Sea Trout SAMARCH 2019
Netting Survey Field Report
18th and 19th March

Survey Field Report for the Sea Trout SAMARCH Netting Survey in Cawsand Bay

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1 Project Background

Cornwall Inshore Fisheries and Conservation Authority (IFCA) was contracted in 2018 to catch sea trout (*Salmo trutta)* in the south-west to support the Salmonid Management Around the Channel project (SAMARCH). SAMARCH is a five year multi-national partnership project, that started in 2017. The project is collecting data from both sides of the Channel to inform the future management of salmon and sea trout fisheries.

This is Cornwall IFCA's second year of involvement in the project and netting for sea trout is proposed to take place in the spring on multiple dates in Plymouth Sound and surrounding areas. Dispensation has been sought and approved for this project from the Environment Agency, who are responsible for the management of salmonid fisheries. Additionally, permission to fish in a no fishing area was granted by the Queens's Harbour Master (QHM) Plymouth.

1.1 Aims and objectives

1.1.1 Aims

- To successfully net for sea trout to provide carcasses to the SAMARCH project.

1.1.2 Objectives

- To further refine the method of netting for sea trout to be repeated on future surveys by Cornwall IFCA.

2 Methodology

2.1 Survey Area

Plymouth Sound is a large estuary on the border of Cornwall and Devon and drains the rivers Tamar, Tavy and Lynher. The area has multiple wildlife designations including; Plymouth Sounds and Estuaries Special Area of Conservation (SAC), Tamar Estuary Sites Marine Conservation Zone (MCZ), Tamar Estuaries Complex Special Protection Area (SPA) and numerous Site of Special Scientific Interest (SSSI) designations. The first netting survey of 2019 took place in Cawsand Bay (Figure 1).

