



## Sea Trout SAMARCH 2018 Netting Survey Field Report



Survey Field Report for the Sea Trout SAMARCH Netting Surveys in the  
Tamar estuary

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2018\_CIFCA\_SAC\_Netting\_SeaTrout

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## 1 Project Background

Cornwall Inshore Fisheries and Conservation Authority (IFCA) has been contracted 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 partnership project, started in 2017. The project is collecting data from both sides of the Channel to inform the management of salmon and sea trout fisheries.

The main aims of the project are listed as:

- Provide novel information on the survival and migration of young salmon and sea trout in four estuaries of the Channel area
- Provide novel information on the movements and swimming depths of adult sea trout in the Channel
- Create a genetic data base for trout on both sides of the Channel
- Create a map of areas that are important for sea trout in the Channel based on sea scape
- Provide new information to further improve the models used in England and France to manage their salmonid stocks
- Train students in the management of coastal and transitional waters
- Engage with stakeholders throughout the project
- Inform current and develop new policies for the better management of salmonid stocks in our coastal and transitional waters (Samarch, 2018).

SAMARCH is focusing on five salmon and sea trout 'Index' rivers for data collection, two of which are in south of England; the Tamar and the Frome (Samarch, 2018). Cornwall IFCA has been contracted by the project to catch sea trout from the Tamar estuary.

The Tamar population of sea trout are currently monitored by the Environment Agency, as an Index river for salmon and sea trout. A number of methods are employed; smolts are trapped and tagged during their spring migration, returning adults are trapped and counted at Gunnislake Weir and electrofishing surveys for juveniles are conducted (King *et al*, 2016). Annual counts of sea trout in the Tamar are kept by the Environment Agency.

This current work with the Tamar population of sea trout will add to the genetic database of trout populations in the south-west and allow both stomach content and parasite analysis. Due to salmonid protection legislation, special dispensation is required from the Environment Agency to retain sea trout on board a vessel. Dispensation has been approved for this project.

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## 1.1 Aims and objectives

### 1.1.1 Aims

- To successfully net for sea trout and provide approximately 50 carcass samples for the project

### 1.1.2 Objectives

- To trial a method of netting for sea trout which can be repeated on future surveys by Cornwall IFCA

## 2 Methodology

### 2.1 Survey Area

The Tamar is a large estuary is on the border of Cornwall and Devon and drains the rivers Tamar, Tavy and Lynher (Figure 1). The estuary 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 Sites of Special Scientific Interest (SSSI) designations.

