

# VESSEL TRACKING SOLUTIONS FOR SCOTTISH SCALLOP FISHERIES



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Open Seas has learned of frequent instances of illegal scallop dredging inside Scotland's network of marine protected areas, and built strong enough evidence to report on several of these. These have spanned a number of years and have not been deterred by the existing regime of Scottish fisheries compliance patrols. This has triggered calls for robust vessel tracking systems to be deployed on the fleet – technology has vastly outpaced enforcement but fisheries management still relies on reporting landings to 30x30 nautical mile squares. This briefing outlines the current vessel monitoring situation, and discusses the various options being considered to resolve it.



DREDGE DAMAGE AND BARREN SEABED INSIDE GAIRLOCH PROTECTED AREA - NOVEMBER 2018

## WHERE ARE WE?

### Automatic Information Systems

In 2002, a system was established which required information regarding vessel identification, location, course and speed to be fitted and maintained in operation on all ships greater than 300 Gross Tonnes<sup>1</sup> (in fishing fleets, this is normally around 20m and above<sup>2</sup>). In 2009, rules extended this to be required on all fishing boats greater than 15 metres in length by 2014<sup>3,4</sup>. This system, known as Automatic Information Systems (AIS), is primarily designed as a collision avoidance system and operates by transmitting and receiving vessel position and speed information using radio transmissions. It is free and essentially transparent to anyone with a receiver (or access to the network of receivers and low orbit satellites!). Swedish Authorities are looking to require this technology on all vessels larger than 8m and use it for enforcement – the industry there has welcomed this because of the cost, and because it can transmit regularly. Downsides are that it can be “spoofed” with simple technology, readily available online<sup>5,6</sup>. Moreover, **although it is already a legal requirement on vessels longer than 15m, it appears this is not enforced by Scottish authorities.**

### Vessel Monitoring Systems

In 2009, the EU-wide ‘control regulations’ were established which require that all fishing vessels greater than 12 metres in length to be equipped with devices allowing Governments “to automatically locate and identify [fishing] vessels”<sup>7</sup>. The technical specification of these devices stipulates that data should identify the vessel and provide “location, course and speed”, it should be transmitted “at least once every two hours”<sup>8</sup> and through a satellite network. The most recent geographical position of the vessel must be reported with a position error of less than 500 metres and the devices are collectively referred to as “Vessel Monitoring System”, VMS. There are three main problems with this system. (1) Data is transmitted only once every two hours, and **vessels can enter, fish and depart a protected area in this time** (though fisheries managers can increase this rate in exceptional circumstances); (2) There are about **4,500 fishing vessels in the UK fleet smaller than 12m which are exempt from using it**; (3) The devices are generally **not tamper-proof** and there are reports of the devices being manipulated; (4) **each transmission costs the vessel, disincentivising regular ‘pings’.**

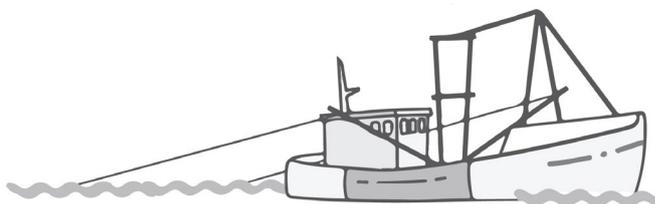
In Shetland, this system has been partially enhanced, and the inshore scallop dredge fishery there has implemented vessel monitoring on around 60% of its fleet. The VMS used here reports every 10 minutes and is used to monitor compliance with closed areas and curfews<sup>9</sup>.

### Fully Documented Fisheries

In July 2017 the Scottish Government established **Fully Documented Fishery (FDF)** rules for scallop vessels fitted with more than 8 dredges per side of the vessel (i.e. the larger scallop dredgers)<sup>10</sup> and operating in inshore waters. This system requires not only that location, time, speed and course be recorded at least every 10 seconds, it also uses sensors on fishing gear to record when they are deployed and cameras to observe catch and bycatch. This system appears to be very powerful and highly effective in better understanding the behaviour of the fishery. This system is considered to be a highly effective means of monitoring the scallop fishery, for both compliance and fisheries management purposes. However, the majority of the vessels using dredges in inshore waters are small, do not carry more than 8 dredges on each side of the vessel and, as such, there has been no incentive for them to fit this sort of system. **Currently only about 14 of the 94 scallop dredgers registered in Scotland are fitted.**

### The English System (iVMS)

English coastal waters are managed by the Marine Management Organisation (MMO) and Inshore Fishery Conservation Authorities (IFCAs), which now require that all fishing vessels using inshore waters are fitted with approved inshore vessel monitoring systems (iVMS). One of the distinguishing characteristics of iVMS is the use of mobile phone (GSM/GPRS) to transmit position reports, rather than satellites. These devices are required to provide vessel course, and location to an accuracy of 5m up to once every minute. The devices transmit the data over the mobile phone network and when out of signal, store the data for up to 3 months, and send it on once signal returns<sup>11</sup> – clearly this is an issue which would be needed in Scotland where mobile phone reception is often very poor. There are currently three equipment providers which meet these requirements<sup>12,13,14</sup>. The devices cost between £650 - £900 including fitting, and around £200 per annum in operation<sup>15</sup>. Critically, the GPS and the transmitter are stored within a tamper proof black box, and when faulty or not transmitting, an approved engineer must be called to fix them at the vessel's expense. This disincentivises unauthorised interference.



