms of management, the TAC is for bycatches only, no targeted fishery for cod. Fishing mortality is currently well below FMSY and has been below FMSY since 2012. There is also regular review of alternative measures. The management PI (2.1.2) score has therefore increased to 80.

2.1.2 – Primary Management [West of Scotland and Irish Sea FUs]	**60 – 79**	No	a	✓	✓
			b	✓	✓
			c	-	✓
			d	N/A	N/A
			e	✓	✓
Rationale: Scores 60-79 due to West of Scotland cod element and Irish Sea whiting element. For West of Scotland cod, the following is noted: In the 2022 Annual Review it was concluded that additional management through the Sea Fish Prohibition on Fishing Firth of Clyde Order 2022 – which implemented a spatial seasonal closure for all fishing gears from 14 Feb to 30 Apr (11 weeks) to protect cod spawning, were expected to ensure that the fishery does not hinder recovery. However, in the 2023 Annual Review it is noted that evidence is not available of either recovery of the stock or of this strategy being effective, and as such the score of 60-79 is awarded in 2023 for management PI (2.1.2). For Irish Sea whiting, the following is noted: Fishing mortality is well above Flim and has been above this level for almost the entire timeseries. The score remains 60-79.					
2.1.3 – Primary Information	**≥80**	No	a	✓	✓
			b	-	-
			c	✓	✓
Rationale: Quantitative data is available for catch composition, including the MMO iFISH database, and stock assessments for main primary species are updated annually.					
2.2.1 – Secondary Outcome	**≥80**	Yes	a	✓	✓
			b	✓	✓
Rationale: MMO landings data is available by weight to allow calculation of the proportion of catch, confirming the list of main secondary species for trawl and creel. Note, that this is somewhat inaccurate for the creel fishery, given that landings are not available by trip and therefore additional species caught in separately targeted fisheries appear in the statistics (including brown crab and lobster). An RBF PSA has been undertaken for all secondary species, resulting in a score of ≥80.					
2.2.2 – Secondary Management	**≥80**	No	a	✓	✓
			b	✓	✓
			c	-	✓
Rationale: Management for main secondary species has been documented by the FIP and is available as a separate excel report. Main management relates to MLS/MCRS, as well as restrictions related to gear technology (demersal trawl) and target species removal limits (TACs at ICES Division level).					
2.2.3 – Secondary Information	**≥80**	No	a	✓	✓
			b	-	-
			c	✓	✓
			d	N/A	N/A
			e	✓	✓
Rationale: Cefas have proportion of catch by FU level to confirm the main secondary species. Extensive Alternative Measures report have been produced for Round 2 and is updated regularly through the Steering Group.					
2.3.1 – ETP Outcome [TR1 and TR2 trawls]	**<60**	No	a	✓	✗
			b	✓	✗
			c	-	✗
Rationale: The assessment remains similar to that undertaken within the 2019 Pre-Assessment. It is unknown whether the direct effects of the trawl fishery are likely to hinder recovery of PMF invertebrate species included within the ETP species list. Species distribution mapping undertaken by the MarPAMM project indicates potential overlap of the fishery with the ocean quahog and fan mussel (MarPAMM, 2023).					
2.3.1 – ETP Outcome [Creels]	**60 – 79**	No	a	✓	✗
			b	✓	✗