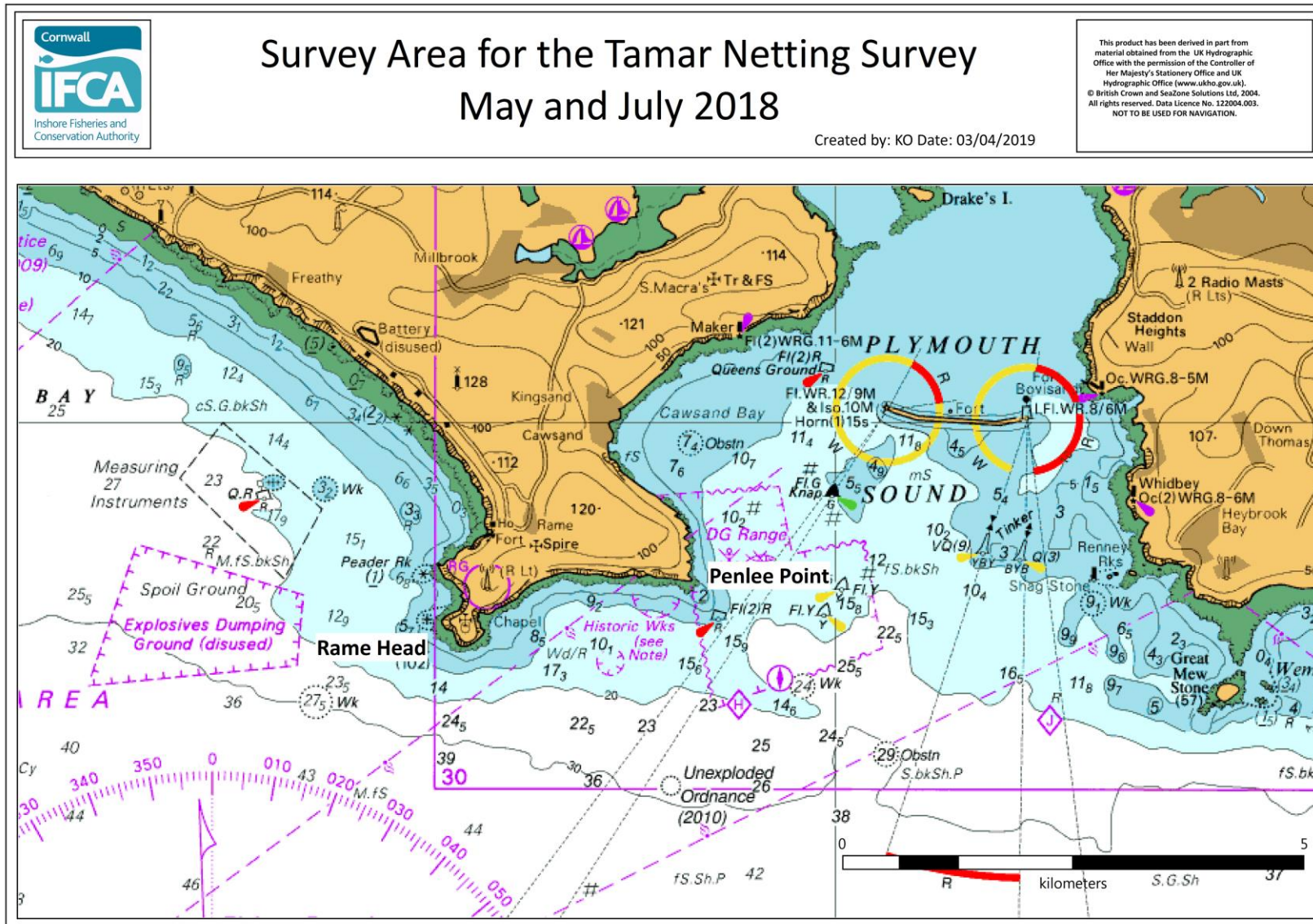


Figure 1: Map of Plymouth Sound showing the survey area used to net for sea trout (*Salmo trutta*) on the 29th May and the 17th July 2018

## 2.2 Vessel Specification

Tiger Lily 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 (Figure 2). All position information was recorded using the Latitude/Longitude 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. Detailed information is shown in Annex 1 – RV Tiger Lily Deck Plan & Offsets.



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

## 2.3 Personnel

The crew on the 29<sup>th</sup> May 2018 consisted of two Cornwall IFCA scientific officers (Colin Trundle and Kate Owen) and Cornwall IFCA skipper (Daniel McIntyre). Also on board were Rob Hocking (Environment Agency), Dylan Roberts (Game and Wildlife Conservation Trust) and Andrew King (University of Exeter), who all took an active role in the survey.

The crew on the 17<sup>th</sup> July 2018 consisted of four Cornwall IFCA Scientific officers (Colin Trundle, Annie Jenkin, Steph Sturgeon and Kate Owen) and Cornwall IFCA skipper (Daniel McIntyre). Also on board were Rob Hurrell (Environment Agency) and Jamie Stevens (University of Exeter) who took an active role in the survey.

## 2.4 Personal Protective Equipment (PPE)

While working on deck both crew and visiting scientists were required to wear lifejackets. IFCA crew were also wearing personal location beacons (PLBs) and steel toe cap boots. Toolbox talks were carried out on both occasions with all crew and visitors in attendance before any survey operations commenced. Both crew and visiting scientists



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

## 2.5 Netting Survey

### 2.5.1 Equipment Specification

29<sup>th</sup> May 2018

One gill net was used in this survey, with a mesh size of 90 mm, length of 250 m and depth of approximately 450 cm.