TYPICAL SCALLOP DREDGER SEEN IN SCOTTISH INSHORE WATERS

## WHAT IS PLANNED?

### Government Announcements

In September 2018 Scottish Fisheries Minister announced that the Scottish Government would commit £1.5m to “enhance the monitoring of under-12m vessels”<sup>16</sup>. The commitment first indicated that Marine Scotland will only establish this system in 2020<sup>17</sup>, but in response to press they have since stated it will come into effect “in 2019” for higher risk vessels<sup>18</sup>. The Scottish Government have yet to define the approach they will use. However, there are approximately 1,643 vessels in Scotland under 12m in length<sup>19</sup>, this would mean there is around £900 a boat being made available by Scottish Government, should this investment all go to that part of the industry.

### Scottish Inshore Fisheries Integrated Data System

Through the Marine Alliance for Science and Technology Scotland (MASTS), the University of St Andrews leads the Scottish Inshore Fisheries Integrated Data System project (SIFIDS)<sup>20</sup>. The project aims to develop open-source systems and processes to inform fisheries management and marine planning, and is not specifically designed as a fisheries compliance tool. The SIFIDS project is prototyping automated equipment and processes that may allow the inshore fishing industry to participate in data collection, including through the equivalent of iVMS and gear sensors. A mobile App to track vessels, and record catch and other data is also being tested.

The project is scheduled to end in May 2019 and will provide the prototype integrated data collection system, alongside recommendations for future adoption of an integrated data collection system which could be deployed across the inshore fleet, harvesting a range of data and monitoring non-compliance.

## WHAT DOES OPEN SEAS RECOMMEND?

We have met with fishers, fisheries managers, technologists and scientists to learn more about the needs for any system in Scotland.

### Technology

Discussions we have had lead us to believe that **the existing AIS and VMS systems are inappropriate for Scottish inshore waters** - not least because the requirement for AIS is not being enforced. We believe that new, alternative approaches are needed.

There is a range of tracking technology available. BlueTraker I-VMS, Succorfish SC2 and Marine Instruments Watching Man Pro have been ‘type approved’ for use in the English IFCAs. In addition to these the AnchorLab system used in Danish mussel dredge fisheries is also available<sup>21</sup>. A further option using Succorfish and AIS in parallel is also being discussed. **Our view is that any of these systems would be appropriate.** Our view is that a system is suitable provided that the following conditions are met,

- **The device should be ‘blackbox’,** i.e. it should contain its own GPS and its own transmitter, and be tamperproof.
- **The device should record locations at a minimum 1 minute intervals.**
- **The device should be able to transmit data using mobile phone networks and, when out of signal, store for up to 3 months,** and send at a later date.
- The device or a connected, separate device should be able to **detect when gear is being deployed or retrieved,** i.e. through gear sensors.

**Additionally, we view the FDF system (which is already being trialled on 14 scallop dredge boats) as the gold standard for the scallop dredge fishery.**

### Data

The system will only work if the data stemming from these devices is properly used. In the case of the scallop FDF system, despite the fact only 14 boats took part in the trial, **only around 12% of the hauls undertaken by vessels in the trial have ever been analysed.** Technology allows analysis to be streamlined and scaled. However, Government must still invest properly in empowering its staff to investigate the evidence.

It is extremely important that the data resulting from these devices is held in a centralised, public and domestically stored database.

**The storage and maintenance of data must not fall to a third party,**

**private enterprise.** The data is needed to inform the sustainable use of a public resource - it is therefore essential that any data management system is robust, publicly-owned and resilient. Existing EU legislation already requires that data is ‘accurate, reliable, stored safely and made accessible’<sup>22</sup>, specifically there are established requirements which mean that it should be available to “end-users of scientific data and other interested parties”<sup>23</sup>. Placing it in private databases risks placing barriers in the way of any subsequent use, and potentially in different jurisdictions.

### Roll Out

Open Seas is of the view that the roll out of the technology should be done in a fair and appropriate way, where Government provide resource to vessel owners to fit the equipment. Elsewhere in the UK, such support has been given and has been time-limited, this has incentivised vessel owners to fit the equipment quickly. It is not clear how the European Marine and Fisheries Fund (EMFF) will be replaced following Brexit, however, we note **EMFF currently provides specific funding to support traceability and monitoring systems.**

Although the approach taken in the English IFCAs, to force the vessel to employ an engineer for any technology malfunction, may be seen by some as penalising vessel owners, it has proved to be a powerful disincentive to tampering. We would recommend this, or other similar approaches to ensure that vessel tracking is maintained in operation.

## CONCLUSIONS

The need for vessel tracking is not a new problem nor is it one experienced by Scotland alone. There has been a legislative gap which has led to large vessels being inappropriately tracked, and vessels smaller than 12m not being tracked at all. An increase in the number of reports of illegal and damaging fishing in protected areas shows there is a desperate need for it, and political declarations in Scotland indicate a desire to resolve it. In England plans are already set out to deploy it across the entire inshore fleet<sup>24</sup>.

Existing technologies are available which adequately resolve the issue, and in Open Seas’ view, provided a set of conditions are met (including that the devices are tamper proof, able to store-and-send, and recording at a minimum of once a minute) technology is not a barrier to deployment.

**For high risk fisheries, which have potential to cause serious environmental harm, Open Seas contends there are immediate solutions. For example, license conditions for all scallop dredge vessels should be urgently revised to require adequate vessel monitoring.**

**The argument for this is clear: Scottish Government need to invest in protecting our seas, and delivering truly sustainable seafood.**

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