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REVIEW OF FRONT- RUNNER FISHERIES MANAGEMENT PLANS

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FINFISH

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Review of Front-runner Fisheries Management Plans - Finfish

1. Background

On leaving the European Union in January 2020, the UK required alternative legislation to replace the Common Fisheries Policy. In November 2020, the UK Parliament passed the Fisheries Act to enable full UK control of and legal responsibility for fishing and to establish a Fisheries Framework for future management in UK coastal waters. The UK Fisheries Management and Support Framework (the Fisheries Framework) provides for a joint approach to fisheries management between the UK Government and the devolved administrations. It includes the Fisheries Act, retained EU law, the Joint Fisheries Statement (JFS) and Fisheries Management Plans (FMPs), in addition to a Fisheries Framework Memorandum of Understanding. The Fisheries Act 2020 (S. 52) provides that the JFS should be prepared by the UK fisheries policy authorities for the devolved nations to outline the policy strategy to achieve, or contribute to achieving, the eight fisheries objectives set out. The JFS 2022 includes a list of FMPs, setting out the lead authority for each FMP, the stocks covered and timescales for publication.

The Fisheries Act 2020 provides a legally binding structure to protect and recover stocks, support a sustainable fishing industry, and safeguard the environment. The objectives set out in the Act provide the basis against which the fisheries policy authorities will manage their fisheries and a commitment to developing FMPs as outlined in the JFS. This will comprise publication of a total of 43 FMPs (as listed in the JFS) by 2028 that will provide the evidence of the state of the stocks and identify measures and actions necessary to improve the evidence base and manage fisheries in a sustainable way.

In July 2023, Defra released six draft 'frontrunner' FMPs for consideration through consultation. These frontrunners were developed through piloting different approaches to preparing plans in partnership with stakeholders with the intention that this will provide valuable information to shape future FMP development.

2. Purpose of this report

This report provides a review of three of the six frontrunner FMPs that pertain primarily to finfish, rather than the full six that also include crustaceans and molluscs (crab and lobster, king scallop, and whelk). Strengths and weaknesses of the FMPs are identified and discussed relative to meeting the objectives of the Fisheries Act 2020 and as elaborated on in the JFS (section 5). Recognising that this is a first iteration of a wider process of fisheries management policy development, providing a pilot programme to facilitate learning to inform future FMPs, recommendations are provided with the intention that these may help advance the process in the future.

3. Review of front-runner FMPs - Finfish

3.1 Southern North Sea and Eastern Channel Mixed Flatfish FMP

This FMP focuses on nine flatfish species (lemon sole, witch, turbot, brill, dab, flounder, halibut, plaice and sole) fished in the waters of the southern North Sea and eastern English Channel. The FMP is challenged by variability in data availability among the subject species, with some being quite limited, i.e. category 3 (survey-based assessments to indicate trends), while others are considered to be category 1 (full analytical assessment). The FMP recognises that there are several gaps in data

across the stocks, and that stocks are under pressure from multiple factors, including overexploitation and climate change.

Management strategies differ as some species are managed through quota, whilst others are not, and the spatial extent of the quota also varies with species (e.g. plaice and common sole have quota throughout the entire FMP area; turbot, brill, lemon sole and witch only for ICES Divisions 4b and 4c). The FMP also recognises that for species managed through quota, the joint Total Allowable Catch (TAC) management for lemon sole and witch, and turbot and brill, are not optimum for the sustainable management of these species and can allow for overexploitation.

Relating to the long-term vision of the FMP, there is good recognition that the introduction of management measures should be based on best available evidence, and when this is insufficient the precautionary approach will be applied. The FMP also refers to the fishing techniques used to catch flatfish, highlighting that these (e.g. trawling) can be among the most environmentally damaging when viewed from a wider marine environment perspective (e.g. integrity of seabed habitat).

The FMP sets out five objectives across four themes (Table 1).

Table 1. Objectives of the Southern North Sea and Eastern Channel Mixed Flatfish FMP

Theme	Objectives
Evidence	1.1. Develop and improve evidence base for quota and non-quota flatfish in the Southern North Sea and Eastern Channel Mixed Flatfish fishery
Sustainable Fisheries	2.1. Deliver effective management of the harvesting of flatfish stocks within the southern North Sea and eastern Channel area 2.2. Support wider environmental sustainability by understanding how the fishing activities within this FMP impact on the wider marine environment and identify options to minimise negative impacts
Social and economic	3.1. To better understand the social and economic value of the fisheries to the coastal communities within the FMP area
Climate change	4.1. Explore options for mitigating risk to the fishery from the changing climatic conditions

In the current iteration of this FMP the following management actions have been stated:

1. Introduce Minimum Conservation Reference Sizes (MCRS) for lemon sole (25cm), turbot (40cm), and brill (35cm). This will be achieved by first aligning with the existing IFCA measures, and then to adjust limits based on evidence gathered to meet sustainability requirements.
2. Commissioning data collation to better understand the status of Atlantic halibut with such work being undertaken by the relevant ICES working group to better identify the stock unit in the North Atlantic and to ultimately develop a stock assessment. Atlantic halibut is currently not assessed by ICES.
3. Consider reopening a survey for common sole in the Eastern channel to address the evidence gaps around recruitment. This is based on a recognition that previous survey work for sole in 7d was disrupted due to Covid-19.

Note that there is also reference to “Towed gear” in the FMP, but it is not clear whether this is a distinct management action.

Objectives 1.1 and 2.1 are relatively clear and focused, i.e. to develop and deliver. The remaining objectives are less clearly defined, i.e. to support, better understand, and explore; the levels of support, understanding and degree of exploration could be either in-depth or very

superficial. More clearly defined objectives in relation to these themes would be useful, although it is noted that the FMP does provide a series of specific sub-objectives that are better defined and time bound in-line with the SMART (Specific, Measurable, Achievable, Relevant, and Time-Bound) framework for setting goals.

