Minutes: Scallops SICA workshop

Meeting Date: 3rd March 2021
Location: MS Teams

Attendees	Organisation
AB: Abigayil Blandon	WWF-UK
AL: Andy Lawler	Centre for Environment, Fisheries and Aquaculture Science
BL: Bill Lart	Seafish
CD: Calum Duncan	Scottish Environment Link
CM: Chris McGonigle	Ulster University
CP: Claire Pescod	Macduff Shellfish
CJ: Clara Johnston	Scottish Environment Link
FN: Fiona Nimmo	Poseidon
HF: Hannah Fennell	Orkney Fisheries Association
JH: Jan Geert Hiddink	Bangor University
JP: Jo Pollett	Marine Stewardship Council
KK: Katie Keay	Marine Stewardship Council
KC: Kenny Coull	Scottish White Fish Producers Association
LB: Lynda Blackadder	Marine Scotland Science
MF: Mairi Fenton	Herriot-Watt University
MK: Mike Kaiser	Herriot-Watt University
PC: Patrick Collins	Queens University Belfast

Apologies from: Cefas (Ewen Bell), North and East Coast Regional Inshore Fisheries Group (Jennifer Mouat), Scottish White Fish Producers Association (Mike Park and Femke de Boer), Tesco (Helena Delgado-Nordmann).

Purpose of the meeting

This workshop brought together experts from the UK scallop Steering Group and wider field to focus on the Ecosystem component of Principle 2 (P2). Using the Scale, Intensity, Consequence Analysis (SICA) methodology, this workshop was to provide qualitative analysis from experts, in the absence of quantitative evidence, to justify selection of scoring guideposts in the SICA. This is permitted within MSC methodology and Risk Based Framework.

Welcome

FN thanked the group for joining and attendees introduced themselves. She had received five responses to the pre-meeting questionnaire and used those to provide an overview and structure to the discussion. She noted that further responses and discussion are required to bring more confidence to the data. The questionnaire was structured around answering the SICA outcome table and the workshop output will be represented in a table detailing the scores and justifications.

FN described the characteristics of the ecosystem component, which looks at the broad ecological community and addresses system-wide issues, such as ecosystem structure, trophic relationships, biodiversity, and community resilience. It does not include considerations of specific habitats or species, which are addressed in other components of the MSC standard and how the group will be

assessing the outcome status. She described how the SICA methodology mimics that of the MSC scoring with criteria to show whether the Unit of Assessment would meet SG60 (a conditional pass), SG80 (best practice) or SG100, and whether there's evidence to support this decision.

Presentation of questionnaire results and further discussion

1. Define the geographic area of the ecosystem(s) and specify reason for choice.
    a. One overall ecosystem for all waters targeted by the fishery (1 response)
    b. Three ecosystems: North Sea, West of Scotland, Irish Sea (1 response)
    c. More than three ecosystems - please specify (3 responses)

FN presented the answers she had received; the most popular response was for more than three ecosystems (answer c). These responses were linked to being more precautionary, to split the geographical areas corresponding to the stock groups, and noting such different ecosystems which, in turn, would have different species compositions (for example sheltered inshore compared with offshore).

Group discussion

AB asked how the overall scoring of a SICA work if there are several ecosystems. FN said each ecosystem would be scored separately for PI 2.5.1. This score contributes to the Unit of Assessment (UoA) scoring spreadsheet, resulting in a score for each stock.

CM advocated for more than three ecosystems due to differences in ocean energetics and capacity to recovery of the impact of fishing. LB agreed, as did MK who noted that there is empirical evidence to support the approach. Using the Irish sea as an example, where some areas are highly sensitive and others highly resilient, he noted that treating the area as one unit can cut off opportunities or be too optimistic in assessments. LB suggested a live voting system during this meeting and CM offered to arrange this during the meeting using Mentimeter.

