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MRV *Scotia*

Survey 1720S

PROGRAMME

8-13 November 2020

Ports
Loading: 05 November 2020, Aberdeen
Departure: 08 November 2020, Aberdeen
Half Landing: NA
Arrival and Unloading: 13 November 2020, Aberdeen

In setting the survey programme and specific objectives, etc the Scientist-in-Charge needs to be aware of the restrictions on working hours and the need to build in adequate rest days and rest breaks as set out in Marine Scotland's Working Time Policy (Lab Notice 34/03). In addition, the Scientist-in-Charge must formally review the risk assessments for the survey with staff on-board before work is commenced.

In the interest of efficient data management it is now mandatory to return the survey report, to I Gibb and the survey Summary Report (old ROSCOP form) to M Geldart, within four weeks of a survey ending. In the case of the survey Summary Report a nil return is required, if appropriate.

Project: 6 days - C80320 (20491)

Fishing Gear: Trawl BT237, Scallop dredges.

Rationale

This survey will conduct testing and demonstration of high-tech systems for the EU fishing sector developed under the SMARTFISH 2020 international research project. The goal is to improve automatic data collection for fish stock assessment and provide evidence of compliance with fishery regulations.

Objectives

1. To catch representative samples of northern North Sea fish and shellfish communities from bottom trawl and scallop dredge gears.
2. To collect CCTV footage of unsorted catch from the conveyor belt (at different simulated belt densities).
3. To collect additional CCTV training footage of any less common species encountered.
4. To collect quantitative information on catch composition and length frequencies of species.
5. To measure and weigh all cod, saithe and haddock and scan them using the CatchScanner unit.
6. To measure, weigh and photograph 300 individuals of all commercial species using the CatchSnap photography boards.
7. To measure, age and photograph all scallops caught and return the shells to the lab, where they will be aged by experts onshore (measures & age determination may be carried out on-board or onshore depending on survey staffing).

Procedure
The fishing gear and scientific equipment for 1720S will be loaded on 5 November. *Scotia* will

sail on 8 November and, after all safety drills, a short shakedown trawl (<15 minutes) will be conducted with the cod end tied off to secure a small catch to carry out a run through of the catch processing procedure in the fish house. The vessel will then steam North heading to fishing grounds around Shetland, weather conditions at the time, and the suggestions of the fishing master will determine the exact start area. During this steam the vessel will stop to fish at the SICs request (as and when the previous haul has been cleared) using known IBTS tows in close proximity to the vessels path. Survey schedule and operations will be decided by the SIC after daily consultation with the Fishing Master and Captain. Due to COVID-19 restrictions it may be necessary to reduce the number of staff in the fish house at any given time. To account for this the working day may be split into two shifts with fishing operations taking place between 05:00 and 20:00. On 10 of November the vessel will steam overnight to the Moray Firth and change gears for two days fishing with scallop dredges before returning to port. On the morning of 11 November there may be a requirement for a work boat to collect two sacks of scallop from an agreed port and onshore processor as a contingency plan in case we have issues catching scallops with the dredges. These will be stored live in a seawater tank on deck (under the hopper). There will be no staff transfers or a scheduled half landing. The survey will finish in Aberdeen on 13th November with all staff and equipment/fishing gear returning to the Marine Laboratory.

Trawling

No specific survey design will be employed, the objective is merely to obtain representative commercial catch compositions. Figure 1 shows the geographical extent of potential fishing activities. The intention is for ~ 6 tows to be undertaken per day on suitable ground within important commercial fishing grounds (i.e. Scalloway deeps, Balta sound) for demersal whitefish species. Deeper water tows targeting monkfish may also be included. The SIC will take direction from the fishing master regarding suitable fishing grounds taking any weather considerations into account. Haul durations will be short (15-30 minutes) as the catch sampling technologies being tested will increase the catch processing time therefore smaller catches are preferable. There will be no performance monitoring of the trawl gear (i.e. Scanmar systems, bottom contact sensors). The kite will not be deployed although additional floats may be added to the topline if required.

Fish sampling

Catches will be passed along the conveyor belt (in view of overhead cameras) multiple times with different degrees of spread to replicate different levels of fish density observed in CCTV footage of commercial catch processing. Fish will then be sorted by species, weighed and measured using the EDC systems in accordance with IBTS manuals and MSS SOPs. The count and length data of catches as recorded on the EDC systems will be compared to machine vision technology applied to the catch conveyor footage to demonstrate its ability to accurately identify and record fish. After catches are recorded using the EDC system all cod, haddock and saithe will be passed through a custom built scanning unit on the conveyor belt both as individual fish and in batches of the same species. Each fish will be measured (mm) and weighed then passed through the machine. Three hundred individuals of each commercial species (over the survey not by haul) will be photographed, measured (mm) and weighed (g).