The proposed actions outlined in this FMP are both positive and largely appropriate. However, based on the information provided in the FMP the list of actions could be extended. In particular:

- (i) The FMP makes reference to Marine Protected Areas but no actions are proposed in relation to them, presumably because this relates to actions under linked legislation. It is suggested that further work is required to reduce the impact of flatfish fishing on habitats beyond MPAs to ensure GES targets for seabed integrity are achieved. However, this element could be elaborated on to include appropriate actions and performance indicators.
- (ii) The FMP highlights data gaps related to impacts of, and responses to, climate change but no actions in this area are provided. A more specific action could be included to work closely with scientists to investigate and quantify potential impacts of climate change (e.g. in relation to fish response to shifts in temperature and pH).
- (iii) The FMP recognises the lack of understanding related to discarding of dab and the survival rates associated with this practice. This could be included as an action for more specific consideration in the FMP.
- (iv) The FMP acknowledges the limited data available for flounder stocks and the lack of analytical assessment. The process of rectifying this could be initiated by including an action related to this in the FMP.
- (v) The FMP states that research and development of new technology will be included in later iterations of the FMP. However, there may be an opportunity to initiative the early stages of research as a clearly defined action under the current iteration to generate momentum in this area.
- (vi) There are several other areas referred to in the FMP in relation to the need to collect further information to close the data gaps, presumably as an introduction to these prior to their consideration in future iterations. Nevertheless, it may be valuable to include actions in the current iteration to initiate this process, e.g. in reference to collection of preliminary information.
- (vii) The FMP highlights the engagement with a range of stakeholders during the formulation of the FMP, e.g. through existing fisheries stakeholder forums. There is a need to ensure that this process be continued moving forwards and for there to be reflection as to whether bias in stakeholder involvement may exist. Methods to grow these networks, particularly to include underrepresented stakeholder groups, should be considered.

Several of the actions are clearly defined as short-term (1-2 years) while others will take place over longer time scales (3-5 years). There are clear links to the timing of the actions in-line with the SMART framework for setting objectives, with those set being time-bound. For short-term actions the month number after publication could be set as a clear target to assess through performance indicators, even if this is stated to be the upper limit of that range (24 months).

In the case of stocks managed by quota Maximum Sustainable Yield (MSY) indicators are provided by ICES advice, resulting in an advised total catch. It is suggested that the UK government should aim to set TAC for quota species in-line with the ICES MSY advice. However, to meet the sustainability and precautionary objectives of the Fisheries Act there is a need to manage stocks so that they are at biomass levels greater than those that achieve MSY. Thus, negotiation is needed

with other EU states to manage stocks accordingly, based on the ICES advice. To do so will be in-line with sections 5.3.8 and 5.6.6 of the JFS.

In the implementation of the plan it is clearly stated that Defra will work closely with industry. This is positive and sensible. It is important, however, to ensure engagement and communication with the wider stakeholder community continues during the implementation phase.

Specific recommendations:

- Enhance clarity of what will be achieved for objective 2.2, 3.1 and 4.1.
- For the quota stock to be managed to biomass levels above those capable of producing maximum sustainable yields (see general recommendations).
- Provide additional actions related to:
 - (i) Initiating research to explore potential to reduce impact of fishing for flatfish both within and outside of MPAs and the potential role of HPMA^s in the area covered by this FMP. There may be potential to include an action to collect evidence for altering designation of MPAs (e.g. to alter fishing techniques used) or to consider extension of HPMA^s to meet objectives of this FMP. In particular, it would be useful to focus on how this may facilitate the conservation of spawning individuals above the MCRS that contribute positively to recruitment.
 - (ii) Commencing engagement with researchers and the academic community to investigate potential impacts of climate change (particularly shifts in temperature and pH regimes) on flatfish listed in the FMP, and how the sectors that harvest them could achieve targets to reduce CO₂ emissions.
 - (iii) Developing plans to investigate the impact of discarding on dab stocks, particularly in relation to the survival rates of discards.
 - (iv) Enhancing data acquisition for the data limited flounder stocks with the aim to achieve improved stock assessment in the future in-line with the precautionary objectives as set out in the Fisheries Act. These should include consideration of how flounder distribution may change with a shifting climate.
 - (v) Initiating further consideration and research related to the development of technologies (e.g. REM).
 - (vi) Further actions could be included to undertake preliminary research in various other areas of relevance to the FMP, e.g. in relation to fishing related litter, seafloor integrity, bycatch, use of data obtaining from national policy and monitoring schemes.
 - (vii) Enhance and ensure continued communication with the wider stakeholder community and be cognisant of any potential positive bias to considering the needs of industry.

3.2 Seabass FMP

This FMP focuses on seabass in English and Welsh waters, an area in which approximately 99% of all bass are landed in the UK. Seabass is a non-quota shared stock, and therefore not subject to the setting of TAC. Seabass is considered a high value species and potentially vulnerable because of the decline in stock levels from 2010 as a result of poor recruitment and high fishing pressure. Data availability for this species is considered to be relatively good (Category 1 – full analytical assessment and forecast), although gaps in understanding remain, particularly in relation to discarding, recreational removals and the socio-economic benefits of bass fishing to coastal communities. Since the implementation of a joint UK/EU management strategy 2015 (e.g. MCRS; domestic

authorisations; seasonal closures, and catch/bycatch limits), the spawning stock biomass has increased although recruitment remains low.

The FMP outlines current management measures implemented by the UK/EU and status of available evidence. The commercial access to the fishery is restricted through a domestic authorisation system. The FMP highlights evidence gaps in areas needed to establish a sustainable fishery and proposes management interventions needed to manage stocks based on the precautionary approach until the evidence base becomes sufficiently robust.

The Seabass FMP is succinctly and well written, with considerable supporting information provided as Annexes. It is perhaps the most advanced of the frontrunner FMPs, likely due to the substantial efforts previously expended in considering seabass management strategies as part of the UK/EU effort to recover the stocks. The FMP provides nine relatively well-defined goals (specific under the SMART framework for setting goals/objectives) and a series of actions intended to help achieve these goals. The goals are as follows:

1. Inclusive stakeholder engagement structures to inform management of the bass fishery
2. Equitable access to the bass fishery, while prioritising stock sustainability (note concerns that focusing on historic precedent of existing fishermen may disincentivise new entrants)
3. Minimise discarding of bass bycatch where survival rates are low
4. Encourage and facilitate full compliance with bass regulations
5. Maximise the benefits of bass fishing for local coastal communities
6. Sustainable harvesting of the bass stock in-line with scientific advice
7. Protecting juvenile and spawning bass
8. Minimise the impact of bass fishing on the wider marine ecosystem
9. Mitigate against and adapt to the impact of climate change on bass fishing

It is noteworthy that considerable evidence and justification for the setting of the goals is provided in the supporting Annex 10 as part of the FMP. The actions are summarised as: (i) improved stakeholder participation; (ii) consider which existing management measures should be reviewed; (iii) adaptive management approaches, and (iv) improving the evidence base. The actions are also considered in terms of time-scales, as being either short-term or medium-long term.

