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## **Cruise report no: 01.07.2024, 30.09.2024-19.10.2024, Jnr. 24/7872**

This cruise report, numbered 01.07.2024, 30.09.2024–19.10.2024, Jnr. 24/7872, is part of the fulfilment of the conditions required to enter the Norwegian zone with the chartered vessels F/V Rossö and F/V Svanen, as outlined by permit "24/7872." The time-series data collected during the cruise will be combined with data from IBTS Q3 and the Swedish coastal survey for formal analysis. The findings will be reported to the Swedish Agency for Marine and Water Management in the spring of 2025.

### **Participants**

F/V Rossö, with skipper Niklas Sterner and crew, was accompanied by Jan-Erik Johansson and Anders Wernbo from SLU Aqua.

F/V Svanen, with skipper Stefan Larsson and crew, was accompanied by Baldvin Thorvaldsen and Björn Karlsson from SLU Aqua during week 41 and by Peter Johannessen and Victor Jacobsson during week 42.

The scientist in charge, Patrik Börjesson, did not participate at sea.

### **Objectives**

The survey is an initiative to supplement the data collection carried out in the International Bottom Trawl Survey during the third quarter (IBTS Q3). By expanding the geographical area and sampling in the deeper parts of the Skagerrak, data on species not currently covered by the IBTS can also be collected. The survey is a so-called fishermen's survey, meaning that knowledge and experience from commercial fishing are used in its design and implementation. The data collected will be analysed together with data from IBTS Q3 and the Swedish coastal survey to generate distribution maps and biomass estimates for stock assessment and environmental evaluation at both national and international levels.

### **Itinerary**

The chartered fishing vessels F/V Rossö (call sign SIGA) and F/V Svanen (call sign SMFH) departed from home port on the evening of September 30, 2024, bound for Lysekil to load equipment and personnel. During the first hauls the following day, it was discovered that the thimbles on the sweeps were heavily worn, and both vessels returned to Kungshamn to address the issue. The rest of the week went smoothly, with F/V Rossö fishing mainly in the eastern Skagerrak at depths between 40 and 170 meters, while F/V Svanen fished at depths between 170 and 500 meters in the northeastern parts of Skagerrak.

During the second week, from October 7 to 9, F/V Rossö fished in shallow waters in southern Skagerrak and north of Skagen. The last survey haul was followed by an experimental haul along the same track using a 120 mm mesh size in the cod-end (instead of the research trawl's 70 mm mesh). F/V Svanen was scheduled to fish along the Norwegian coast and in western Skagerrak but had to abort and return to port due to a malfunctioning VMS transmitter. The equipment was replaced, and fishing resumed later in the week. While fishing at position 57°51.05' / 08°35.71', the trawl became stuck on a wreck, causing a minor tear in one wing, but the trawl was successfully hauled with the catch intact.

A total of 41 hauls were conducted during the 2024 expedition: 17 hauls in Danish waters, 15 hauls in Norwegian waters, and 9 hauls in Swedish waters.

Figure 1 shows the distribution of trawl stations, while Table 1 presents additional haul information.

