

Regulatory Triage Assessment

Title of measure	Inshore (under 12m) vessel monitoring
Lead Department/Agency	Marine and Fisheries / Defra
Expected date of implementation	31 st March 2019
Origin	Domestic
Date	24/07/2018
Lead Departmental Contact	Rachel Mason
Departmental Triage Assessment	Low-cost regulation (fast track)

Rationale for intervention and intended effects

The purpose of this public consultation is to seek views on the proposed introduction of legislation to make it a statutory requirement to install Inshore Vessel Monitoring Systems (I-VMS) for all licensed British fishing boats under 12 metres in length operating in English waters (with English boats also covered outside of English waters). We recognise that there is more we can do to improve data gathering and create sustainable fisheries for the future through more effective enforcement and informed management.

The intended effect of intervention is to:

- Assist in the management of Marine Protected Areas (MPAs)
- Provide valuable data that will assist in making future policy, regulation and enforcement decisions more effective and proportionate; and
- Provide intelligence in terms of risk based targeted inspections selection

Viable policy options (including alternatives to regulation)

The policy objective is to gain better understanding of the fishing activity of the inshore fleet by requiring licensed British fishing boats under 12 metres in length operating in English waters (with English boats also covered outside of English waters) to install Systems (I-VMS).

I-VMS records the accurate location, speed and heading of vessels using a secure tamper resistant system. It sends this information using mobile telephone technology, utilising the existing monitoring infrastructure that is in place for the 12 metre and over vessels. This information can be assessed in near real time, in the field using a secure access web platform and is recorded allowing analysis.

This improved level of data would inform a number of areas key to managing fisheries in a sustainable way and provide a number of additional benefits as detailed below and in the supporting evidence summary.

The two options considered in this assessment are summarised below:

Option 0 – ‘Do Nothing’

Currently under 12m vessels do not need to have a vessel monitoring system on board and information on location of catch is gathered retrospectively through sales notes. This information has been shown to be unreliable due to the apparent mismatches when trying to reconcile data. As a consequence the current level of information is not robust. Subsequently, we cannot monitor vessel activity at sea, including the effective

protection of MPAs where fishing activity may be prohibited or limited. To achieve this we need to improve data gathering and sharing, and gain an enhanced understanding of the activities of under 12 metre fishing vessels operating in English waters.

Less than 11% of the total English fleet have an effective vessel monitoring system on board, these vessels are 12 metres and over in size. Vessels under 12 metres make up a large proportion of the fleet, and are not being monitored as effectively as they could be. As a consequence a number of management decisions are based on substandard information and inspections are not as targeted as effectively as they could be.

Option 1 – England wide Statutory Instrument (SI)

Although IFCA bylaws and licencing conditions were considered, the introduction of legislation was chosen to provide a nationally consistent approach. Byelaws only apply in the 0 to 6nml and so would not capture those vessels fishing outside this area. It was concluded the detail required in licence conditions would make it unwieldy. The Statutory Instrument will require all licensed British under 12m vessels operating in English waters to carry a functioning I-VMS device and an SI was deemed the only option that will entirely meet the policy objective and rectify the problems. There will be benefits for industry including finer data on where vessels are operating which could assist in maximising fishing opportunities, such as zoned management within Marine Protected Areas. This means access may be allowed to certain types of fishing in areas where it was previously prohibited.

Initial assessment of impact on business

Description and scale of key monetised costs by ‘main affected groups’

This would affect all British licensed under 12m fishing boats operating in English waters (and English boats outside of English waters). The total discounted costs would be £6.88m¹ over a 10 year period (these costs include installation costs, reporting, project coordination and replacement costs). The initial cost (£1,266 including installation per device) of the I-VMS unit is being met by the European Maritime and Fisheries Fund (EMFF) and, if necessary, government matched funding. The proposed legislation is applicable to British licensed vessels. However, the total number of registered vessels (2,601) rather than licensed vessels (2,324) has been used to calculate the cost of the project, as the number of licensed vessels can fluctuate from year to year. This allows the project policy to mitigate the risk of an increase in licensed vessels and to take into account new entrants to the licensed fleet during the period that the policy is being implemented. It is expected that the legislation will require that all vessels will be fitted with I-VMS fitted by 31 March 2021.

No additional cost to the government is anticipated regarding enforcement, indeed more data will allow more efficient, targeted inspections in line with a risk based and intelligence led approach. It is anticipated that the MMO will set up the geo-fencing² and Inshore Fishing Conservation Authorities (IFCAs) will conduct the day-to-day monitoring.

Other key non-monetised costs by ‘main affected groups’

¹ This is the best case scenario

² Geo-fencing is the use of geographic location information to define boundaries for an area. Geo fences will be used in multiple areas around the coast to, for example, identify when a vessel has entered a port where reduced reporting is required, or a Marine Protected Area where increased reporting may be required.

Masters/owners may incur additional costs through purchasing an extended warranty however this will depend on risk appetite and personal choice. Additionally new entrants into the fishing industry may need to purchase the I-VMS device and have it installed at their own cost.

Description and scale of key monetised benefits by ‘main affected groups’

We have not been able to monetise benefits, but there have been a number of key benefits noted in a qualitative assessment immediately below and in the supporting evidence section.