The FMP successfully considers wider environmental impacts, e.g. bycatch of marine mammals, seabirds, and impacts on seabed habitat outside of MPAs. The FMP highlights the need to monitor the potential impacts of the policies developed to identify any unforeseen negative consequences. This is in-line with section 5.6.4 of the JFS.

In the development of the FMP, over 1400 stakeholders were engaged. The evidence provided informed the development of the goals of the FMP, as highlighted in Annex 10. The FMP also recognises that the need to engage with “all stakeholders” must continue beyond its publication. In the example provided for participation of stakeholders in the short-term plan related to Goal 1 (p. 15 of 26) there is reference to, “commercial fishers, recreational anglers, representatives of the wider supply chain and industry, scientists, policy makers and regulators”. There is no mention of marine conservation interests or the general public more widely. Inclusion of poorly represented stakeholders should be further considered moving forward.

A list of short-term actions are proposed to improve bass management measures over the short-term (p. 6 of 26). Unfortunately, several of these come across as being relative weak, i.e. would be nice to do. The use of verbs such as, “exploring”, “considering”, “reviewing”, “encouraging” and “improving” create an impression of a lack of concrete actions against which progress could be clearly measured. Consider how an independent reviewer will judge success in relation to, “encouraging better monitoring” or “reviewing the most suitable timing and duration of

closed seasons”? More specific details of what will be measured in terms of performance indicators is needed. Likewise, more details is needed on “how industry might be better supported to decarbonise in the future”.

The FMP states that, “Each goal is set out with a rationale, evidence, stakeholder views, short (one-two years) and medium-long term actions, and performance indicators to monitor delivery”. Indeed, the goals in many ways align well with the SMART framework. However, there is potential to improve clarity still further (see specific recommendation and general recommendation for all FMPs).

In the consideration of “stock Level goals” (p. 20 of 26) there is reference to not exceeding a MSY approach within confidence intervals of 95%. Note the need to set targets above MSY (likely biomass levels that are 1.2 x that needed to achieve MSY due to the uncertainty in data, potential to miss the target, and to facilitate adaptation of stocks to climate change) as discussed in the general recommendations section related to MSY. Considering the current status of scientific understanding (e.g. ⁱⁱ), there is likely limited value to commission further research to assess alternative harvest strategies other than that proposed here in which the principle of MSY is maintained, but it is used to define limits rather than targets (see general recommendations and associated evidence base). The research base on harvest strategies are extensive.

Specific recommendations:

- Ensure diverse stakeholders representation is engaged and included throughout implementation, including members of the general public and marine conservation groups. Ensure monitoring and reflection related to potential for bias, e.g. towards the fishing sector. There is potential for some of the proposals of the FMPs to be divisive considering the fishing sector involved, i.e. recreational versus commercial. This should be considered carefully when developing stakeholder representation.
- Redefine the improvement to bass management measures outlined so that they are more robustly stated (e.g. avoiding verbs such as “exploring” or “considering”).
- It is noted that detailed work plans will be developed to support the implementation of this FMP. However, some would likely argue that such detailed work plans should be included within this FMP, as that is its purpose – at least for the short-term actions that should be delivered within the next 1-2 years. As it the case also for the other FMPs, it would be useful to create a table, or some other illustrative element, that can clearly illustrate coherence of the FMP (see general comments). Consideration should be given to how the individual actions link directly back to one of the goals; the time-scale of each action by providing clear target dates for implementation (particularly for the short-term actions); and much more specifically defined performance indicators against which failure or success of the FMP can be assessed by an independent reviewer. For example, “appropriate size limits for the bass stock have been considered” is a relatively weak performance indicator. Here it is important to recognise that failure to achieve a stated goal should not necessarily be considered a negative outcome. The setting of ambitious goals, which should be applauded, are by definition more likely not to be achieved in the time-scale set as those that are less so; this should not promote a risk averse culture and avoidance of setting ambitious targets. It is important, however, to monitor success and failure to ensure the allocation of appropriate resources to goals set in future iterations of the plans; that is there is a need to learn lessons from failures.

- If alternative harvest strategies are considered and seabass is managed through quota, then the stock should be managed to biomass levels above those capable of producing maximum sustainable yields (see general recommendations).

3.3 Channel Demersal Non-Quota Species (NQS) FMP

The proposed Channel Demersal NQS FMP covers only the English waters of the Channel, comprising ICES areas 7e (eastern) and 7d (western English Channel). It provides for 19 species, nine of which are bony fish, 3 are elasmobranchs, and 7 are cephalopods, with cuttlefish being the most important in terms of landing weight and value. These mixed stocks are considered to be economically valuable (particularly cuttlefish, squid, lemon sole, turbot and brill) but vulnerable to over-exploitation (e.g. brill, grey gurnard, red mullet and turbot) and with limited data availability to adequately assess and monitor stock status based largely on landing data alone. Only brill, grey gurnard, lemon sole, lesser spotted dogfish, red gurnard, red mullet and smoothhound within the Channel are included in ICES assessments. The recognition of data deficiency for the stocks considered in the FMP is a key driver for the goals and actions outlined, with recognition that the precautionary approach to fisheries management will be required until data availability is improved. The data gaps are identified in the FMP, supplemented by an evidence statement (Annex 1).

The NQS species are targeted by a range of fishing methods, with trawlers (beam and otter trawls) being the predominant type and those most likely to have wider environmental impacts, particularly in relation to seabed integrity and benthic habitat. However, fly-seiners, and associated newer and larger vessels, are also a cause for concern as indicated by recent consultations (conducted by Defra in 2022). There is also considerable spatial and temporal variation in fishery activity, with some species (e.g. lesser spotted dogfish and bib) caught all year around, some peaking in the spring and autumn (e.g. lemon sole and turbot) and some caught more in the autumn and winter (e.g. cephalopods, brill and red mullet).

