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Evidence base to accompany the Isle of Man King Scallop Long-term Fisheries Management Plan Consultation

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Fisheries Report

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1. Introduction:

1.1 Isle of Man King Scallop Fishery:

A fishery for king scallops, *Pecten maximus*, has been prosecuted in and around the Isle of Man's territorial waters since 1937 and developed rapidly in the 1960s as more and larger boats joined the fishery (Duncan et al., 2016). The Isle of Man king scallop fishery is seasonal, occurring from 1st November to 31st May by vessels using toothed, Newhaven, dredges. Management of the fishery differs between an inner 0 to 3 nm zone, and an outer 3 to 12 nm zone, with more stringent regulations in the inner zone. During the 2020/2021 season a total of 83 vessels from the Isle of Man, Wales, Scotland, England and Northern Ireland were eligible for a licence (including vessels with activated licences and licences currently on hold with DEFA) to fish for king scallops within Isle of Man territorial waters 3- 12 nm zone. For the 2020/2021 fishing season the management measures that applied to the fishery included:

Table 1: Current management measures for the Isle of Man king scallop dredge fishery (as for 2020/2021 fishing season)

Management measure	Applicable zone
Minimum landing size (110 mm)	0 to 12 nm zone
Closed season (01/06 to 31/10)	0 to 12 nm zone
Curfew (18:00 to 06:00)	0 to 12 nm zone
VMS required for all vessels	0 to 12 nm zone
Submission of EU logbook	0 to 12 nm zone
Submission of IoM daily catch return	0 to 12 nm zone
Aggregate dredge width of 762 cm	0 to 3 nm zone
Aggregate dredge width of 1067 m	3 to 12 nm zone
Maximum of 9 teeth per dredge	0 to 12 nm zone
Maximum tooth spacing of 75 mm	0 to 12 nm zone
Maximum tow bar diameter of 185 mm	0 to 12 nm zone
Minimum belly ring internal diameter 75 mm	0 to 12 nm zone
Minimum dredge net mesh of 100 mm	0 to 12 nm zone
Under 221 kW (except Grandfather Rights)	0 to 12 nm zone
≤ 15.24 m vessel registered length	0 to 3 nm zone
French dredge prohibited	0 to 12 nm zone

These management measures were implemented under the Fisheries Act 2012, various secondary legislation and through restrictive licencing conditions.

In addition to the statutory EU logbook data collection fishers participating in the Isle of Man king scallop fishery must operate a VMS and must submit a daily catch return (DCR) via NestForms by midnight on the day of fishing activity. The data collected within the DCR includes information on fishing date, time spent fishing, location of fishing activity, information of gear configuration and total catch and the data is restricted to fishing activity within the Isle of Man territorial waters. The data collected within DCR forms will be used within this report to provide an evidence base for new management measures for the Isle of Man king scallop fishery as proposed within the main consultation.

1.2 Landings ICES Rectangles 36E5, 37E5 and 38E5:

The annual landings of king scallops from the ICES Rectangles 36E5, 37E5 and 38E5, which cover the main extent of Isle of Man territorial waters, increased rapidly from 2006 to 2009 almost doubling during that period from 2111t to 3971t (Figure 1). Annual landings have continued to increase since 2009 with an annual average of 4020t from 2010 – 2015 and a peak in 2016 of 5714t. Landings from

ICES Rectangles 36E5, 37E5 and 38E5 decreased in 2017, 2018 and 2019 following the introduction of TACs within Isle of Man territorial waters. Landings however continue to exceed pre-2006 values (with the exception of 1999) which is of concern given the general lack of knowledge and management of the stock at these high fishing levels.