Other key non-monetised benefits by ‘main affected groups’

Industry

- With higher frequency data of where vessels are operating, finer scale management can assist in maximising fishing opportunities, such as zoned management within MPAs (for example prohibiting fishing in smaller areas within the MPA rather than the whole MPA), creating a more responsive management system.
- I-VMS will ensure the inshore fleet can trade with countries that require catch certificates, a requirement of which is to include (and verify) where the fish have been caught.
- Masters/owners could develop business plans using this information, demonstrate a track record of fishing for certain species and identify key fishing grounds.
- There are also safety at sea implications, and the tracking functionality may assist with recovery and swifter payment of insurance claims in case of loss or damage of vessel at sea.

Government and other public sectors

- Government could use the information to improve management of MPAs, to meet sustainability commitments and to make better informed management decisions.
- Improved intelligence allows more targeted inspections and reduces guesswork and improves risk assessments.

Key risks / assumptions

Risk	Associated with which option	Mitigation / Notes
Funding is not available after EU exit for purchasing I-VMS units	Option 1	The Chancellor announced in October 2016 that all EMFF projects approved before the UK leaves the EU on 29 March 2019 will be fully funded under a Treasury guarantee, even when these projects have not completed by the UK

		<p>exit date. Since then, the Withdrawal Agreement confirmed the intention that the UK will continue to participate in all EU programmes financed by the Multiannual Financial Framework (2014-2020) until their closure. Therefore it is expected that EMFF will continue to be open for new projects until 2020. EU funding for UK participants and projects will be unaffected by the UK's withdrawal from the EU for the entire lifetime of such projects. Therefore vessels that have the unit installed post March 2019 would still be eligible for EMFF funding.³</p>
<p>New entrants post policy implementation (expected 1st April 2021) will need to purchase an I-VMS device at their own cost when the initial funding has been utilised and if alternative funding is not available</p>	Option 1	<p>As an additional start-up cost to new entrants an I-VMS device represents an increase of only 2.6% (detailed in the supporting evidence)</p>
<p>Installation bottlenecks are created due to the number of vessels needing I-VMS fitted and the likely reluctance to have them installed early</p>	Option 1	<p>The I-VMS requirement will have a staggered rollout to mitigate this risk.</p>
<p>There are dependencies that may affect rollout, e.g. for successful installation there is a dependency that:</p> <ul style="list-style-type: none"> • Engineers are available • Suppliers are able to meet demand • The MMO can commission (test) the device in good time • Or that the suppliers confirm the installation and provide an invoice 	Option 1	<p>Closer working relationships with stakeholders and lessons learned from previous projects. Pilot Projects will address these issues and suggest a methodology.</p>

³ The EMFF applications are being completed and submitted by the Marine Management Organisation.

<p>Completion of rollout by 31 March 2021 could be jeopardised by the decision not to make the rollout schedule mandatory. This may result in vessel owners seeking I-VMS to be fitted on their vessels in the run-up to the end date resulting in suppliers / fitters being unable to meet demand.</p>	<p>Option 1</p>	<p>The MMO has Project Manager Resource assigned; has an experienced IFCA member as Senior Responsible Officer; and on governance, has a specific project board in place that reports to the MMO</p>
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The monetised costs are calculated based on the number of registered vessels. This is due to the fluctuations in the number of licenced vessels from year to year. In order to mitigate the risk of lack of funding if numbers increase and to ensure any new entrants within the implementation time frame are included, the number of registered vessels (2,601) has been used.

There is an assumption that even if a vessel is inactive the skipper / owner will still need to pay the full reporting costs. If a vessel goes to refit and the owner wishes to turn-off the unit, they will need to seek permission from the MMO/IFCA and use a registered engineer to turn-off / turn-on the unit. If the vessel is in port, and thus not undertaking any fishing activity, this will be identified by the geo-fence and the reporting requirement will be reduced (expected to be once every two hours). The airtime cost of running I-VMS is based on a twelve month contract therefore there would be no rebate for time spent in refit for a vessel. Most refits last for two weeks. Anything longer than that and the skipper could have a discussion with the MMO/IFCA.

There is an assumption that funding for purchase and installation will be available for I-VMS units purchased in advance of the statutory cut-off date of 1st April 2021

BIT status/score

This SI is counted as “non-qualifying” as it is a low-cost measure of under £5m.

Rationale for Triage rating

Whilst the new regulation has a financial impact on UK businesses it is below the £5m per year threshold for a full IA and so the regulation qualifies for the fast track on the basis of being “low cost”.

Supporting evidence

1. The policy issue and rationale for government intervention

Well-managed fisheries are critical to achieving a sustainable and profitable industry in the long term. Government intervenes directly in the fisheries sector because without intervention a number of market failures would occur. Fish stocks are defined as common goods for their rivalrous and non-excludable nature. They are non-excludable because without a regulated system of fisheries management it would be almost impossible to prevent someone from fishing in the sea and it is rivalrous because once a fish has been caught it cannot be caught by anyone else. Given the non-excludable aspect, fish stocks may be subject to excessive fishing affecting all users; in this case over-fishing can harm the stocks of fish in the long run leading to stock and industry collapse. Negative externalities also occur as a result of fishing techniques, e.g. fishing gear may damage environmentally valuable habitats.

These market failures mean that the sector is unable to fish sustainably unregulated and provides a strong rationale for government intervention to ensure fishing stocks are preserved for future generations.