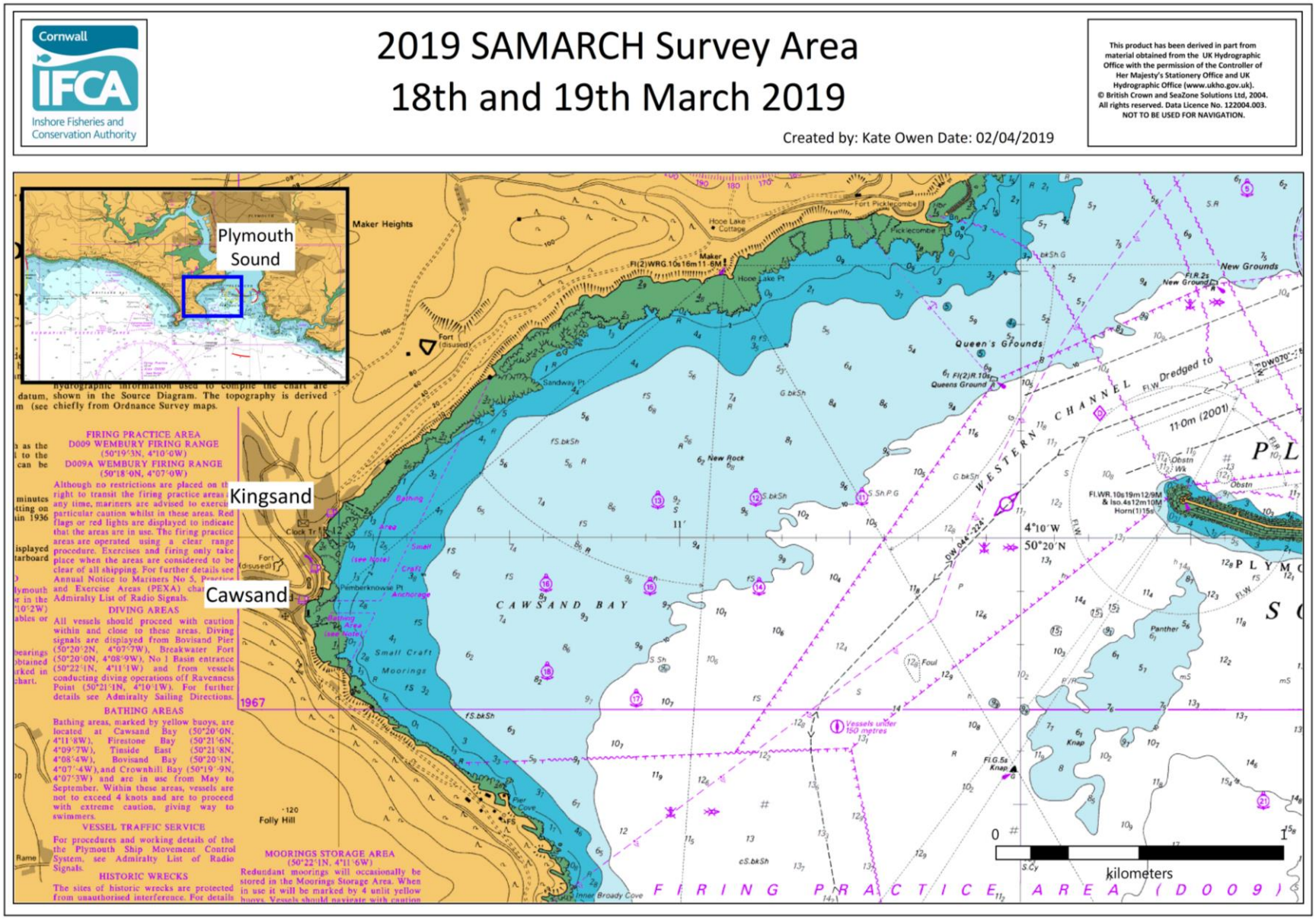


Figure 1: Map showing the location of Cawsand Bay and the survey area

2.2 Vessel Specification

The Cornwall IFCA research vessel (R/V) Tiger Lily VI (Figure 2) has been refitted for survey work and includes a purpose built survey station within the wheelhouse, fitted with an inverter and uninterruptable power supply (UPS) for stable 240v power, NMEA outputs and dedicated GPS with WAAS enabled. All position information was recorded using the Long/Lat WGS84 projection taken from the dedicated survey GPS receiver. All times recorded are in UTC from a single source, a Furuno GP32 GPS. R/V Tiger Lily VI is MCA coded to Cat 2 and is fitted with all necessary safety equipment, including life rafts, lifejackets, first aid kits and fire suppression systems. The vessel specification is shown in Annex 1.

Figure 2: Cornwall IFCA's dedicated survey vessel, R/V Tiger Lily VI.

2.3 Personnel

The crew on the 18th March 2019 consisted of three Cornwall IFCA scientific officers (Colin Trundle, Annie Jenkin and Kate Owen) and independent skipper (David Raymond). On the 19th March the team were also joined by Charlie Ellis from Exeter University.

2.4 Personal Protective Equipment (PPE)

While working on deck both crew and visiting scientists were required to wear lifejackets with safety knives attached, IFCA crew were also wearing personal location beacons (PLBs), and all crew had steel toe cap boots. Toolbox Talks were carried out for all crew and visitors before any survey operations commenced. Crew were made aware whenever the net was being shot and kept well clear of the equipment as it went overboard. As the net was

hauled, good communications were maintained and feet kept clear of the net, as sometime it was necessary to pay the net back out into the water. No accidents or near misses were reported.

2.5 Netting Survey

2.5.1 Equipment Specification

Three gill nets were set on the 18th March 2019, with mesh sizes of 90mm, 100mm and 110mm.

Floats were attached at regular intervals along the headlines to keep the nets at the surface of the water. A 5kg anchor was attached at each end of the nets and different coloured buoys used to mark the ends. Whilst transiting to the site the nets were stored in a container on deck at the stern of Tiger Lily, flaked and ready for deployment (Figure 3). Ends (anchors and marker buoys) were attached to the nets on the deck of R/V Tiger Lily, prior to deployment (Figure 4).