There are currently few management measures in place to control fishing effort of NQS in the Channel, risking the attainment of sustainability targets in the future. Within this context, the FMP aims to deliver sustainable management of specified Channel Demersal NQS to a position driven by robust stock assessments based on data, as evidenced by the development of a research plan (Annex 2) to highlight and close evidence gaps. There is also recognition of the mixed stock nature of the fishery, driving a need to better consider Ecosystem Based Approaches to fisheries management. The FMP has strong aspirations and vision to develop management of demersal NQS fisheries in the English Channel so that environmental, social and economic sustainability is achieved for the benefit of coastal communities and wider society.

The summary FMP (p. 11 of 18) outlines 6 overarching goals that fall into three key themes that link to the objectives of the Fisheries Act (Table 2).

Table 2. Goals of the Channel Demersal Non-Quota Species (NQS) FMP

Theme	Goals
Evidence	<ol style="list-style-type: none"> 1. Better understand wider NQS evidence needs 2. Develop the NQS evidence base
Sustainable Fisheries	<ol style="list-style-type: none"> 1. Deliver effective management of demersal NQS in the English Channel 2. Deliver wider biological sustainability
Social and economic	<ol style="list-style-type: none"> 1. Better understand and optimise economic and social benefits 2. Build capacity for the industry to be able to input into matters effecting non-quota species fisheries management

The FMP was developed in collaboration with the Marine Management Organisation taking into account the perspective of multiple stakeholders, including environmental non-government organisations and coastal communities. A working group was established during the development of the FMP involving a number of stakeholders, including fisheries managers, representatives from the UK fishing industry, and statutory nature conservation bodies. More detail beyond that provided in Annex 3 to summarise numbers and composition of the stakeholders community engaged would have been useful. This would help a reader better understand whether there may have been bias in participation rates, and whether the general public were successfully engaged in these initiatives compared to other sectors. The recognition that stakeholder involvement is critical in moving forward is strong, with the proposition in the FMP that a NQS management group will be continued going forward, again involving multiple stakeholders. It will be important to monitor the make-up and involvement of the group to ensure sufficiently diverse representation is provided, and that there is no real or perceived positive bias towards industry, e.g. particularly in the implementation phases.

Regarding harvest strategies, Annex 6 states that “devised for this FMP has been left intentionally vague and underdeveloped; allowing for scope to further develop the strategy as new evidence becomes available”. While this is understandable, an ethos defined in the main document is one of the strengths of this FMP in that it recognises the need to propose actions that help reach harvest **below** MSY (see general recommendations). This aligns with the precautionary objective of the Act and translated to the JFS, providing a mechanism that will likely facilitate real stock recovery if achieved. However, there is a need to more clearly define the level above biomass that is estimated will provide MSY (see general comments regarding $1.2 \times B_{MSY}$) as a goal of the FMP, the achievement of which should be included as a performance indicator. Clearly this is some way off for stocks that have limited evidence, but stronger statements to adopt this approach would be valuable with performance indicators that link to a staggered plan to attain this (e.g. [i] enhance data to enable stock assessments to be achieved; [ii] medium-long term plan to achieve $1.05 \times B_{MSY}$; [iii] longer term plan to build stocks to $1.20 \times B_{MSY}$).

The FMP proposes a number of actions as the priority areas for management intervention (Table 3).

Table 3. Proposed actions for the Channel Demersal Non-Quota Species (NQS) FMP

Action	Details
Flyseining restriction	<ol style="list-style-type: none"> Standard net mesh size of 100 mm for all flyseining vessels operating in English waters of the Channel Restrict engine size for flyseining vessels within 12 nm of the English Channel to 221 kW
MCRS	Cuttlefish - 23 cm, lemon sole – 25 cm, turbot – 30 cm and brill - 30 cm (in-line with IFCA's MCRS)
Cuttlefish	Short lived species. Seasonal restriction to protect critical spawning seasons or recruitment pools from high impact fishing gear. Temporary seasonal closure for cuttlefish trawlers to protect pre-spawn juvenile cuttlefish, or egg-laying habitat
Monitoring	Improve evidence base, potentially using REM. Initial recommendation in early adopter scheme for flyseining vessels
Education, voluntary guidelines and codes of conduct	Partnership working, co-management is proposed via voluntary guidelines, education, and codes of conduct for both commercial and recreational fishers

The proposed actions relating to restrictions of future flyseining effort and the MCRS are well defined, tangible, and measurable. Other actions are less well defined due to the need for more evidence, such as for the temporary seasonal closures for cuttlefish trawlers to protect pre-spawn juvenile cuttlefish or egg-laying habitat. Nevertheless, despite limitations in evidence the provision of clear performance indicator against which progress of actions can be tracked would be helpful, even for actions that may result in uncertain outcomes at this stage.

The aspirations of the actions related to education, voluntary guidelines and codes of conduct are highly commendable. Nevertheless, consideration should be given to what actions might be implemented if such partnership working and co-management fails to meet the objectives of the Act; is there a plan B for stronger regulation if needed (see general recommendations)?

The FMP considers (e.g. via the Strategic Environmental Assessment) the potential for wider environmental impact of the fisheries on the marine environment, particularly through potential to damage seabed integrity due to the activity of trawlers and potential bycatch from drift and fixed nets. This is in-line with section 5.6.4 in the JFS.

Considering the number of species included in the mixed fisheries of the Channel Demersal NQS FMP, and spatial variability in geography (and potentially culture) between the eastern and western Channel, there is likely to be some debate and differences in opinion related to the suggested actions. For example, the east coast fishing communities may be more supportive of the proposed MCRS for cuttlefish than the west, whilst there may be contradictions between the minimum mesh size for the trawl fishery versus minimum landing size for the trap fishery for this species. Furthermore, there are likely to be challenges defining the occurrence of peak spawning of cuttlefish and how this might vary regionally and annually; suggesting there may be a requirement to randomly allocate spatial restrictions.