PC asked whether this could be linked to existing JNCC classifications of these sites. FN said it could but suggested not being too complex with our approaches. She recommended linking with how the MSC methodology in other performance indicators splits stock areas. PC asked if there is evidence the stocks have biological or ecological differences or if they are entirely management units. LB said there are biological differences in growth rates. PC asked if there is population structuring and LB confirmed there is for some and that WGScallop would report on the latest genetics work later this year. The map shows stock assessment areas but some of these are data deficient. LB cautioned that if the ecosystem is broken into many smaller units (such as inshore/offshore), it will get very complicated and there is a need to be realistic in what we want to achieve in this decision.

FN proposed a combination of answers (b) and (c), so that there is a separate score for each of the three regions but, within those different ecosystems – such as those with low or high resilience – are taken into consideration. JH agreed with that approach. He noted that by dividing ecosystems in large divisions, the score will be affected by healthy grounds compensating for poorer grounds. Decreasing the sizes will reduce risk of overcompensation. It can be difficult to make ecological judgements but feels it is better to be more careful and use smaller areas. BL supported the point.

MK asked how the West of Scotland is being defined. BL suggested that it should be defined as a part of the ICES Celtic Seas ecoregion. The Celtic Seas, ecoregion also extends into part of ICES Division 4a and includes Orkney and Shetland.

Mentimeter voting outcomes

Of 10 Mentimeter responses, the majority (nine) voted for more than three ecosystems, and one voted for three ecosystems. CM suggested using the spatial footprint of VMS data to guide divisions. FN thought VMS data is relevant and will be considered in stock assessment areas, and that focusing on scallop assessment areas to define those separate ecosystems would be a logical step. PC suggested managing the area by looking at population structures, with support from genetic population data. FN reflected that this approach would manage the ecosystem, not the scallops themselves. AB also added that the parameters PC suggested are not management units but assessment units. There are papers on the genetics and ICES will be reviewing in October. Later, CM asked the Steering Group whether physical or biological indicators were defining the concept of ecosystem, with BL suggesting depth to be a consideration for defining an area.

FN asked whether the Steering Group would expect the scallop population to vary significantly across the ecosystem. MK said the population may vary due to ocean energetics, so the Irish sea would be a key unit to consider due to its variability in resilience and intensity of use. He suggested that the Irish sea could be split, or the areas within the unit are managed differently by looking at various thresholds to help balance overall impacts. FN confirmed for LB that the area could initially be split into three areas, then be adjusted according to the outcome.

2. What elements of the ecosystem do you think may be affected by the fishery? *Please rank elements 1 to 5, where 1 is most affected and 5 is least affected. Please enter answers in one column OR many columns where your answer varies across different ecosystems.* Please explain the basis for your choice.

    a. Composition of the species in the ecosystem - Detectable changes in the identity of species within the ecosystem
    b. Functional group (for example, plankton) - Species that share similar suites of traits and provide a similar ecological function or service to the ecosystem
    c. Distribution of communities – Change in geographic range of communities which can impact community dynamics
    d. Trophic structure – Change in mean trophic level of species within the ecosystem, not specifically target species
    e. Size structure – Change in biomass/number in each size class for each species within the ecosystem, not specifically target species
    f. Other element of the ecosystem (specify)

3. Which element of the ecosystem do you think is most likely to be affected by the fishery?

Please choose one option - this is likely to align with the element ranked as 1 in Q.2. Please enter answers in one column OR many columns where your answer varies across different ecosystems.

a. Composition of the species in the ecosystem (3 responses)
b. Functional group (for example, plankton)
c. Distribution of communities (1 response)
d. Trophic structure
e. Size structure (1 response)
f. Other element of the ecosystem (specify)

These questions were discussed in tandem. FN asked respondents to rank their answers, which was not part of MSC methodology but thought it an interesting way to review responses. FN reminded the group that there is low confidence in the results received prior to the workshop as they are only from five questionnaires. Each subcomponent is ranked from 1 (most affected) to 5 (least affected). Three respondents voted *a. Species Composition* to be most affected, and two voted that it would be second-most affected. One respondent thought *c. Distribution of communities* would be most affected, another thought *e. Size structure* would be most affected, and two thought it would be second-most affected.

