**Supplementary Material 2**

**Case study fisheries**

*Lobster and crab fishery in Scotland*

European lobster (*Homarus gammarus*) and brown crabs (*Cancer pagurus*) are caught using baited pots known as creels. The majority of fishers use D-shaped lobster creels or parlour creels (Marine Scotland Science, 2017), which can be deployed individually or in strings, where a number of pots (usually between 10-40) is attached to one long rope. Trips are conducted mainly during the day. After leaving port fishers steam at high speeds to desired locations where pots have been previously deployed, usually one to a few days before. The skipper decreases the speed of the vessel to hook the gear’s marker buoy and begins to haul the pots. The movement of the vessel depends on the turning rate of the mechanical hauler (rotating drum) used to retrieve the creels and the effects of wind and currents acting upon the vessel. The line of creels or pots usually offers sufficient resistance (drag) to cause the vessel to align in the direction of the string, the vessel effectively pivoting on the hauling device. Once onboard, the creel is opened, and its contents sorted. Crabs and lobsters above the minimum legal size are retained, and the rest is discarded. Creels are then quickly re-baited and positioned at the back of the boat in an ordered manner to allow creels and lines to be deployed at intermediate to high speeds.

Highly resolved spatial data were collected by on-board observers during 74 fishing trips (889 hauls) from 59 different fishing vessels that took place May 2017–July 2018, as part of the Scottish Inshore Fishing Integrated Data System (https://www.masts.ac.uk/research/emff-sifids-project/) project. For each trip, positions were recorded at 60 second intervals (Mendo et al., 2019a) using a handheld Garmin Etrex 20. Observers also recorded the target species, numbers of creels deployed in each haul, and the start and end time of hauling events.

*Norway lobster fishery in Scotland*

Norway lobstersare caught using baited pots, specifically D-shaped creels similar to lobster pots, only lighter. These creels are usually deployed in sets of 40 to 100 pots per string. The trips and fishing operations are conducted in a similar way as described above for the lobster and crab fishery.

Highly resolved spatial data (every 60 seconds) were collected by on-board observers during 38 fishing trips (364 associated hauls) from 33 different fishing vessels that took place May 2017–July 2018, as part of the Scottish Inshore Fishing Integrated Data System (see above). For each trip, positions were recorded at 60 second intervals using a handheld Garmin Etrex 20. Observers also recorded the target species, numbers of creels deployed in each haul, and the start and end time of hauling events

*Hake gillnet fisheries in Peru*

Gillnet fisheries in Los Órganos target mainly hake, which is one of the most important resources for artisanal fisheries in the north of Peru. While hake is landed in about 10 fishing communities, the Los Órganos community is one of the most important in terms of landed weight (IMARPE, 2020). This fishery underpins the economic activity of many families and is fundamental for local, regional, and national food security. Trips start at night, usually after 10 pm. Fishers steam to fishing grounds, set a net at high speeds (comparable to steaming speed) and turn off the engine. The vessel then drifts while the crew rests until dawn (around 6 am) when there is sufficient daylight to operate without artificial lighting. The vessel steams back to the location where the net was set and, once roughly in the area, the skipper decreases the speed of the vessel to look for the marker buoys (no navigational aids are used). When found, the skipper approaches one end of the net fleet at low speed, and further decreases the speed of the vessel to hook the marker buoy and begins to haul the net with a rotating drum. The catch is sorted immediately, and the net is carefully placed at the back end of the vessel. Once the entire net fleet is on board, the vessel steams back to port at high speeds.

Highly resolved spatial data were collected by on-board observers in 101 fishing trips from 15 vessels that took place between January and March 2019. For each trip, positions were recorded at 180 second intervals using a handheld Garmin Etrex 20. Observers also recorded the date, target species, and the start and end time of hauling events. Information on the length of the net was obtained by interviews with fishers. Fishers reported the number of fishing panels they were deploying, which are approximately 50 metres long each and total net length (in metres) was estimated by multiplying number of panels x 50.

*Gillnet fishery in Denmark*

Traditionally, Danish gillnetters operating in the Western Baltic Sea target mostly Atlantic cod and European plaice, with seasonal shifts to other valuable commercial species e.g. lumpsucker, Atlantic mackerel (*Scomber scrombus*), or turbot (*Scophthalmus maximus*). A drastic reduction in cod quota, following the recent collapse in cod stocks in the region, led some gillnet fishers to relocate their fishery to areas where cod densities are lower e.g. on sandy bottoms instead of mussel beds. In this coastal fishery, vessels generally go out on daily trips lasting 3-10 hours depending on the amount of gear to be deployed. When targeting flatfish (and cod), nets are set during the day and left soaking for between 24 and 72 hours. A fisher will sometimes also set a net near shore right outside the harbour while leaving and haul on the way back a few hours later. Targeting lumpsucker or turbot requires fishers to leave their nets soaking for extended periods that can last for a week or more. In all cases, the fishers typically steam toward the known location of their fishing gears usually marked on their plotter. Once in the area, they find a floating marker (flag) identifying one end of the net fleet from the surface and approach it at low speed. The rope connecting the flag to the net fleet is passed in a mechanical hauler, which then gently pulls the net fleet onboard. The vessel accompanies the net retrieval at very low speed to avoid damaging the gear. Depending on net fleet length and the amount of catches, a normal hauling operation may last from 20 minutes to more than one hour. Once hauling is finished, the fisher often re-sets the net in the same location if the catch was satisfactory, or steams to a new location. Setting is always done at intermediate speed and parallel to the direction of the current.

Highly resolved spatial data (every 10 seconds) were collected from 2016 to 2021, using an electronic monitoring (EM) system installed onboard one gillnet vessel, totalling 745 fishing trips. For each trip, the entire fishing activity of that vessel was recorded. The position (start and end) of 3383 pairs of sets and hauls, as well as the duration (in hours), and length (in meters) of each fishing operation were estimated with the help of the GPS tracks and video recordings of the activity on deck. Soak time (in hours) was calculated as the difference between the mean time of setting of a net fleet and the mean time of hauling of the same net fleet.

*Iceland longline fishery*

Icelandic longliners target mostly Atlantic cod, with haddock (*Melanogrammus aeglefinus*), Atlantic wolfish (*Anarhichas lupus*), common ling (*Molva molva*), and blue ling (*Molva dypterygia*) also captured regularly. The fleet is composed of around 90 vessels, 85% of them being less than 15 meters, the larger vessels ranging from 30 to 60 meters in length. In general, each setting is completed before another setting is made. Captains are required to make recordings of each setting, at minimum the date, position, number of hooks, and catch by species. In addition, captains can record the start and end time of hauling. The median time of the hauling process is around 8 hours for the smaller vessels and around 19 hours for the larger vessels.

For the fishery in Iceland AIS/VMS signalling are a mandatory requirement for all vessels, primary used for real-time continuous safety-at-sea monitoring by the Icelandic coastguard. There is thus no incentive to turn off AIS signals, because that would result in SAR response within the hour. The positional and speed data are collected at around 10-minute resolution. This information was used in conjunction with captains reporting of start and end time of a setting to spatially demarcate the fishing event.