			c	-	×
Rationale: Two key pieces of research inform this component for creel: NatureScot Research Report: SEA - understanding the scale and impacts of marine animal entanglement in the Scottish creel fishery – 2021 IWC report: estimates of minke and humpback whale entanglements in Scotland 2020 Key points and findings of the SEA 2021 report: Scotland's Future Fisheries Management Strategy – 2020 to 2030 commits to monitor and reduce incidental bycatch, and the UK Fisheries Act (2020) establishes an Ecosystem Objective, including to 'minimise and where possible eliminate sensitive species bycatch'. Estimated more than 95% of entanglement cases currently go unreported. Expanding the amount and quality of data collected is essential Spatio-temporal distribution in fishing effort for the under 12m fishing fleet is insufficient. The areas that showed the greatest co-occurrence of sightings of minke whales and creel fleets were: to the east of the Outer Hebrides, west of North Uist and throughout the waters around Skye. The extent and incidence of entanglement events in Scottish waters may be sufficient to impact at a local population level, and this is a concern for conservation and the population recovery trajectories of minke and humpback whales. There is an urgent need to develop and encourage adoption of best-practices to minimise the threat to marine animals from entanglement in fishing gear. Reducing the amount of rope in the water column, both as active fished gear and marine litter/debris will reduce the incidence of entanglements. Initiatives which aimed to reduce entanglement risk including a move toward negatively buoyant ropes, reduced creel fishing effort and ropeless fishing systems were supported by fishers interviewed in the SEA study. Based on the above evidence, it remains likely that the UoA will not hinder recover of the ETP species it interacts with and the score remains 60-79.					
2.3.2 – ETP Management	**60 – 79**	No	a	N/A	N/A
			b	✓	×
			c	✓	×
			d	-	×
			e	✓	×
Rationale: There are measures in place in the form of MPA management including closed areas, but not a strategy. Some review of alternative measures to minimise mortality (release rays back to sea), but not regular.					
2.3.3 – ETP Information	**60 – 79**	No	a	✓	×
			b	✓	×
Rationale: While landings data and discard data are available, this is not considered adequate to assess the UoA related mortality to all ETP species, specifically recognizing the species ID of rays. There is some data on interaction of marine mammals and basking sharks associated with creels, but it is estimated that more than 95% of entanglement cases currently go unreported. Overall, there is qualitative data, but not sufficient quantitative data and therefore the score remains 60-79.					
2.4.1 – Habitats Outcome [TR1 and TR2 trawls]	**60 – 79**	No	a	✓	✓
			b	✓	×
			c	✓	-

Rationale: This PI has been harmonised with the SFSAG certified joint demersal fishery.
The FIP have undertaken significant post-doctoral research into the habitat impacts of demersal otter trawl fisheries.
Whitton and Hiddink (2022) completed the habitats study titled: Determining the impact on seabed habitats of fishing for nephrops with trawls and creels around the UK. Both TR1 (mesh size ≥100mm, typically targeting whitefish as well as nephrops) and TR2 (mesh size ≥70mm and <100mm typically targeting nephrops) gear is included in the assessment.
The study used the MSC Benthic Impact Tool (BIT) to calculate the relative benthic status and recovery of habitats with the following conclusions:
Commonly encountered habitats (circalittoral mud):
• TR2 and TR1 reach SG80 or SG100 at all areas studies (Celtic Sea, West of Scotland and North Sea)
Vulnerable Marine Ecosystems (as defined in the VME master list developed for the FIP)
• The VME habitats assessment used two depletion scenarios which could be considered as:
- Low depletion: 0.06 for trawling and 0.14 for creels
- High depletion: 0.5 for all gears
• The VME habitats assessment used two occurrence levels for VME records:
- All VME records (including certain and uncertain records)
- Certain VME records only
• A summary of the results for TR2 and TR1 are provided below, (SpBMC: sea pens and burrowing megafauna communities)

VME Records	All		Certain only	
Depletion level	0.06	0.5	0.06	0.5
TR2	Celtic: <60 SpBMC	Celtic: <60 SpBMC	Celtic: ≥80	Celtic: ≥80
	WoS: 60-79 SpBMC	WoS: <60 SpBMC	WoS: 60-79 SpBMC	WoS: <60 SpBMC & Modiolus
	NS: ≥80	NS: 60-79 SpBMC	NS: ≥80	NS: ≥80
TR1	Celtic: ≥80	Celtic: ≥80	Celtic: ≥80	Celtic: ≥80
	WoS: ≥80	WoS: ≥80	WoS: ≥80	WoS: ≥80
	NS: ≥80	NS: 60-79 SpBMC	NS: ≥80	NS: ≥80

