NORAD-FAO PROGRAMME
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CRUISE REPORTS *DR FRIDTJOF NANSEN*
EAF-Nansen/CR/2018/2

SURVEY OF THE FISHERY RESOURCES AND ECOSYSTEM OFF SOUTHEAST AFRICA

Mozambique

12 February – 19 March 2018

Instituto Nacional de Investigação Pesqueira
Maputo, Mozambique

Institute of Marine Research
Bergen, Norway

The EAF-Nansen Programme

The EAF-Nansen Programme "Supporting the application of the Ecosystem Approach to Fisheries Management considering climate and pollution impacts" (GCP/GLO/690/NOR) aims to further strengthen the knowledge base and the overall institutional capacity for the implementation of the Ecosystem Approach to Fisheries (EAF) in developing countries, with additional attention to the impact of climate variability and change, pollution and other anthropogenic stressors.

The programme, that started implementation in May 2017, builds on earlier phases, and is governed by an agreement between the Food and Agriculture Organization of the United Nations (FAO), the Institute of Marine Research (IMR), Norway and the Norwegian Agency for Development Cooperation (Norad). The three pillars of the new programme are: Science, Fisheries management, and Capacity development. A new state of the art research vessel, *Dr Fridtjof Nansen* is an integral part of the programme. A science plan, covering 11 research themes, guides the programme scientific work.

The programme works in partnership with countries, regional organizations, other UN agencies as well as other partner projects and institutions.

Le Programme EAF-Nansen

Le Programme EAF-Nansen "Appuyer la mise en œuvre de l'approche écosystémique de la gestion des pêches en tenant compte des impacts du climat et de la pollution" (GCP/GLO/690/NOR), vise à renforcer la base de connaissances et la capacité institutionnelle pour la mise en œuvre de l'approche écosystémique des pêches (AEP) dans les pays en développement, en accordant une attention particulière aux effets de la variabilité et du changement climatique, de la pollution et d'autres facteurs de stress anthropiques.

Le programme, qui a débuté en mai 2017, s'appuie sur les phases précédentes et est régi par un protocole d'accord entre l'Organisation des Nations Unies pour l'alimentation et l'agriculture (FAO), l'Institut de recherche marine (IMR) de Norvège et l'Agence norvégienne de Coopération au développement (Norad). Les trois piliers du nouveau programme sont : la science, l'aménagement de la pêche et le développement des capacités. Un navire de recherche à la pointe de la technologie, le nouveau *Dr Fridtjof Nansen*, fait partie intégrante du programme. Un plan scientifique, couvrant 11 thèmes de recherche, guide les travaux scientifiques du programme.

Le programme travaille en partenariat avec les pays, les organisations régionales, d'autres agences des Nations Unies ainsi que d'autres projets et institutions partenaires.

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CRUISE REPORTS *DR FRIDTJOF NANSEN*

SURVEY OF THE FISHERY RESOURCES AND ECOSYSTEM OFF SOUTHEAST AFRICA

Mozambique

12 February – 19 March 2018

by

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Institute of Marine Research
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EXECUTIVE SUMMARY

This survey was organised based on a request from the Ministry of Fisheries of Mozambique to the Food and Agriculture Organization (FAO) of the United Nations for assistance to update the information from the 2014 *Dr Fridtjof Nansen* survey and was part of a regional coverage of the fishery resources and ecosystems of South East Africa. The survey aimed at collecting data on oceanographic conditions, pelagic and demersal resources, on the presence of pollutants (microplastics and marine debris) and to collect samples for analysis of nutritional value and contaminants in seafood. Data and samples collected will be further analysed under the activities planned as part of the EAF-Nansen Science Plan.

The water column at the Central Mozambique Channel and the Sofala Bank was highly influenced by the terrestrial outflow of numerous rivers. The chlorophyll maximum (DCM), was typically located deep near the coast and just above the thermocline in the open sea because supply of nutrients is the highest here and light intensity still sufficient for primary productivity. Low chlorophyll concentrations were found at the surface. In Mozambique the more productive waters are found near the coast and plankton production is likely a concomitant result of upwelling, rivers discharge, and current flows that supply nutrients to the upper water layers.

Acoustic biomass estimates were calculated for clupeoids (PEL1) and a group consisting of carangids, barracudas, hairtails and scombrids (PEL2). Altogether ~69 000 tonnes of PEL1 species were found. Of these 3 500 tonnes were found in the south while the rest was found in the central region, with only a minor contribution in the north (<1 000 tonnes). In 2014 about 15 000 tonnes of PEL1species were found along the coast of Mozambique. Of the PEL2 group a total estimate of 170 000 tonnes were recorded, compared with 67 000 along the whole coast of Mozambique in 2014. Of this the larger part (112 000 tonnes) was found in the central region while about 30 000 tonnes and 27 000 tonnes were found in the southern and northern regions, respectively. The distribution of PEL1 species was associated with the Limpopo and Zambezi rivers while the PEL2 species had a wider distribution inshore in most of the southern region and over the Sofala Bank. Both the PEL1 and PEL2 species show a considerable increase in biomass compared to past surveys, i.e. 2007 and 2014.

The overall swept area biomass estimated for the survey was 165 000 tonnes compared with 212 000 tonnes found in the south and central region in 2014. In 2018, 107 000 tonnes were found in the south and almost 60 000 tonnes were found in the central area compared with 110 000 tonnes and 102 000 tonnes, respectively, in 2014.

Biomass estimates from scientific surveys provide an index of standing stock biomass. It is highly recommended that these results are examined in greater depths and jointly with information from the fishery for a realistic estimate of a sustainable potential.

CHAPTER 1. INTRODUCTION

1.1 The survey area

In 2018 the research vessel (R/V) *Dr Fridtjof Nansen* operated in the Indian Ocean. The areas surveyed included the continental shelf and upper slope of East Africa [continental] (Leg 1), the Mascarene Bank (Leg 2) and parts of the Bay of Bengal region (Leg 3). Leg 1 covers the continental shelf and upper slope of eastern Africa, with oceanographic transects in the Agulhas Current region and off Tanzania to the Seychelles (Figure 1).

In Mozambique, the survey encompassed two legs; Leg 1.2, an Ecosystem survey with a strong component of abundance estimates for pelagic and demersal fish stocks and Leg 1.3, a special survey aiming to conduct a baseline assessment of the environmental and ecosystems health in the northern Mozambique oil and gas development area. This report describes the ecosystem survey along the coast of Mozambique from the border with South Africa to the border with Tanzania (Legs 1.2 and 1.4) covering the hydrographic conditions, plankton, mesopelagic, pelagic and demersal resources abundance and pollution (microplastics, food safety and nutritional value).

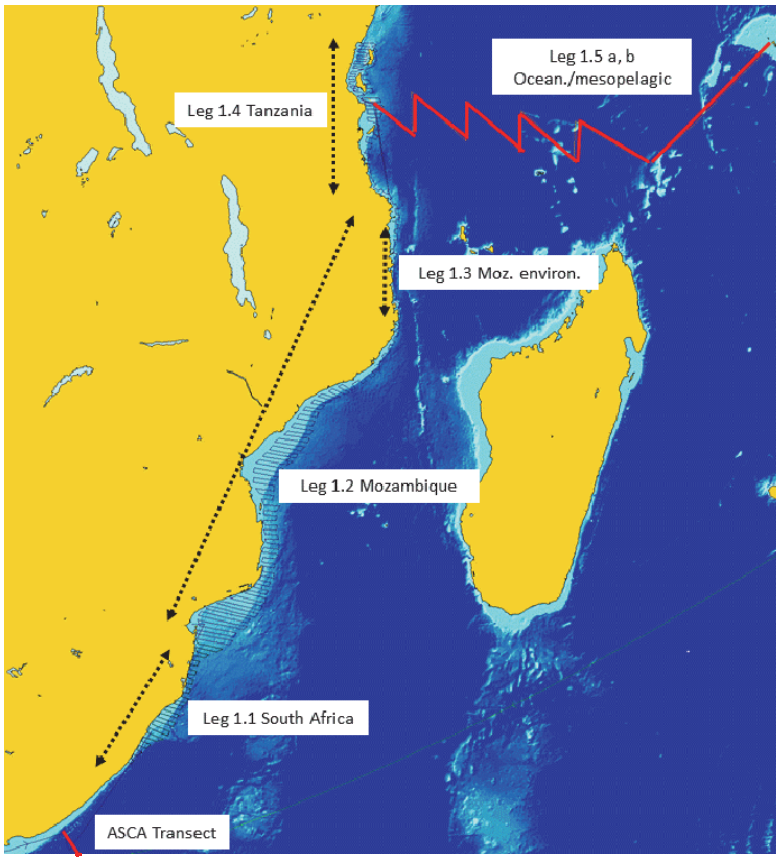


Figure 1. R/V *Dr Fridtjof Nansen* survey programme 2018, Leg 1.

1.2 Survey objectives

Hydrography:

- To map the hydrographic/environmental conditions in the survey area (temperature, salinity, oxygen, chlorophyll, nutrients, total alkalinity and pH values)

Phytoplankton, zooplankton, ichthyoplankton and jellyfish:

- To establish as far as possible, the distribution, abundance and composition of phyto- and zooplankton (including jellyfish), and species composition of fish eggs and larvae.

Pelagic and demersal stocks:

- To obtain information on abundance, distribution (also by size) of the main pelagic fish species, and also considering the pelagic sub-groups *PEL 1 (clupeids, engraulids)* and *PEL2 (carangids, scombrids, barracudas, hairtail)*, using acoustic methods in a systematic grid survey strategy and conducting targeted trawling
- To obtain information on abundance, distribution (also by size) of the main demersal fish species, crustaceans and squids, using a swept area method with bottom trawls
- To collect information on maturity stages, for the main pelagic fish, demersal fish, crustaceans and squids
- To collect samples for genetic analysis for stock identification for selected species
- To collect stomach samples for analysis of contents (diet) including microplastics.

Mesopelagic fish:

- To identify the main species and collect samples for identification and isotope analysis.

Marine debris and pollution:

- To record occurrence of marine debris (surface)
- To collect samples for levels of nutrients and contaminants including microplastics in the marine environment
- To map occurrence of microplastics and describe associated neuston communities.

Contaminants:

- To collect samples of fish species consumed locally, the most abundant/less exploited deep-water fish species and other indicator species such as soles, for analysis of contaminant levels and nutrient values.

Sediments and benthos:

- To carry out detailed bottom habitat studies (in selected areas).

1.3 Participation

A total of 50 scientists and technicians from Mozambique and Norway, including two invited scientists from the Republic United of Tanzania and two from South Africa, participated in the survey. The full list of the participants and their affiliations is given in Table 1 below.

Table 1. List of participants, their role, affiliation and the period they stayed onboard.