Marine fisheries legislation is enforced in England by the MMO and the ten regional IFCAs. The MMO manage and monitor the entire English fishing fleet, quotas for catches and ensure compliance with all fisheries regulation. They also have responsibility for enforcing certain legislation such as fishing vessel licenses and time at sea. IFCAs enforce legislation in the 0-6 nautical mile sea area of their designated districts. They manage their local fisheries through voluntary actions and district-wide byelaws and enforce national and EU technical conservation measures such as to protect juveniles and gear specifications.

There are currently 327 English vessels being tracked using VMS as per EU legislation requirements. These vessels are 12m or over in length and tend to operate further offshore and catch a larger proportion of fish (83% of the total tonnage and 76% of the landed value of fish by the English fleet as a whole⁴), hence they were prioritised for VMS on a risk-based consideration approach. The remaining under 12 metre licensed vessels do not have VMS and we cannot be assured of where they have been operating. We also cannot be sure of what they are catching because of data issues with catch reporting. MMO is currently undertaking a project to introduce digital catch reporting, enforced via a licence condition, for the inshore fleet which will provide more robust and standardised data on what is being caught. The two initiatives combined will give us a more complete picture of fishing across our whole fleet.

The collection of more robust data is important to Defra to enable us to prove our ability to manage fisheries and preserve and increase our fish stocks to meet the government's 2017 manifesto commitments, as well as our own commitments⁵ to build on progress made on sustainability and decisions made using real time data.

Secondary legislation to require licensed vessels under 12m to fit a vessel monitoring system could potentially transform how the government manages fisheries in England. It would allow us to monitor all licensed under 12 metre fishing vessels in English waters and as a result enforcement is likely to improve the following areas:

⁴ This is based on 2017 MMO data.

⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501709/defra-strategy-160219.pdf

- Fisheries Management – including but not limited to: improvements in monitoring quota, spatial management such as Bass nursery areas, closing spatial management loop holes e.g. vessels misreporting their catch to a different area.
- Marine spatial planning and data recording – reliable fishing intensity and spatial and temporal footprints help fishermen identify and protect key fishing areas as well as speed up and reduce costs for marine infrastructure projects because there would be conclusive evidence of where vessels have been fishing.
- MPA Management – we would be better informed as to whether fishing vessels were infringing on these designated areas. A benefit for industry would include finer data on where vessels are operating which could assist in maximising fishing opportunities, such as zoned management within Marine Protected Areas. This means access may be allowed to certain types of fishing in areas where it was previously prohibited.
- Efficiency in targeted inspections – we would have enhanced information to utilise a more informed risk based approach, and allow regulators to identify and pursue high risk vessels.

What is I-VMS?

I-VMS records the accurate location, speed and heading of vessels using a secure tamper resistant system. It sends this information to an established hub using mobile telephone technology. This information can be assessed in near real time, in the field using a secure access web platform and is recorded allowing analysis.

Equivalent systems using satellite technology (Vessel Monitoring System – VMS), have been used by all European fishing vessels over 15m since 2003. A new hybrid system (VMS+) using satellite and mobile phone options has been used on vessels 12m and over since 2013. These systems have been used extensively as enforcement and management tools. In a move to develop a lower cost, more flexible system that would be fit for purpose for the under 12m vessels, the MMO in collaboration with the IFCA's have type approved three I-VMS packages from several suppliers.

Why is I-VMS needed?

We recognise that there is more we can do to improve data gathering and sharing and gain an enhanced understanding of the activities of under 12 metre licensed fishing vessels operating in English waters. We need to create sustainable fisheries for the future through more effective enforcement and informed management.

At present less than 11% of the English fleet (327 12m and over vessels) have a vessel monitoring system on-board. Extending this to the inshore fleet would provide a more consistent approach to the fisheries management of the inshore and offshore fleet⁶. Tracking vessels does not reduce the need for inspections on land and at sea, but it does help make the process more efficient and focussed.

2. Policy objectives and intended effects

⁶ Inshore fleet includes all vessels under 12m in length, Offshore fleet includes all vessels 12m and over in length.

The policy objective is to gain better information on where vessels are fishing by extending vessel monitoring to all licensed British fishing boats under 12 metres in length operating in English waters (with English boats also covered outside of English waters). This will gather greater intelligence on the fishing activity of that fleet, information that we know we are lacking. This improved level of data will inform a number of areas key to managing fisheries in a more fair and efficient way. It will also:

- Assist in the management of MPAs. There are over 250 MPAs and 3000 km² gear closure areas protecting fragile environments. It could also help with our ability to manage MPAs on a finer scale; potentially opening up fishing opportunities to certain types of fishing in areas where it was previously prohibited.
- Provide valuable data that will assist in making future policy, regulation and enforcement decisions more effective and proportionate.
- Provide intelligence in terms of risk based targeted inspections selection.

3. Policy options considered, including alternatives to regulation

Option 0: Do Nothing

Under the Do Nothing situation the under 12m fleet will continue not to have I-VMS. Under this situation we will not have improved understanding of our fisheries putting at risk our sustainability commitments. We will not be able to demonstrate to international stakeholders and trading partners that we can manage our fisheries in a responsible manner.