Group discussion

FN noted the English Channel scallop group identified 'Functional group composition', as fishing grounds are occupied by short-lived, opportunistic mobile species and could be most affected by dredging.

CM opened the interactive voting system (Mentimeter). *A. Composition of species* and *b. Functional group* gained the majority of votes (3 votes each). PC voted for *d. Trophic structure* as his current research has found skates are using rocky scallop ground as nurseries, and the eggs are disturbed/displaced from dredging activity. Removal of these apex predators will impact the trophic balance. FN said impact on the skates will be picked up in the endangered, threatened or protected (ETP) species assessment. CD supported PC's concern and commented that he [CD] chose *c. Distribution of communities* as high ranking as trawling can simplify the seabed and affect epi/benthic fauna. This is particularly acute to biogenic reefs and how well mixed/ sorted the sediment is. He asked how ecosystem services are being considered. FN said it will be taken into account when written up and recognises the difficulty in identifying the primary element.

4. What aspect of fishing activity is most likely to affect the ecosystem? *Please choose one option. Please enter answers in one column OR many columns where your answer varies across different ecosystems.*
    a. Fish removal (i.e. removal of the target species and/or other species caught by the fishery) (2 responses)
    b. Interaction with the habitat (4 responses)
    c. Loss of fishing gear
    d. Bait collection (if relevant to the fishing industry)
    e. Anchoring gear (if relevant for fishing)
    f. Boat mooring (if relevant for fishing)

FN noted she had received six responses, rather than five, as someone could not decide between the options. FN and MK agreed the popularity of *b. Interaction with the habitat* was an expected result. The live Mentimeter result was 11 votes for *b. Interaction with habitat* and one for *a. Fish removal*. CM could not vote as he was hosting Mentimeter, but also supported *b*. This outcome in the meeting fairly reflected the proportion of questionnaire responses received previously.

5. Spatial scale: what is the scale of overlap between the fishery and the element of the ecosystem that is most likely to be affected by it? *Please select one option based on your expert judgement. Please enter answers in one column OR many columns where your answer varies across different ecosystems. Please explain the basis for your choice.*
    a. Less than 1% overlap (1 response)
    b. 1-15% overlap (1 response)
    c. 16-30% overlap (1 response)
    d. 31-45% overlap
    e. 46-60% overlap
    f. Over 60% overlap (2 responses)

The most popular scale was *f. Over 60% overlap* (two responses), based on the scallop habitat aligning so closely with the scallop fishery distribution. *A. less than 1%* was based on the distribution of key ETP species, *b. 1-15% overlap* was based on the area's fishery impact score (see Rijnsdorp et al 2020 for the North Sea score), and *c. 16-30% overlap* was based on the impact of the scallop dredge.

After the discussion, CM shared the Mentimeter responses. There were three votes each for: Overlap of 1-5%, 16-30% and over 60%. FN thought it interesting that 31-45% and 46-60% had not been selected and suggested that the question should be revisited with more information.

Group discussion

CM noted difficulty in answering Question 5 as the response depends on how questions 1-4 were answered, which LB later seconded. FN agreed, noting the influence on scale if impacts on the scallop (and wider habitat) were included with/or just VMS data. BL and CM suggested a habitat map would help inform responses. JH supported this, adding the Relative Benthic Status curve suggested by BL could be used later to identify what the effect of fishing in those areas would be.

FN showed the EUNIS habitat classification for UK (which links to work Mairi Fenton's PhD project on the habitat impact of scallop dredging). CD explained his reason for answering over 60% overlap. As dredging (broadly) only takes place on grounds suitable for dredging, the overlap with scallop habitat will be high. Initially, the impact will be based on the resilience of the modelled area, but as the area may have since been altered, the affected element in the ecosystem may subsequentially be more/less affected.