LEG	PARTICIPANT	ROLE	AFFILIATION	PERIOD
1.2.1	Jens-Otto Krakstad	Cruise leader	IMR	12.02-05.03
1.2.1&2	Rui Mutombene	Local cruise leader	IIP	12.02-20.03
1.2.1	Sarah Ann Bruck	Fish and biological sampling	IMR	12.02-05.03
1.2.1&2	Frøydis Rist Bogetveit	Fish and biological sampling	IMR	12.02-20.03
1.2.1	Oddgeir Alvheim	Taxonomy	IMR	12.02-05.03
1.2.1	Jan Frode Wilhelmsen	Acoustic engineer	IMR	12.02-05.03
1.2.1	Olaf Sørås	Acoustic engineer	IMR	12.02-05.03
1.2.1	Jorunn Sanden	Plankton sampling	IMR	12.02-05.03
1.2.1&2	Tone Lillian Galluzzi	Fish contaminants	IMR	12.02-20.03
1.2.1	David Cervantes	Hydrography	IMR	12.02-05.03
1.2.1	Maria Ascensão Pinto	Fish and biological sampling	IIP	12.02-05.03
1.2.1	Sandra Ruveneco	Fish and biological sampling	IIP	12.02-05.03
1.2.1	Emildo Marcelo Notisso	Fish and biological sampling	IIP	12.02-05.03
1.2.1&2	Gonçalves Donato Bernabe	Plankton sampling	IIP	12.02-05.03
1.2.1&2	Eurico Pereira Morais	Fish and biological sampling	IIP	12.02-20.03
1.2.1&2	Feliciano Manjate	Fish and biological sampling	IIP	12.02-20.03
1.2.1&2	Francisco Zivane	Plankton sampling	IIP	12.02-20.03
1.2.1	Badrú Hajy	Hydrography	IIP	12.02-20.03
1.2.1&2	Manuel Taque	Plankton and plastic sampling	IIP	12.02-20.03
1.2.1	Isaías Tembe	Fish and biological sampling	IIP	12.02-05.03
1.2.1	Herinques Bustani	Hydrography	IIP	12.02-05.03
1.2.1	Helena Salencia	Plankton sampling	IIP	12.02-05.03
1.2.1	Stela Fernando	Fish and biological sampling	IIP	12.02-05.03
1.2.1	Lourenço Mucambe	Fish and biological sampling	IIP	12.02-05.03
1.2.1	Argélio Américo Cuamba	Fish contaminants	INIP	12.02-05.03
1.2.1&2	António Francisco Gimo	Hydrography	INAHINA	12.02-20.03
1.2.1	Agnaldo Luís Neve	Hydrography	UEM	12.02-05.03
1.2.1	Álvaro Albino Vetina	Fish and biological sampling	UEM	12.02-05.03
1.2.1	Siajali Pamba Zegge	Plankton sampling	UDSL	12.02-05.03
1.2.2	Bjørn Erik Axelsen	Cruise leader	IMR	06.03-20.03
1.2.2	Marek Ostrowski	Hydrography	IMR	06.03-20.03
1.2.2	Tor Magne Ensrud	Plankton and bethos	IMR	06.03-20.03
1.2.2	Irene Huse	Fish and biological sampling	IMR	06.03-20.03
1.2.2	Geir Landa	Acoustic engineer	IMR	06.03-20.03
1.2.2	Åse Sudmann	Acoustic engineer	IMR	060.3-20.03
1.2.2	Carlota Amoda	Plankton and plastic sampling	IIP	06.03-20.03
1.2.2	Vanessa Muianga	Fish and biological sampling	UEM	06.03-20.03
1.2.2	Carlos Braimo Ibraimo	Fish and biological sampling	IIP	06.03-20.03
1.2.2	Carlos Cuamba	Fish and biological sampling	EP	06.03-20.03
1.2.2	Adriano Alfredo Manjate	Fish and biological sampling	IIP	06.03-20.03
1.2.2	José Halafo	Fish and biological sampling	IIP	06.03-20.03
1.2.2	Hélder Mabjaia	Fish and biological sampling	IIP	06.03-20.03
1.2.2	Rosario Fernandes Jorge Laissane	Fish and biological sampling	IDEPA	06.03-20.03
1.2.2	Samuel Sitoe	Fish and biological sampling	ADNAP	06.03-20.03
1.2.2	Aniceto Cululo	Plankton sampling	UNILURIO	06.03-20.03
1.2.2	Mark Gibbons	Plankton taxonomy and sampling	UWC	06.03-20.03
1.2.2	Delphine Thibault	Plankton taxonomy and sampling	UCT	06.03-20.03
1.2.2	Baraka Chrisostoms Sekadende	Plankton sampling	TAFIRI	06.03-20.03
1.2.2	Antonio Pegado	Hydrography and Acoustics	IIP	06.03-20.03
1.2.2	Daniel Mualeque	Fish and biological sampling	IIP	06.03-20.03

List of institution abbreviations: IMR –Institute of Marine Research, IIP – Instituto Nacional de Investigação Pesqueira, INIP – Instituto Nacional de Inspencção do Pescado, IDEPA – Instituto de Desenvlvimento da Pesca e Aquacultura, ADNAP – Administração Nacional das Pescas, INAHINA – Instututo Nacional de Hidrografia e Navegação, UEM – Universidade Eduardo Mondlane, UNILURIO – Universidade de Lurio, UNDS – University of Dar-Es-Salaam, TAFIRI – Tanzanian Fisheries Research Institute, UCT – University of Cape Town, UWC – University of Western Cape, EP – Escola de Pescas

1.4 Narrative

The vessel arrived in Maputo port at 10th of February after the completion of Leg 1.1 along the East Coast of South Africa. Embarkation of local scientists was made on the 11th of February at 18:00 local time (UTC +2). During the morning of February 12th, a reception was organised on the vessel by the Norwegian Embassy allowing the vessel to be visited by representatives of the Mozambique Government (Minister of Sea, Inland Waters and Fisheries, Minister of Science and Technology, Higher Education and Technical-Professional), Norwegian Embassy, FAO and IMR. The reception was successfully carried out and generated considerable media attention. The vessel left Maputo in the afternoon of the 12th of February around 16:30 and steamed south to the border with South Africa where the first trawl of the Southern region was commenced the next day. The southern region of Mozambique was surveyed from the 13th of February until 26 February, before the vessel crossed over to the Central region (Sofala bank). On 3 March in the morning the survey was interrupted off the Zambezi River mouth to go north to Pemba for the scheduled crew change. The vessel reached the port of Pemba on 5 March in the morning. After the crew change the vessel left Pemba on the 7th at 06:00 and steamed southward back towards the Zambezi River (19°S, 36°E) where operations were resumed on 9 March around 11:00. On 13 March the vessel crossed over to the Northern region (17°30'S), continuing the transect lines according to plan. The last transect line at the northern border (10°30'S) was completed on 17 March at 14:00, commencing steaming to Pemba port. The vessel made port in Pema 18 March at 17:00 LT. Duration of the survey at each region is summarized in Table 2.

Table 2. The three areas of Mozambique were surveyed on the following dates.

Survey area	Days	Date Start	Date Completion
Southern region: border of South Africa – 21°30'S.	14	13/02/2018	26/02/2018
Central region: The Sofala bank area (21°30' S – 17°15'S).	14	27/02/2018	12/03/2018
Northern region: 17°15'S – border of Tanzania	5	13/03/2018	17/03/2018
Total	33	13/02/2018	17/03/2018

1.5 Survey effort

The design of the standard survey and the sampling followed the agreed design described in the sailing orders for Leg 1.2. This implied a systematic survey track consisting of pseudo-parallel acoustic transect lines perpendicular to the coast line spanning from 20 m to 1 000 m depth. Transect lines were equally spaced, approximately 15 nautical miles apart.

Besides acoustic sampling for pelagic and mesopelagic fish biomass estimates, the survey design also allowed a continuous recording of data from the multibeam bottom mapping echosounder EM710, the thermosalinograph and the weather station.

Bottom trawling for biomass estimates of demersal fish and crustaceans was carried out in the southern and central regions. Sampling was carried out within four pre-defined depth-strata: 20-50 m, 50-100 m, 100-200 m and 200-800 m depth. Wherever possible all strata were sampled for all transects with a maximum distance of 20 nm between trawl stations. In the Sofala Bank area, where the shelf is relatively wide and the slope beyond rather steep, fewer

demersal trawl stations could be obtained at the slope. In the northern region the topography is rather unsuitable for bottom trawling as there is no continental shelf plateau, only steep, rocky trenches. Demersal trawls were carried out wherever possible for biological sampling, but it was not possible to obtain a coverage that could support an estimate based on the swept area method in the north. Pelagic trawls were only conducted in the northern region to sample acoustic targets. Pelagic targets in the central and southern regions were used for identification of pelagic species present (according to the PEL1 and PEL2 target categories). CTDs were deployed and sediment samples taken at every bottom-trawl sampled.