17<sup>th</sup> July 2018

Three gill nets were used in this survey, with mesh sizes of 90 mm, 100 mm and 110 mm.

Floats were attached at regular intervals along the headlines to keep the nets at the surface of the water. A 5 kg 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 R/V Tiger Lily, flaked and ready for deployment.

### 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. 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 and visiting scientists were present on deck and kept clear of the net as it was deployed. GPS locations of the nets were marked on the vessels OLEX. Images of the net being deployed and recovered are shown in Figure 3 to Figure 8.



Figure 3: Nets flaked in container on deck and ready for deployment on the 17<sup>th</sup> July survey



Figure 4: Cornwall IFCA officer on the deck of Tiger Lily as the net is deployed on the 29<sup>th</sup> May 2018

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Figure 5: Net being deployed from the stern of Tiger Lily on the 29<sup>th</sup> May 2018

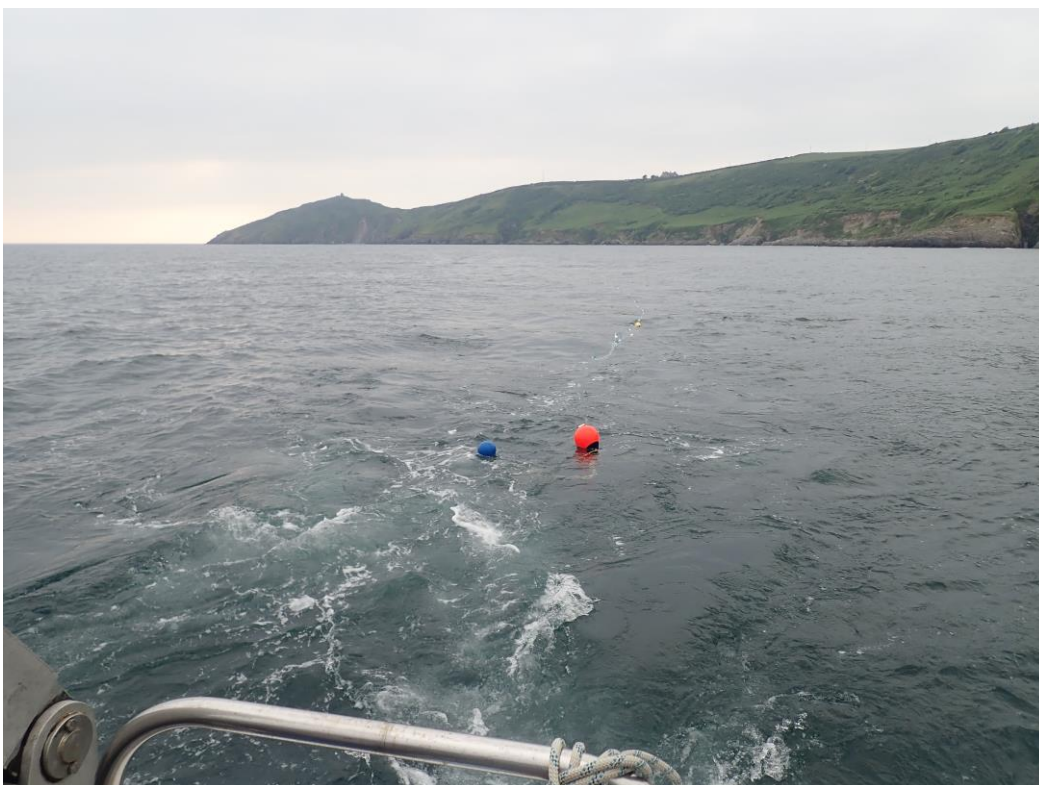


Figure 6: Net and buoys in the water after deployment from Tiger Lily on the 29<sup>th</sup> May 2018

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Nets were left in the water for at least two hours, exact location and length of each net deployment is shown in Table 1 and Table 2. By only leaving nets to soak for two hours it was anticipated that the survival rates of any bycatch were likely to be higher.