• Whitton and Hiddink (2022) concluded that for TR2 trawling 'Sea-pen and burrowing megafauna communities' and '*Modiolus modiolus* horse mussel beds' did have assessment with suggested scores not reaching SG60 under different combinations of VME data layer and depletion values for the Celtic and West of Scotland assessment areas. This showed that the VME assessment is sensitive to the habitat layer and the depletion values used, both of which have uncertainty in the assessments conducted and merit future refinement and quantification.
Overall, the post-doc work demonstrates that for both trawl gears (TR1 and TR2) there is uncertainty with the habitat score relative to VME interaction and therefore an increase to SG80 is not warranted.

2.4.1 – Habitats Outcome [Creels]	**≥80**	No	a	✓	✓
			b	✓	✓
			c	✓	-

Rationale:
The FIP have undertaken significant post-doctoral research into the habitat impacts of creel fisheries. The Whitton and Hiddink (2022) study used the MSC Benthic Impact Tool (BIT) to calculate the relative benthic status and recovery of habitats subject to creel activity. The creel UoA reached SG100 for all scenarios studied for both commonly encountered habitats and VMEs. The habitat outcome status score remains at ≥80.

2.4.2 – Habitats Management	**60 – 79**	No	a	✓	×
			b	✓	×
			c	-	×
			d	✓	×

Rationale: There are measures in the form of technical gear restrictions and closed areas, but not a partial strategy. There is not sufficient quantitative evidence that protection measures (within MPAs for example) are complied with. FMP should have a habitat section to detail this.					
2.4.3 – Habitats Information	**60 – 79**	No	a	✓	✓
			b	✓	×
			c	✓	✓
Rationale: Very good level of detail to inform habitat assessment. Know habitat types, sensitive species and footprint of the fishery understood for a large portion of the fleet. Can identify increased risk through monitoring VMS effort data. However, it is noted that iVMS is in the process of being implemented for all vessels <12m and therefore information related to the footprint of this fleet segment is yet to be determined or understood. Therefore scoring issue b is not met at SG80.					
2.5.1 – Ecosystems Outcome [TR1 and TR2 trawls]	**60 – 79**	No	a	✓	×
Rationale: Wider ecosystem function, linked to indirect effects resulting from habitat disturbance. Nephrops not a key prey item, so do not expect removal of target species to be an issue. Change in ecosystem, based on effects on habitat that supports a wider range of benthic invertebrates.					
2.5.1 – Ecosystems Outcome [Creels]	**≥80**	No	a	✓	✓
Rationale: Wider ecosystem function, linked to indirect effects resulting from habitat disturbance. Nephrops not a key prey item, so do not expect removal of target species to be an issue. Overall, for the creel fishery, it is considered highly unlikely that biodiversity, community structure and productivity are adversely impacted , however, targeted evidence of this is not available.					
2.5.2 – Ecosystems Management [TR1 and TR2 trawls]	**60 – 79**	No	a	✓	×
			b	✓	✓
			c	-	✓
Rationale: A number of measures exist that manage the interaction of the nephrops fisheries, including: • Closed areas within the Marine Protected Areas network. • Technical gear restrictions • TACs and quotas • Minimum landing sizes However, these measures are unlikely to qualify as a partial strategy in relation to the demersal trawl fishery and are not expected to restrain impacts across the wider ecosystem. Not all measures take appropriate account of ICES catch advice, particularly for whiting in West of Scotland where catch scenarios demonstrate that any level of catch will hinder recovery, which could subsequently have wider impacts on community structure.					
2.5.2 – Ecosystems Management [Creels]	**≥80**	No	a	✓	✓
			b	✓	✓
			c	-	✓
Rationale: A number of measures exist that manage the interaction of the nephrops fisheries, including: • Closed areas within the Marine Protected Areas network. • Technical gear restrictions • TACs and quotas • Minimum landing sizes For creel fisheries, this is expected to restrain ecosystem impacts so as to achieve SG80					
2.5.3 – Ecosystems Information	**≥80**	No	a	✓	✓
			b	✓	✓
			c	-	✓
			d	-	✓
			e	-	✓

Rationale: Significant work has been undertaken, need to ensure research and scientific papers are obtained in a P2 library.