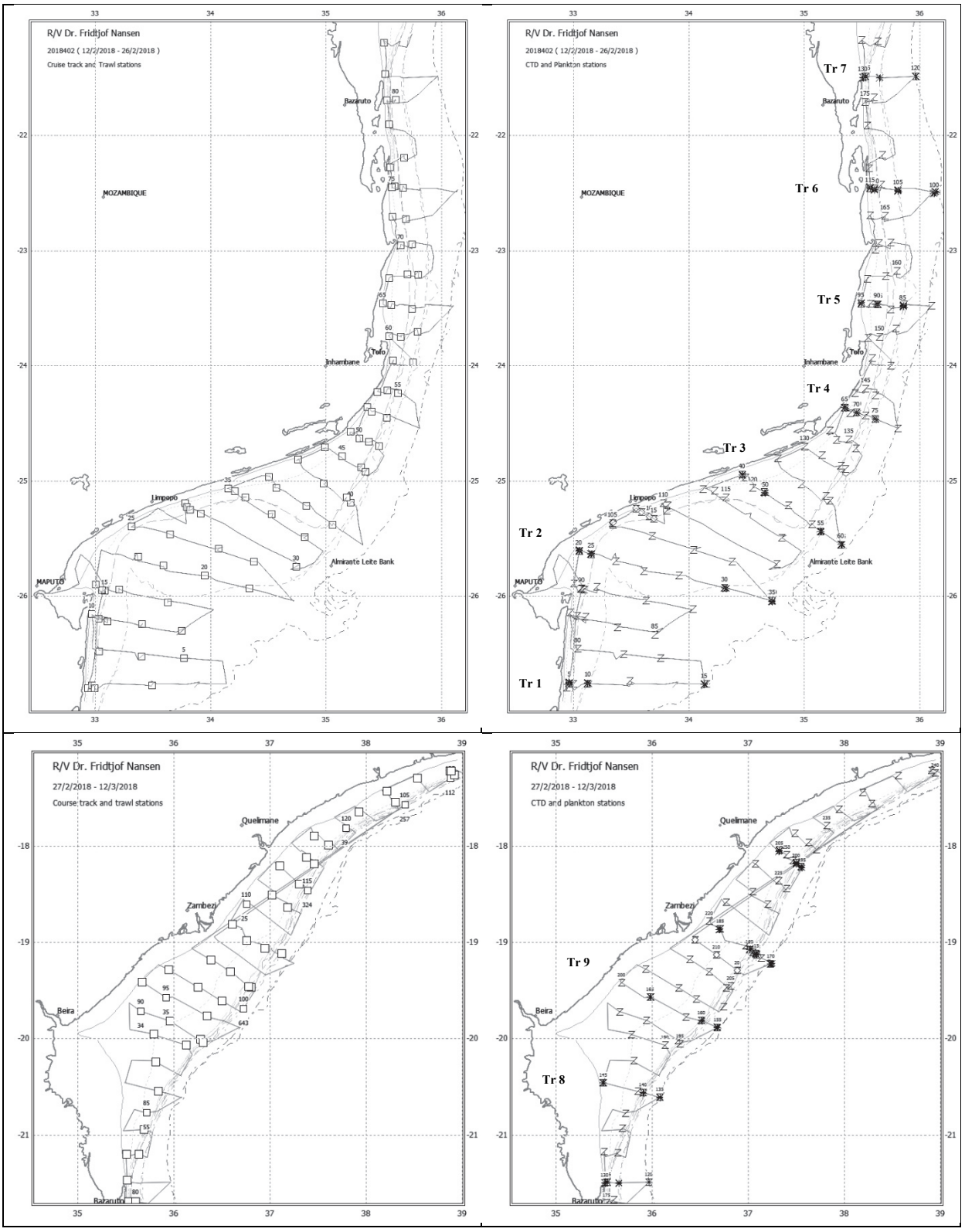
Hydrographic variables were measured at every bottom trawl station and at sections perpendicular to the coastline at about every 60 nm. At these "super transects" or "ecosystem transect" (every 60 nm) a more elaborate sampling program was conducted, including CTD, plankton/egg and larvae sampling, microplastic/ neuston as well as water samples for chemical and nutrient analyses. Additional to that, benthic sampling using grabs was carried out on two dedicated transects off the Limpopo (25°20'S, 33°E) and Zambezi Rivers (18°S, 50°E) to get an understanding of riverine-influenced bethic habitats. Tables Table 3 and Table 4 summarise the survey effort in each sub-area. The cruise tracks with bottom-trawls, pelagic trawls, plankton, benthos and hydrographic stations can be found in Figure 2.

Table 3. Survey effort in number of sampling stations (total and by regions). Number of CTD, Phyto - phytoplankton nets, WP-2 – zooplankton nets, Multi – nets for eggs and larvae, Manta – Trawl for plastic particles in the surface, BT-bottom trawl and PT- Pelagic trawl hauls. The distance sailed in each region is also provided.

Region	Distance sailed	CTD	Phyto	WP-2	Multi	Manta	BT	PT	Grab
South	1 960.766	105	20	37	19	21	80		15
Central	2 212.059	60	15	28	16	14	41		5
North	968.592	27					17	5	
Total	5 141.417	164	35	65	35	35	138	5	20

Table 4. Survey effort in areas swepted by botoom trawls (per region and by depth strata). Biomass of demersal resources was not estimated in the northern region due to insufficient coverage, hence no area and trawl/area ratio are presented.

Region	Effort	Depth strata (m)			
		20-50	51-100	101-200	201-800
South	N° hauls	17	13	14	36
	Area/Trawl	70.2	90.5	112.8	312.6
	Area (NM^2)	1 194	1 176	1 579	11 256
Central	N° hauls	20	12	3	6
	Area/Trawl	325.2	209.7	241.0	427.5
	Area (NM^2)	6 505	2 516	482	2 565
North	N° hauls	12	3	1	1


R/V Dr. Fridtjof Nansen
2018402 (12/2/2018 - 26/2/2018)
Cruise track and Trawl stations
R/V Dr. Fridtjof Nansen
2018402 (12/2/2018 - 26/2/2018)
CTD and Plankton stations
Tr 7
Tr 6
Tr 5
Tr 4
Tr 3
Tr 2
Tr 1
Bazaruto
MOZAMBIQUE
Inhambane
Tofo
Limpopo
Almirante Leite Bank
MAPUTO
R/V Dr. Fridtjof Nansen
27/2/2018 - 12/3/2018
Course track and trawl stations
R/V Dr. Fridtjof Nansen
27/2/2018 - 12/3/2018
CTD and plankton stations
Quelimane
Zambezi
Beira
Tr 9
Tr 8
Bazaruto

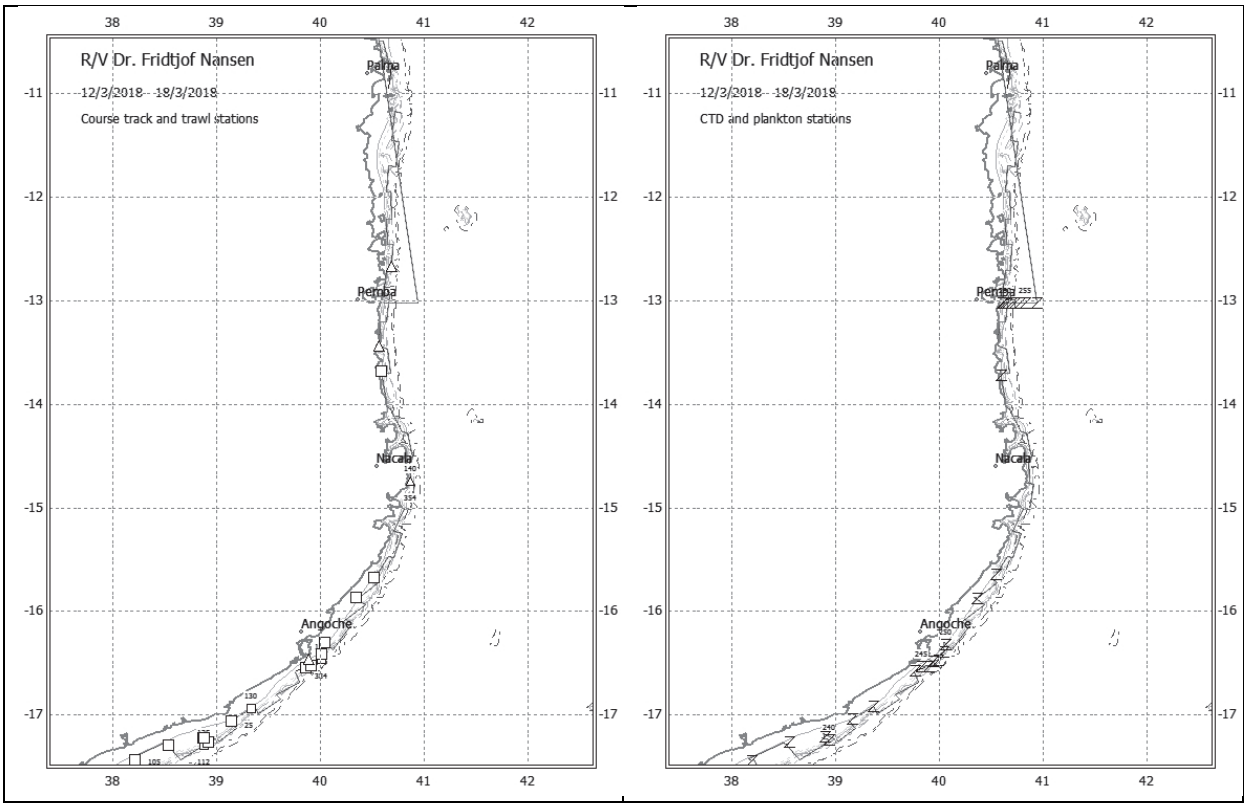


Figure 2. Course track and trawl stations (left) and CTD and plankton stations (right). Top panels: Southern region; mid panels: Central region; bottom panels: Northern region. Depth contours: 50, 100, 200, 500 and 1000 m. Numbers on the two upper right panels refer to the transect numbers in Annex VI.

CHAPTER 2. METHODS

2.1 Underway sampling

2.1.1 Meteorological observations

Meteorological data were normally logged continuously from the AANDERAA Smartguard meteorological station and included wind direction and speed, air pressure, relative humidity, air temperature and solar radiation. All data were logged to the Nansis tracklog system, averaged every 60 sec. A problem with the sensor systems was at times reducing the quality of the data.

2.1.2 Thermosalinograph

The SBE 21 SeaCAT thermosalinograph ran continuously during the survey, obtaining samples of sea surface water (at 4 m depth) and recording salinity and relative temperature every 10 seconds. An attached in-line C3 Turner Design Submersible Fluorometer measured turbidity and chlorophyll-*a* levels.

2.1.3 Current speed and direction measurements (ADCP)

Two hull-mounted Acoustic Doppler Current Profiler (VMADCP) from RD Instruments ran during the survey. The frequency of the VMADCP are 75 and 152 kHz. The system was run in narrow band mode and set to estimate the current in 8 and 16 m vertical bins at 152 and 75 kHz. The depth range covered by these instruments was variable, depending on sound scattering conditions, but typically mantained the 20-400 and 25-800 m ranges at 152 and 75 kHz, respectively. The heading data to convert the current recorded in the ship-referenced coordinates to the absolute zonal and meridional components were obtained from the vessel's differential GPS system. The files collected until March 3 (the first part of the survey) were preserved for later postprocessing. Those collected after March 10 were postprocessed on-board. The postprocessing involved two steps: quality control and presentation preparation. The quality control involved data screening to remove spurious currents near the bottom and noise removal from the GPS heading data. True currents were obtained by subtracting the GPS-derived speed of the vessel from the ADCP record. Following this, ping-based data were averaged over 120 seconds to suppres the noise in the current estimates caused by randomness of the acoustic backscatter. Finally, the resulting data were adjusted for the misalign angle between the pre-set and true orientation of the transducers with respect to the ship's heading. This angle was estimated by means of the standard water layer referencing method (Joyce, 1989).

The presentation step involved the separation of cross-shelf and alongshore transects from the continuous recording. The currents over individual transects were standardized over 1 km distance steps to eliminate the effect of the uneven rate of the spatial coverage due to the varying speed of the vessel. During trawl stations the vessel departed from the main surveying

direction to perform trawl hauls. All current data collected during such departures were averaged into a single profile representing the mean current velocity during a trawl haul.