As it is recognised that the different FMPs are being developed from different starting points it is perhaps unsurprising that some are more advanced than others. For example, the seabass FMP is arguably more advanced than the Channel demersal NQS FMP because the single species considered in the former has received considerable fisheries management attention over recent years as part of a UK/EU initiative to facilitate stock recovery. The Channel Demersal NQS FMP proposes the development of a more detailed implementation programme as part of an ongoing process, including the provision for timings and milestones for delivery to be provided later. However, some might argue that the purpose of an FMP is to provide a plan that includes this information from the outset. Most certainly, more details might be expected for the short-term actions designed to build momentum that will ultimately set the direction for achieving longer-term goals. Nevertheless, this FMP does go a long way in starting to develop the coherent plan expected via Table 1. This should be built on further to better demonstrate clear linkages between objectives of the Act, goals of the FMP, management actions, time-scales, and performance indicators (see general recommendations). To illustrate this, considering Table 1 in more detail, the first action stated on row 4 relates to the need to define the precautionary approach. This could be stated more robustly (avoiding weaker verbs such as “consider” and exchanging them for those more appropriate, such as “conduct” or “commission”) and specific target month post publication could be set considering this is a short-term target. The methods paper referred to could be provided as a “deliverable” to evidence the achievement of a stated performance indicator (as yet to be defined). Some of the later actions in Table 1 are relatively poorly defined, such as to “undertake research into the impact of climate change on Channel demersal NQS”. This is pretty meaningless unless a clearer statement of the focus is provided and a specific performance indicator defined; consider how might a reviewer judge whether this was achieved or not? In other examples, the actions to “Consider research to identify opportunities to implement climate change mitigation and adaptation measure” or

“Consider research to look at Channel demersal NQS lens of broader anthropogenic impacts” also require greater definition and clarity, with clear deliverables and performance indicators provided.

Specific recommendations:

- Develop the tables as described in the general recommendations sections for this FMP so that stronger coherent linkages can be illustrated between the objectives of the Fisheries Act, goals of the FMP, actions, performance indicators, deliverables, and time-scales. A good start has been made in this area (Table 1) but more work is required. Consider how this might be independently reviewed in the future and what type of evidence would be required to demonstrate success or failure against the key performance indicators.
- More information is required to summarise stakeholder involvement (e.g. numbers and composition) and how this will be developed moving forward with monitoring and actions taken to reduce participation bias. Efforts are likely required to enhance engagement with the general public. Future groups could be chaired by an appropriately experienced “lay person” (see general recommendations).
- Adopt a systems dynamics approach (see general recommendations) to investigate and quantify potential complex interactions between facets of the FMP (e.g. between stocks, regions, sectors of the fleet). This could help identify where conflict may be likely, potential for trade-offs and synergies, and how policy may have unforeseen consequences. In particular, systems analysis may help visualise mechanisms that underpin differences in east and west Channel fishing communities or trawler versus trap sector response to proposed actions (e.g. cuttlefish MCRS; mesh size). Such an approach will help the equal access objectives described in section 5.2.6 of the JFS be achieved.
- There are several evidence gaps identified in this FMP. One that may require greater focus is the need to define the occurrence of peak spawning of cuttlefish and how this might vary regionally and annually. While information is improved, there may be a need to develop methods that could use predictive models to ascertain potential spawning space in the absence of empirical evidence, or other strategies, such as randomly allocated spatial restrictions, could be tested.

4. Comments on the processes of developing the FMPs

The six frontrunner FMPs have been developed by different groups who have piloted a range of approaches to this process with the view to identify the most effective way to widen engagement and work with stakeholders. These approaches have ranged from those that are highly sophisticated (e.g. Seabass FMP supported by the Policy Lab) to those that have been based on simpler and more traditional mechanisms (e.g. the King Scallop FMP supported by Seafish). Here, three of the six frontrunner FMPs (Seabass, Channel Demersal NQS, and King Scallop) are reviewed to illustrate differences in approach adopted and potential strengths, weaknesses, and risks associated with each.

The development of the Seabass FMP was based on a multiphase process supported by the Policy Lab. Elements included interviews, lived experience research, and a “collective intelligence debate” (conducted in August 2022). The findings of the debate were shared with those who had registered an interest in the FMP (by completing a general interest form) and who were kept up-to-date via e-mail. The findings were used to inform face-to face (held in Plymouth, Milford Haven and Lowestoft) and online co-design workshops and were directly used in the development of the FMP. The workshops aimed to bring together diverse stakeholders to identify effective solutions for the

FMP, using scenario testing. The final stage of the Policy Lab's work provided an opportunity to feedback (via e-mail) on the priorities selected by the stakeholders in the co-design process. The selected priorities were sent via an online co-refine survey to which participants were able to respond and provide comments. At the end of this process the stakeholder FMP priorities were feedback to Defra and informed the final FMP prior to the formal public consultation process.

Participation in the workshops was based on selection through a process of computer randomisation. Those not selected were able to participate by engaging with an online survey that aimed to find out more about stakeholders' preferences for addressing some of the main challenges of the FMP. The online survey was based on the same scenarios as presented in the workshops, with potential solutions drafted by Policy Lab in collaboration with Defra and Cefas. Likewise, those that participated via the online survey were also able to participate in the follow-up co-refine survey.

The approach adopted in developing the FMP was well designed and implemented. However, some may have concerns over the nature by which some stakeholders were selected to participate through one pathway and others an alternative (e.g. workshops versus on-line surveys), while some participated in interviews or the collective intelligence debate whereas others did not. Likewise, the regional location of the venues for the face-to-face workshops may have been an impediment for some, while a focus on on-line dissemination of information and engagement (e.g. surveys) could have disadvantaged (the average age of vessel owners in the UK is 50ⁱⁱⁱ) and perhaps disenfranchised others. Nevertheless, the process of developing the Seabass FMP involved more than 1400 stakeholders in total, with the co-refine survey generating over 450 responses (53% from the recreational sector and 40% from the commercial sector). Summary statistics on the number and composition of stakeholders involved in the process would be useful.