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 gunwhale door on the starboard side of Tiger Lily, with the vessel motoring against the tide. One crew member was responsible for hauling the net on board, with one or two further crew members removing any fish and tangles once it was on board. Any fish caught were removed from the net and placed in the live well tanks on board Tiger Lily. A further two crew members flaked the net back into the container on deck, ready either for a second deployment or to be stowed for the transit home.



Figure 7: Cornwall IFCA Officer removing tangles from the net on board Tiger Lily on the 29<sup>th</sup> May 2018

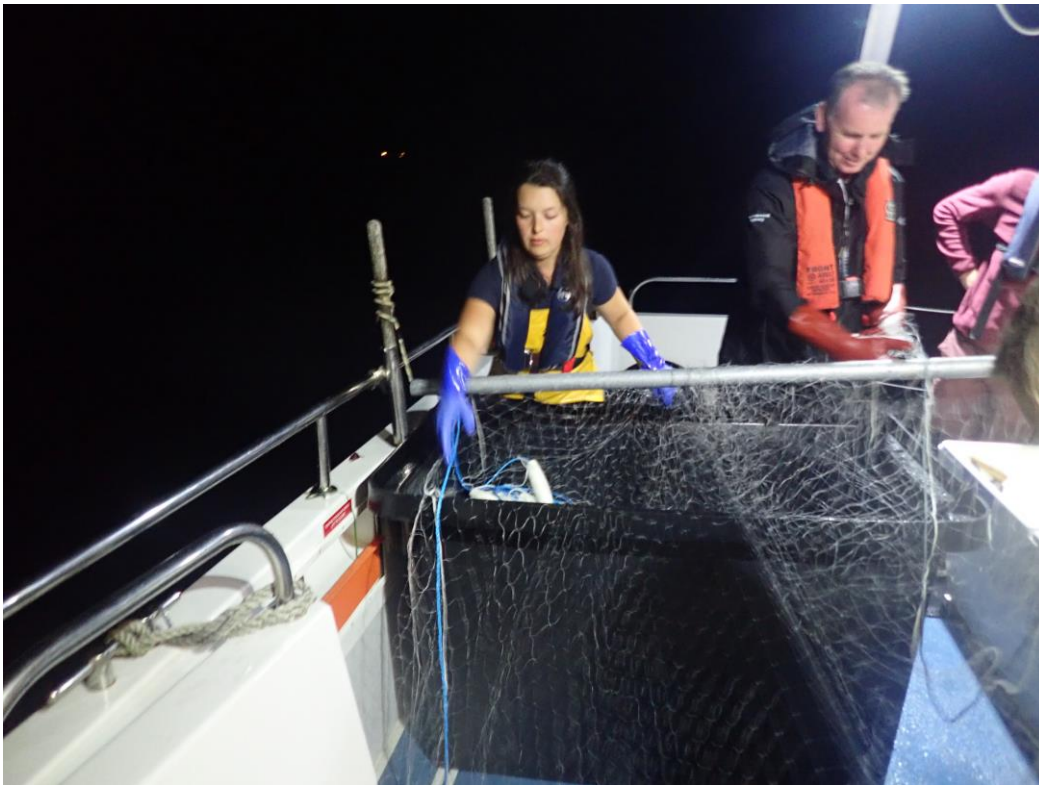


Figure 8: Cornwall IFCA and Environment Agency Officers flaking the net back into the container to be stowed away on the deck of Tiger Lily on the 29<sup>th</sup> May 2018

Sampling protocol for sea trout caught was as follows:

- Adipose fin clipped and stored for later DNA analysis.
- Fish examined for external parasites. Parasites collected and stored in alcohol.
- Sea trout gutted and innards stored in alcohol for later internal parasite and diet analysis.

### 3 Results

The locations of the net deployments on the 29<sup>th</sup> May and 17<sup>th</sup> July 2018 are shown in Figure 9 and Figure 10.