2.2 Station sampling

A series of samples including plankton, microplastics and water samples were collected every 60 NM (every 3rd acoustic transect) at identified 'super stations'. These super stations were performed at (i) the inshore end of the acoustic transects with a bottom depth of 25 m, (ii) at the bottom depth of 100 m and (iii) at bottom depth of 500 m (or deeper if possible) at the outer end of the transect. The *Dr Fridtjof Nansen* is equipped with a 12 Niskin bottle rosette to collect water samples from pre-defined depths. The standard sampling depths were set to: 500 m, 400 m, 300 m, 200 m, 100 m, 75 m, 50 m, 25 m and 5 m. These samples were used to analyse chlorophyll-*a*, pH, total alkalinity and nutrients (nitrate, nitrite, silicate and phosphate). Samples collected on these transects are shown in Figure 3 and in Annex I. Additional CTD deployments (without environmental sampling) were also performed at all bottom trawl stations.

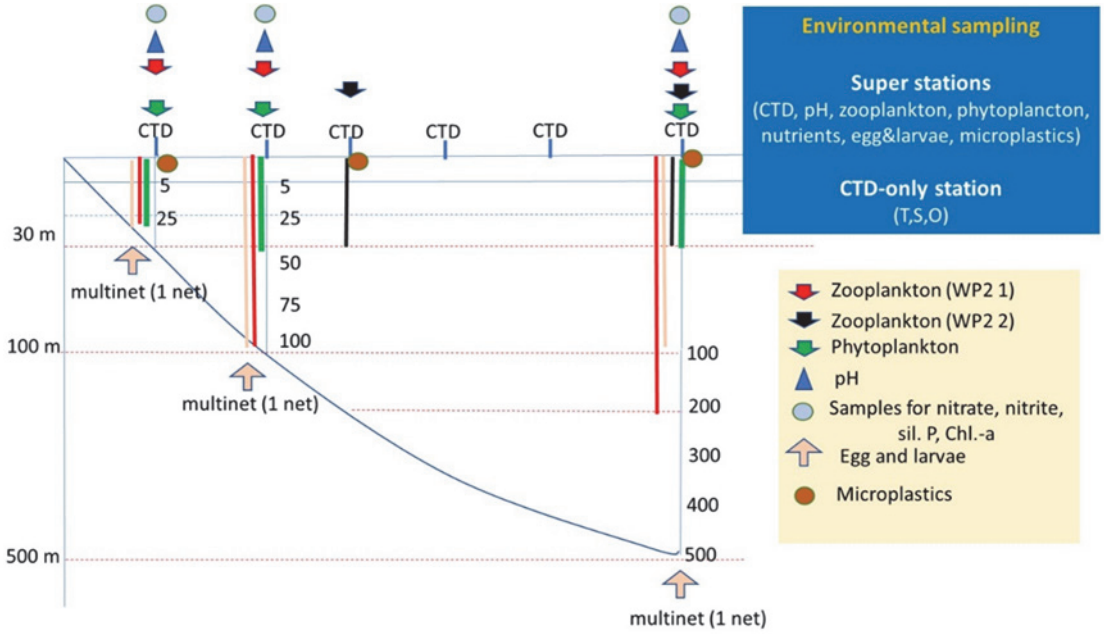


Figure 3. Sampling diagram showing the depth and the equipment used at the super stations transects, from the inshore (left side) towards the deep 500 m stations (right side).

2.2.1 CTD sensors – temperature, salinity, oxygen and fluorescence

Vertical temperature and salinity profiles were obtained by a Seabird 911 CTD, while in situ concentrations of dissolved oxygen were measured using a CTD-mounted SBE 43 oxygen sensor. Real time logging and plotting was performed using the Seabird Seasave software. Attached to the CTD was also a Chelsea Mk III Aquatracka fluorometer, which measures in situ fluorescence on a relative scale and a Photosyntetic Active Radiation (PAR) sensor, measuring downwelling irradiance (in micromole photons m^{-2}).

To verify the salinity values from the CTD conductivity sensor, water samples were collected and measured on board with a Guildline Portasal Salinometer 8410A and standardized with IAPSO salinity standard seawater. Sensor values were compared to water samples at the same depths (Figure 4, left). Observations show that CTD salinity values were much more reliable during the second part of the survey. The dissolved oxygen sensor values were also checked via onboard Winkler titrations (Grasshoff *et al*., 1999) (Figure 4, right). Any verified offsets with the sensor data were corrected at the Institute of Marine Research.

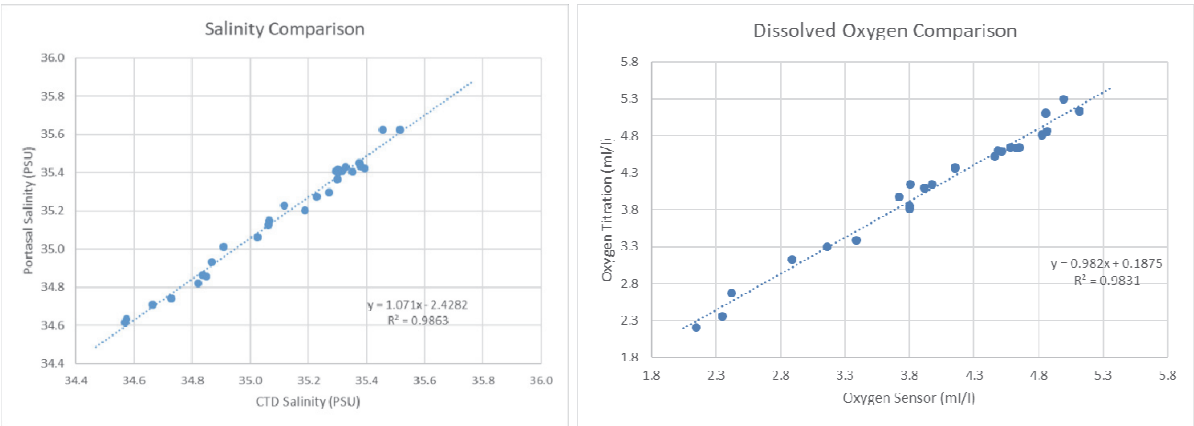


Figure 4. CTD calculated salinity values compared to Portasal calculated salinity values from water collected at the same depths from 200 m to 2000 m at stations between 100 and 254 (left panel). CTD mounted SBE 43 dissolved oxygen sensor measurements compared to Winkler titration measurements from water collected at the same depths from 200 m to 2000 m at stations between 99 and 254 (right panel).

2.2.2 Ocean acidification parameters (pH and alkalinity)

Water samples for pH and total alkalinity analyses were collected in the same 250 ml borosilicate glass bottle using silicone tubing. Since no preservative was used, it was necessary to keep the samples in the dark while waiting to be brought to 25°C (with a water bath) for analysis. pH was determined using an Agilent Cary 8454 UV-Vis Diode Array spectrophotometer and a 2 mM m-cresol purple indicator dye solution. The indicator dye was measured every 24 hours to determine the correction factor necessary for sample measurements (Clayton and Byrne, 1993; Chierici *et al*., 1999). All pH spectrophotometric measurements were performed in duplicates on board. Total alkalinity was measured via potentiometric titration using a 0.05M HCl solution with a sodium chloride background as the titrant. A Metrohm 888 Titrando equipped with an Aquatrode plus pH electrode with Pt1000 temperature sensor was used in combination with the Metrohm tiamo software to measure the change in pH and perform the total alkalinity titrations. Certified Reference Material of known total alkalinity from the Andrew Dickson Lab at Scripps Institution of Oceanography was measured every 24 hours to determine the correction factor appropriate for sample measurements. All total alkalinity titrations were performed in triplicates on board.

2.2.3 Nutrient samples

Water samples for nutrient analyses (nitrate, nitrite, silicate and phosphate) were collected stored in 20 ml polyethylene vials, conserved with 0.2 ml chloroform and kept cool and dark

in a refrigerator (Hagebø and Rey, 1984). Nutrient samples were sent to the Institute of Marine Research and analysed using a Skalar San++ Continuous Flow Analyser while following standard procedures (Grasshoff *et al*., 1999).

2.3 Phytoplankton sampling

Chlorophyll-*a* water samples were collected in 250 ml plastic bottles from 200 m to the surface and were filtered using a 0.7µm filtration system (Munktell glass-fibre filters Grade: MGF, vacuum 200 mm Hg). Filters were stored at -20°C until they were transferred to centrifuge tubes and 10 ml of 90% acetone were added. After being stored in the dark at 4°C for at least 15 hours for extraction, the samples were centrifuged and immediately transferred to cuvettes for measurement on a 10AU Fluorometer. First measured without acid for chlorophyll-*a* determination and then a second time with two drops of 5% HCl for phaeopigment determination. The 10AU is calibrated approximately every three months with standards created from a chlorophyll-*a* (from spinach) solid.

Qualitative phytoplankton samples were collected at super-stations as described above. At each superstation, qualitative phytoplankton samples were collected with a net (35 cm in diameter and mesh-size of 10 µm, hauled vertically at a speed of 0.1 ms^{-1} from the depth of 30 m to the surface (from ca. 5 m above bottom at the 30 m stations). These samples are not quantitative but used to establish the taxonomic composition of the phytoplankton community.

2.4 Zooplankton

Mesozooplankton was collected with a WP2-net along the super-station hydrographic transects at stations positioned at bottom-depths of approximately 30 m, 100 m and 500 m. The WP2-net (56 cm diameter, mesh size 180 µm, (Figure 5), (Fraser 1966, Anonymous 1968) was hauled vertically at a speed of ~0.5 ms^{-1} at each station. At the shallowest and intermediately deep stations (bottom-depths of 30 m and 100 m, respectively) the sampling strata were from near-bottom to the surface (deepest sampling depths of ~25 and 90 m, respectively). At the stations with bottom-depth of ~500 m or greater, the sampling stratum was from the depth of 200 m to the surface.

Furthermore, a second sample with the WP2-net was collected from the upper 30 m at the stations with bottom depths of 100 m and 500 m. The purpose of these additional samples was to enable a direct comparison of the zooplankton composition and concentrations in the uppermost layer of the water-column along the bottom-depth gradient. Each zooplankton sample was divided into two equal parts using a Motoda plankton splitter (Motoda 1959). The first part of the sample was size-fractioned by using a series of sieves with the decreasing mesh-sizes of 2000 µm, 1000 µm and 180 µm, and the zooplankton retained on each sieve were dried on aluminium trays at ~60 ºC for 24 h. These samples were dried once more and weighed on shore after the cruise at IMR for estimation of biomasses for the different size-

groups. The second part of the sample was preserved in seawater with a final solution of 4% formaldehyde buffered with borax for subsequent species identification and quantification.