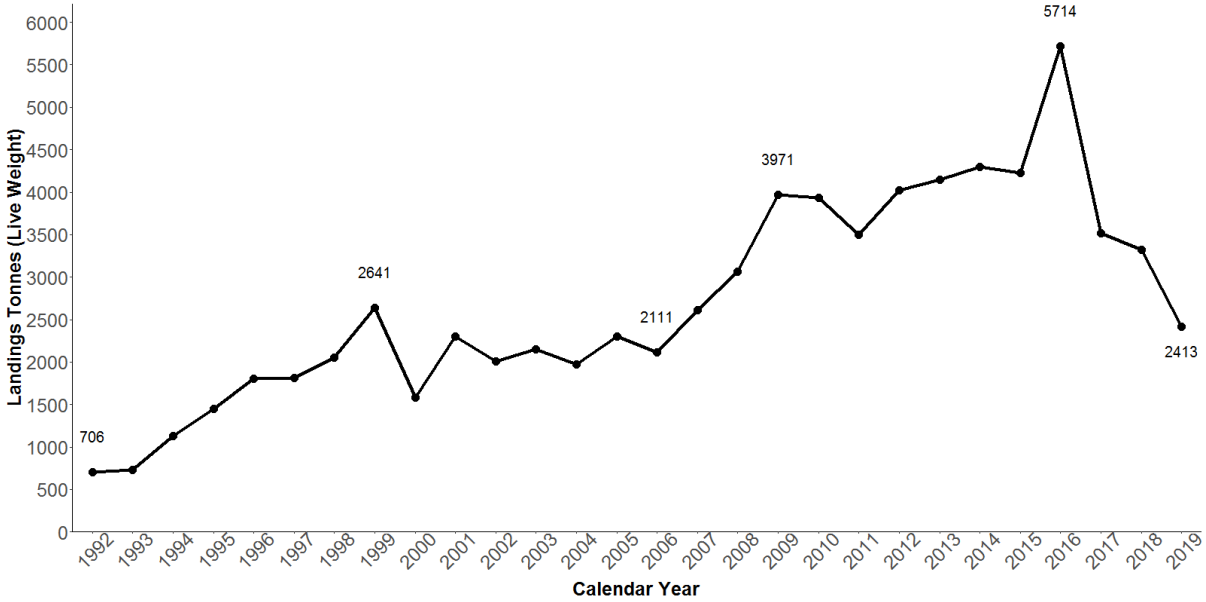

Figure 1: Annual (calendar year) King Scallop landings (t) from ICES Rectangles 36E5, 37E5 and 38E5 from 1992 to 2019 (Source: Logbook data DEFA, Marine Scotland, MMO and IFISH 2). For information the landings (t) values from key years are annotated on the graph.

1.3 Long term Fisheries Management Plan:

A long term fisheries management plan (LTFMP) for the Isle of Man king scallop fishery is essential to secure a sustainable and profitable fishery for the future that minimises environmental impact and help avoid short-term reactionary management that could potentially impact on the longer-term sustainable approaches to fisheries management. This approach will provide better security for the stock and industry by providing a documented, formalised, long-term management approach underpinned by science.

As part of the LTFMP for king scallops a series of high level objectives have been formulated by industry with input from DEFA and Bangor University.

1. Restore and maintain good stock status and achieve long-term stability
2. A Harvest Control Strategy (HCS) in pursuit and continuation of the above primary objective, which:
    a. Sets biologically sustainable limits on fishing activity, informed by robust/best available scientific stock data linked to biological reference points (limit and target reference points).
    b. Manages vessel numbers, access, and effort so that fleet capacity is economically viable within the limits set (in 2.1), and with consideration of environmental, economic, and monitoring-control surveillance (MCS) requirements.
    c. Utilises harvest control rules (HCRs) with defined limits that are effective, responsive, and enforceable.
    d. Safeguards against poor recruitment.
    e. Incorporates spatial management.

3. An environmentally-considered fishery, following an ecosystem-based approach.
4. A high-quality seafood product, produced sustainably, that delivers market access and maximises stakeholder economic return.
5. A high level of safety and wellbeing for those people working in the industry.
6. An energy efficient fishery
7. The fishery (and stock) is considered in relation to marine spatial planning, marine developments, and wider fisheries management.

In order to implement the high level objectives developed as part of the LTFMP a series of new management measures may be required. The majority of this consultation is seeking views and support for the high level objectives and associated changes to management required to implement them. An evidence base is provided below to accompany the parts of the consultation that present and/or propose specific outcomes that can be quantitatively assessed.