The Channel demersal NQS FMP process involved the establishment by the Marine Management Organisation's FMP team of a working group comprising representatives from the commercial (inshore and offshore) and recreational fishing sectors across ICES areas 7d and 7e as well as Defra and IFCA representatives. Members of the working group were selected through a combination of stakeholder analysis and based on previous engagement with fishermen on the south coast to identify individuals who could act as representatives for groups of fishermen and other key marine stakeholders. During the autumn and winter of 2022, the working group held a series (a minimum of three) of meetings in which they discussed background information related to the FMPs, species prioritisation, where the working group would have the most input into drafting elements of the FMP, vision and goals of the FMP, timeframes for development, and details of the Evidence and Communications and Engagement Plans. For those outside of the working group and who had registered an interest in the FMP, engagement was achieved through e-mail correspondence and signposting to a dedicated landing site on GOV.UK to provide updated information on upcoming engagement events and further information on the development of the FMP. Access to various documents was provided, including links to other FMPs, videos providing an overview of working group discussions, feedback received from the recreational sector, and a summary paper outlining the initial species scoping work and associated data set. Social media was also used to disseminate information more widely. In Spring of 2023, online events were held to provide feedback on the FMP development process, highlighting the work of the stakeholder group and expert advisory group. Further in-person engagement sessions were delivered by the Marine Management Organisation, including by the quayside and during the evening, intended to disseminate information to recreational anglers who may be working during the day. The Angling Trust also hosted a "Virtual Sea Angling Forum" with the Marine Management Organisation to engage with the recreational sea angling community to voice their views and raise questions directly.

The process of developing the Channel Demersal FMP centred around the activities of the FMP team and the working group, with dissemination of information to specific interested parties through direct invitation to participate. Despite the vision referring to coastal communities and wider society, it was not clear if and how the general public were engaged or attracted to participate, with limited focus on coastal citizens more generally (see general recommendations regarding citizen engagement, with recent examples such as the “People’s Assembly for Nature”). The selection of the working group also appeared to be a one-way exercise that would likely preferentially select participants with an active track record in the area of interest. There did not appear to be any calls extended to attract a wider and more diverse group. This carries a risk of a positive bias to industry (but possibly excluding new entrants) and a negative bias against the general public. Care should also be taken in the use of social media and other on-line approaches for some sectors of the community. Summary statistics on the number and composition of stakeholders involved in both the working group and wider community would be useful.

The development of the King Scallop FMP was led by the Scallop Industry Consultation Group Working Group (SICGWG), an industry-led co-management group, and supported by Seafish. It involved stakeholder participation through a series of both in-person and online events commencing in October 2022. The approach was relatively simple and after initially registering interest in the FMP, there was no requirement to register to attend an event, with nothing more needed than arrival at the venue at the designated time, or gaining access to on-line events via a link included in the invitation e-mail. Although recognising the importance of stakeholder involvement in the development of FMPs, the King Scallop engagement events targeted the industry sector, with statements that “Online events are open to anyone with an interest in harvesting, processing, selling king scallops from English and Welsh fisheries”. The on-line events had a regional focus but were open to anyone with an interest in English and Welsh king scallop fisheries more generally. Further dissemination was encouraged through peer-to-peer communication with the aim to ensure that as many interested people as possible have a chance to discuss the FMP. Interested participants were provided with information via e-mail correspondence on the development of the FMP and how stakeholders can be involved. This included background information on FMPs, what this means for English and Welsh king scallop fisheries, key dates for the development process, and a list of the upcoming in-person and online stakeholder engagement events. At the events stakeholders were able to learn more about the progress made to date on the FMP, including the proposed aims and objectives and potential management measures, providing an opportunity to feed into the development process.

The simplicity of the process involved in developing the King Scallop FMP is undoubtedly one of its strengths, with an attempt to be fully inclusive relative to the key stakeholders identified. However, the stakeholders targeted represent a limited section of society and are positively biased to those directly involved in the king scallop fishing and processing industries and the wider supply chain. The Fisheries Act and the JFS recognise that fisheries are a public asset and for this reason a wider representation of stakeholders (e.g. conservation bodies and the general public) in the development of FMPs through active engagement is highly desirable.

In conjunction with the start of the formal consultation period on the FMPs the Defra Domestic Fisheries Reform group held a series of “Future Fisheries Management LIVE” events as part of a Roadshow to disseminate the key points associated with each FMP. The events involved representation by the FMP delivery partners and provided an opportunity for interested stakeholders to find out more and ask questions. Attendance at the roadshow events were variable, with some well attended (particularly if close to the quayside at some location to make it easier for fishers to participate) while for others this was rather limited. The events were not designed for engagement with the general public.

5. FMPs and linkage to the Joint Fisheries Statement

The Fisheries Act 2020 sets out the legal framework governing fisheries in the UK and provides for UK Fisheries Policy Authorities to prepare and publish FMPs, setting out policies designed to restore stocks and maintain them at sustainable levels. FMPs are prepared for the purpose of meeting the requirements set out in the Fisheries Act as objectives in section 6. The Joint Fisheries Statement (JFS) sets out further details of the policies the UK fisheries authorities will follow to achieve or contribute to achieving the objectives. Details on the FMPs are set out in section 5 of the JFS, with a list provided as an Annex, setting out the lead authority for each FMP, the stocks covered and timescales for publication.

The FMPs must provide sufficient information and evidence required to meet the minimum legal requirements for an FMP, as set out in the Fisheries Act and Joint Fisheries Statement. Areas that are set-out in section 5 of the JFS that may require further consideration before final publication of the FMPs are outlined below (Table 4) to ensure that they have been fully (as opposed to partially) met.

