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## **Cruise report no: 05.09.2023, 02.10.2023-20.10.2023, Jnr. 23/11702**

This cruise report, numbered **05.09.2023, 02.10.2023-20.10.2023, Jnr. 23/11702** is a part of the fulfilment of the conditions required to enter Norwegian zone with the chartered vessels F/V Rossö and F/V Svanen given by permit “23/11702”. The time series data collected during the cruise will be combined with data from IBTS Q3 and the Swedish coastal survey for a formal analysis. The findings will be reported to the Swedish Agency for Marine and Water Management in the spring of 2024.

### **Participants**

F/V Rossö with skipper Niklas Sterner and crew and from SLU Aqua: Peter Johannessen and Victor Jacobsson.

F/V Svanen with skipper Stefan Larsson and crew, and from SLU Aqua: Jan-Erik Johansson and Anders Wernbo.

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 that are not currently covered by IBTS will also be collected. The survey is a so-called fishermen survey, i.e. knowledge and experience within the commercial fishery is used in the design and implementation of the survey. The data collected will be analysed together with data from the IBTS Q3 and the Swedish coastal survey to generate distribution maps and biomass estimates for stock assessment and environmental evaluation at national and international level.

### **Itinerary**

The chartered fishing vessels F/V Rossö (call sign SIGA) and F/V Svanen (call sign SMFH) departed from port on the evening of October 1, 2023, heading towards Lysekil, Sweden. Upon arrival, they rigged the survey trawls and calibrated the door sensors. Between October 2 and October 5, F/V Rossö mostly predominantly operated in the eastern Skagerrak, fishing at depths ranging from 60 to 200 meters, while F/V Svanen fished at 240 to 500 meters depth in the central and northern parts of the Skagerrak. During the second week, from October 09 to October 10, most of the fishing occurred at depths from 150 to 400 meters along the southern edge of the Norwegian trench, and in shallow water in the southern

Skagerrak. Due to poor weather conditions, the survey was cut short and not all planned stations could be completed. During the 2023 cruise, 36 valid hauls out of the planned 40 were completed in Danish waters (11 hauls), Norwegian waters (16 hauls), and Swedish waters (9 hauls). Figure 1 shows the distribution of trawl stations, while Table 1 presents additional haul information.

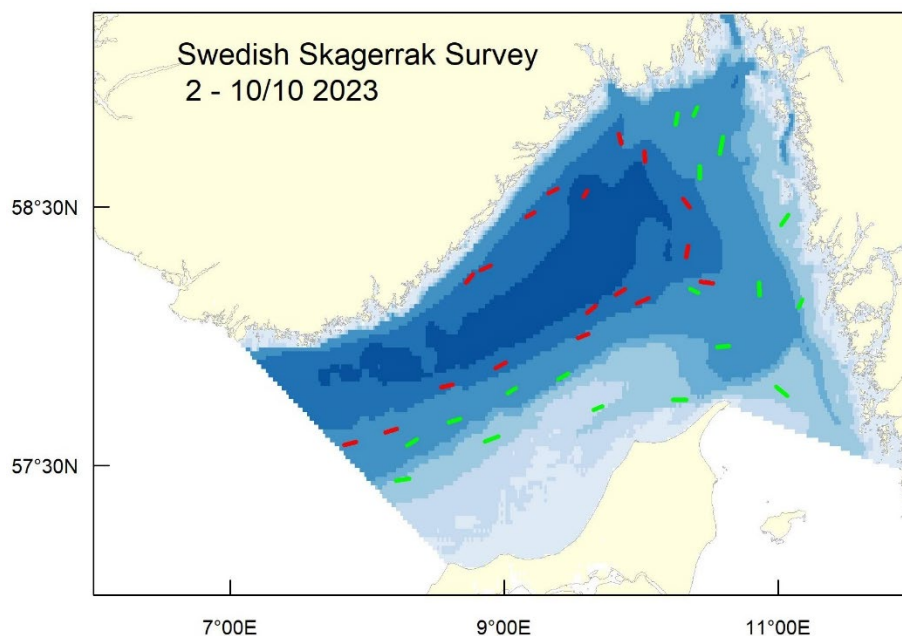


Figure 1. Map showing trawl stations in Skagerrak 2023 fished by F/V Rossö (green tracks) and F/V Svanen (red tracks).