CM agreed with CD, and that 'habitat' should be clearly defined from 'ecosystem' especially when using EUNIS data, as they are based on model data so require scrutiny when using. CD added the Scottish Mean Assessment 2020 has substantial detail on the status of ecosystem elements of most concern (like biogenic reefs). LB asked whether closed areas such as wind farms will be considered. FN confirmed they would as they are all part of the overall ecosystem under assessment and they reduce the overlap percentage of that ecosystem element with fishing grounds. MK noted most mapped

fishing grounds are from historical knowledge rather than actual current fishing range. He referenced Claire Szostek's paper on the English Channel that models habitat types and environmental parameter predictors of scallop distribution. MK added that restrictions on days at sea in Western Waters causes fishing effort to concentrate towards the coast. These examples suggest that the questionnaire maps do not show all scallop fishing grounds.

KC suggested the groups' responses reflect the range of professional interests the Steering Group. He did not vote for over 60% as areas experience temporal change in fishing intensity. CM reasoned voting behaviour is also impacted by how one interprets the question. On fishing intensity, FN noted that VMS data only exists for >12m vessels, though landings data from smaller vessels could help support future analysis. MK added the sediment on the seabed could not be considered exclusively; the overlaying water column and oceanographic features must also be considered, as well as the scallop transport process. This is exemplified by the low VMS records south-east of the Isle of Man due to poor scallop fishing despite the relatively highly fished surrounding area.

6. Time scale: how often does the fishery interact with the element of the ecosystem that is most likely to be affected by it? *Please select one option based on your expert judgement. Please enter answers in one column OR many columns where your answer varies across different ecosystems. Please explain the basis for your choice*.
    a. 1 day every 10 years or so
    b. 1 day every few years
    c. 1-100 days per year
    d. 101-200 days per year
    e. 201-300 days per year (2 responses)
    f. 301-365 days per year (3 responses)

FN noted the question is not asking how many days the scallop dredge is operating, rather how many days per year is that element of the ecosystem affected. The most popular response received before the workshop was for *f.301-365 days per year* (three responses). The reasons were that the fishery typically operates all year with smaller vessels limited by weather, and larger ones impacted by crew changes or refits on land. BL voted for fewer days due to the Irish Sea closed season which will result in lower temporal overlap than the North Sea and West of Scotland, and a caveat that fishing is highly variable so it is hard to estimate. From seven Mentimeter responses, *c.1-100 days* got five votes; *d. 101-200 days* got two votes and *e.201-300 days* got two votes.

Group discussion

CP noted the large, nomadic fleets used to justify option f mainly operate in the English Channel, rather than the areas referred to in the SICA questionnaire. CD added that measuring impact on the ecosystem element by fishery interaction time would require information on habitat type, fishing intensity and recoverability of sub-element in order to be informative. BL asked to what extent Western Waters effort control affects the number days permitted at sea, to which FN and CP agreed to look further into by contacting the MMO.

MK voiced frustration at qualitatively estimating these answers when quantitative data is available, allowing calculations for frequency of disturbance per area and overlay that in the context of the relevant habitat for more robust data. FN suggested that the approach could become an additional

milestone as it provides an evidence-based evaluation. MK and CM agreed this and FN will add a new milestone to the Action Plan.

7. Intensity: How intense is the interaction of the fishing industry with the element of ecosystem that is most likely to be affected by it?
   This relates to the element identified in Q.3. Please select one option based on your expert judgement. Please enter answers in one column OR many columns where your answer varies across different ecosystems. Please explain the basis for your choice.

   a. **Negligible -** Remote probability of the effect of the activity detected at any spatial scale or temporary
   b. **Minor** – Minor activity occurs rarely or in some restricted places, and evidence of activity even at these scales it is rare
   c. **Moderate** - Moderate activity detection on a wider spatial scale or obvious detection but local **(4.5 responses due to split vote)**
   d. **Major -** The detectable evidence of activity occurs reasonably often on a broad spatial scale **(0.5 responses due to split vote)**
   e. **Severe** - Easily detectable localized evidence of activity and widespread and frequent evidence of activity
   f. **Catastrophic** Local or regional evidence of activity or continuous and widespread evidence

The majority of responses were for *c. Moderate* (4.5 votes) as the effect of activity is detectable in highly dredged areas (*Bradshaw et al 2002)*, VMS activity shows the extent of scallop fishing around the UK, and localised reports of grounds being fished extremely hard.