Table 4. Areas of the frontrunner FMPs (Finfish) that require further consideration prior to final publication

JFS section	Requirement	Further enhancement
5.1.4	The fisheries policy authorities will seek to engage stakeholders with an interest in the target stocks(s) when preparing the FMP	It is difficult to assess to what extent this was achieved. Summary information to define the number of stakeholders engaged and the sectors they represent is required. An analysis of potential bias should be conducted.
5.2.2	Each FMP will identify what measures will be used to deliver its policies	This has only been partially met. In several cases the measures have been poorly defined with a lack of clear measurable outcomes and performance indicators
5.2.3	National fisheries authorities will monitor the effectiveness of the FMPs and use the statutory review cycles to evaluate progress	The lack of well-defined objectives, measures, and performance indicators in several cases will make this difficult to perform
5.2.4	The FMP must specify the steps that the relevant authority or authorities propose to take to obtain the scientific evidence necessary to enable an assessment of a stock's MSY	In several cases this remains unclear in the FMP for those stocks that would be managed by quota
5.2.5	Each FMP must specify the relevant indicator(s) that fisheries managers will use to assess the effectiveness of the plan. Where appropriate, these indicators will be linked to timebound targets that relate to the goals and management targets of the FMP	This has only been partially achieved in several areas. It would likely be difficult for a review group to adequately monitor success or failure due to the nature of some objectives, measures and performance indicators being poorly defined
5.7.1	The fisheries policy authorities will implement appropriate monitoring against the specified indicators	Due to the poor definition of the FMP goals, measures, and performance indicators in several areas this will be difficult to achieve in a rigorous and robust manner

6. General recommendations for improving FMPs

- Standardisation of the approach:* The six frontrunner FMPs, including the three that focus predominantly on finfish, have been selected as pilots with different groups leading each and applying a range of approaches. As a result, the FMPs look very different and are not presented in a standardised format. Going forward it is presumed that a standardised format and approach might be developed based on lessons learnt from this pilot exercise. Nevertheless, the objectives set should be based on the SMART framework. A general observation is that the objectives or goals set do align with some elements of the SMART framework, but not all. While the clarity of some goals in the FMPs vary (some are very well defined, others are rather “fuzzy”) it is not always clear how the actions proposed link to the objectives, and the rationale for selecting these as opposed to other actions are in some cases not well justified. What is usually less clear is what measurable outcomes will be delivered at the end of the FMP period against which success or failure will be evaluated. The definition of the time bound elements of the FMP are important, with both short term and medium-long term action clearly defined, recognising the need (as stated in the FMPs) of balancing between building momentum for short-term actions and setting direction for the longer-term. Care is needed to avoid falling into the trap of setting “fuzzy” objectives and a lack of measurable outcomes so that the plan is perceived to be successful at the end of the FMP period. More ambitious plans are inherently more risky, but to be risk averse is to demonstrate a lack of ambition. There is also a need to learn from failures in the same way as to learn from successes. **To clearly define and link objectives, actions, timeframes, and performance indicators it is recommended that a standardised table is provided in each and all future FMPs that outline the following (as columns): (i) objective as set out in the Fisheries Act 2020 (or theme); (ii) objectives / goals of the FMP; (iii) actions (measures) that will be adopted to meet the objective / goal; (iv) timeframe (for short term goals this could be a specific month after publication); (v) well defined performance indicator against which success or failure of the plan will be measured; and (vi) stated deliverable (e.g. report, model, methods paper) against which the performance indicator will be evidenced.**
- Review process:* The Fisheries Act 2020 requires that the FMPs be formally reviewed no longer than every six years, or earlier if the responsible authority feels there is a need to do so. However, the process by which the FMPs will be reviewed is not particularly clear and more information would be useful. In particular, elaboration on who will conduct the review is needed and reassurance that this will be an independent group (i.e. not those who actively participated in the development of the FMP). For this reason, the provision of very clear and measurable performance indicators against which an independent review body will be able to assess success in terms of delivery of the FMP is essential.
- Clear definition of sustainability targets in harvest strategies:* The primary purpose of each FMP is to provide an evidence-based plan that sets out clearly defined objectives and describes in detail a series of time bound (short-term) actions and a longer-term vision needed to achieve sustainable fisheries. However, for this to work what is meant by “sustainable” in the context of the FMP must be clearly stated. In the three frontrunner FMP plans that focus predominantly on finfish, the definition of “sustainable”, e.g. in the context of harvest, is often poorly defined and varies between plans. For example, in the summary of the Southern North Sea and Eastern channel mixed flatfish FMP (page 9 of 18) it is stated that, “The FMP sets out the principles for managing **to** maximum sustainable yield (MSY) for quota stocks”. Similarly, the seabass FMP refers to **not exceeding** a MSY approach within confidence intervals of 95% (which means that MSY will be exceeded some of the time). Conversely, the summary of the Channel Dermersal Non-Quota Species FMP (p. 11 of 18), “proposes actions to help reach harvest **below** MSY”, in

other words – maintain stock biomass at levels **above** that estimated to achieve MSY. In the Fisheries Act 2020, MSY is defined as the highest theoretical equilibrium yield that can be continuously taken on average from a marine stock under existing environmental conditions without significantly affecting the reproduction process. This is transcribed to the precautionary objective in the JFS that states, “The objective of maintaining biomass levels **above** levels capable of producing MSY provides fisheries policy authorities with a valuable tool to assess and manage the status of fish stocks”. Any shift from “**above**” (as stated in the JFS) to “**to**” as in the Southern North Sea and Eastern channel mixed flatfish FMP and Seabass FMP represent the weakening of opportunities to achieve the sustainability and precautionary objectives, and could represent a failure to translate the sustainability objective as outlined in the act into the respective FMPs.