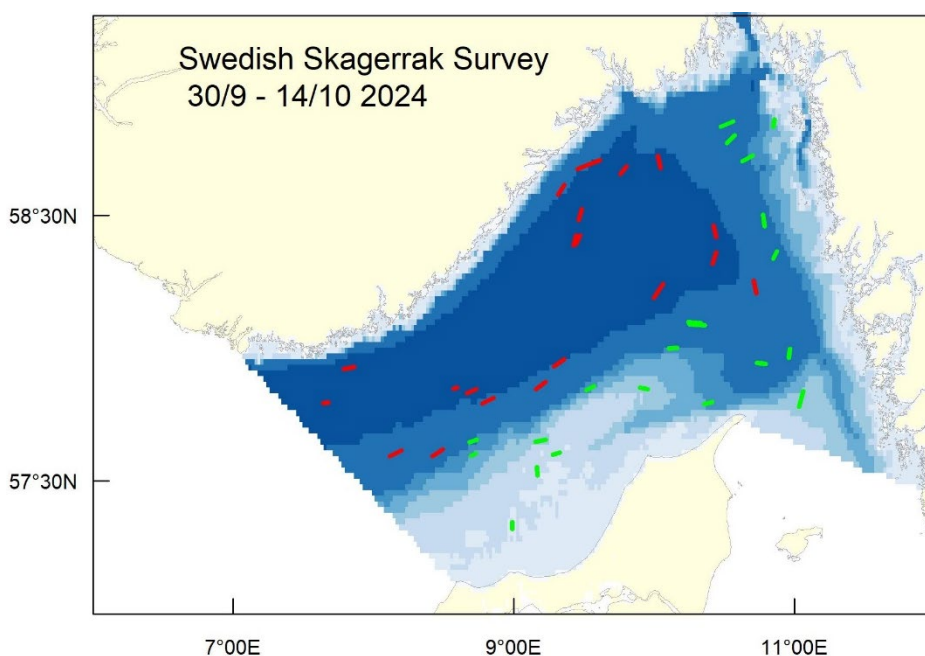


Figure 1. Map showing trawl stations in Skagerrak 2024 fished by F/V Rossö (green tracks) and F/V Svanen (red tracks).

## Results

The total catch amounted to 15.4 tonnes and included 50 different fish species, of which 11 were chondrichthyans (sharks, rays, and rabbit fish). The most common fish species, based on occurrence, was witch flounder, found in 33 out of 41 hauls. Long rough dab, hake, and haddock were caught in 29, 28, and 27 hauls, respectively, whereas cod were caught in 25 out of 41 hauls.

The largest catches by weight were haddock (4.2 t), roundnose grenadier (3.1 t), and greater silversmelt (2.6 t). The catch of cod was somewhat lower than in previous years, totaling 0.55 t (Table 2). The most frequently caught elasmobranchs during the cruise were starry ray and velvet belly, each recorded in

24 out of 41 hauls. The largest chondrichthyan catches by weight were rabbit fish (0.36 t) and spurdog (0.22 t) (Table 3).

As expected, fewer fish (32 individuals from 8 species) were caught in the experimental haul with a 120 mm mesh in the codend compared to the standard haul with a 70 mm mesh (1,545 individuals from 13 species). The number of large individuals ( $\geq 50$  cm) was comparable between the two hauls, but in addition to cod, saithe was caught in the experimental haul, whereas hake was caught in the standard haul.

Age and individual weights were recorded for 584 cod specimens, but genetic sampling of cod was discontinued this year. Instead, increased effort was devoted to collecting genetic samples from elasmobranchs. A total of 98 genetic samples were collected from starry rays, 20 potential *Dipturus sp.*, 17 round skates, 14 sail rays, and one thornback ray. Additionally, 29 samples of black-mouth dogfish and one starry smooth-hound were collected. The uncertain *Dipturus* samples are currently undergoing genetic identification through DNA barcoding.