Additionally by not proceeding with this initiative we jeopardise our ability to realise the full potential of another project, on introducing digital catch reporting to the inshore fleet. The two are intrinsically linked and one is devalued without the other, i.e. you would know what the fishermen were catching but not be assured of where it was being caught.

Also, the white paper on sustainable fisheries states that Defra will consider a targeted scientific trial in English waters to see whether effort controls could provide an effective way to manage some waters or stocks consistent with delivering our commitment to fish at sustainable levels. This would initially be focused on the lowest impact inshore fisheries and would require robust vessel monitoring systems and catch reporting to be in place before any trial could begin in order to evaluate the outcomes and case for any extension of trialling. Clearly, if the I-VMS system is not adopted such an initiative would be seriously jeopardised.

Option 1: England wide Statutory Instrument (SI)

A voluntary approach would not be appropriate to deal with this problem as it would not ensure coverage of the entire fleet. An SI is the simplest and most cost effective way (compared to running several consultations for individual byelaws) of introducing a single joined up monitoring system across England.

In terms of the type of monitoring system to be fitted, two options were considered – I-VMS and AIS (Automatic Identification System).

I-VMS (preferred)

I-VMS is a version of the current VMS system that is in place that the MMO utilises to monitor licensed fishing boats of 12 metres or more in length. I-VMS units are lower cost (compared to VMS) and utilise high frequency reporting, receiving messages using mobile signals on board vessels, and transmit the data onwards. If there is no mobile signal the device will store reports and transmit when in range.

The MMO have undertaken a type approval exercise⁷ to ensure that suppliers providing I-VMS products to all licensed British fishing boats under 12 metres in length operating in English waters implement the I-VMS specification of requirements consistently and correctly.

Any product that meets the device specification requirements and is approved by MMO and IFCA will be seen as effective as a management and control tool and will be listed on the approved register. There is scope to add further devices in the future or remove previously approved devices, offering a degree of future proofing. This is after feedback from the 12m and over fleet stating their dissatisfaction with there being only one approved VMS provider.

Industry are responsible for choosing their preferred device and deal directly with each supplier. The MMO will submit EMFF bids for affected vessels operating in their areas. The MMO will co-ordinate the installation centrally using the project management resource included in the EMFF bid.

The Welsh Government is considering the introduction of legislation to require the use of I-VMS on all fishing vessels operating within Welsh Waters and the Scottish Government is currently considering options for inshore vessel tracking and monitoring with a view to introducing appropriate technology across its inshore fleet by 2020.

AIS

An alternative to I-VMS is AIS. AIS utilises ship to ship radio transmissions and reception, over spare frequencies on the marine radio spectrum. It was originally conceived as a vessel safety system for collision avoidance and supplements marine radar. The transmissions utilised by AIS operate on line of sight, therefore any obstruction between the transmitter and receiver will result in the transmission being reduced or blocked.

Considering both systems on their merits, I-VMS was deemed to be the preferable option, in light of the following points;

- There are reporting crossover issues if we were to use AIS, not just between IFCA's potentially operating different systems, but Welsh Government have also indicated that they see AIS as a safety system and not an enforcement tool. Wales are also considering introducing I-VMS on all vessels under 12m and this will be a requirement for any British fishing boat operating in their waters. AIS alone will not meet those requirements. The North Western Waters Advisory Council (NWWAC) have advised that AIS "...should not be used for control purposes⁸"

⁷https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/516749/IVMS_approval_programme_guide.pdf

⁸http://www.nwwac.org/fileupload/Opinions%20and%20Advice/Year%2012/FINAL_NWWAC_Opinion_APR_2017_EN.pdf

Additionally Marine Scotland will not be using AIS as they have concerns over privacy, coverage and data issues, instead they are currently piloting mobile technology based solutions. Their assessment of coverage concluded;

“With respect to AIS, we have also found problems with the quality of received data. AIS data comes from a variety of receivers of variable quality. If AIS was to be used for statutory data collection purposes, a network of AIS receivers of known location and provenance would be required to ensure data quality.”

- AIS can be switched off, which could cause safety issues for the industry and reputational issues for Defra as we are aware of the possibility that it could be switched off but recommended it as a compliance tool regardless.
- Industry may be reluctant to use AIS as it is an open data source that fishermen could use to identify competitors fishing activity. This was true of a trial undertaken by Marine Scotland where privacy concerns were raised.
- I-VMS on the other hand is a more secure, private system with stringent protocols. Fishers would not see each other's data or location and the data cannot be as easily spoofed or altered. The fact that data can be altered could be used as a defence against any enforcement challenge.
- VMS has been tested, it is working and it has benefitted from improvements over time. We have also built up a valuable relationship with suppliers, frequently exchanging ideas and alerting each other to issues.

Given the scale of this initiative it is recommended that the SI does not specify a timetable for rollout to avoid a prescriptive approach that may not be achievable. Instead we anticipate that the SI will include an end date by which time all relevant vessels must have I-VMS units installed. This date, 1st April 2021, will be supported by a timetable allowing a progressive rollout to help meet the project's technological, logistical and financial challenges.

Feedback from the MMO and IFCA's on proposed SI options involving rollout considerations have highlighted concerns over the magnitude of the task to install around 2,601 units, when it took three years to install 327 VMS and VMS+ units on the larger vessels that have more stable power supply and super structures in place. Therefore it is not a viable option to install the unit on all under 12m vessels in the first year of the policy initiative and a staggered rollout is our preferred approach. A suggested timetable for progressive rollout is outlined in table 9 with the aim of having all licenced vessels equipped with an I-VMS unit by the 31st of March 2021.