2. Evidence Base:

2.1 Latent capacity within the fleet

Although 83 vessels are eligible for a licence (including vessels with activated licences, licences currently on hold with DEFA and vessels with licences that have yet to be renewed for the 2021/22 licensing period) to fish for king scallops within Isle of Man territorial waters only 82 vessels have recorded landings of king scallops within this area during the proposed track record period of 01/11/2017 to 31/03/2020.

As detailed in the main consultation document the Scallop Management Board has recommended that an appropriate track-record criteria for the purpose of removing latency would be a track-record of at least 54 days at sea within a reference period beginning 01/11/2017 and ending 31/03/2020. This equates to an overall participation rate of 10% of the total number of potential fishing days in the reference period (total = 542 days). The Scallop Management Board has also recommended that, if a vessel fails to meet the overall participation rate required (i.e. 10%, or at least 54 days), a TR of half of the overall participation (i.e. 27 days) would mean that vessel would be eligible if those days were within a single fishing season. This is to account for variability between seasons, discontinuity among licenced fishing vessels, and decisions taken by some skippers to not participate in order to encourage stock recovery.

Track Record = At least 54 Days-at-sea overall, or at least 27 Days-at-sea in a single fishing season
Reference Period = 01/11/2017 – 31/03/2020 (inclusive)

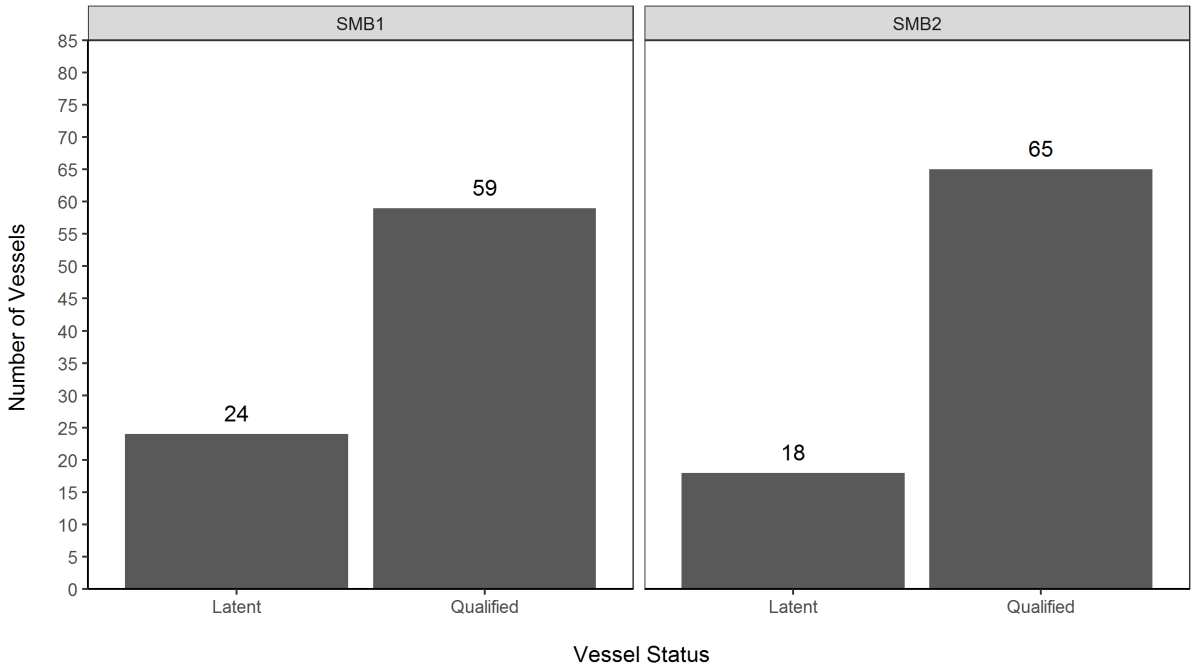

Figure 2: The impact in terms of current licenced vessels (83 vessels) being considered as latent or qualifying under the SMB preferred option for track record period (TRP). SMB1 is a simplified option of 54 days minimum within the TRP and SMB2 includes the dual criteria of either 54 days within the TRP or 27 days within any one of the three TRP seasons. Source: Isle of Man Daily Catch Returns submitted through Nest Forms App.