CM split the Mentimeter survey into *Species composition* and *Functional group*. From seven Mentimeter responses, three voted for *c. Moderate* and three for *d. Major* for *Species composition* (the impact of scallop dredging on the species composition). CD requested a vote for *d. major* as he responded based on his understanding of scale from previous questions and the impact on vulnerable areas such as flame shell beds which CP supported, asking how we look at individual features within areas. FN clarified the responses should be the level would you rate the detectable change in the identity of species composition without giving weight to one species over another except if it is less resilient.

To avoid running too far over time, the Mentimeter results for *Functional group* were not discussed, though three votes were placed for *c. Moderate.*

8. Consequence: what do you think are the consequences of the impact of the fishery on the aspect of the ecosystem most likely to be affected?
   This relates to the element identified in Q.3. Please select one option based on your expert judgement. Please enter answers in one column OR many columns where your answer varies across different ecosystems. Please explain the basis for your choice.
   a. **Interactions are unlikely to be detectable against natural variation.**
   b. **Interactions are likely to cause up to 5% change in characteristic; impact recovery is likely to take up to 5 years. (3 responses, Species composition)**

c. Interactions are likely to cause up to 10% change in characteristic; impact recovery is likely to take up to 20 years. (1 response, Community distribution)

Options a - c link to SG100, SG80 (best practice) and SG60 (conditional pass) respectively. Lower than SG60 (a fail) was removed from the questionnaire. The majority voted for *b. up to 5% change* (3 responses) in *Species composition,* reasoning there's higher impact for the Irish Sea and West of Scotland; good recruitment in the Isle of Man despite the dredging; relatively low impact scores in dredged areas of the North Sea (*Rijnsdorp et al 2020*). There was one vote for *c. up to 10% change* in *Community distribution*, based on slow recovery of flame shells and documented declines in and concerns for biogenic habitats.

CM split the Mentimeter question into *Species composition* and *Functional group*. CM added the energetics may impact time taken for response to be registered and there is a lot of variation across the area. CD referred to his earlier comment that the response depends largely on scale, and both current and historical habitat distribution so it is challenging to simplify. Of eight Mentimeter votes, four voted for *b. up to 5% change* and four for *c. up to 10% change* in *Species composition.* Of six Mentimeter votes, four voted for *b. up to 5% change* and three for *c. up to 10% change* in *Functional group*.

Next steps

FN will now collate any further questionnaire responses and comments; write up workshop findings which will go into a report FN is writing. FN thinks will be too early to convert the findings into a score, and further discussion is needed. There will be further consideration for action plan milestones which will be brought to the next Steering Group meeting. She invited participants to submit any further comments, references or sources of information either within the questionnaire or in an email.

Any Other Business

FN noted for those that would be joining the *Nephrops* SICA workshop the following week that she would arrange the Mentimeter beforehand. KK said the MSC has access to this and JP confirmed she would support FN ahead of the next workshop.

Meeting Closes

The meeting closed at 16:10. Draft minutes will be circulated to the participants of the meeting for feedback and then uploaded to the Project UK website and FisheryProgress.org.

	Actions Arising	Responsibility
1	Contact the MMO to ask to what extent Western Waters effort control affects the number days permitted at sea	FN /CP
2	Add a milestone into the scallop action plan to review this when quantitative data is available.	FN
3	Send any additional comments or references to FN by email.	All
4	Prepare Mentimeter access ahead of the next SICA workshop.	FN/JP