4. Expected level of impact on business and government

This section identifies both monetised and non-monetised impacts with the aim of understanding what the overall impact to government and business might be from implementing these options. The economic assessment below aims to reflect these impacts through a cost-benefit analysis. Wherever possible, we have tried to monetise the estimated costs and benefits.

Assumptions used in the calculations

Estimates for the impact on business involves the following assumptions:

- Cost per I-VMS unit is based on the 2018 prices. These costs are based on the number of units bought, therefore prices may fall depending on demand, and it has been assumed that the unit prices are fixed costs.
- The number of vessels included in the analysis is based on February 2018 data that has been derived from an MMO registration and licencing database. Registered vessels with unknown home ports where assigned to the IFCAs admin port.
- Reporting costs are based on an annual 3 minute reporting interval, this has been deemed most practical and balances the monitoring needs against the storage and capacity of the VMS hub. An average of the reporting costs across all three suppliers is used, in addition to low and high estimates. Suppliers have agreed that reporting costs will remain as described below regardless of the reporting interval period.
- The initial rollout of I-VMS units is eligible for EMFF funding, however costs to replace the units and the cost of units for new entrants outside the policy timeframe is not⁹, therefore will need to be borne by the industry. The cost to new entrants has not been included in the cost-benefit analysis due to the high level of uncertainty in the evidence (see details below).
- The cost to replace an I-VMS unit is based on the assumption that the device would need to be replaced at some point after 5 years of purchase but can potentially last longer. The costs are based on the assumption that for the best estimate in year 6 and onwards, every year 20% of vessels would need to change the device. The low estimate is based on a 10% replacement rate and the high case scenario where all I-VMS devices would need to be changed after 6 years from the installation. The costs are based on the proposed rollout approach across the 10 year appraisal period.
- The extended warranty costs have been calculated based on the information provided by the suppliers. The costs are not added to the overall calculations as businesses will only purchase the extended warranty if the marginal benefits received from the warranty outweigh the marginal costs¹⁰.
- The calculations over the 10 year appraisal period are based on the proposed timetable for rollout. The purpose of this approach is to target larger vessels that could potentially have a bigger environmental impact. Table 9 outlines the proposed timetable for rollout based on vessel length. We will have more information as to the practicality of the proposed rollout after a number of trials that are due to take place next year are concluded and implementation issues are ironed out. This information will be used to revise the proposed timetable and calculations in the final RTA.

Option 0 – Do nothing

This option represents the baseline scenario under which Defra will not implement the policy, and therefore vessels under 12m will not be legally required to have a monitoring system on board. This option presents the status quo and as such its Net Present Value (NPV) is zero. Although there is no monetised cost to this option, there

⁹ The Treasury has guaranteed funding for all EMFF funded projects that have been approved by the EMFF board before the UK leaves the EU.

¹⁰ The extended warranty figures are based on 2017 prices, and therefore are likely to change.

is a social cost of the preservation of fish stocks and the longer term issue of reduced fishing stocks affecting fishermen's income.

The costs and benefits of option 1 is measured relative to those of this option, and are based on the most robust and up to date analysis available.

Option 1 – SI mandating I-VMS be installed on all under 12m vessels

Cost of Implementation to government

The Chancellor announced on the 24th of July 2018 that all EMFF projects approved before the UK leaves the EU on 29 March 2019 will be fully funded under a Treasury guarantee, even when these projects have not completed by the UK exit date. Since then, the Withdrawal Agreement confirmed the intention that the UK will continue to participate in all EU programmes financed by the Multiannual Financial Framework (2014-2020) until their closure. Therefore it is expected that EMFF will continue to be open for new projects until 2020. EU funding for UK participants and projects will be unaffected by the UK's withdrawal from the EU for the entire lifetime of such projects.

Device and installation costs

The proposed legislation is applicable to 2,324 UK licensed vessel operating in English waters. However, the total number of registered vessels (2,601) has been used to calculate the cost of the project as the number of licensed vessels can fluctuate. The average cost of each device is around £1,266 including installation¹¹. MMO are satisfied that the device and installation costs for each UK registered under 12m vessel are eligible for EMFF funding. As cost calculations are based on the number of registered vessels, any excess funding once project is completed will be returned. See table 7 in summary section below for total costs in present value terms.

As implementation will be through a staggered approach (based on vessel length, see implementation plans below), costs will occur in years 1, 2, and 3. Full proposed staggered rollout timetable is outlined in table 9 below. Table 1 shows the cost to government showing the best, low and high estimates. The low and high estimates are based on the lowest and highest costs provided by the supplier.

Table 1- Discounted cost to government (rounded to the nearest '000)

		Trial ¹²	Year 1	Year 2	Year 3	Total ¹³
Number of units installed		145	586	987	883	2,601
Cost of I-VMS and installation	Best estimate (£) (£1,266 per unit)	183,000	717,000	1,166,000	1,007,000	3,074,000
	Low (£) (£1,032 per unit)	150,000	584,000	951,000	822,000	2,507,000
	High (£) (£1,577 per unit)	229,000	893,000	1,453,000	1,256,000	3,830,000

¹¹ The cost of units do vary depending on which supplier is chosen and the quantity bought. We received unit cost information from 3 suppliers, and calculated the average. The unit costs are based on 2018 prices.