The impact of this track record period (SMB 2) would be that 18 currently licenced vessels (or vessels with licences on hold or that have not renewed) would lose their Isle of Man king scallop fishing licence and not be able to fish for king scallops within the Isle of Man territorial waters.

2.2 Reduction to 6-aside dredges within 3-12 nm limit

Dredge numbers are currently limited in the king scallop fishery by specifying the aggregate dredge width that a vessel may operate which is equivalent to a maximum of 7 dredges a-side in the 3-12 nm limit and a maximum of 5 dredges-a-side in the 0-3 nm limit.

The Scallop Management Board's proposal is to reduce the dredges-a-side limit within the 3-12 NM area to 6 dredges-a-side.

The DCRs indicate that during the TRP a total of 7949 fishing days occurred solely in the 3-12 nm limit (~71 % of all fishing days within the territorial waters which also includes DAS reported within the 0-3 nm only or DAS which occur within both the 0-3 and 3-12 on the same day).

Table 2: Days at sea (DAS) and landings of king scallops in tonnes (t) from the 3-12 nm limit of the Isle of Man territorial waters for the TRP split by the number of dredges aside used on the DAS and the mean proportion of the DCL met (accounting for variance in the DCL among and within seasons).

Dredges	DAS	Landings (t)	Prop DCL Met
3-aside	3	0.5	27 %
4-aside	440	162.7	50 %
5-aside	1604	711.1	61 %
6-aside	3840	2196.2	80 %
7-aside	2062	1332.2	85 %

To help establish the potential impact the activity of vessels known to fish with 7 dredges per side has been analysed. During the TRP a total of 29 unique vessels have reported landings from the 3-12 nm whilst fishing with 7 dredges per side (~ 35% of the fleet). Using data from DCR forms for the TRP it is possible to estimate which vessels would be most impacted. Of these 29 vessels, only 19 have reported more than 10 DAS fishing in the Isle of Man king scallop fishery within the 3-12 nm with 7 dredges per side. On average vessels fishing with 7 dredges per side typically caught 5% more of the daily catch limit compared to vessels fishing 6 dredges per side and 24 % more of the DCL than vessels fishing 5 dredges per side (Table 2).

Vessels that did not wish to reduce the number of scallop dredges being used from 7 per side to 6 per side could change their fishing patterns to spend more time outside the Isle of Man territorial waters in areas where they are permitted to fish for king scallops with 7 dredges per side or greater. Alternatively vessels could choose to reduce to 6 dredges per side in order to fish within the Isle of Man 3 – 12 nm zone but at a lower catching rate. The impact of vessels dropping from 7 dredges per side to 6 dredges per side will reduce vessels catching capacity per tow within the 3-12 nm limit by around 14 % (i.e. 2 dredges fewer per tow). With a daily catch limit (DCL) in place the overall maximum catch per vessel per day will ultimately remain restricted by the value set for the DCL. Presuming that the density of scallops remains the same, the impact of fishing with 2 dredges fewer could be to either increase the fishing time required to catch the DCL (should it be possible to catch the DCL within the 12 hour fishing day) or to decrease the proportion of the DCL caught by a vessel (should it not be possible to catch the DCL within the 12 hour fishing day). There are many other factors in addition to the number of dredges fished that also affect the catching efficiency of a vessel including belly ring size, tooth spacing, weather, fishing ground, vessel size, scallop density and skippers experience.

2.3 Increase from 5-aside to 6-aside dredges within 0-3 nm limit

The consultation is seeking views on the harmonisation of dredge-a-side limits with the 3-12 nm (i.e. an increase in the maximum number of aggregate dredges from 7.62 m (5 dredges per side) to the equivalent to a maximum of 6 dredges per side.