4.1.3 Principle 3

Performance Indicator	Draft scoring range	Data deficient?	Issue	SG60	SG80
3.1.1 – Legal and customary framework	**≥80**	No	a	✓	✓
			b	✓	✓
			c	✓	✓
Rationale: The UK has exited the EU with resulting amendments to UK legislation, but retains a robust framework in relation to P1 with the UK Fisheries Act 2020 and in relation to P2 through amended marine environmental regulations retaining & building upon the EU network.					
3.1.2 – Consultation, roles and responsibilities	**≥80**	No	a	✓	✓
			b	✓	✓
			c	-	✓
Rationale: Fisheries is a devolved matter and therefore managed by authorities in the UK's devolved authorities. Roles and procedures are well defined under a fisheries framework including the Fisheries Act and a Joint Fisheries Statement setting out how the various authorities will work together. The JFS was published in November 2022 and includes commitment for Marine Scotland to be the lead authority in developing Fishery Management plans for Nephrops in the West of Scotland and North Sea with delivery from 2022 to 2024.					
3.1.3 – Long term objectives	**≥80**	No	a	✓	✓
Rationale: Fisheries Act 2020 and TCA agreement have MSY and precautionary objectives in line with the MSC criteria. The JFS sets out the fishery policy authorities interpretation of the eight objectives set out in the Act and how they will deliver them.					
3.2.1 – Fishery specific objectives	**60 – 79**	No	a	✓	✕
Rationale: The fishery specific management mainly relates to the Multi Annual Management Plans for the North Sea and Western Waters. Nephrops is defined as a named species with a series of conservation objectives set out for management at a Functional Unit level. However, reference points cited within the MAPs are not yet defined and short and long term objectives are not explicit.					
3.2.2 – Decision making processes	**≥80**	No	a	✓	✓
			b	✓	✓
			c	-	✓
			d	✓	✓
			e	✓	✓
Rationale: The Trade and Cooperation Agreement provides for annual negotiations on total allowable catches and related issues each year for nephrops at an ICES Division level. The TCA requires the UK and EU to seek to agree the timetable for the following years' consultations no later than 31 January each year and the Specialised Committee on Fisheries is tasked with preparing for the annual EU/UK negotiations. The decision-making processes in relation to these nephrops FUs at ICES Division level are established.					
3.2.3 – Compliance and enforcement	**60-79**	No	a	✓	✕
			b	✓	✓
			c	✓	✓
			d	-	✓

Rationale: A risk of non-compliance with the EU landing obligation has been identified in the demersal trawl fishery due to the MCS systems inability to enforce LO-specific management measures, strategies and rules. It is noted that the SFSAG re assessment for joint demersal species also scores other 3.2.3 SGs below 80, also linked to the fisheries' inability to prove compliance with LO requirements.					
3.2.4 – Management performance evaluation	**≥80**	No	a	✓	✓
			b	✓	✓
Rationale: Key parts of the management are evaluated, e.g. western waters. There is internal and external review. UK Fisheries Act includes review provisions for fisheries management plans. The TCA has provisions to be re-evaluated after 5.5 years, while the UK-EU TACs for shared stocks are agreed annually. ICES stock assessments are also reviewed bi-annually and benchmarked regularly. The fishery-specific management systems would be subject to an external review and so the scoring is likely to be at 80.					