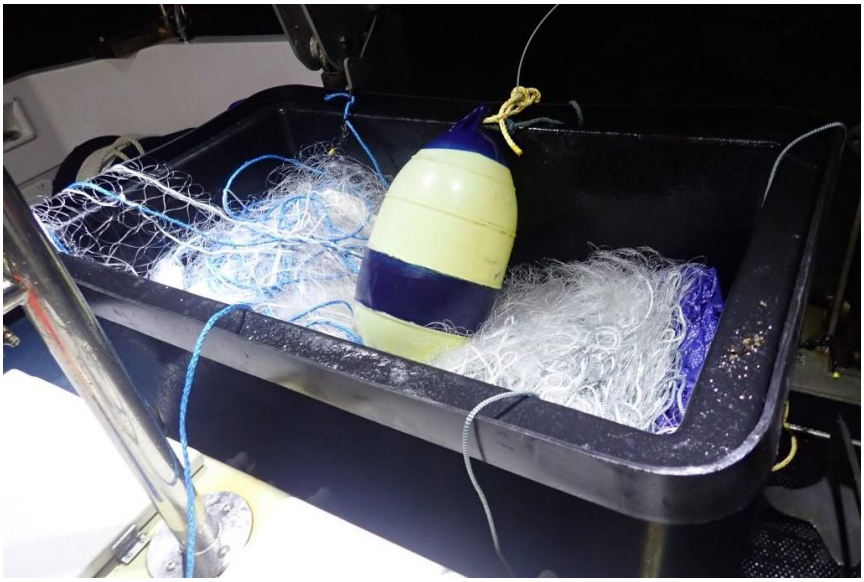


Figure 3: Nets flaked in container on the deck of R/V Tiger Lily and ready for deployment on the 18th March 2019.

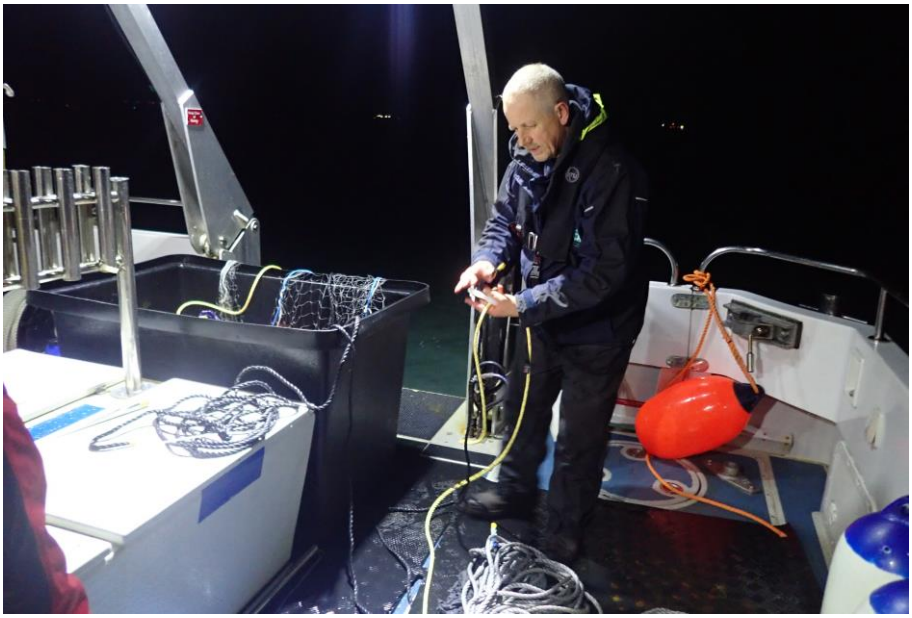


Figure 4: Ends being attached to the nets on the deck of R/V Tiger Lily before deployment on the 18th March 2019.

2.5.2 Methodology

Locations for deployment of the nets were chosen based on expert opinion and local knowledge of sea trout. Deployment of the net was from the stern of Tiger Lily, through the A-Frame as shown in Figure 5. The first marker buoys were cast away and the net left to run out freely as the vessel moved slowly forwards against the tide. All crew were present on deck and kept clear of the net as it was deployed.

Three targets were created in Hypack MAX Version 2018 for each net. A target was created for start of line (SOL – anchor overboard), when the net itself started to go overboard and at the end of line (EOL – second anchor overboard).