¹² These costs refer to the vessels that will be part of a trial (194). These numbers are subject to change, and once trials have started we will be better informed of the practicality of the proposed rollout. Base year is 2017. [This covers all different sizes of vessels.](#)

¹³ As these figures have been rounded, the sum of the years may not add up to the total.

Project Coordination costs

The project will be funded by EMFF. The costs are based on 2 FTE based in Newcastle (Table 2 shows the best estimate costs). The project coordination costs will only occur in the first 2 years of the 10 year appraisal period as MMO aim to get vessels scheduled for future installation as early as possible and project coordination will slowly be absorbed into business as usual. Expenses per FTE have also been included to cover travel to IFCA districts.

Table 2- Discounted project coordination costs (rounded to the nearest '000)¹⁴

Project Coordination costs	Year 1	Year 2	Total
Best Estimate (£)	71,000	68,000	139,000

Cost to industry

The cost to industry would be limited to reporting costs, ongoing repairs, replacement costs and the option of purchasing a warranty once the initial warranty has expired.

Reporting costs

Annual reporting costs are based on the three minute reporting intervals from the I-VMS unit to the reporting hub (it requires no additional effort from the fishermen). These will average at around £142 per vessel based on information received from suppliers. Please see table 3 and 4 for more details. Table 4 below outlines the discounted average reporting costs per annum showing the best, low and high estimates once all under 12m vessels have I-VMS installed. Please note the best estimate is calculated using the average reporting cost across the three suppliers, the low estimate uses the lowest reporting cost and the high estimate uses the highest reporting cost provided.

Table 3 – Annual reporting cost per supplier

	Supplier A	Supplier B	Supplier C
Annual Airtime (3m reporting) including VAT	£168	£114	£144

Table 4 – Discounted annual reporting cost for business year 1 to 10 (rounded to the nearest '000).

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total ¹⁵
Number of Vessels	145	731	1,718	2,601	2,601	2,601	2,601	2,601	2,601	2,601	2,601
Best estimate (£k) (£142 per year)	21	100	228	333	322	311	300	290	280	271	2,457
Low (£k) (£114 per year)	17	81	183	267	258	250	241	233	225	218	1,972
High (£k) (£168 per year)	24	119	269	394	381	368	355	343	332	321	2,907

¹⁴ Only best estimates have been included due to not having a low and high hourly wage.

¹⁵ As these figures have been rounded, the sum of the years may not add up to the total.

Ongoing maintenance costs

There are no known ongoing maintenance costs, i.e. they do not need to be serviced each year. It will be a matter of whether damage is incurred and the severity. This is therefore not possible to quantify.

Extended Warranty Costs

Each supplier has a different warranty length and one of the suppliers was unable to provide an extended warranty cost as they could not work this out until they were certain of how many units they sold. In terms of warranty cost this is not considered to be a burden on business as it is a decision for each individual to make and will depend entirely on their risk appetite and personal choice. Warranty cost can be excluded from the cost benefit analysis as the marginal benefit will outweigh the marginal cost, i.e. a rational consumer will only purchase an extended warranty if the benefits of holding a warranty outweigh the costs for the warranty itself. Therefore the cost to the industry would either be zero or the consumer would benefit from the extended warranty, hence we do not consider this cost in the calculations. For information the known costs are provided in table 5 below.

Table 5 – Extended warranty costs (rounded to the nearest ‘000) based on 2017 prices.¹⁶

	Supplier A	Supplier B	Supplier C
Warranty offered	24 months	24 months	12 months
Extended warranty option	N/A	£144 or £360 pa*	£120 pa
Extended warranty cost for 2,601 vessels	N/A	£375,000-£936,000	£312,000

* Two different warranty types are on offer

Replacement of initial I-VMS units

In terms of lifespan of the I-VMS units only one supplier responded and stated that their device would work for longer than five years, but similar to a mobile phone, become outdated at that point. It has therefore been assumed in working out the cost over the given ten year period that a number of the devices will need to be replaced in that time, at a cost to the fishermen. The worst case scenario (high estimate) is that in year six all fishermen who had their I-VMS installed in year 1 will need to replace their unit but then should not need to do so for another period of around five years. Additionally it is likely that in future years I-VMS units may cost less and reduce in size as we see technological improvements.

Table 6 below outlines the replacement costs from year 6-10, showing the best, low and high estimates. The low and best estimates are based on the assumption that 10% and 20% of units over five years old will need to be replaced each year respectively, throughout the reporting period, and this cost will become an on-going cost until the end of the reporting period. The cost of the device including installation was used to calculate the replacement costs. The cost of approximately £1,266 per unit was used to calculate the best estimate, the lowest priced unit (£1,032 per unit)

¹⁶ Prices are based on 2017 prices and therefore are subject to change.

was used to calculate the low estimate and the highest priced unit (£1,577 per unit) was used for the high estimate¹⁷.

Table 6 – Discounted cost to replace I-VMS unit (rounded to the nearest ‘000).