Dredging

Scallop hauls will be made at a selection of stations (Figures 2-3 and Table 1) used on previous scallop surveys with a variety of ground types being considered. The primary survey area will be the Moray Firth, depending on progress towards Objectives 2-5 between 8-11 November scallop hauls may also be made near to Shetland (Figure 3) prior to travelling back to the Moray Firth if time permits. Hauls will be ~30 minutes duration with the gear rigged with 2/3 dredges on a single beam deployed from the methot winch. Dredges will be recovered and

emptied into a trough on deck. Catches will be transferred in baskets from the trough to the fish house for sampling.

All of the scallops will be measured to the half centimeter below and aged. The catches will be processed as described in fish sampling above. Following processing, the scallops will be transferred to the otolith container to be photographed and stored for transportation to the laboratory on unloading. The scallops will be aged from the shells and images by staff onshore, increasing the dataset for the image based scallop age reading project.

Normal contacts will be maintained with the laboratory.

The vessel will return to Aberdeen for unloading on 13 November.

Submitted:
H Holah
05 October 2020

Approved:
I Gibb
27 October 2020

Figure 1

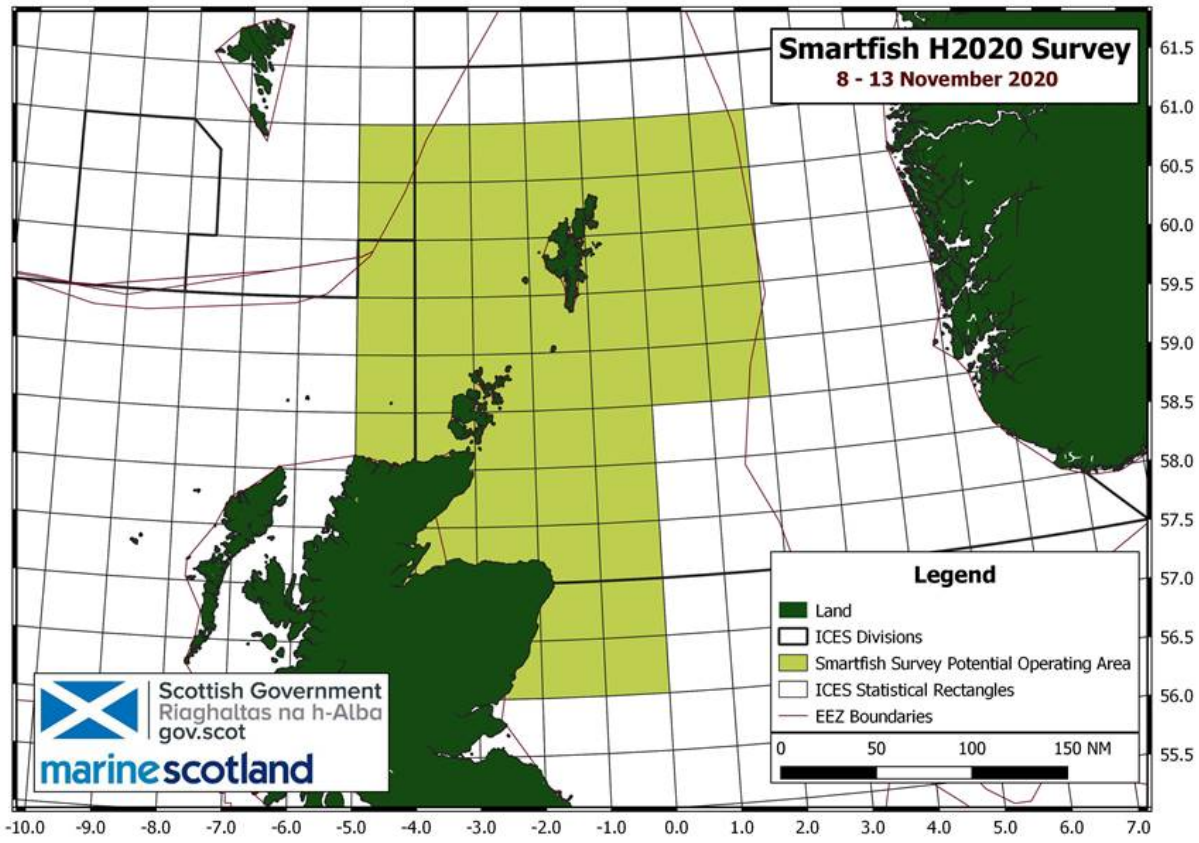

Figure 2

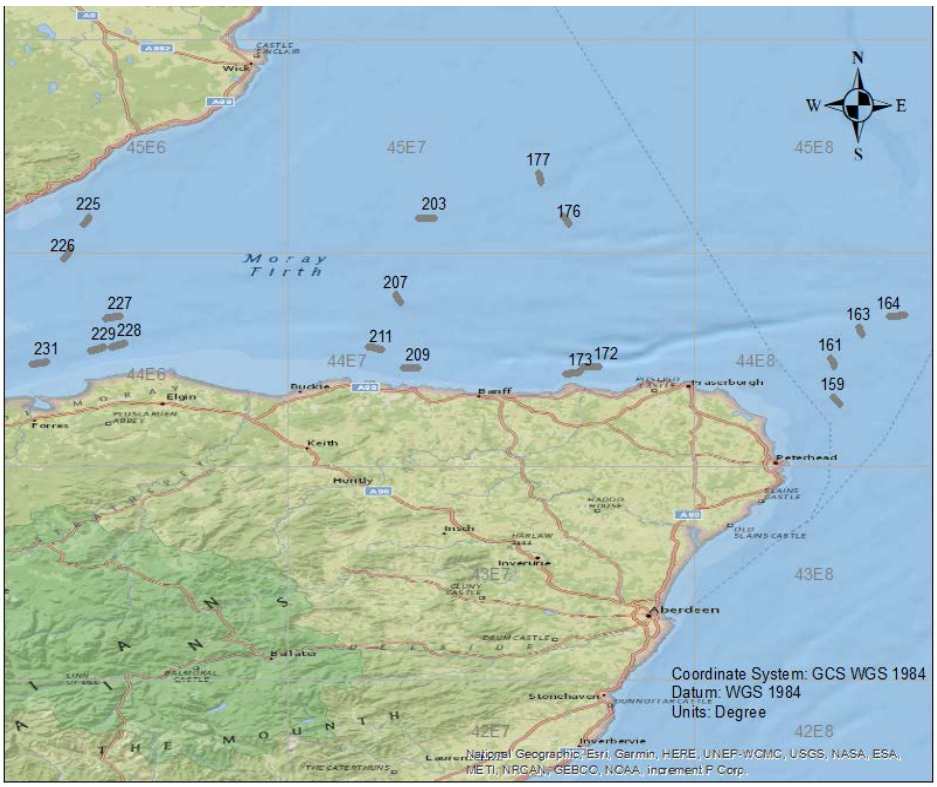

Figure 3


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SHETLAND ISLANDS
307
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157 m
SHETLAND ISLANDS
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273
281 m
A970
272
49E8
49E9
SHETLAND ISLANDS
268
Lerwick
262
259
292 m