Figure 5: Net being deployed through the A-frame of Tiger on the 18th March 2019

Nets were left in the water overnight. Marker buoys at the end of nets were located prior to hauling the nets and a boat hook used to pull in the line. Nets were hand-hauled through the gunwale door on the starboard side of Tiger Lily (Figure 6), with the vessel motoring against the tide. One crew member was responsible for hauling the net on board, with one crew member removing any fish and tangles once it was on board. A further two crew members flaked the nets back into the container on deck (Figure 7, ready for transit back to Mylor. Any fish caught were removed from the net for later identification and to be photographed.

Figure 6: Cornwall IFCA Principal Scientific Officer hauling net through the gunwale door of R/V Tiger Lily on the 19th March 2019

Figure 7: Cornwall IFCA Scientific Officer and Exeter University Crew member flaking the net back into container on-board R/V Tiger Lily 19th March 2019

2.5.2.1 Survey log

Arrival on the site was later than planned on the 18th March as R/V Tiger Lily took a broken down fishing vessel under tow from Rame Head into Plymouth Sound. Once inside Plymouth Sound another vessel was able to take over the tow and Tiger Lily transited to Cawsand Bay to begin netting. In accordance with the conditions imposed by QHM, Longroom VTS Control were contacted prior to shooting the nets.

The first net (mesh size 110mm) was deployed in Cawsand Bay at approximately 20:49 (UTC). All nets were deployed running out in an easterly direction from the shore, with the shallowest end deployed first. The second net (100mm) was deployed slightly further north in the bay at approximately 21:09 (UTC). The final net (90mm) was deployed slightly north-east of the first two at approximately 21:28 (UTC). Locations of all net deployments are shown in Figure 8. All nets went overboard without any issues. Two scientific officers were dropped off in Plymouth for the evening, whilst the Principal Scientific Officer and Skipper remained onboard, with Tiger Lily sitting at anchor near the gear overnight.

At approximately 06:30 (UTC) the two IFCA Scientific Officers and Charlie Ellis (Exeter University) were picked up from Sutton Harbour. R/V Tiger Lily then transited to Cawsand Bay to begin hauling the nets. Again, prior to hauling the nets Longroom VTS were contacted.

Net three (90mm) was hauled first at approximately 07:29 until 07:55 (UTC). Net two (100mm) was hauled at 08:04 to 08:26 (UTC) and Net 1 (110mm) at 08:34 until 08:53 (UTC). Charlie Ellis was then dropped back into Sutton Harbour before Tiger Lily transited back to Mylor, arriving at approximately 14:00 (UTC).

The daily logs for the 18th March and 19th March 2019 are shown in Annex Table A and Annex Table B.

3 Results

The exact locations of the net deployment on the 18th March 2019 are shown below in Table 1. Locations of the nets have been mapped and are shown in Figure 8.

Table 1: Time and location of the fishing net deployments from R/V Tiger Lily in Cawsand Bay on 18th March 2019.

Date	Time	Name	WGS84 Latitude	WGS84 Longitude	Mesh size (mm)	Depth (m)
18/03/2019	20:49:55	Net 1 SOL - anchor away	50.328715	-4.197925	110	3.6
18/03/2019	20:50:12	Net 1 - net goes overboard	50.328735	-4.197820		4.2
18/03/2019	20:52:20	Net 1 EOL – all deployed	50.328705	-4.195040		6.2
18/03/2019	21:09:46	Net 2 SOL - anchor away	50.333755	-4.197388	100	3.4
18/03/2019	21:10:04	Net 2 - net goes overboard	50.333747	-4.197167		3.9
18/03/2019	21:12:33	Net 2 EOL – all deployed	50.333675	-4.194353		6.6
18/03/2019	21:28:04	Net 3 SOL - anchor away	50.337498	-4.190485	90	5.6
18/03/2019	21:28:25	Net 3 - net goes overboard	50.337448	-4.190327		5.7
18/03/2019	21:31:13	Net 3 EOL – all deployed	50.337285	-4.187640		6.7