The Manta-trawl (335 µm) was towed at the surface for 15 mins to sample microplastics and collect samples of associated neuston. All net samples were preserved in seawater with a final solution of 4% borax buffered formaldehyde solution.

2.5 Fish eggs and larvae

Oblique tows to a maximum depth of 100 m were conducted with a Hydrobios Multinet (0.25 m^2 mouth area), fitted with one 405 µm mesh nets, and were used to collect ichthyoplankton (fish eggs and larvae) in the upper 100 m. Removal of fish larvae from the sample was done under a stereoscope using a subsample that ranged from 25% to 100% of the original sample. Larvae were subsequently photographed and transferred to a separate jar for each station, preserved in 4% borax buffered formaldehyde solution. When all visible fish larvae had been removed, the rest of the sample was preserved for reference purposes and to check for any overlooked larvae. The fish-eggs will be sorted, and the larvae identified, on shore after the cruise at the laboratory in Zanzibar (ref. Margareth Kyewalyanga).

Figure 5. Plankton sampling equipment. Top: Phytoplankton net, WP2 net, Multinet rigged for oblique tow. Bottom: Manta trawl. Image credits: Jenny Huggett.

2.6 Jellyfish

Jellyfish caught as part of the trawl haul were identified to the lowest taxonomical level possible, and counted and weighed. Jellyfish specimens that were in a good condition were photographed (top and bottom sections), before being processed and preserved for future analysis. A small piece of the oral arm tissue as well as one gonad was removed and preserved in 96% ethanol (EtOH), and stored at -20°C. Tissue samples stored in EtOH were collected for genetic studies, aimed at determining species and population structure, as well as establishing regional and global connectivity. The rest of the specimen was preserved in 10% formalin. These samples formed part of a greater morphological identification and taxonomic study.

2.7 Fish and demersal/ benthic organisms

Biological sampling of fish and demersal/ benthic organisms was carried out using pelagic and bottom trawls. In shallow waters (<30 m bottom depth) and generally at night when pelagic fish were close to the surface the bottom trawl, fitted with floats, was used for sampling near the surface. A detailed description of instruments and fishing gear is given in Annex II. Sampling procedures followed in the fish lab are shown in Annex III.

All catches were sampled for composition by weight and numbers of each species caught. Species identification was based on the FAO Species Identification Guides. For the selected target species length (total length to the nearest cm), weight (to the nearest 0.5 g), sex, gonad maturity stage and stomach fullness were recorded. A list of biological scales used for maturity and stomach fulness is given in Annex IV. Length and weight measurements were used to estimate the length-weight relationship. For acoustic biomass calculations of the PEL1 and PEL2 target groups, the length used for estimating the biomass index for the two taxonomic groups was 14 cm for PEL1 and 23 cm for PEL2, as during the 2014 survey in Mozambique. Additionally, samples were also collected for onshore genetic analysis and morphometric analysis (25-30 fish, frozen samples). The acoustic target groups used for this survey can be found in Table 9, while the complete records of fishing stations and catches are provided in Annex V.

2.8 Microplastics and debris

Microplastics are small pieces of plastic marine debris normally less than 5 mm long. Microplastics were collected along the hydrographic transects at all super-stations At each station, the surface layer was sampled with a Manta-trawl, with a rectangular opening of 19 cm × 61 cm (HxW), mesh-size 335 µm and two wings to keep it balanced and at the surface during the tow. Trawls were hauled horizontally at a speed of ~1.5 ms^{-1} for 15 minutes. The counts of a manual flowmeter attached in the lower part of the trawl opening were recorded at the start and end of each trawl. Trawling was performed some meters away from of the starboard side, about mid-ship, attempting to avoid the wake of the vessel.

Once the Manta-trawl was back on the ship, the samples were washed with filtered sea-water over a sieve with a mesh-size of 180 µm. Microplastic particles were sorted from the sample under a stereo-microscope, and the sorted sample was then checked once more to reduce the risk of overlooking the smallest plastic particles. All assumed plastic items were then placed on a gridded petri dish for examination under the stereo-microscope, photographed and, to the extent possible, also measured and described (e.g. length, shape, type and colour). The sorted microplastics were washed with distilled water and dried in pre-weighed aluminium-trays in a drying cabinet at 30 ºC. The trays were packed in aluminium foil and stored in room-temperature until transport to the laboratory of IMR, where they will be studied in more detail. After removing the plastics, the remaining part of the samples - mainly biological material - was preserved in formalin for studies of neuston at IMR after the cruise.

2.9 Sediment coring

Sediment from bottom trawls: stainless steel cylinders were mounted on the footrope of the trawl to collect bottom sediment samples at every trawl station. The samples were collected from the cylinder when the trawl was on deck and stored in Rizan plastic bags and preserved for further analyses of sedimentological and chemical composition. For macrobenthos, sediment from grabs at stations in planned bottom depths of 20 m, 50 m, 100 m and 200 m were collected with a short-arm or long-arm van Veen grab appropriately weighted for depth. Three replicates were carried out per station. The drift of the vessel between replicates should not be >100 m, or else the vessel should steam back to the original station location. The macrofauna was than isolated by sieving sequentially through a series of sieves, before preservation in formalin and ethanol. Habitat information was obtained from multibeam scans and sub-bottom profiling. A single CTD cast was deployed to the maximum depth of the station to characterize the water column in terms of oceanographic properties. Two benthic transects were undertaken in the outflow areas of the two major rivers (Zambezi and Limpopo) for sediment/pollution studies in the shelf areas influenced by the riverine outlet.

2.10 Food safety

Whole fish, fillet and different organs from various fish that are regularly consumed in Mozambique were sampled during this survey and preserved. All the samples will be analysed for a wide variety of nutrients and contaminants at IMR, Bergen, as listed below. Tissue samples from mackerel samples will also be analysed for the parasite Kudoa. Some of the samples will also be analysed for correspondence between the microbiota and the metal content of the gut. One pelagic fish sample and two mesopelagic fish samples will be analysed for the content of microplastic particles.

2.11 Seabirds and top predators

There was no dedicated observers for seabirds and top predators on board for this leg of the cruise.

2.12 Acoustic recordings

2.12.1 Echosounder

Acoustic data were recorded using a Simrad EK80 Scientific Split Beam Echo Sounder running keel-mounted transducers at nominal operating frequencies of 18 kHz, 38 kHz, 70 kHz, 120 kHz, 200 kHz and 333 kHz. The last calibration was conducted in Bergen on the 23rd January, 2017. Calibration outputs and acoustic settings applied during the survey can be found in Annex II.

2.12.2 Multibeam sonar

A Simrad SH90 Sonar recorded data continuously during the survey for post processing after the survey. The sonar was set to a frequency of 26 kHz, in FM Normal mode. The sonar was operated using bow up/180 deg operation mode with the bearing of the vertical beams 90 deg, perpendicular to the vessel direction with a range of 450 m and with the horizontal beams set to 450 m with a tilt angle of 3 deg. The filters built into the sonar software to improve the school representation (i.e. AGC, RCG and ping to ping) were set to default values except for the Noise filter, which was turned off. The settings including range and tilt was kept the same during all the surveying except during trawling operations where the sonar was at times used actively to focus in on targets. No other sonars were used during the survey.

2.12.3 Bottom mapping echo sounder

The EM 710 and EM 302 multibeam echo sounders both belong to a high to very high-resolution seabed mapping system. Data acquisition depth starts approximately 3 m below the transducers and the maximum acquisition depth is limited in practice to 1000–1500 m on *Dr Fridtjof Nansen*. Across track coverage (swath width) is up to 5.5 times water depth and may be limited by the operator either in angle or in swath width without reducing the number of beams. The operating frequencies are between 70 to 100 kHz. There are 128 beams with dynamic focusing employed in the near field. The transmitting fan is divided into three sectors to maximize range capability and to suppress interference from multiples of strong bottom echoes. The sectors are transmitted sequentially within each ping and use distinct frequencies or waveforms. The along track beam width is 1 degree. Ping rate is set according to depth. The receiving beam width is 2 degrees. Sound profiles were set manually in the system according to the area of operation. The data was logged to the on-board Olex plotting system.

2.12.4 Allocation of acoustic energy to species group

Acoustic data were logged and post-processed on board using the latest acoustic data post-processing software, the Large-Scale Survey System (LSSS), Version 2.0. The acoustic data were scrutinized daily. Scrutinizing was done at 38 kHz, but echograms were frequently inspected at other frequencies as well. During the scrutinizing process 5 NM integrals of acoustic backscattering coefficients s_A (m^2 NM^{-2}) were analyzed and targets allocated to a predefined set of acoustic categories on basis of established echogram features. Scrutinized

data were then stored as mean s_A by acoustic category in 1 NM (horizontal) times 10 m (vertical) sized bins.

Due to low aggregation densities and the relatively high diversity targets were only allocated to two combined acoustic categories during the survey. These were clupeoid-like species (PEL1) and carangid-like species (PEL2). The PEL1 category consists of pelagic fish in the families Clupeidae, Dussumieriidae and Engraulididae, while the PEL2 category consist of pelagic fish the families Carangidae, Scombridae, Barracuda and Hairtails (Table 5). In terms of their acoustical properties, PEL1 is usually separated from PEL2 as they generally give stronger acoustic targets at similar densities. The PEL1 group also often appears as more defined, "spiky" school targets than PEL2. These characteristics are largely due to the more frequent occurrence of gas filled swimbladder among the species in the PEL1 group. Inspection of the frequency response patterns in candidate schools/ aggregations was therefore often used to assist the scrutinizing, with the typical frequency response curve of fish with gas-filled swim bladders (18 kHz peak) suggesting PEL1 to be more likely than PEL2.

Table 5. Acoustic categories used.

Group	Taxon	Species
Pelagic species group 1 (PEL1)	Clupeidae[1]	
		Dussumieria acuta
		Sardinella albella
		Sardinops sp.
	Engraulidae	
		Stolephorus spp.
		Encrasicholina punctifer
		Thryssa spp.
Pelagic species group 2 (PEL2)	Carangidae[2]	
		Selar crumenophthalmus
		Carangoides spp.
		Decapterus spp.
		Megalaspis cordyla
	Scombridae	
		Auxis thazard
		Rastrelliger kanagurta
		Sarda orientalis
		Scomber japonicus
		Scomberomorus commerson
	Sphyraenidae	
		Sphyraena spp.
	Trichiuridae	
		Benthodesmus elongatus
		Lepidopus caudatus
		Trichiurus lepturus
Other demersal species	Demersal families	
Mesopelagic species	Myctophidae	
	Other mesopelagic fish	
Plankton	Calanoidae	*Calanus* sp.
	Euphausiidae	*Meganyctiphanes* sp.
	Other plankton	

Ground truthing was accomplished by means of targeted pelagic and demersal trawling. The species composition in adjacent trawl samples was always inspected for verification of classification of the acoustic target, and the relative distribution in the biological sample was always given priority in case of doubt.