The DCR forms indicate that during the TRP a total of 2838 fishing days occurred solely in the 0-3 nm limit (~25 % of all fishing days within the territorial waters which also includes DAS reported within the 3-12 nm only or DAS which occur within both the 0-3 and 3-12 on the same day).

To help establish the potential impact the activity of vessels known to fish with 5 dredges per side has been analysed. During the TRP a total of 38 unique vessels have reported landings from the 0-3 nm whilst fishing with 5 dredges per side (~ 46% of the total fleet). Using data from DCR forms for the TRP it is possible to estimate which vessels would be most impacted. Of these 38 vessels, 35 have reported more than 10 DAS fishing in the Isle of Man king scallop fishery within the 0-3 nm with 5 dredges per side.

Table 3: Days at sea (DAS) and landings of king scallops in tonnes (t) from the 0-3 nm limit of the Isle of Man territorial waters for the TRP split by the number of dredges aside used on the DAS.

Dredges	DAS	Landings (t)
3-aside	9	1.2
4-aside	476	178.8
5-aside	2353	1094.4

If such a change was implemented then vessels could choose to increase from 5 to 6 dredges per side within the Isle of Man 0 – 3 nm limit. The impact of vessels increasing from 5 dredges per side to 6 dredges per side would be to increase vessels catching capacity per tow within the 0-3 nm limit by around 20 % (i.e. 2 dredges more per tow). With a daily catch limit (DCL) in place the overall maximum catch per vessel per day will ultimately remain restricted by the value of the DCL. Presuming that the density of scallops remains the same, the impact of fishing with 2 dredges more could be to either decrease the fishing time required to catch the DCL (should it be possible to catch the DCL within the 12 hour fishing day) or to increase the proportion of the DCL caught by a vessel (should it not be possible to catch the DCL within the 12 hour fishing day). There are many other factors in addition to the number of dredges fished that also affect the catching efficiency of a vessel including belly ring size, tooth spacing, weather, fishing ground, vessel size, scallop density and skippers experience.

2.4 Maximum tow bar length

Traditional Newhaven scallop dredges used by the majority of the Isle of Man king scallop fishing fleet comprise heavy steel tow bars with spring-loaded, toothed dredges attached to a steel ring collector bag that is dragged along the seabed bed. As detailed in the main consultation document other jurisdictions currently specify a maximum tow bar length along with a specific number of dredges that can be towed by a vessel. At present there is no restriction on maximum tow bar length in the Isle of Man king scallop fishery and no details on tow bar length are recorded in fishers' logbooks, daily catch returns or by officers boarding vessels. Fishers may remove dredges from tow bars to meet restrictions on dredge numbers. Thus larger vessels capable of towing more than 7 dredges per side, may fish within the Isle of Man's territorial sea, and vessels capable of towing more than 5 dredges per side may fish within the 0-3 nm zone.

The Scallop Management Board's proposal is to harmonise the technical specifications so that regulations are harmonised with those in Northern Ireland (i.e. including a maximum tow bar length of 5.5 m and a maximum number of dredges of 6 per side).

If the permissible tow bar length was reduced, then vessels would not be permitted to use or carry onboard within territorial waters a tow bar of a length greater than that specified. An impact of specifying a maximum tow bar length alongside a maximum number of dredges per side is improved enforcement. It is easy for enforcement officers to measure the length of any tow bar in use (or any tow bar not lashed and stowed if that is the regulation) to check whether the tow bar is within the maximum specifications and to confirm whether or not an offence has been committed. The financial impact of specifying a maximum tow bar length would be that any vessel that does not have a tow bar within the maximum permitted length would incur costs from the manufacture of a new tow bar or the modification of a current tow bar to comply with the new specifications. A new 5.5 m tow bar is estimated to cost around £1,000 - £2000.

2.5 Belly Ring Size and teeth spacing

In the Isle of Man king scallop fishery, the current minimum internal diameter of scallop dredge belly-rings is 75 mm. In addition the current maximum number of teeth permitted per dredge is 9 with a maximum tooth spacing of 75 mm. Details on belly ring size and tooth numbers are not recorded in fishers' logbooks, daily catch returns or by officers boarding vessels.