## Results

The total catch was 18.7 tonnes and included 37 different fish species and 8 elasmobranchs, including rabbit fish. The most common fish species, based on occurrence, was witch flounder found in 31 out of 36 hauls. Cod, saithe, blue whiting and Norway pout were found in 24 out of 36 hauls each. The largest catches by weight were greater silversmelt (5.4 t), haddock (5.2 t), roundnose grenadier (2.2 t), and dab (1.1 t). The catch of cod was similar to previous years (0.85 t) (Table 2). The most frequently caught elasmobranchs during the cruise were velvet belly and starry ray, which were caught in 24 out of 36 hauls each. The largest catches by weight were rabbit fish (0.58 t) and spur dog (0.36 t) (Table 3).

Age and individual weights were recorded for 584 cod specimens, while genetic samples were collected from 267 cod specimens. Additionally, genetic samples were collected from 34 starry ray specimens, 10 sailrays, and 2 specimens each of thornback rays and round skates.

**Table 1.** Station list for the Swedish Skagerrak Survey October 02 – October 10 2022.

Vessel	Date	HaulNo	Set position		Haul position		StatRect	Depth	Duration (min)	Speed (knt)	Door spread (m)
			Latitude	Longitude	Latitude	Longitude					
SIGA	2/10 2023	1	58°8.48N	11°10.57E	58°6.65N	11°8.99E	45G1	79	46	3.0	70.0
SIGA	2/10 2023	2	57°57.76N	10°38.42E	57°57.45N	10°33.46E	44G0	138	61	2.8	86.0
SIGA	2/10 2023	3	57°55.52N	10°24.91E	57°54.68N	10°30.84E	44G0	104	60	3.4	71.0
SIGA	2/10 2023	4	57°45.27N	10°19.75E	57°45.25N	10°14.04E	44G0	74	60	3.0	68.0
SIGA	3/10 2023	5	58°10.01N	10°25.12E	58°10.95N	10°21.60E	45G0	205	50	2.7	69.0
SIGA	3/10 2023	6	58°9.43N	10°51.95E	58°12.37N	10°51.68E	45G0	152	60	3.0	78.0
SIGA	3/10 2023	7	58°39.36N	10°25.71E	58°36.58N	10°25.65E	46G0	174	60	2.6	75.0
SIGA	4/10 2023	8	58°49.05N	10°15.01E	58°51.59N	10°15.95E	46G0	179	60	2.8	74.0
SIGA	4/10 2023	9	58°53.04N	10°24.68E	58°51.16N	10°23.11E	46G0	169	50	2.6	77.0
SIGA	4/10 2023	10	58°42.25N	10°34.58E	58°46.16N	10°35.90E	46G0	120	50	2.8	69.0
SIGA	5/10 2023	11	58°28.11N	11°4.37E	58°25.80N	11°1.32E	45G1	59	60	2.9	69.0
SIGA	9/10 2023	12	57°51.36N	9°28.03E	57°50.03N	9°23.74E	44F9	92	60	2.8	74.0
SIGA	9/10 2023	13	57°47.91N	9°5.11E	57°46.79N	9°1.50E	44F9	135	50	2.5	79.0
SIGA	9/10 2023	14	57°40.81N	8°40.55E	57°40.04N	8°35.80E	44F8	151	60	2.7	83.0
SIGA	9/10 2023	15	57°36.13N	8°21.63E	57°34.65N	8°17.38E	44F8	159	60	2.6	83.0
SIGA	10/10 2023	16	57°26.60N	8°12.70E	57°27.01N	8°18.43E	43F8	73	60	3.1	66.0
SIGA	10/10 2023	17	57°35.67N	8°51.54E	57°36.80N	8°57.39E	44F9	64	60	3.3	68.0
SIGA	10/10 2023	18	57°42.92N	9°39.11E	57°43.79N	9°42.87E	44F9	32	60	3.3	60.0
SIGA	11/10 2023	19	57°48.25N	10°59.14E	57°46.24N	11°3.92E	44G0	42	60	3.2	59.0
SMFH	2/10 2023	1	58°18.36N	10°19.83E	58°20.87N	10°20.57E	45G0	376	60	2.7	86.0
SMFH	2/10 2023	2	58°29.79N	10°21.33E	58°31.85N	10°18.31E	45G0	312	60	2.7	85.0
SMFH	2/10 2023	3	58°40.37N	10°1.70E	58°42.71N	10°1.37E	46G0	348	60	2.6	87.0
SMFH	3/10 2023	4	58°16.29N	8°54.04E	58°15.28N	8°49.59E	45F8	354	60	2.6	86.0
SMFH	3/10 2023	5	58°14.31N	8°46.37E	58°12.36N	8°43.21E	45F8	294	60	2.7	88.0
SMFH	3/10 2023	6	58°27.59N	9°9.71E	58°28.73N	9°13.15E	45F9	349	60	2.3	87.0
SMFH	3/10 2023	7	58°33.65N	9°36.43E	58°32.33N	9°34.75E	46F9	499	61	1.8	84.0
SMFH	4/10 2023	8	58°34.14N	9°23.34E	58°33.13N	9°19.35E	46F9	329	60	2.7	86.0
SMFH	4/10 2023	9	58°46.80N	9°50.21E	58°44.60N	9°51.36E	46F9	371	60	2.7	84.0