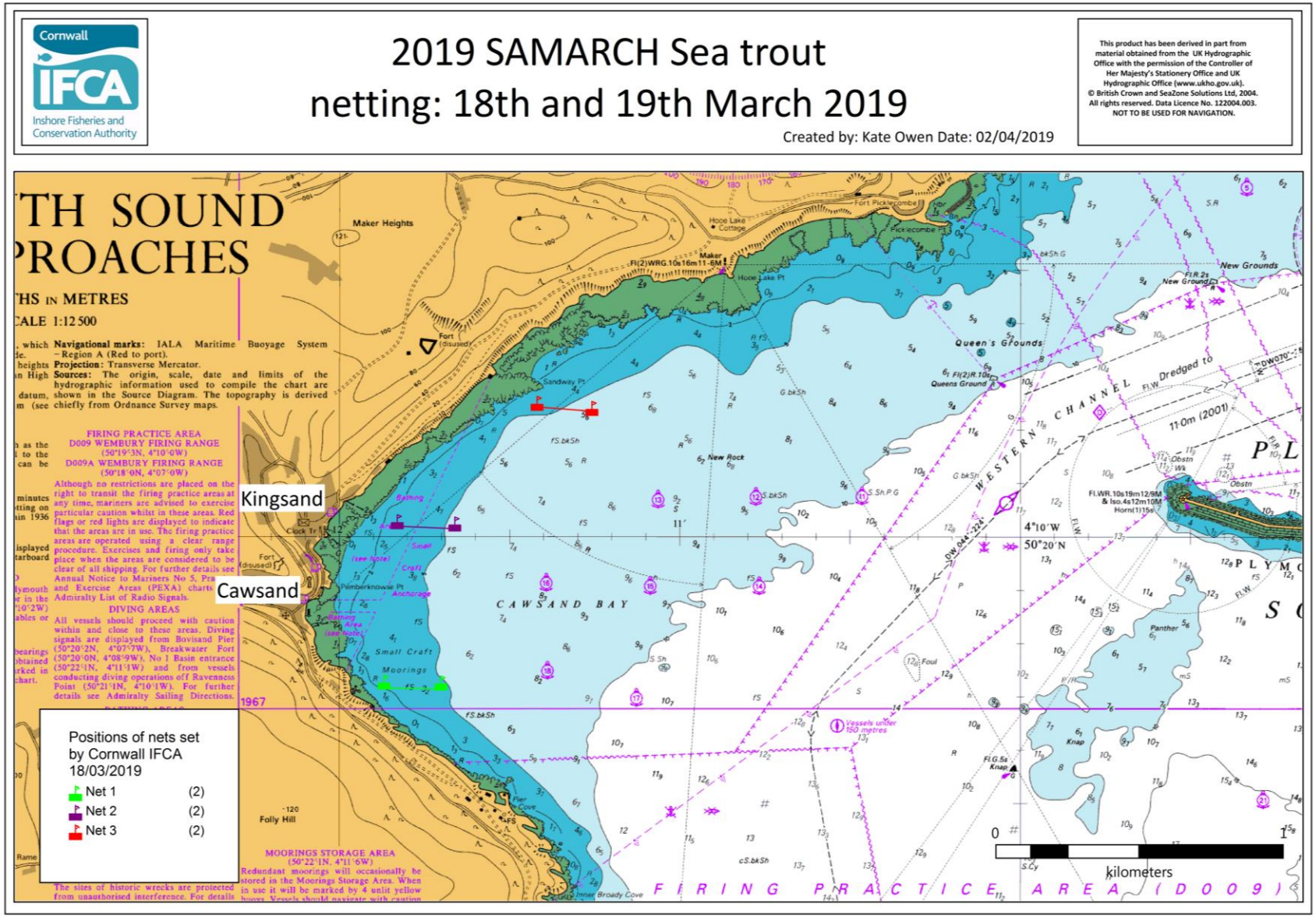


Figure 8: Map showing Cawsand Bay and the location of the three nets shot by Cornwall IFCA on 18th March 2019. Locations shown on the map are from where the start of the net went overboard to where the end of the net and anchor went overboard (which was in approximately the same location.

No sea trout were caught in the nets on this survey. The catch from net 1 (110m) is shown in Annex Figure A. The catch consisted of three sardines (*Sardine pilchardus)* and two anchovies (*Engraulis encrasicolus*). One sardine slipped out of the net so isn't visible in this photo. No fish were caught in net two (100mm). The catch from net 3 (90 mm) is shown in Annex Figure B. The catch consisted of 17 sardines (*S. pilchardus)*, three anchovies (*E. encrasicolus)* and one mackerel (*Scomber scombrus).* One anchovy slipped out of the net so isn't present in this photo. Two fish slipped out of the net as it was being hauled, so won't be visible in the photographs.