**Table 1.** Station list for the Swedish Skagerrak Survey September 30 – October 16 2024.

Vessel	Date	HaulNo	Set position		Haul position		StatRect	Depth	Duration (min)	Speed (knt)	Door spread (m)
			Latitude	Longitude	Latitude	Longitude					
SIGA	30/09 2024	1	58°20.16N	10°51.12E	58°21.85N	10°52.47E	45G0	125	60	3.1	80.0
SIGA	30/09 2024	2	58°27.50N	10°47.28E	58°30.01N	10°46.56E	45G0	121	50	3.1	83.0
SIGA	30/09 2024	3	58°43.40N	10°42.15E	58°42.19N	10°37.90E	46G0	92	60	3.0	73.0
SIGA	1/10 2024	4	58°51.08N	10°33.85E	58°49.93N	10°28.60E	46G0	127	60	3.0	64.0
SIGA	1/10 2024	5	58°46.18N	10°31.30E	58°48.02N	10°34.44E	46G0	114	60	2.9	74.0
SIGA	1/10 2024	6	58°51.59N	10°51.50E	58°49.90N	10°51.10E	46G0	76	40	2.9	70.0
SIGA	2/10 2024	7	57°51.49N	9°34.40E	57°50.57N	9°30.98E	44F9	73	40	3.1	68.0
SIGA	2/10 2024	8	57°39.40N	8°44.22E	57°38.72N	8°41.00E	44F8	111	40	3.1	71.0
SIGA	2/10 2024	9	57°35.72N	8°41.65E	57°36.23N	8°43.80E	44F8	79	30	2.9	71.0
SIGA	3/10 2024	10	57°47.35N	10°21.55E	57°47.80N	10°24.77E	44G0	86	40	2.8	79.0
SIGA	3/10 2024	11	57°46.85N	11°2.12E	57°59.40N	11°3.78E	44G1	41	50	3.2	60.0
SIGA	3/10 2024	12	57°57.86N	10°57.68E	57°59.79N	10°57.97E	44G0	132	40	3.1	76.0
SIGA	7/10 2024	13	58°0.11N	10°9.72E	57°59.91N	10°6.25E	45G0	82	40	2.9	62.0
SIGA	7/10 2024	14	57°50.75N	9°57.30E	57°51.12N	9°53.91E	44F9	53	40	3.0	70.0
SIGA	7/10 2024	15	57°36.44N	9°19.68E	57°36.02N	9°16.63E	44F9	20	40	3.0	47.7
SIGA	8/10 2024	16	57°19.25N	8°59.43E	57°20.77N	8°59.40E	43F8	20	30	3.1	47.7
SIGA	8/10 2024	17	57°31.34N	9°10.24E	57°33.15N	9°9.81E	44F9	22	40	3.2	47.7
SIGA	8/10 2024	18	57°38.84N	9°9.28E	57°39.33N	9°13.55E	44F9	38	50	3.0	59.0
SIGA	9/10 2024	19	57°56.46N	10°47.61E	57°56.64N	10°43.98E	44G0	169	40	3.0	84.0
SIGA	9/10 2024	20	58°5.63N	10°19.88E	58°5.84N	10°14.65E	45G0	127	60	2.7	82.0
SIGA	9/10 2024	21	58°5.40N	10°15.21E	58°5.13N	10°21.68E	45G0	121	60	3.2	82.0
SMFH	30/09 2024	1	58°12.44N	10°43.85E	58°15.19N	10°42.74E	45G0	196	63	2.9	85.0
SMFH	30/09 2024	2	58°18.99N	10°25.07E	58°21.61N	10°26.49E	45G0	326	60	2.7	87.0
SMFH	30/09 2024	3	58°25.06N	10°26.52E	58°27.58N	10°25.55E	45G0	297	60	2.6	86.0
SMFH	1/10 2024	4	58°40.70N	10°2.75E	58°43.29N	10°1.69E	46G0	334	60	2.6	89.0
SMFH	1/10 2024	5	58°40.99N	9°48.24E	58°39.28N	9°45.62E	46F9	485	60	2.3	90.0