References

Carruthers, T. & D. J. Agnew, 2016. Using simulation to determine standard requirements for recovery rates of fish stocks. Marine Policy 73, pp 146–153

Froese, R., Coro, G., Kleisner, K. and Demirel, N. (2014), Revisiting safe biological limits in fisheries. Fish and Fisheries. http://onlinelibrary.wiley.com/doi/10.1111/faf.12102/abstract

ICES (2019) https://www.ices.dk/community/groups/Pages/WKNephrops2019.aspx

ICES, 2021. ICES Advice on fishing opportunities, catch, and effort Celtic Seas ecoregion Whiting (Merlangius merlangus) in Division 7.a (Irish Sea)

ICES, 2022. ICES Advice on fishing opportunities, catch, and effort Celtic Seas Ecoregion Cod (Gadus morhua) in Division 6.a (West of Scotland)

ICES, 2022. ICES Advice on fishing opportunities, catch, and effort Celtic Seas Ecoregion Cod (Gadus morhua) in Division 7.a (Irish Sea)

ICES, 2022. ICES Advice on fishing opportunities, catch, and effort Celtic Seas Ecoregion Whiting (Merlangius merlangus) in Division 6.a (West of Scotland)

ICES, 2022. ICES Advice on fishing opportunities, catch, and effort Greater North Sea Ecoregion Whiting (Merlangius merlangus) in Subarea 4 and Division 7.d (North Sea and eastern English Channel)

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 4.b, Functional Unit 5 (central and southern North Sea, Botney Cut-Silver Pit). ICES Advice on fishing opportunities, catch, and effort. Greater North Sea Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 4.b, Functional Unit 6 (central North Sea, Farn Deeps). ICES Advice on fishing opportunities, catch, and effort. Greater North Sea Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 4.b, Functional Unit 7 (northern North Sea, Fladen). ICES Advice on fishing opportunities, catch, and effort. Greater North Sea Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 4.b, Functional Unit 8 (central North Sea, Firth of Forth). ICES Advice on fishing opportunities, catch, and effort. Greater North Sea Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 4.b, Functional Unit 9 (central North Sea, Moray Firth). ICES Advice on fishing opportunities, catch, and effort. Greater North Sea Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 4.b, Functional Unit 10 (northern North Sea, Noup). ICES Advice on fishing opportunities, catch, and effort. Greater North Sea Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 6.a, Functional Unit 11 (West of Scotland, North Minch). ICES Advice on fishing opportunities, catch, and effort. Celtic Seas Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 6.a, Functional Unit 12 (West of Scotland, South Minch). ICES Advice on fishing opportunities, catch, and effort. Celtic Seas Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 6.a, Functional Unit 13 (West of Scotland, the Firth of Clyde and Sound of Jura). ICES Advice on fishing opportunities, catch, and effort. Celtic Seas Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 6.a, Functional Unit 14 (Irish Sea, East). ICES Advice on fishing opportunities, catch, and effort. Celtic Seas Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 6.a, Functional Unit 15 (Irish Sea, West). ICES Advice on fishing opportunities, catch, and effort. Celtic Seas Ecoregion.

ICES. 2022. Norway lobster (Nephrops norvegicus) in Division 4.b, Functional Unit 34 (central North Sea, Devil's Hole). ICES Advice on fishing opportunities, catch, and effort. Greater North Sea Ecoregion.

IWC, 2020. Estimates of minke and humpback whale entanglements in Scotland

MarPAMM (2022). Marine Protected Area Management and Monitoring https://www.mpa-management.eu

MSC (2018). Scoring stock status against Bmsy for ICES stocks (FCR v2.0 - Annex SA PI 1.1.1). https://mscportal.force.com/interpret/s/article/Scoring-stock-status-against-Bmsy-for-ICES-stocks-PI-1-1-1-1527262010506

NatureScot Research, 2021. SEA - understanding the scale and impacts of marine animal entanglement in the Scottish creel fishery.

North Sea Advisory Council (2015). A Long-Term Management Plan for North Sea Nephrops https://www.nsrac.org/wp-content/uploads/2020/06/2-1415-2015-02-16-Nephrops-LTMP.pdf

Seafish, 2022. Kingfisher mapping fishery restrictions.

Whitton, T. Hiddink, J.G. (2023), Determining the impact on seabed habitats of fishing for Nephrops with trawls and creels around the United Kingdom, Bangor University.

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