Tooth spacing and belly ring size can affect selectivity of dredge gear towards scallops over minimum landing size (Lart et al., 1997). Selecting scallops at the seabed can result in a 75% reduction in stress compared with deck sorting (Lart et al., 2003). Although selection at the belly rings is considered to be

more reliable than tooth selection, Lart et al., 2003 recommend that the best approach is to optimise both parameters. This consultation is gauging support for a reduction in the number of teeth per dredge to 8 and/or an increase in the minimum internal diameter specified for scallop dredge belly-rings (although no specific size increase is stated) as a means of increasing size selectivity for dredges (i.e. catching and retaining fewer scallops under minimum landing size (MLS)).

The internal diameter of belly rings has been found to have an important influence on the size selectivity of scallops caught by dredge. For scallops of 100 mm, belly ring sizes of 85 mm internal diameter have been found to be optimum for selectivity (Lart et al., 2003). For scallops of 110 mm, belly rings of 88 and 92 mm have been investigated but the data was unable to support that these sizes were optimum for achieving full efficiency of this size of scallop (Lart et al., 2003).

The French have now set minimum ring size at 92mm (ICES WGSCALLOP 2018). The SELEDRAG project was set up to assess the correlation between the increase of the diameter of belly ring size and improvements of gear selectivity and handling time. The study showed that the selectivity of king scallop dredges increased with the diameter of the rings used (85, 92 and 97 mm). The data indicated that selection was not so much optimised towards scallops of commercial size (i.e. > 110 mm) but that fewer undersized scallops (i.e. scallops > 100 mm) were caught and retained when using larger belly ring sizes. Increased ring size was found to reduce the catches of under size scallops and waste (pebbles, rocks, dead shells, debris, brittle stars, etc.), resulted in a larger average shell size of catch, and a reduction of sorting time for the crew on deck. The ring size of 97 mm, which is now in use in the inshore King Scallop fishery of the Saint-Brieuc Bay is 97 mm, was additionally found to reduce catches of scallop between 102 – 110 mm. (ICES WGSCALLOP 2019).

The data on selectivity improvements using tooth spacing is more variable than belly ring size and selectivity can be affected by tooth designs, length and condition (Lart et al., 2003). However, where teeth do function as selective devices the optimum configuration for selectivity of 110 mm scallops is 8 teeth per 700 mm bar (Lart et al., 2003).

The impact of increasing the belly ring size and/or tooth spacing could be to improve the size selectivity of dredges to reduce catch of scallops under the MLS of 110 mm. Sorting scallops on the seabed rather than on deck could reduce the stress on undersize scallops (scallops under 110 mm) and thus improve survival rates of undersized scallops. The financial impacts of a management change to increase belly ring size and/or tooth spacing would create a cost incursion for any vessels currently using gear that would not comply with the new management regulations. However, tooth bars and belly rings require replacing within a season as standard as they wear and so the costs would not be significant departure from standard wear and tear replacement costs.

2.6 Removal of 'historic' or 'grandfather' rights

As detailed in the main consultation report:

"Bye-law 5(7) of the Sea Fisheries (Scallop Fishing) Bye-laws 2010 restricted access to the Isle of Man scallop fishery to vessels <221 kW, but also made provision for 'qualifying vessels' with engines in excess of 221 kW by introducing what are now referred to as 'Grandfather Rights (GFRs). If vessels could demonstrate having fished for scallops (or queen scallops) in the Manx Territorial Sea for more than 50 days between 01st November 2008 and 31st May 2010, access to the scallop fishery was permitted by way of GFRs.

Currently, GFRs are only extinguished when the licenced vessel is either sold or transferred. The majority of vessels that were initially permitted access to the fishery under GFRs have either retired from the fishery (and the licence returned to the Department) or have had their engine de-rated. However, a small proportion of the current fleet (6 vessels) continue to access the fishery with using vessels with engines exceeding 221 kW.