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Table 1: 1720S – Positions of potential scallop sampling stations.

Station	DecStartLat	DecStartLong	DecEndLat	DecEndLong	Region	Station	DecStartLat	DecStartLong	DecEndLat	DecEndLong	Region
159	57.6621	-1.659	57.6441	-1.641	Moray Firth	259	60.0598	-1.0813	60.0466	-1.0595	Shetland
161	57.7541	-1.665	57.7341	-1.6501	Moray Firth	262	60.0858	-1.0706	60.1013	-1.0913	Shetland
163	57.8271	-1.5953	57.8086	-1.5868	Moray Firth	268	60.2273	-1.0426	60.212	-1.0676	Shetland
164	57.8515	-1.5206	57.8555	-1.4811	Moray Firth	272	60.2585	-1.0808	60.2505	-1.1153	Shetland
172	57.7348	-2.237	57.7345	-2.2751	Moray Firth	273	60.2945	-1.0538	60.2945	-1.0945	Shetland
173	57.7218	-2.28015	57.7173	-2.3178	Moray Firth	274	60.3051	-1.0556	60.287	-1.0661	Shetland
176	58.067	-2.3076	58.087	-2.3236	Moray Firth	302	60.5461	-0.7775	60.5631	-0.74583	Shetland
177	58.1878	-2.3845	58.1651	-2.3765	Moray Firth	303	60.6215	-0.74116	60.6423	-0.74433	Shetland
203	58.084	-2.6398	58.0823	-2.6806	Moray Firth	305	60.6445	-0.799	60.6516	-0.837	Shetland
207	57.9028	-2.735	57.883	-2.7223	Moray Firth	307	60.7451	-0.77183	60.764	-0.77433	Shetland
209	57.731	-2.6785	57.7313	-2.7161	Moray Firth	310	60.5948	-1.2176	60.5736	-1.218	Shetland
211	57.7745	-2.7678	57.7813	-2.8016	Moray Firth	313	60.6445	-1.2403	60.6281	-1.2706	Shetland
225	58.084	-3.489	58.067	-3.5026	Moray Firth	314	60.6221	-1.2795	60.6418	-1.2765	Shetland
226	57.987	-3.5516	58.0068	-3.5368	Moray Firth	315	60.6256	-1.274	60.6078	-1.2531	Shetland
227	57.8525	-3.413	57.8468	-3.4491	Moray Firth	316	60.5956	-1.2571	60.6128	-1.272	Shetland
228	57.7895	-3.401	57.7798	-3.4345	Moray Firth	318	60.5878	-1.2786	60.5668	-1.2735	Shetland
229	57.7795	-3.4533	57.7713	-3.4871	Moray Firth						
231	57.7455	-3.594	57.74	-3.6318	Moray Firth						