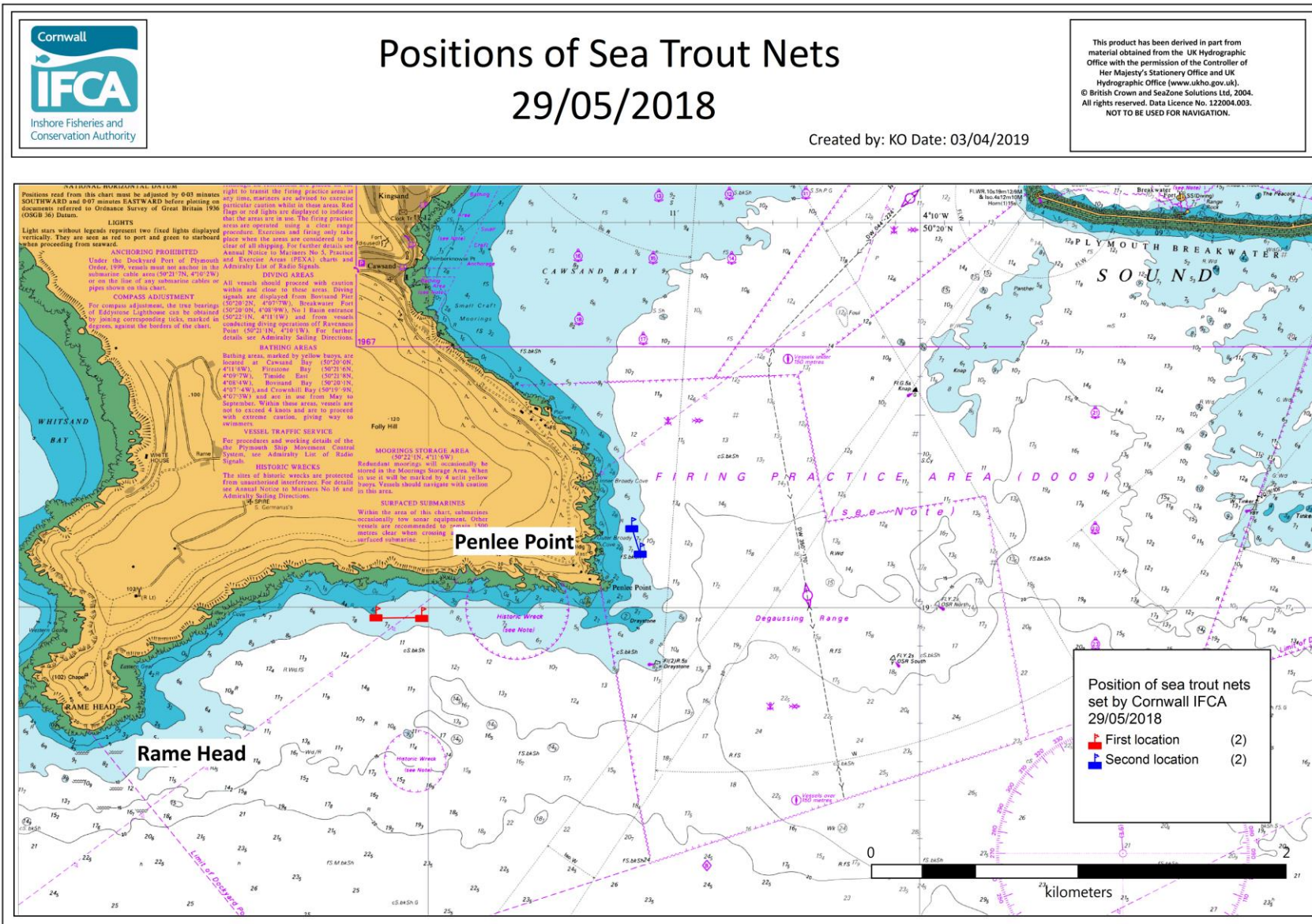