Despite no specification of a 'sunset clause' (fixed end date) in the Sea Fisheries (Scallop Fishing) Bye-laws (2010), GFRs were not intended to be long-term arrangement in the Isle of Man scallop fishery, which is an inshore fishery and should therefore be restricted to access by inshore vessels. This could be achieved by introducing a sunset clause on existing GFRs, thereby requiring all vessels to be under-221 kW by a specific date."

There are 6 vessels licenced to access the Isle of Man king scallop fishery that exceed the current legislated engine size of 221 kW that are permitted to fish under historic 'grandfather rights'. The removal of 'grandfather rights' would therefore impact less than 5 % of the current fleet. However, there would be an impact on the 6 vessels with 'grandfather rights' if they are removed, through a direct cost to vessel owners due to reduced access to fishing grounds.

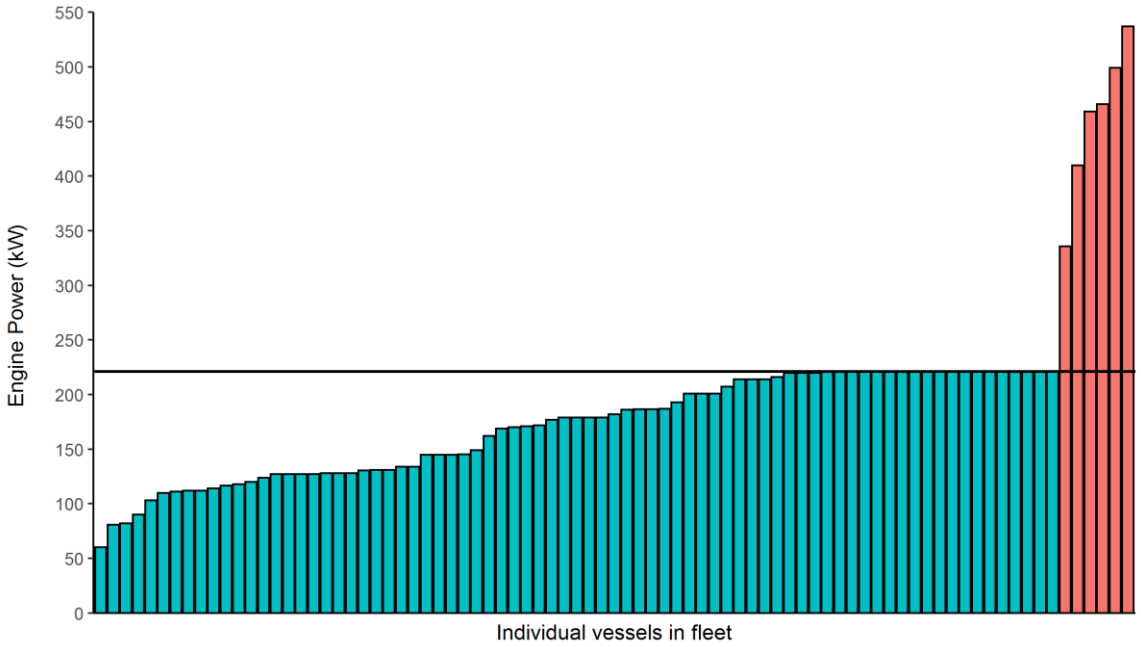

Figure 3: Chart showing the engine power (kW) of all vessels currently licenced to fish for king scallops in the Isle of Man. The black horizontal line indicates the current cut of in legislation of 221 kW. Red bars indicate vessels with engine power greater than 221 kW that are currently fishing under 'grandfather' rights.

The impact from the phasing and out and removal of 'grandfather rights' from these 6 vessels will depend on the outcome of previous sections of the consultation (i.e. are these vessels latent or qualifying). Should the vessels qualify under the track record period criteria then then will have the option to transfer their current licence onto a vessel that meets the vessel requirements of the king scallop fishery (i.e. under 221 kW). Should the vessel qualify and not have a suitable vessel to transfer their current licence too, then after the phase out period, that licence will expire and the individual vessels will lose access to the Isle of Man king scallop fishery.

3. References:

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