**Table 1, continued**

Vessel	Date	HaulNo	Set position		Haul position		StatRect	Depth	Duration (min)	Speed (kn)	Door spread (m)
			Latitude	Longitude	Latitude	Longitude					
SMFH	5/10 2023	10	58°9.56N	9°48.86E	58°10.84N	9°52.93E	45F9	436	60	2.7	86.0
SMFH	5/10 2023	11	58°7.58N	9°58.16E	58°8.78N	10°3.25E	45F9	239	60	2.8	78.0
SMFH	5/10 2023	12	58°12.64N	10°26.22E	58°12.30N	10°31.35E	45G0	247	60	2.7	86.4
SMFH	9/10 2023	13	58°5.41N	9°36.35E	58°7.05N	9°40.17E	45F9	437	60	2.8	82.0
SMFH	9/10 2023	14	57°59.61N	9°32.35E	58°0.56N	9°36.87E	44F9	240	60	2.8	83.0
SMFH	9/10 2023	15	57°52.62N	8°56.26E	57°53.94N	9°0.77E	44F8	393	60	2.7	83.0
SMFH	10/10 2023	16	57°34.86N	7°49.89E	57°35.47N	7°55.07E	44F7	232	60	2.8	82.0
SMFH	10/10 2023	17	57°37.77N	8°8.08E	57°38.50N	8°12.81E	44F8	236	60	2.8	82.0
SMFH	10/10 2023	18	57°48.15N	8°32.44E	57°48.72N	8°37.27E	44F8	422	60	2.8	86.0