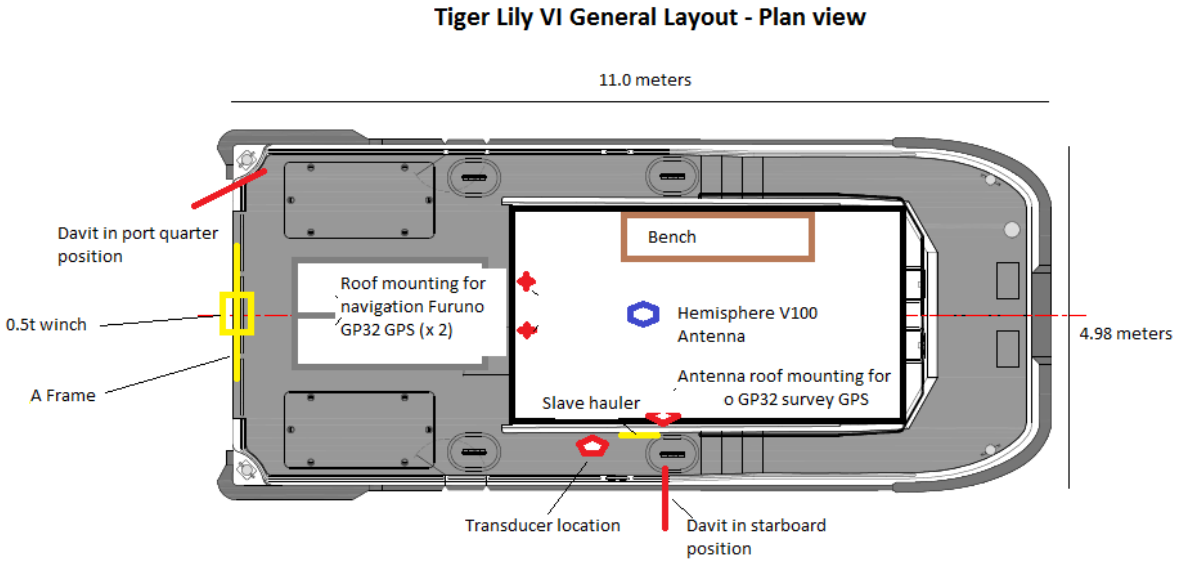
4 Acknowledgments

Cornwall IFCA would like to thank Charlie Ellis for his assistance during the survey.

5 Appendices

Annex 1 – RV Tiger Lily Deck Plan & Offsets

Builder	South Boats Ltd
Model	Island MkII
Built	2007
LOA	11.0m
Beam	4.98m
Draught	1.1m (aft)
Tonnage	c.10 tonnes
Area of operation	MCA Category 2
Call sign	MRWR7
MMSI Number	235054954
MECAL Certification number	M07WB0111059
Complement	14 (including min 2 crew)
Propulsion	2 x 450hp Iveco NEF series
Speed	Cruising: 16 – 18 knots Top: 24 – 26 knots
Range	c. 400 nautical miles
240v AC supply	Victron 3Kw power inverter 5KvA Volvo-Perkins generator (All 240 AC power is accessed via APC Smart UPS C1500)
Stern Gantry	500kg SWL
Winch (on stern gantry)	Spencer Carter 0.5t with scrolling level wind
Slave hauler	Sea Winch 200m dia.
Electric line hauler	12v Spencer Carter Bandit
Positioning	Hemisphere V100 GNSS 3 x Furuno GP32
NMEA data outputs	4 x USB 4 x Serial 4 x banjo
Navigation	Olex with data export Knockle Hypack Max



Settings

Equipment			Offset (m)		
NMEA Device	**Make/Model**	**Offset Name**	**X (Forw'd)**	**Y (Port)**	**Z (+)**
Navigation depth	Furuno Navnet	Furuno transducer	5.5	0.75	-0.5
Survey GPS	Furuno GP32	Furuno mushroom antenna	4.8	1.0	