Table 1, *continued*

Vessel	Date	HaulNo	Set position		Haul position		StatRect	Depth	Duration (min)	Speed (knt)	Door spread (m)
			Latitude	Longitude	Latitude	Longitude					
SMFH	1/10 2024	6	58°42.39N	9°36.69E	58°40.47N	9°27.32E	46F9	264	60	2.7	84.0
SMFH	1/10 2024	7	58°36.81N	9°21.52E	58°34.63N	9°18.95E	46F9	266	60	2.5	80.0
SMFH	2/10 2024	8	58°31.34N	9°29.00E	58°28.89N	9°27.72E	46F9	513	70	2.9	90.0
SMFH	2/10 2024	9	58°25.45N	9°28.49E	58°23.45N	9°26.55E	45F9	510	60	2.2	92.0
SMFH	2/10 2024	10	58°25.39N	9°26.70E	58°23.22N	9°25.51E	45F9	498	60	2.2	91.0
SMFH	3/10 2024	11	57°50.80N	9°9.43E	57°52.43N	9°13.70E	44F9	168	60	2.9	75.0
SMFH	3/10 2024	12	58°11.35N	10°0.01E	58°14.51N	10°3.78E	45G0	404	60	2.1	87.0
SMFH	7/10 2024	13	57°55.84N	9°17.28E	57°57.49N	9°21.53E	44F9	249	61	2.6	89.0
SMFH	7/10 2024	14	57°37.16N	8°29.60E	57°35.68N	8°25.26E	44F8	142	60	2.3	75.0
SMFH	14/10 2024	15	57°48.76N	8°51.38E	57°47.51N	8°46.59E	44F8	236	60	2.7	85.0
SMFH	14/10 2024	16	57°49.81N	8°40.06E	57°50.79N	8°43.85E	44F8	431	60	2.3	85.0
SMFH	14/10 2024	17	57°50.88N	8°34.25E	57°51.05N	8°35.71E	44F8	490	26	2.3	87.0
SMFH	15/10 2024	18	57°55.77N	7°51.69E	57°55.26N	7°47.34E	44F7	365	60	2.4	86.0
SMFH	15/10 2024	19	57°47.67N	7°40.63E	57°47.60N	7°38.40E	44F7	469	30	2.3	83.0
SMFH	15/10 2024	20	57°35.65N	8°6.95E	57°36.89N	8°11.98E	44F8	206	60	3.0	77.0

**Table 2.** Total catch in kg and in numbers of all fish species during the Skagerrak trawl survey in 2024, sorted by occurrence (elasmobranchs are presented separately in table 3).

Swedish name	English name	Scientific name	Frequency of occurrence	Total number	Total weight (kg)	No. of individual weights / DNA
Rödtunga	Witch	<i>Glyptocephalus cynoglossus</i>	33	676	123.520	
Lerskädda	Long rough dab	<i>Hippoglossoides platessoides</i>	29	1993	152.946	
Kummel	Hake	<i>Merluccius merluccius</i>	28	315	222.243	
Kolja	Haddock	<i>Melanogrammus aeglefinus</i>	27	8497	4153.380	
Torsk	Cod	<i>Gadus morhua</i>	25	550	548.290	
Rödspätta	Plaice	<i>Pleuronectes platessa</i>	23	3079	420.944	
Gråsej	Saithe	<i>Pollachius virens</i>	23	562	606.289	
Marulk	Monkfish	<i>Lophius piscatorius</i>	22	67	347.860	
Vitling	Whiting	<i>Merlangius merlangus</i>	22	4008	1196.100	
Blåvitling / kolmule	Blue whiting	<i>Micromesistius poutassou</i>	20	328	69.276	
Bergtunga	Lemon sole	<i>Microstomus kitt</i>	19	364	53.980	
Vitlinglyra	Norway pout	<i>Trisopterus esmarkii</i>	19	258	7.078	
Guldax	Greater silversmelt	<i>Argentina silus</i>	16	9371	2608.125	
Skoläst	Round-nose grenadier	<i>Coryphaenoides rupestris</i>	13	8482	3102.812	
Fjällbrosme	Greater forkbeard	<i>Phycis blennoides</i>	13	41	38.088	
Taggmakrill	Horse mackerel	<i>Trachurus trachurus</i>	13	381	155.544	
Makrill	Mackerel	<i>Scomber scombrus</i>	11	138	34.333	
Sill / strömming	Herring	<i>Clupea harengus</i>	10	43	5.491	
Sandskädda	Dab	<i>Limanda limanda</i>	10	2566	319.948	
Knot / knorrhane	Grey gurnard	<i>Eutrigla gurnardus</i>	9	126	18.975	
Birkelånga / blåånga	Blue ling	<i>Molva dypterygia</i>	8	19	61.558	
Långa	Ling	<i>Molva molva</i>	7	25	44.934	
Blåkäft	Blue mouth	<i>Helicolenus dactylopterus</i>	6	41	6.420	
Fyrtömmad skärlånga	Fourbearded rockling	<i>Enchelyopus cimbrius</i>	5	14	1.586	
Slätvar	Brill	<i>Scophthalmus rhombus</i>	4	9	6.166	
Mindre kungsfisk	Redfish	<i>Sebastes viviparus</i>	4	4	1.146	