2.12.5 Estimation of biomass

The abundance of fish ρ_i (in numbers) is derived from the general relation:

$$\rho_i = \frac{s_A \cdot A}{\sigma} \quad (1)$$

where A is the area of distribution (NM^2), s_A the acoustic area backscattering coefficient (m^2NM^{-2}) and σ the acoustic backscattering cross-section of the target organisms (m^2).

The target strength (TS) to fish length relation used to convert mean area backscattering coefficient, s_A (m^2NM^{-2}) at 38 kHz to number of fish can be expressed as:

$$TS_{38kHz} = 20 \log L + b_{20} = 10 \log\left(\frac{\sigma}{4\pi}\right) \text{ (dB)} \quad (2)$$

where σ is the acoustical backscattering cross-section at 38 kHz (m^2), L is the total fish length (cm), and b_{20} is the species specific TS constant, or TS function. Here a TS function of b_{20} = -78 dB was applied for both PEL1 and PEL2 groups. This TS to size relation was first established for North Sea herring, but has later been attributed as a proxy clupeids in general (Foote *et al*., 1986; Foote, 1987), and has been used consistently for PEL1 and PEL2 groups on previous surveys with the *Dr Fridtjof Nansen*.

The distribution areas of the PEL1 and PEL 2 groups were defined by means of contouring around clusters of positive s_A values within the inner and outer zero-value limits of the transect lines. The strata contours were subsequently digitised using Nansis Maptool Version 2.1.4, determining the spatial extent of the distribution area and their estimated surface areas (A). Sub-stratification was used to isolate areas of similar densities, using the following standardized, pre-defined categories: 1 ($0<s_A<300$); 2 ($300<s_A<1000$); 3 ($1000<s_A<3000$); 4 ($3000<s_A<10000$); 5 ($s_A>10000$).

The target groups used during the survey can be found in Table 5 while the complete records of fishing stations and catches are shown in Annex V.

Low catches, patchy distribution and high diversity of the pelagic species precluded reliable estimation of mean lengths by species. The total length used for biomass estimation used was therefore the one used on previous surveys in Mozambique: 14 cm for PEL1 and 23 cm for PEL2. As mean length across these species should not initially be expected to change considerably over time, and in the interest of comparability across surveys, this seems a reasonable proxy for estimating the abundance of a multi-species group.

2.12.6 Swept area density calculations

In the bottom trawl survey, stock biomasses were estimated by the swept-area method with catch per haul as the index of abundance (see Strømme 1992). In most hauls the trawling time (with the gear at the bottom) was around 30 min. The area swept by the trawl net within 30 minutes trawl time was 0.015 NM² and it corresponds to an average horizontal trawl opening of 18.5 m efficient net width, towing at 3.0 knots. Diagrams of the bottom trawl used are shown in Annex II. The general formula to estimate biomass B, using this method is:

$$B=\frac{A}{a}.\frac{\overline{X}}{q} \tag{3}$$

where A is the total area surveyed, a is the swept area of the net per haul, $\overline{X}$ is the average catch per haul (the index of abundance) and q is the proportion of fish in the path of the net that are actually caught (trawl catchability voefficient). The density of the resource is estimated as biomass per unit area. In a stratified survey of k non-overlapping strata, if the mean catch per haul in stratum *i* and its variance are denoted by $\overline{X}_i$ and s_i^2 respectively, then an unbiased estimate of the population mean $\overline{X}$ is the stratified mean $\overline{X}_{st}$, which is given by:

$$\overline{X}_{st} = \frac{1}{N}\sum_{i=1}^{k} N_i \overline{X_i} = \sum_{i=1}^{k} W_i \overline{X_i} \tag{4}$$

where $Wi=\frac{Ni}{N} = \frac{A_i}{A}$ is the relative size of the i^{th} stratum (A_i is the area of the i^{th} stratum and A is the total area surveyed). The variance of the stratified mean is given by

$$\text{var}(\overline{X}_{st}) = \sum_{i=1}^{k} w_i^2 \,\text{var}\,\overline{X}_i = \sum_{i=1}^{k} w_i^2 \frac{s_i^2}{n_i} \tag{5}$$

where n_i is number of hauls in the i^{th} stratum and n is the total number of hauls in the survey. A stratified semi-random design was used with depth and area as stratification factors. Estimated total biomass by species/group was obtained by summing estimates for each depth stratum.

For conversion of catch rates (kg/hour) to fish densities (t NM^{-2}), the effective fishing area was considered as the product of the wing spread and the haul length, or distance over the bottom, as measured by means of the SCANMAR® equipment based on GPS readings. The area swept for each haul was thus 18.5 m (traditionally applied wing spread for the "Nansen" bottom trawl) times the distance trawled, raised to NM^{-2} $hour^{-1}$. The catchability coefficient (q), i.e. the fraction of the fish encountered by the 18.5 m horizontal opening of the trawl that was actually caught, was assumed equal to 1. Catchability may vary depending on the type of gear used and the type of species (e.g. gears with bobbins are apparently less efficient for species such as flatfishes and octopus, while gears without bobbins and with footrope touching the bottom are more efficient for benthic species). Departures of q from 1 can

introduce biases in biomass estimates leading to wrong fisheries management advices (David Somerton, 1996). Mean fish densities by species and strata, were calculated by the swept-area module in Nansis.

CHAPTER 3. RESULTS

3.1 Oceanographic conditions

The coast of Mozambique has a length of about 2 700 km. The continental shelf is narrow, rarely extending more than few kilometres offshore. The notable exceptions are the Sofala Bank located in the central section of the coast where the region shallower than 100 meters occupies nearly 50 000 km^2 and the ~500 m deep Almirante Leite Bank just east of Maputo. Mozambique is located on the western side of the Mozambique Channel separated from the island of Madagascar by as little as 400 km at the narrowest point. The main source of the surface water masses along the Madagascar coast is the South Equatorial Current (SEC), which carries across the Indian Ocean warm and relatively low saline water sourced from the Pacific and the Indonesian Seas. Upon reaching Madagascar the SEC diverges. One branch, the East Madagascar Current (EMC) flows east of Madagascar and reaches the Mozambican coast at the latitude of Maputo, while the other branch, the Mozambican Current (MC), enters the Mozambican Channel west of Madagascar and flows along the Northern and Central coasts of Mozambique. Just south of Maputo both branches join resulting in the Agulhas Current. Recent satellite observations have revealed that both branches are pathways for the southward propagating eddies rather than a continuous mean flow. As a consequence, the current velocities observed along the coast are expected to vary strongly depending on the size, direction and the speed of the passing eddy field.

3.1.1 Southern region

Meteorological conditions

Wind speed and direction were recorded from the vessel's weather station and results are illustrated in Figure 6. The highest wind speed for the whole cruise was recorded in the southern region and particularly off Dikambane, and south of Maputo. The direction was variable and changed in direction from SE and NE. Further north the wind calmed down and became stable from SE.