Annex 2 – Daily Logs

Daily log – 18th March 2019

Annex Table A: Daily log for 18th March 2019

Project information		
Project	SAMARCH 2019	
Survey code	20190318_SAMARCH	
Location	Cawsand	
Date	18th March 2019	
Vessel	Tiger Lily	
Staff		
Survey role	**Company**	**Name**
Principal Scientific Officer	Cornwall IFCA	Colin Trundle
Scientific Officer	Cornwall IFCA	Annie Jenkin
Scientific Officer	Cornwall IFCA	Kate Owen
Skipper	Independent	David Raymond
Weather and tides		
High water time:	15:11 (UTC)	
High water (m)	4.60m	
Wind direction	NW	
Wind speed	25mph	
Beaufort scale	3	
Cloud coverage	6/8	
Time weather recorded	20:30	
Safety		
Toolbox talk time	20:40	
Induction	None required	

Summary of operations

Time start (UTC)	Activity	Latitude (DD)	Longitude (DD)	Depth (m)
17:30	Depart Mylor			
20:28	Arrive survey site			
20:49	Start shooting Net 1 (110 mm) - anchor away	50.328715	-4.197925	3.6
20:50	Net 1 - net starts being deployed	50.328735	-4.197820	4.2
20:52	Finish shooting Net 1	50.328705	-4.195040	6.2
21:09	Start shooting Net 2 (100 mm) - anchor away	50.333755	-4.197388	3.4
21:10	Net 2 - net starts being deployed	50.333747	-4.197167	3.9
21:12	Finish shooting Net 2	50.333675	-4.194353	6.6
21:28	Start shooting Net 3 (90 mm) – anchor away	50.337498	-4.190485	5.6
21:29	Net 3 - net starts being deployed	50.337448	-4.190327	5.7
21:31	Finish shooting Net 3	50.337285	-4.187640	6.7
23:24	Arrive Sutton harbour			

Overall progress

Action	Total
Nets shot	3

Daily log 2 – 19th March 2019

Annex Table B: Daily log for 19th March 2019

Project information						
Project	SAMARCH 2019					
Survey code	20190318_SAMARCH					
Location	Cawsand					
Date	19th March 2019					
Vessel	Tiger Lily					
Staff						
Survey role	**Company**	**Name**				
Principal Scientific Officer	Cornwall IFCA	Colin Trundle				
Scientific Officer	Cornwall IFCA	Annie Jenkin				
Scientific Officer	Cornwall IFCA	Kate Owen				
Skipper	Independent	David Raymond				
Weather and tides						
High water time:	16:46 UTC					
High water (m)	5.22m					
Wind direction	W					
Wind speed	5mph					
Beaufort scale	2					
Cloud coverage	4/8					
Time weather recorded	07:15					
Safety						
Toolbox talk time	07:17					
Induction	None required					
Summary of operations						
Time start (UTC)	**Activity**	**Species**	**Latitude (DD)**	**Longitude (DD)**	**Depth (m)**	
06:30	Depart Sutton harbour					
07:15	Arrive survey site					
07:29	Start hauling Net 3 (90 mm)		50.337180	-4.187978	3.6	
07:55	Finish hauling Net 3	17 sardines, 3 anchovies (1 slipped out of net so isn't in picture), 1 mackerel	50.337310	-4.190540	4.2	
08:04	Start hauling Net 2 (100 mm)		50.333682	-4.194492	6.2	
08:26	Finish hauling Net 2	No fish in net	50.333745	-4.196635	3.4	
08:34	Start hauling Net 1 (110 mm)		50.328530	-4.195572	3.9	
08:53	Finish hauling Net 1	3 sardines (1 slipped out of net so isn't in picture), 2 anchovies	50.328725	-4.197835	6.6	
09:45	Arrive Sutton harbour to drop off Charlie				5.6	
10:15	Depart Sutton harbour				5.7	
14:00	Arrive Mylor				6.7	
Overall progress						
Action	**Total**					
Nets hauled	3					

Annex 3 – Catch photographs

Annex Figure A: The catch from net 1 (110 mm) hauled on 19th March 2019.

Annex Figure B: The catch from net 3 (90 mm) hauled on 19th March 2019.