Table 2, *continued*

Swedish name	English name	Scientific name	Frequency of occurrence	Total number	Total weight (kg)	No. of individual weights / DNA
Fjärsing	Greater weever	<i>Trachinus draco</i>	4	51	11.266	
Nordlig silvertorsk	Silvery pout	<i>Gadiculus argenteus</i>	3	6	0.126	
Piggvar	Turbot	<i>Scophthalmus maximus</i>	3	6	4.981	
Äkta tunga	Sole	<i>Solea solea</i>	3	3	1.464	
Silverfisk	Silver smelt	<i>Argentina sphyraena</i>	2	4	0.180	
Tungevar	Scaldfish	<i>Arnoglossus laterna</i>	2	3	0.068	
Fenknot	Tub gurnard	<i>Chelidonichthys lucerna</i>	2	4	1.032	
Hälleflundra	Halibut	<i>Hippoglossus hippoglossus</i>	2	2	1.486	
Ålbrosme	Vahl's Eelpout	<i>Lycodes gracilis</i>	2	4	0.110	
Bleka / lyrtorsk	Pollack	<i>Pollachius pollachius</i>	2	2	5.850	
Sjurygg	Lumpfish	<i>Cyclopterus lumpus</i>	1	1	4.200	
Mullus	Red mullet	<i>Mullus surmuletus</i>	1	1	0.174	
Glyskolja	Poor cod	<i>Trisopterus minutus</i>	1	1	0.028	

**Table 3.** Total catch in kg and in numbers of elasmobranch species caught during the Skagerrak trawl survey in 2024, sorted by occurrence.

Swedish name	English name	Scientific name	Frequency of occurrence	Total number	Total weight (kg)	No. of individual weights / DNA
Klorocka	Starry ray	<i>Amblyraja radiata</i>	24	175	123.500	98 / 98
Blåkäxa	Velvet belly	<i>Etmopterus spinax</i>	24	594	188.190	
Havsmus	Rabbit fish	<i>Chimaera monstrosa</i>	19	532	358.827	
Hågäl	Black-mouth dogfish	<i>Galeus melastomus</i>	10	37	21.281	29 / 29
Pigghaj	Spurdog	<i>Squalus acanthias</i>	9	109	221.367	
Slätrocka (tentative) <sup>1</sup>	Common skate (tentative) <sup>1</sup>	<i>Dipturus sp(tentative)<sup>1</sup></i>	8	21	110.808	20 / 20
Vitrocka	Sailray	<i>Rajella lintea</i>	4	15	30.956	14 / 14
Rundrocka	Round skate	<i>Rajella fyllae</i>	3	14	6.208	17 / 17
Nordlig hundhaj	Starry smooth-hound	<i>Mustelus asterias</i>	1	1	0.858	1 / 1
Knaggrocka	Thornback ray	<i>Raja clavata</i>	1	1	4.386	1 / 1
Småfläckig rödhaj	Lesser spotted dogfish	<i>Scyliorhinus canicula</i>	1	1	0.885	1 / 0

<sup>1</sup> Morphological identification uncertain. Molecular identification is currently in progress.