- Setting sustainability targets above MSY for quota stocks:* Not only should the harvest of quota species be managed so that spawning biomass remains above that estimated to be able to achieve MSY, but just how much “above” should also be clearly defined. Current evidence (e.g. ⁱⁱ, ^{iv}) suggests that managing stocks to a biomass level that just achieves MSY is unlikely to be sustainable in the long run. This is not to suggest that MSY should not be used as a primary management principle, but it should be used not to set targets, but limits. By doing the former, in the best of circumstances, would lead to MSY being exceeded on average half of the time, risking stock sustainability as result. A useful analogy might be in reference the field of economics where attempts to minimise inflation by the central bank, but not risk deflation (which is equally harmful due to a fall in production and wages), are through setting inflation targets at above zero (e.g. often +2%). In addition to creating a buffer against deflation, such inflation targeting is also thought to increase economic stability. In the case of marine fisheries resource management there is a need to establish a policy to rebuild fish populations to a level above that required to generate MSY; this would also increase profits for the fishing industry through maximising the economic yield^v. Greater clarity is needed as to what “**above**” actually means. Should it be +5%, +10%, +15% a, or set at 20% above as is the case in Australia? **It is recommended here that for most stocks that are managed by quota biomass should be maintained at a minimum of 120% of that which will achieve MSY (B_{MSY}), and the limit set at 30% of MSY** (^{vi}). This level of biomass would likely provide sufficient buffer to accommodate uncertainty in biomass estimates and the response of fish populations to climate change (as required by the Climate Change objective as stated in the Fisheries Act), thus helping drive genuine stock recovery. The value of B_{MSY} should typically be taken to be 50% of that which would occur if the population was at carrying capacity (i.e. at its unfished level). Quota should be reduced linearly if stocks fall to below $1.2B_{MSY}$ until recovery is achieved. This mechanistic approach should be clearly stated in the final FMPs dealing with stocks managed by quota.
- Quantifying stakeholder involvement and continued engagement:* While variation in number of stakeholders involved in the process of developing the frontrunner FMPs is apparent, it is not immediately clear how many and who were involved / engaged. This is not currently consistently reported in the FMPs. For example, the seabass FMP informs the reader that over 1400 stakeholders were involved. It is not clear what the composition of that stakeholder community was, nor it is clear just how many stakeholders were involved in the development of the other FMPs making it impossible for a reader to review the information in terms of bias. Summary information is therefore required to illustrate the composition of the stakeholder community engaged and which sectors they represented. There is a need to consider methods to better engage less well represented groups, particularly the general public in recognition that the marine fisheries are a public asset as stated in the Fisheries Act (2020) and JFS. The People’s recent “Assembly for Nature”^{vii} could provide a useful case study in wider public engagement;

e.g. creating a “People’s Assembly for Fisheries” or some similar vehicle might be an option in future scenarios. Furthermore, the potential for positive bias towards focusing on the needs of the fishing industry should be monitored and guarded against. For example, the Southern North Sea and Eastern Channel Mixed Flatfish FMP highlighted the fishing industry’s strong desire to take greater responsibility for managing fisheries, and hence the FMP had been developed very closely by or in close engagement with the fishing sector and with industry bodies as a consequence. It is also important for all FMPs to have a process of stakeholder engagement that continues beyond the publication of the FMP, e.g. by developing specific stakeholder groups / boards, perhaps with an appropriately experienced lay person (respected member of the general public such as a nurse, lawyer, business leader) acting as the chair.

- *Alternative options to “soft” governance if required:* Reference to improved education, voluntary guidance and codes of conduct (e.g. in the Demersal Channel NQS FMP) is highly commendable and reflects a growing trend in institutional response over recent times in which an emphasis on legislation regulating fisheries is shifted towards “soft” governance, e.g. relying on voluntary codes of conduct as has been proposed for management of trawling^{viii}. This is very positive, and there is undoubtedly value in working in collaboration with stakeholders in developing future fisheries management policy. However, some argue that relying purely on voluntary measures alone will rarely bring about substantial improvement in environmental outcomes^{ix}, and hence **there is a need to consider other options including greater regulation and enforcement if required.**
- *Systems approach to understanding interactions:* A systems dynamics approach has real value in developing policy and governance regimes when dealing with the management of complex primary resources and associated natural capital. As recognised in the Seabass FMP as an important component of meeting the overarching aim to ensure stocks are harvested sustainably, whilst benefitting a diverse range of environmental, commercial, and social interests, such methods can help identify and optimise synergies and trade-offs, avoid duplication of effort, and better detect unforeseen and unintended consequences of actions. FMPs are developed within a complex landscape where they interact with other FMPs and overlap with other policy instruments. For example, the Channel Non-Quota Demersal FMP overlaps directly with the Southern North Sea and Eastern Channel Mixed Flatfish FMP and thus needs to align with this policy that involves shared stocks or interactions with gear/species. This may potentially influence the management of lemon sole, turbot and brill between geographic areas, driving a requirement for strong and consistent communications. A systems approach may also be particularly useful when considering the need to incorporate social and economic data, such as that related to developing an evidence base on blue carbon habitat in the UK. For these reasons, it is recommended that systems thinking will provide an important tool in the further development of the frontrunner and future FMPs.

ⁱ Benyon Review

ⁱⁱ Pauly, D. & Froese, R. (2021). MSY needs no epitaph—but it was abused. *ICES Journal of Marine Science*, 78, 2204 – 2210. DOI: 10.1093/icesjms/fsaa224.

ⁱⁱⁱ Seafish Employment in UK Fishing Fleet 2021

^{iv} Kemp, P. S., Froese, R., & Pauly, D. (2020). COVID-19 provides an opportunity to advance a sustainable UK fisheries policy in a post-Brexit brave new world. *Marine Policy*, 120, 104114. Doi: 10.1016/j.marpol.2020.104114.

^v Dichmont, C. M., Pascoe, S., Kompas, T., Punt, A. E., & Deng, R. (2010). On implementing maximum economic yield in commercial fisheries. *PNAS*, 107, 16-21. Doi: 10.1073/pnas.0912091107.

^{vi} Kemp, P. S, Subbiah, G., Barnes, R., Boerder, K., O'Leary, B. C., Stewart, B. D. and Williams, C. 2023. The future of marine fisheries management and conservation in the United Kingdom: Lessons learnt from over 100 years of biased policy, *Marine Policy* 147, 105075, ISSN 0308-597X, <https://doi.org/10.1016/j.marpol.2022.105075>.

^{vii} <https://peoplesplanfornature.org/peoples-assembly-nature>

^{viii} McConnaughey, R. A., Hiddink, J. G., Jennings, S., Pitcher, C. R., Kaiser, M. J., Suuronen, P., Sciberras, M., Rijnsdorp, A. D., Collie, J. S., Mazon, T., Amoroso, R. O., Parma, A. M., & Hilborn, R. (2020). Choosing best practices for managing impacts of trawl fishing on seabed habitats and biota. *Fish and Fisheries* 21, 319-337. DOI: [org/10.1111/faf.12431](https://doi.org/10.1111/faf.12431)

^{ix} Aragón-Correa, J. A., Marcus, A. A., & Vogel, D. (2020). The effects of mandatory and voluntary regulatory pressures on firms' environmental strategies: a review and recommendations for future research. *Academy of Management Annals*, 14, 339-365. DOI: [10.5465/annals.2018.0014](https://doi.org/10.5465/annals.2018.0014).