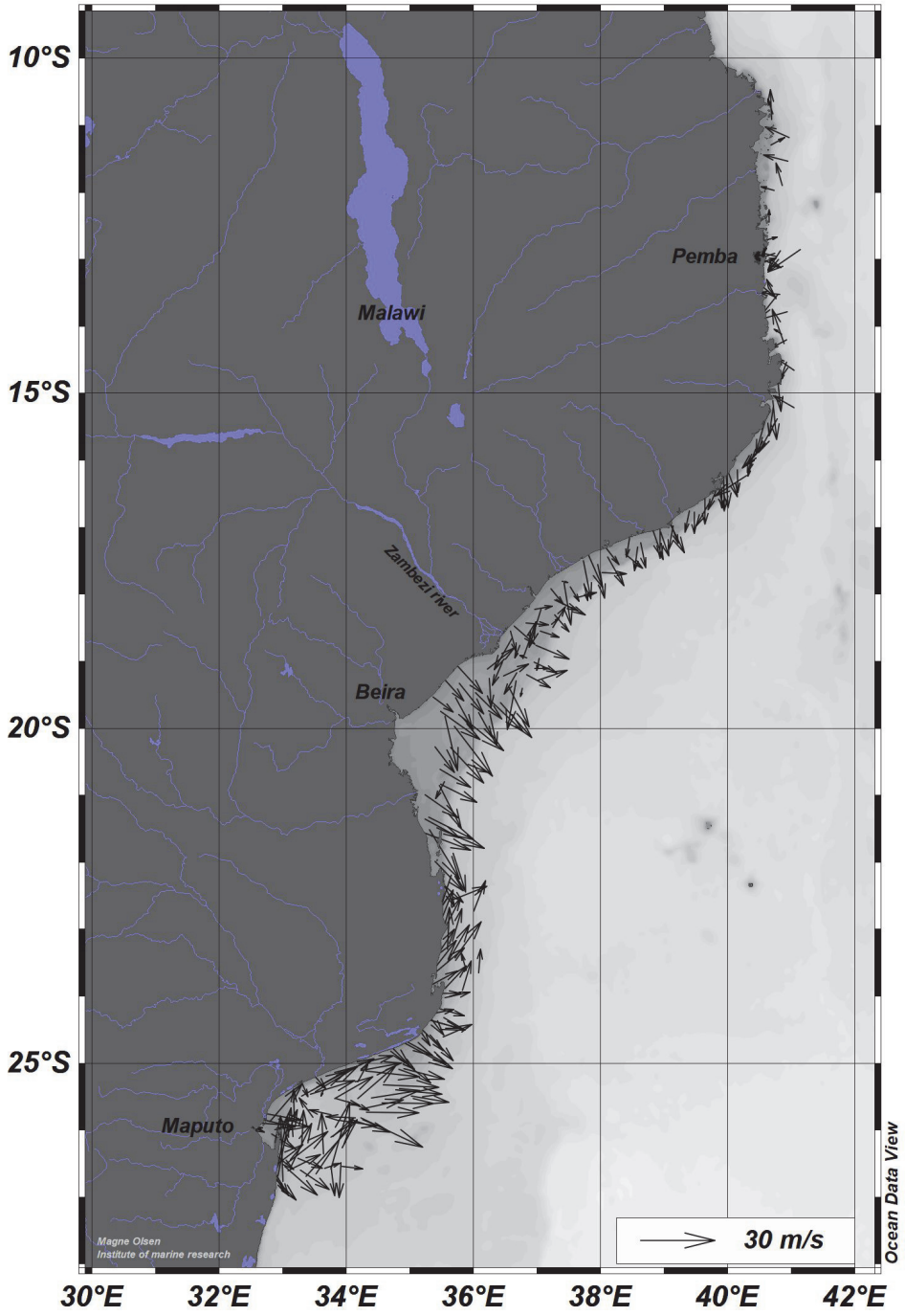


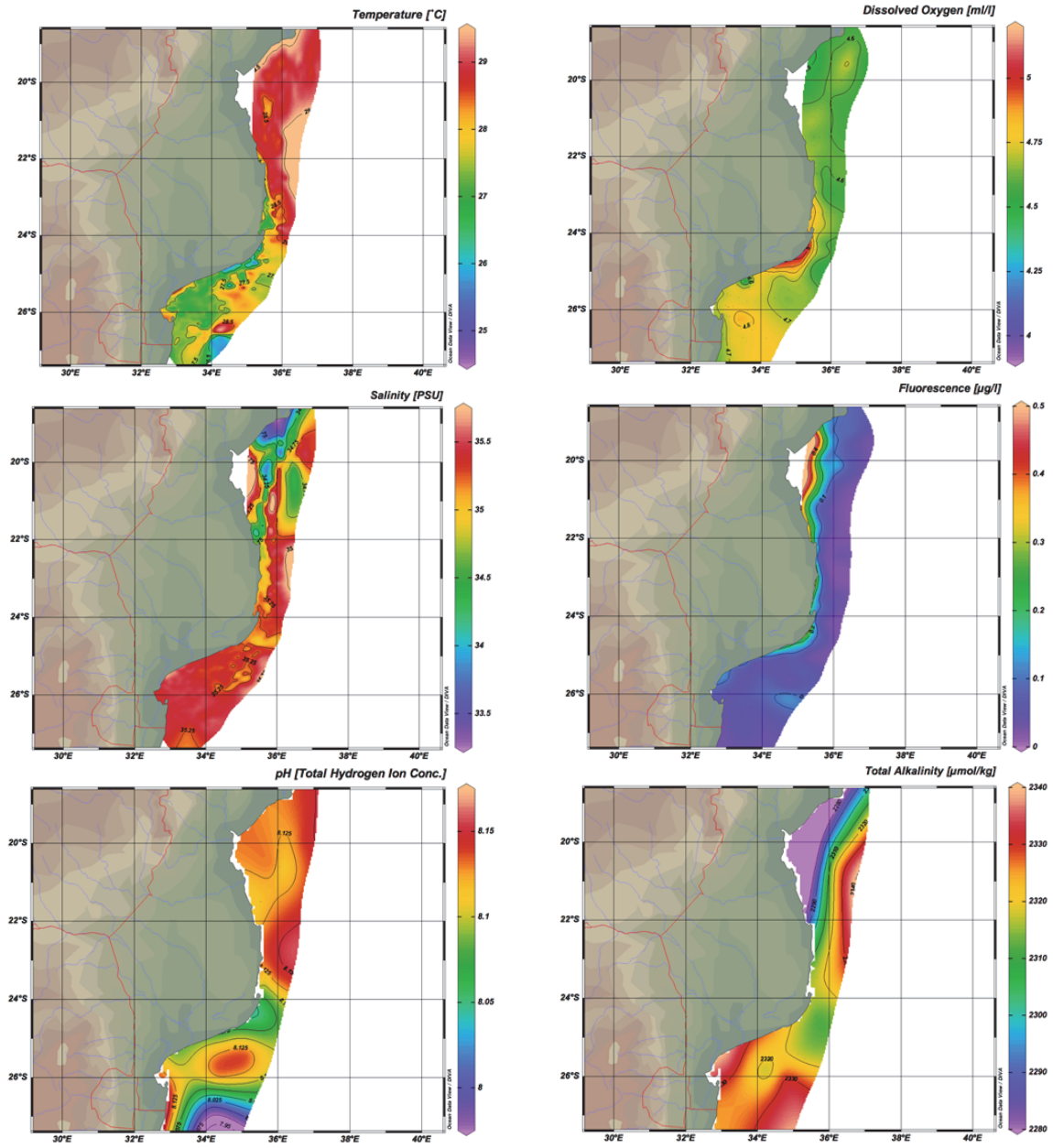
Figure 6. Wind direction and wind speed indicated by direction and length/color of arrows.

Large scale oceanographic parameters

Near-surface oceanographic parameters at 4 m depth were observed for the entire Southern region and the southernmost part of the Central region (Figure 7). Near 24°S, temperatures began to climb from 28°C as the survey progressed up the East African coast. The relatively coolest area (26.5°C) lay just above the Limpopo River outlet. Also observed near the Limpopo River outlet were increased levels of oxygen (5.0 ml/l) and fluorescence (0.25µg/l).

These increases indicate the possibility of primary production from higher phytoplankton density characteristic of nutrient-rich areas. High oxygen combined with low levels of pH and total alkalinity here indicate an increase in CO_2 absorption in this area, which is supported by the increase in dissolved inorganic carbon (DIC, derived). The increase in DIC also supports the high oxygen observations if that carbon is used for photosynthesis.

As the survey approached the Zambezi River outlet, varied levels of salinity and fluorescence were observed. This particular area displayed low salinity levels (33.5) from the freshwater mixing caused by the various river outlets. This area is also expected to have higher nutrient levels, which can be speculated by the highest fluorescence readings (+0.5µg/l) during the survey. However, levels of high pH, low DIC, and average oxygen readings would indicate little photosynthetic activity.



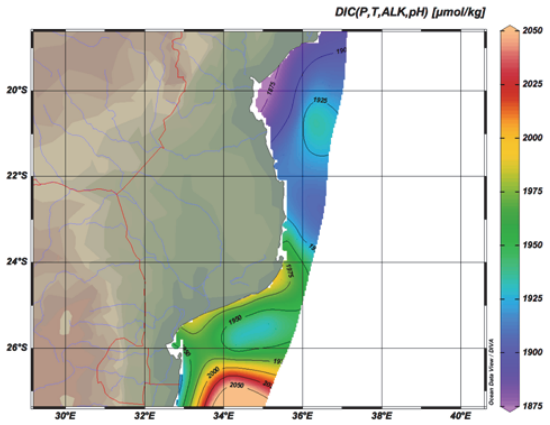


Figure 7. Horizontal near-surface (4 m depth) distributions of temperature, salinity, dissolved oxygen, fluorescence, pH, total alkalinity, and dissolved inorganic carbon (derived) along the South and Central region of Mozambique. Plots are produced with Ocean Data View with DIVA gridding interpolation (Ocean Data View, Schlitzer, R., http:odv.awi.de, 2017).

Hydrographic transects

Nine hydrographic transects were occupied along the Southern and entering into the Central regions of Mozambique. Hydrographic sensors were used to collect data for conductivity, temperature, pressure, salinity, oxygen, and fluorescence. During each transect, water was collected from various depths along the water column for pH, total alkalinity, nutrients (nitrite, nitrate, phosphate, silicate), and chlorophyll-a. Water was also collected for dissolved oxygen and salinity analyses for CTD sensor calibration.

Seven of the nine hydrographic transects were performed in the Southern Region. The final two transects were at the beginning of the Central Region. A relatively consistent thermocline was observed throughout all seven transects with surface temperatures remaining at 25°C and greater. Near Limpopo River, Transects 4 and 5 show signs of cooler water raising in the water column due to upwelling, which is further supported by the relatively high concentrations of fluorescence. The transects near Limpopo River show the highest oxygen levels at 5.0 ml/l and above. Lower salinity levels from freshwater mixing were observed near the Limpopo river outlets but the lowest surface salinity values were seen along the shore at Transects 7 and 9 near the Zambezi outlets. The lowest surface pH levels (<8.0) were observed about 125 km off the coast on Transect 1. This area also derived the highest surface DIC concentrations (2050 µmol/kg). Furthermore, this area also contains the highest offshore levels of dissolved oxygen, supporting the possibility of primary production taking place. The varied oceanographic parameters observed near the coast in the Central region are not observed in the cross-shelf distributions because the transects did not begin close enough to the coast to pick up that data. Cross-shelf distributions of temperature oxygen, salinity, fluorescence, pH, total alkalinity, dissolved inorganic carbon (derived) for each of the transects are shown in Annex VI.

3.1.2 Central region

CURRENT OBSERVATIONS

The Channel eddies and coastal circulation

Mesoscale eddies are known to dominate the circulation in the Mozambique Channel. The flow patterns of the eddy field in the open channel waters largely determine properties of the currents impinging on the Mozambique coastal zone. As the survey region was confined to the coastal zone, to make sense of the ship-based coastal current observations these were interpreted in the context of the large-scale eddy field patterns in the Mozambique Channel observed during the survey period.

We have analysed the altimetry-derived map series for the Mozambique Channel (source data: https://www.aviso.altimetry.fr) covering all survey days between March 6 and 21 (not shown). From that map series, their seemed that an eddy field was moving southwards – an expected behaviour of the sea level anomalies in the surveyed area. However, the southward movement was slow, totalling approximately 30-40 km during the two weeks of the survey observations. For this reason, and with the purpose of relating the ship observed currents to the satellite-derived eddy field, a single daily snapshot from the eddy evolution process will be considered, using the daily snapshot of the eddy circulation from March 14, 2018 which is presented in Figure 8 and Figure 9.

The survey track vs. sea level changes

Figure 8 shows the sea level anomaly (SLA) distribution revealing the pattern of alternating sea level depressions and elevations attributed to the cyclonic and anticyclonic eddies. Of interest in the survey context are the eddies impinging on the Mozambique coast to cross the *Dr Fridtjof Nansen* survey path. Along the survey track, the vessel encountered the following anticyclones: off the Sofala Bank (marked as L_1 in Figure 8), off Lumbo (L_2) and on the Tanzanian boundary approach (L_3); the vessel encountered the cyclones off Angoche (H_1) and along the Nacala-Pemba (H_2) sector. Notice the limited coverage of the R/V *Dr Fridtjof Nansen* survey path with respect to the eddy dimensions.

Besides the eddy-induced sea level changes the vessel crossed the region of the rising sea level located close the coast over the Sofala Bank. By the law of geostrophic balance, the light plume deflects to the left from the river discharge point upon meeting the denser, saline oceanic waters. Because the freshwater plume spreading over oceanic waters rises the sea level, the observed coastal sea-level elevation probably represents the Zambezi River plume expanding northwards from the river mouth.

Relating the observed currents to the altimetry derived eddy circulation

Figure 9 compares the ship-observed currents to the eddy-driven mesoscale geostrophic circulation derived from altimetry. To present the observed currents on a map at a scale comparable to the large-scale altimetry, the ship-observed currents were reduced to point data,

each data point representing the average flow at a depth 20–28 meters across one section perpendicular to the coast visited during the survey.

Figure 10 indicates a good correspondence between the point current estimates from the observations depicted as the arrows and the flow pathways derived from altimetry depicted as the streamlines. The flow directions, and flow magnitudes presented by the arrows and the streamlines are reproduced closely.