Cost to replace I-VMS unit		Year 6 ¹⁸	Year 7	Year 8	Year 9	Year 10	Total ¹⁹
Number of units eligible to be replaced for best estimate assumption		145	702	1,549	2,122	1,698	
20% units replaced every year	Best estimate (£1,266 per unit)	£31,000	£145,000	£308,000	£408,000	£315,000	£1,270,000
Number of units eligible to be replaced for low estimate assumption		145	717	1,632	2,352	2,116	
10% unit replaced every year	Low (£1,032 per unit)	£13,000	£60,000	£132,000	£184,000	£160,000	£550,000
Number of units eligible to be replaced for high estimate assumption		145	586	987	883	-	
100% units replaced every year	High (£1,577 per unit)	£193,000	£752,000	£1,223,000	£1,057,000	-	£3,225,000

Cost to New entrants

There is a possible impact to new entrants into fishing that incumbents will not face, e.g. after EMFF funding is not available (post March 2021), entrants will have to purchase a new device and have it installed at their own cost if alternative funding is not available. At this stage we are unable to predict the number of new entrants post March 2021. Any new entrants during the implementation of the policy will be eligible for funding, as these numbers will be captured in costs²⁰.

Table 7 outlines the business start-up costs.

Table 7 – Summary of cost to new entrants

Asset	Range of costs ²¹
Fishing boat	£20,000 - £340,000
On-board electronic equipment	£1,000 - £20,000
Fishing gear	100 pots, e.g. £5,000 Trawl gear, e.g. £20,000
Safety equipment for workers	£2,000
Fishing handling equipment	£1,000 - £10,000
Fishing vessel licence and entitlements	£20,000 - £50,000

¹⁷ The cost of units do vary depending on which supplier is chosen and the quantity bought. We received unit cost information from 3 suppliers, and calculated the average. The unit costs are based on 2018 prices.

¹⁸ Based on the assumption that units will need to be replaced after 5 years but can potentially last significantly longer.

¹⁹ As these figures have been rounded, the sum of the years may not add up to the total.

²⁰ The number of registered vessels is used to calculate costs to absorb any new entrants during the policy implementation.

²¹ Data collected by Seafish

Fixed Quota Allocation units	£0 - £1 million
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As there are a large range of start-up costs, it is difficult to include these costs into the overall calculations. Costs would vary depending on business needs and their ability to finance different assets. The Seafish report on the economics of the UK Fishing Fleet states that the average annual operating costs was approximately £36,000 for under 10m vessels²². As a percentage of cost, reporting cost would represent less than a 0.4% increase in yearly operating costs. The outlay for a new I-VMS unit would represent a 2.6% increase in operating costs, but would not be a yearly cost, rather until the unit failed or became obsolete. This shows the cost to purchase and install the device is relatively small in relation to the other start-up and ongoing costs (e.g. fuel) that businesses face. The cost therefore is not deemed sufficient as either a barrier to entry or as a new overhead for existing businesses.

Considering these factors and the high degree of uncertainty, cost to new entrants post March 2021 have not been included in the calculations.

Additional Costs

In line with the existing legislation that governs vessels of 12m and over, there is the possibility that offences will be committed against this policy which may be penalised. These measures are not practical to quantify as each case differs, but include (not limited to):

- it will be an offence to tamper with an I-VMS device; and
- it will be an offence to sail without a functioning device.

The I-VMS unit will provide data demonstrating non-compliance with regards to fishing in areas that are protected or where quota is not held.

Following standard Impact Assessment methodology, these additional costs are out of scope as we assume 100% compliance with provision. However, where this turns out not to be the case there may be additional costs for the criminal justice system. A justice impact test is being undertaken.

There is the possibility that an increase in the number of vessels being monitored and potentially investigated will require additional VMS operator resource.

In terms of administrative burden, there should be no additional obligation from this initiative, e.g. no requirement for the skippers to complete paper or electronic based returns. The only additional burden that may be incurred is during installation and in replacing the unit (if required).

Benefits

This proposal will deliver a number of benefits to industry, government and the wider marine sector and the environment. It is not possible to quantify these due to their mostly intangible nature, but a qualitative assessment follows;

Benefits to industry include (but not limited to):

- I-VMS is a key tool in helping achieve a culture of compliance within the fishing industry.

²² http://www.seafish.org/media/publications/Quay_Issues_-_Economics_of_UK_Fishing_Fleet_-_2016_interactive_version.pdf

- With higher frequency data of where vessels are operating, finer scale management can assist in maximising fishing opportunities, such as zoned management within MPAs, and create a more responsive management system. This means access may be allowed to certain types of fishing in areas where it was previously prohibited.
- Ability to provide consumers with accurate information of catch locations which may improve consumer confidence when purchasing local fish.
- A number of I-VMS devices have safety at sea functionality and the tracking aspect may assist with recovery and swifter payment of insurance claims in case of loss or damage of vessel at sea.
- Ability to prove that the UK is taking appropriate steps to fish more sustainably and as a result the industry is able to market it as such.
- I-VMS will ensure the inshore fleet can trade with countries that require catch certificates, a requirement of which is to include (and verify) where the fish have been caught.
- From the fishermen's point of view the data captured could be used to develop business plans.
- Previously we have required fishermen to demonstrate they have a track record in catching a certain species of fish. If they have I-VMS and catch reporting data they could meet this requirement, e.g. for bass²³.
- Over the last decade there has been an increase in Offshore Windfarms, MPAs and Marine Infrastructure developments which has had an impact on inshore fishing fleets. At present there is very limited data that these fishermen can use to engage in consultation processes.