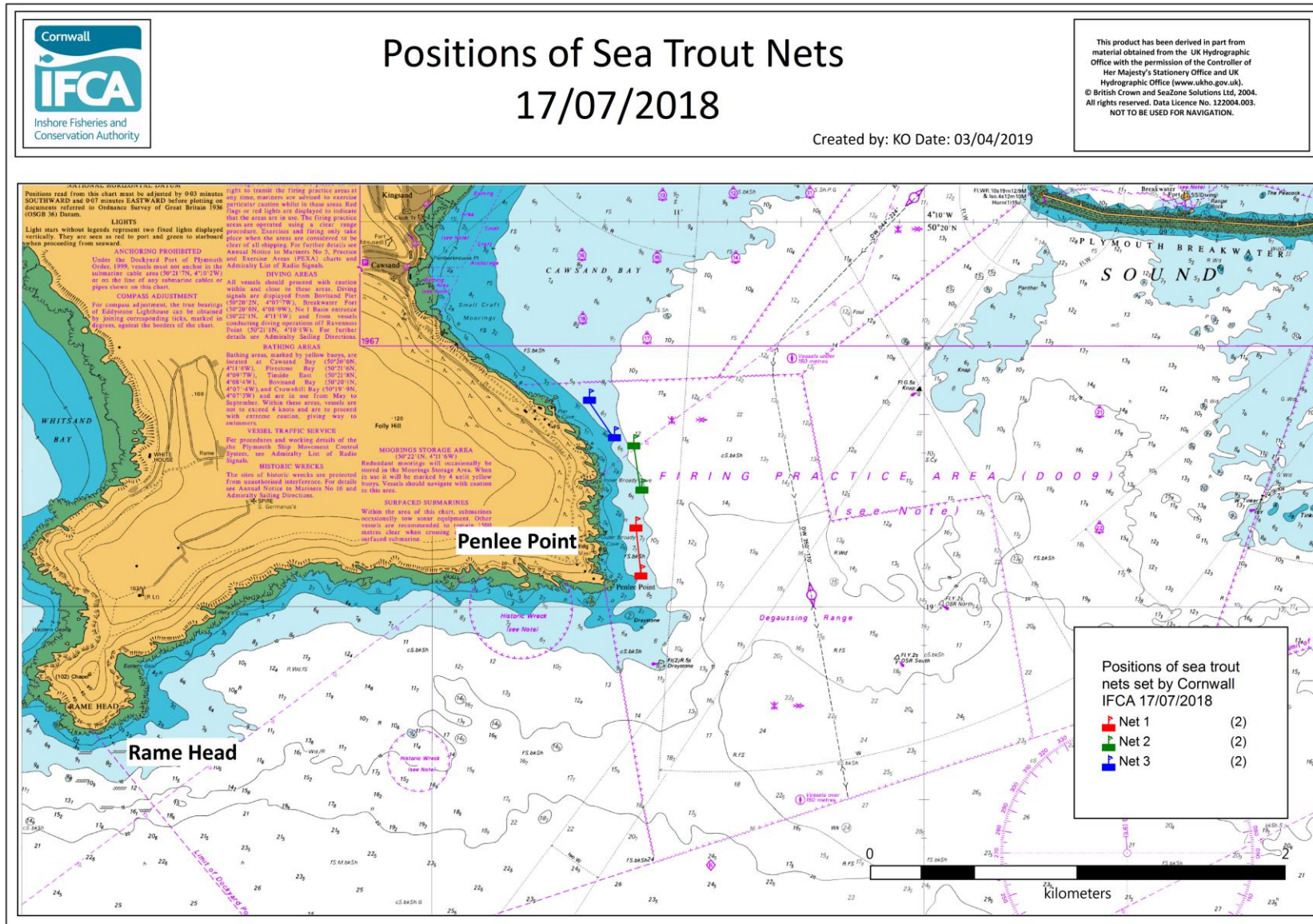