**Table 2.** Total catch in kg and in numbers of all fish species during the Skagerrak trawl survey in 2023, 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>	31	394	76.904	
Torsk	Cod	<i>Gadus morhua</i>	24	1820	849.266	584 / 267
Blåvitling / kolmule	Blue whiting	<i>Micromesistius poutassou</i>	24	184	42.063	
Gråsej	Saithe	<i>Pollachius virens</i>	24	567	503.784	
Vitlinglyra	Norway pout	<i>Trisopterus esmarkii</i>	24	200	5.695	
Kolja	Haddock	<i>Melanogrammus aeglefinus</i>	22	17584	5208.995	
Kummel	Hake	<i>Merluccius</i>	20	125	114.450	
Lerskädda	Long rough dab	<i>Hippoglossoides platessoides</i>	19	857	57.053	
Marulk	Monkfish	<i>Lophius piscatorius</i>	18	36	200.676	
Guldlox	Greater silversmelt	<i>Argentina silus</i>	16	18095	5404.525	
Långa	Ling	<i>Molva</i>	16	50	75.131	
Fjällbrosme	Greater forkbeard	<i>Phycis blennoides</i>	16	49	38.301	
Vitling	Whiting	<i>Merlangius merlangus</i>	15	1230	358.145	
Bergtunga	Lemon sole	<i>Microstomus kitt</i>	15	996	132.751	
Makrill	Mackerel	<i>Scomber scombrus</i>	15	249	111.083	
Rödspätta	Plaice	<i>Pleuronectes platessa</i>	14	6527	802.346	
Skoläst	Round-nose grenadier	<i>Coryphaenoides rupestris</i>	13	6793	2187.255	
Taggmakrill	Horse mackerel	<i>Trachurus</i>	13	116	39.772	
Sandskädda	Dab	<i>Limanda</i>	11	9286	1053.909	
Birkelånga / blålånga	Blue ling	<i>Molva dypterygia</i>	10	17	50.502	
Knot / knorrhane	Grey gurnard	<i>Eutrigla gurnardus</i>	8	208	25.495	
Nordlig silvertorsk	Silvery pout	<i>Gadiculus argenteus</i>	6	10	0.296	
Blåkäft	Blue mouth	<i>Helicolenus dactylopterus</i>	6	89	16.950	
Sill / strömming	Herring	<i>Clupea harengus</i>	5	25	4.515	
Bleka / lyrtorsk	Pollack	<i>Pollachius</i>	3	5	14.936	
Fyrtömmad skärlånga	Fourbearded rockling	<i>Enchelyopus cimbrius</i>	2	2	0.390	

Table 2, continued

Swedish name	English name	Scientific name	Frequency of occurrence	Total number	Total weight (kg)	No. of individual weights / DNA
Hälleflundra	Halibut	<i>Hippoglossus hippoglossus</i>	2	2	45.763	
Skäggsimpa	Pogge	<i>Agonus cataphractus</i>	1	1	0.011	
Lubb	Tusk	<i>Brosme brosme</i>	1	1	14.000	
Fläckig sjökock	Spotted dragonet	<i>Callionymus maculatus</i>	1	2	0.018	
Sjurygg	Lumpfish	<i>Cyclopterus lumpus</i>	1	1	3.158	
Rötsimpa	Bull rout	<i>Myoxocephalus scorpius</i>	1	1	0.128	
Skrubbskädda	Flounder	<i>Platichthys flesus</i>	1	1	0.349	
Slätvar	Brill	<i>Scophthalmus rhombus</i>	1	1	0.310	
Större kungsfisk	Red fish	<i>Sebastes norvegicus</i>	1	11	2.808	
Äkta tunga	Sole	<i>Solea solea</i>	1	9	2.634	
Fjärsing	Greater weever	<i>Trachinus draco</i>	1	1	0.101	

Table 3. Total catch in kg and in numbers of elasmobranch species caught during the Skagerrak trawl survey in 2023, 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	133	73.321	34 / 34
Blåkäxa	Velvet belly	<i>Etmopterus spinax</i>	24	556	175.434	
Havsmus	Rabbit fish	<i>Chimaera monstrosa</i>	22	931	578.861	
Hågäl	Black-mouthed dogfish	<i>Galeus melastomus</i>	8	34	20.141	
Pigghaj	Spurdog / spiny dogfish	<i>Squalus acanthias</i>	6	198	355.159	
Vitrocka	Sailray	<i>Rajella lintea</i>	5	14	51.366	10 / 10
Knaggrocka	Roker	<i>Raja clavata</i>	2	2	7.815	2 / 2
Rundrocka	Round skate	<i>Rajella fyllae</i>	1	1	0.388	2 / 2