Benefits to government and other public sector organisations;

- Key tool in ensuring features of MPAs are effectively protected, decisions on marine habitats and Habitats Regulations Assessment (HRA) processes are better informed.
- Improved intelligence allows more targeted inspections and reduces guesswork and improves risk assessments.
- A clear and simple regulatory option (reduces the need for 10 independent IFCA by-laws and MMO by-laws).
- IFCAs and MMO can ensure that costly at-sea surveillance is targeted at specific, high risk vessels.
- I-VMS data will feed into the VMS hub which is accessed by the Devolved Agencies and IFCAs who can use the data to support intelligence led, joint operations.
- English Heritage have highlighted the potential of the I-VMS initiative in terms of protecting shipwrecks and war graves.

Summary of Costs (calculations for best estimate)

Table 8 below shows a summary of the best estimate discounted costs to the government and business over the 10 year appraisal period, totalling to around

²³ <https://www.gov.uk/government/publications/bass-fishing-guidance>

£6.882m. The costs borne by business come from reporting costs and replacing the I-VMS unit.

The best estimate of the Equivalent Annual Net Cost to Business (EANCB)²⁴ is £0.4m. This is calculated by dividing the total cost to the industry (£3.66m) by the annuity rate²⁵ for a 10 year period (8.61). This suggests a relatively small burden on business as the one-off costs of the unit and installation is covered by EMFF funding. This cost should be seen in context of the non-monetised benefits to business from installing I-VMS as shown in section above.

Table 8– Summary of best estimates of discounted costs over the 10 year appraisal period (2018 prices, rounded to the nearest 0.01m)²⁶

Costs	Total (£)
Cost to Government/EMFF funding	
Cost of I-VMS and installation	3.07m
Project Coordination Cost	0.14m
Total Costs to Government/EMFF funding	3.25m
Cost to Business	
Reporting Costs	2.46m
Cost to replace I-VMS unit	1.21m
Total Costs to the industry	3.66m
Total Costs	6.88m²⁷

Rationale and evidence that justify the level of analysis used in the RTA (proportionality approach)

The analytical approach taken in this assessment is proportionate, and uses available data to conduct the analysis. In order to gather evidence for the assessment, we have consulted with suppliers, MMO, IFCA and with Seafish (a levy body representing the UK seafood industry).

We aim to gather more information in the consultation stage, which will be reflected in the final RTA.

Summary and preferred option with description of implementation plan

The preferred option is to mandate installation of I-VMS units on all inshore vessels via SI (option 1) this will meet the objectives of the policy and realise the potential benefits. It offers a greater degree of consistency than using by-laws or licence conditions have been considered.

However given the scale of this initiative it is recommended that the SI provides the flexibility to allow for a staggered rollout in order to allow for a smoother transition to meet the technological, logistical and financial challenges. Feedback from the MMO and IFCA on proposed SI options involving rollout considerations have highlighted concerns over the magnitude of the task to install around 2,601 units, when it took

²⁴ This figure is adjusted using the GDP deflator and discounted back to the base year.

²⁵ The annuity rate takes into consideration the time period of the policy and the discount rate of 3.5%.

²⁶ Annual costs could not be calculated due to implementation being through a staggered approach as costs would vary from year to year. Therefore, the costs are the total costs over the 10 year appraisal period.

²⁷ Due to rounding, there is slight discrepancy in the total cost figure

three years to install 327 VMS and VMS+ units on the larger vessels who have more stable power supply and super structures in place. Therefore it is not a viable option to install the unit on all under 12m vessels in the first year of the policy initiative, and a staggered rollout is the only viable option. A suggested timetable for progressive rollout is outlined in below with the aim of having all licenced vessels equipped with an I-VMS unit by March 2021.

Table 9 below outlines the proposed timetable for rollout based on the size of the vessel. The purpose of this approach was to target larger vessels that would potentially have a bigger environmental impact.

Table 9-Milestone for I-VMS rollout

Completion Date	Process	Number of vessels affected
April 2019	Staggered rollout commences with vessels 9m to 11.99m in length	N/a
September 2019	All licensed fishing vessels of 9m to 11.99m in length to have an I-VMS device installed	722(this includes 136 vessels from trial plus 586 vessels from rollout)
October 2019 - June 2020	All licensed fishing vessels 6m to 8.99m in length to have an I-VMS device installed	995 (8 vessels from trial plus 987 from rollout)
July 2020 – June 2021	All licensed fishing vessels up to 5.99m in length to have an I-VMS device installed	884(1 vessel from trial and 883 from rollout)
		2,601

The MMO has Project Manager Resource assigned, has an experienced IFCA colleague as Senior Responsible Officer and has several project boards set up. The project is responsible for the effective rollout of the devices across the country working closely with the IFCAs to do so.

There are pilots which are taking place that will provide an indication of how many units could be rolled out in a given time and will provide lessons learned to aid future implementation and drafting of the SI. In the interim suppliers could also develop solutions that may ease some of the concerns over installation, e.g. one supplier has produced a solar powered device which could mitigate the power supply issues on smaller vessels. MMO are confident that the I-VMS device has been more rigorously tested both in-house and at sea compared to the VMS and VMS+ devices installed on over 12m vessels and so some implementation risks can be mitigated.

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