Figure 9: Location of sea trout nets set by Cornwall IFCA on the 29th May 2018



### 3.1 29<sup>th</sup> May 2018

The first net deployment (90mm mesh) was close to Rame Head at 17:50 UTC with the net running from west to east. After approximately two hours in the water the first net was hauled. No sea trout were caught, with one mackerel as bycatch. The second deployment was at approximately 21:35 UTC, close to Penlee Point, with the net running from north to south. Locations and lengths of net deployments are given in Table 1 and displayed in Figure 9: Location of sea trout nets set by Cornwall IFCA on the 29th May 2018. The daily logs are shown in Annex 2 – Daily Logs.

**Table 1: Times and locations of net deployments from Tiger Lily on 29/05/2018**

	Net deployed	Net hauled	Start of net	End of net
<b>First deployment</b>	17:46 UTC	20:00 UTC	50.316316, -4.203618	50.316287,-4.200508
<b>Second deployment</b>	20:34 UTC	23:35 UTC	50.320172, -4.186254	50.319068, -4.185683

Location and retrieval of the net the second time was more difficult than the first, as the headline had sunk below the surface in some sections and only the northern end of the net could be located. The net therefore had to be hauled with the vessel motoring south along the net, with the tide, which was a longer and more difficult process.

One sea trout was caught in this net. The sea trout was 43cm long and was estimated to weigh just under 2lbs (Figure 11). Two sea lice were removed from the fish and stored (Figure 12). The stomach was removed and taken for later content analysis and the adipose fin clipped and stored for DNA analysis (Figure 13).



Figure 11: Sea trout (*Salmo trutta*) caught in the netting survey.





Figure 12: Sea lice being removed from the sea trout on board Tiger Lily on the 29<sup>th</sup> May 2018



Figure 13: Dissection of sea trout for stomach content analysis on the 29<sup>th</sup> May 2018

### 3.2 17<sup>th</sup> July 2018

The first net (100 mm mesh) was deployed close to Outer Broady Cove at 18:05 UTC with the net running towards Penlee Point. The second net (110 mm mesh) was deployed north of Inner Broady Cove at 18:24 UTC, finishing south of Inner Broady Cove. The third net (90 mm mesh) was deployed at 19:03 UTC off Pier Cove, running to the north of Inner Broady Cove. Locations and lengths of net deployments are given in Table 2 and displayed in Figure 10. The daily logs are shown in Annex 2 – Daily Logs.

Table 2: Times and locations of net deployments from Tiger Lily on 17/07/2018

	Net deployed	Net hauled	Start of net	End of net
<b>First net</b>	18:05	21:03	50.320186, -4.186221	50.318108, -4.185886
<b>Second net</b>	18:24	21:31	50.323748, -4.186368	50.321829, -4.18582
<b>Third net</b>	19:03	22:17	50.325721, -4.189378	50.324093, -4.187678

The first net came overboard smoothly at first, however, large sections of the net were tangled and rolled up and weren't capable of fishing. The second net was hauled at 21:31 UTC and came overboard relatively smoothly. The end anchor line of this net was caught on a string of pots and despite best efforts to untangle it this didn't prove possible. The anchor line was therefore cut. The final net had a longer soak and was hauled at 22:17 UTC and this net came overboard smoothly. No sea trout were caught in these nets, with a horse mackerel and grey mullet as bycatch in the third net.

## 4 Discussion

The successful catch of a sea trout on the second deployment of the net on the 29<sup>th</sup> May shows that the method employed is suitable for catching sea trout, as was the small amount of bycatch.

The lack of sea trout caught on the 17<sup>th</sup> July may have been for a number of reasons. Multiple nets were used as this was thought to increase the chances of catching a range of sizes of sea trout. However, it's possible that mesh sizes of 100 mm and larger were too big to catch the size of sea trout that were present in the estuary. Expert opinion also suggests that the lack of sea trout caught may have been due to the time of year, as ideally fishing surveys would be carried out earlier in the spring time.

It is unclear why the headline of the net sunk on the second deployment on the 29<sup>th</sup> May and the first net came back very tangled on the 17<sup>th</sup> July. Both nets appeared to go overboard fairly smoothly with no tangles and were left with the floats clearly visible on the surface.

## 5 Recommendations

A number of recommendations have been identified for future surveys:

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- Fishing earlier in the year, ideally in the spring time
- Using multiple nets of mesh size approximately 90mm
- Further research into the best locations for setting sea trout nets

## 6 Acknowledgments

Cornwall IFCA would like to thank Rob Hocking, Dylan Roberts, Andrew King, Rob Hurrell and Jamie Stevens for their involvement in the netting survey and subsequent sampling of the sea trout.

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## 7 References

King, R, Hillman, R, Elsmere, P, Stockley, B and Stevens, J. 2016. Investigating patterns of straying and mixed stock exploitation of sea trout, *Salmo trutta*, in rivers sharing an estuary in south-west England. Fisheries Management and Ecology. Volume 23:5 pp.376-389

Samarch. 2018. Samarch Salmonid Management Round The Channel. Available at: <http://samarch.org/> [Accessed 05/06/2018]

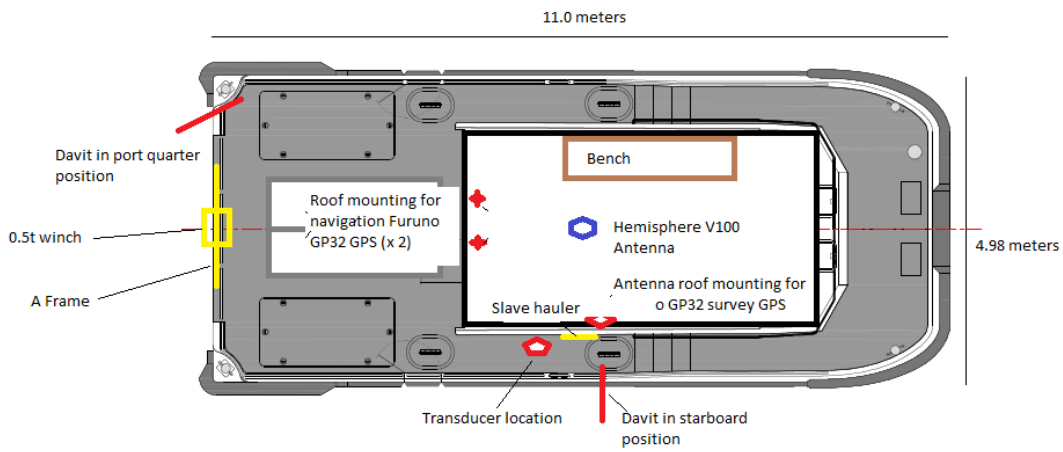
## 8 Appendices

### 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

**Tiger Lily VI General Layout - Plan view**



**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	

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## Annex 2 – Daily Logs

Daily log from the survey on the 29<sup>th</sup> May 2018

Time (UTC)	Description
<b>29/05/2018</b>	
13:15	Arrived at Mylor, re-fuelled and loaded net onto boat
14:50	Tiger Lily departs Mylor for Plymouth
17:16	Arrived at site near Rame Head
17:46	Net deployed and GPS position marked on olex.
20:00	First net hauled
20:34	Net shot for the second time
23:35	Approximate time net hauled for the second time
<b>30/05/2018</b>	
01:00	Departed Plymouth for Mylor
03:00	Tiger Lily alongside berth at Mylor

Daily log from the survey on the 17<sup>th</sup> July 2018

Time (UTC)	Description
<b>17/07/2018</b>	
15:00:00	Left mooring to fuel
15:15:00	Departed Mylor and rigged first and second net en route
17:55:00	Arrived at survey site
18:05:11	Started deploying first net (100 mm) - Outer Broady Cove 11.5 m
18:07:16	Deploying finished - Penlee Point 11.7m
18:24:27	Started deploying second net (110 mm) North of Inner Broady Cove 14.1 m
18:27:05	Deploying finished - South of Inner Broady Cove 14 m
18:31:06	Rigging third net
19:03:54	Started deploying third net (90 mm) - Pier Cove 10.3 m
19:05:58	Deploying finished - north of Inner Broady Cove 10.1 m
19:26:00	Deployed Swift off Pier Cove 16m
21:03:35	Started hauling first net
21:23:03	Finished hauling - no fish. Net tangled and rolled up.
21:31:37	Started hauling second net
22:12:03	Finished hauling - no fish. End weight caught on sting of pots (unable to lift) so cut off end and anchor.
22:17:04	Started hauling third net
22:45:38	Finished hauling - one horse mackerel and one mullet.
23:00:00	Left survey site to return back to Mylor.
<b>18/07/2018</b>	
02:15:00	Tiger Lily alongside berth at Mylor