The geostrophic current streamlines shown, exhibit a multi-pole circulation pattern composed of pairs of counterrotating eddy cells. The survey-derived arrows capture the behaviour of these dipole circulations along their outer perimeters that impinge on the Mozambican coast.

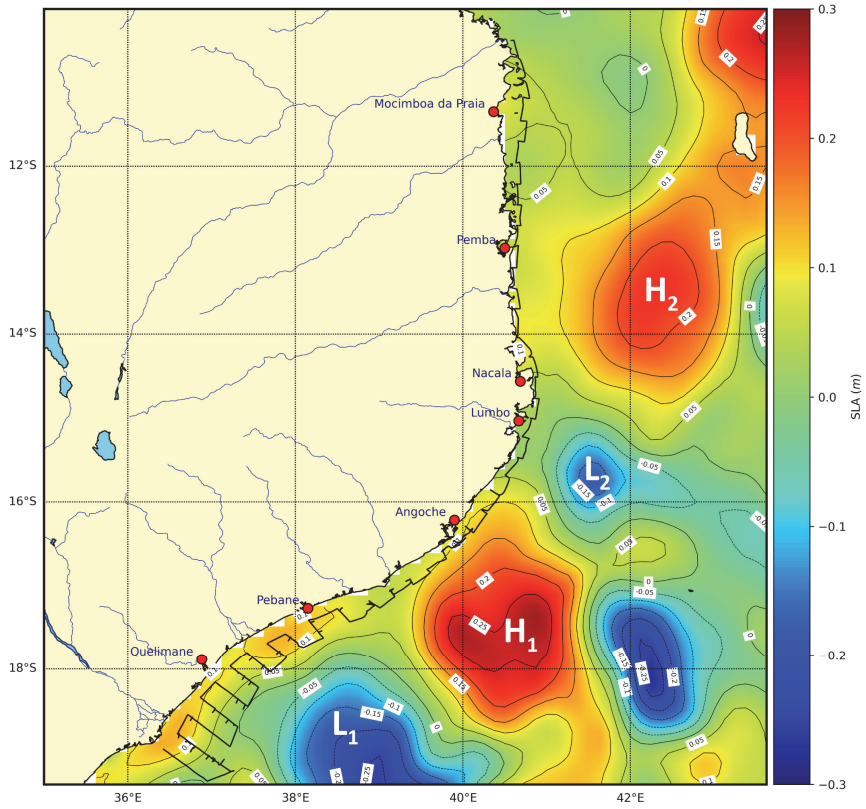


Figure 8. The Sea level anomaly (SLA) map on March 14, 2018, characterizing the synoptic eddy conditions during Leg 2 (6-21 March). The cyclonic and anticyclonic eddies are indicated by the SLA depressions and elevations, respectively. The survey track of the *Dr Fridtjof Nansen* marked along the coast. The labels over the principal eddies are explained in the text. The nominal pixel resolution on the map is 12.5 km. The SLA were downloaded from AVISO+ data centre (https://www.aviso.altimetry.fr).

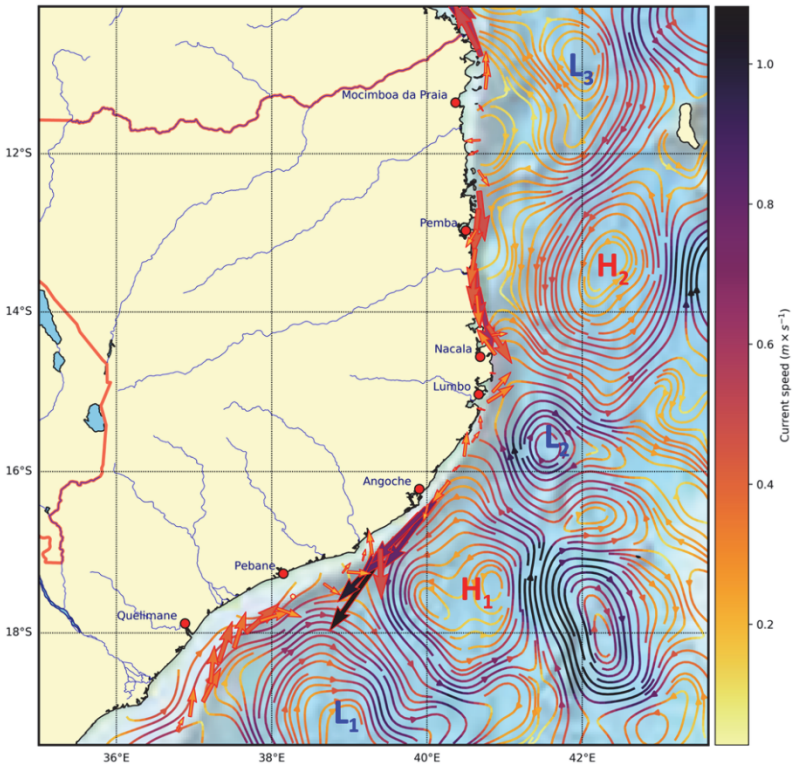


Figure 9. The geostrophic current anomaly (GCA) on March 14, 2018 depicted as the streamlines, and the vessel-observed mean current along the *Dr Fridtjof Nansen* survey track, 6–21 March 2018 depicted as the arrows. The colour scale denotes magnitude of the current. The same data source as described in the caption of Figure 8.

Notes:

- The current observed between the Zambezi River mouth and Pebane flows towards the northeast in agreement with the circulation pattern in the L_1 cyclone.
- A strong south-westward flow is observed off Angoche, consistent with the direction of the circulation in the H_1 anticyclone.
- The current turns to north-east off Lumbo, consistent with the rotation in the L_2 cyclone.
- The flow reverses to the south between Nacala and Pemba to reproduce the H_2 cyclone circulation pattern.
- Finally, the observed current turns northwards once again towards Mocimba da Praia and the Tanzanian Border where the cyclone L_3 dominates.

The coast-to-ocean exchange zones observed along the Mozambique coast

One consequence of the multi-pole circulation along the Mozambique coast is the formation of the narrow zones where the current flows perpendicular to the coast. The flow is directed seaward if a cyclone is located to the south of an anticyclone; in contrast, it is directed shoreward in the opposite case if a cyclone is to the north of an anticyclone. The

altimetry-derived current map (Figure 9) identifies the inshore transport filaments at these locations:

- off the Zambezi Delta,
- between Angoche and Lumbo and to the north of Pemba;

and the offshore export filaments at thsee two locations:

- to the north of Pebane
- off Nacala.

The southward movement of the eddy field in the Channel implies that the positions of these coast-to-ocean water exchange zones slowly sweep along the coast.

The ship-observed currents indicate the location of the inshore and offshore filaments at the same places as inferred the altimetry map.

Observations of the cross-shelf structure of the coastal current

The continental shelf in the northern part of the survey region is characterized by the very narrow shelf and the steep continental slope. As the survey generally did not cover regions seaward to the shelf-break, the transect lines were very short. The Sofala Bank was the exception. Here the continental shelf is much wider, so the transect lines were sufficiently long to resolve the cross-shelf structure of the observed currents.

Figure 10 shows the current vectors at 25 m depth along from the cross-shelf survey lines over the Sofala Bank, collected between March 9 and 13. The survey lines are numbered from 1 to 13. No observation is available from waters shallower than 30–35 m. This is due to the detection range limit of the vessel-mounted ADCPs.

The northwestward flow (V= 25-60 cm s^{-1}) follows the continental slope dominating over the shelf break area. Line 2, occupied along the hydrographic Zambezi Line, reveals the presence of the opposite flowing southward current that is located seaward of the shelf-break. This southward current is not detectable on other survey lines, which is likely because of their shorter offshore extent. Notice that the southward flow at this location is inconsistent with the altimetry-derived current direction in the L_1 cyclone 1 (see Figure 9). The discrepancy between the altimetry-derived and ship-observed currents may have several reasons, including the coastal bias on the altimetry, topographic steering of the current, or the departure of the cyclonic eddy dynamics from the pure geostrophy. The detailed discussion of these reasons is, however, beyond the scope of this report.

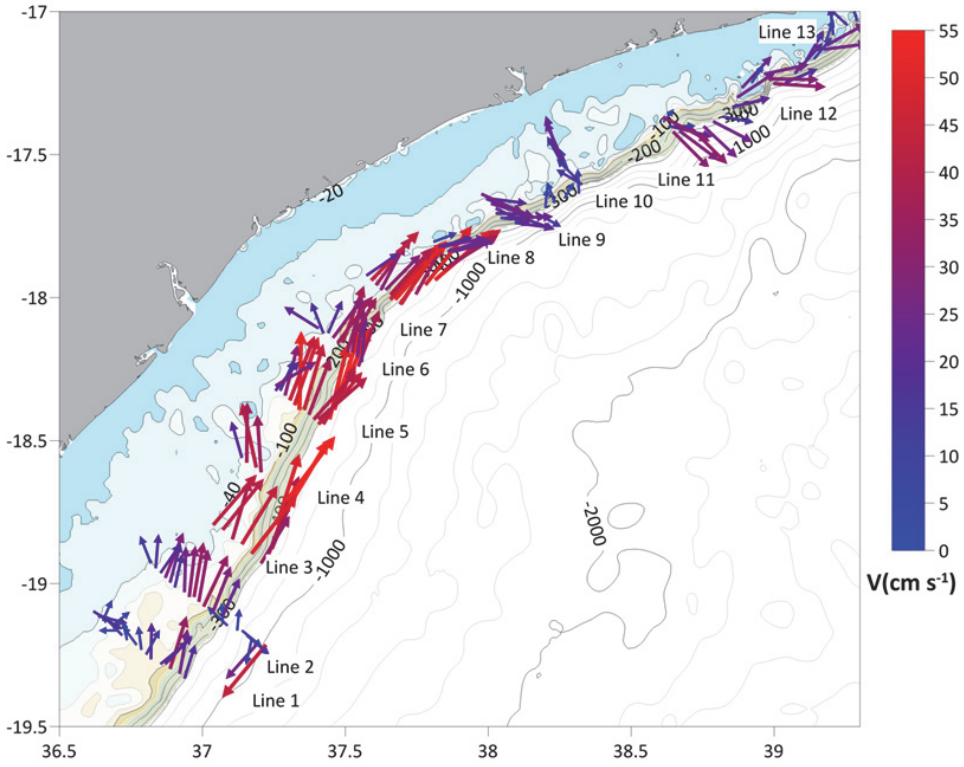


Figure 10. Distribution of the current at 25 m observed over the Sofala Bank, during 9-13 March 2018. The current velocities are colour coded. The colour scale shown to the left. Each crossing of the shelf marked by the line number displayed seawards of the survey grid. The presented bathymetry sourced from the GEBCO Atlas.

The evidence for the coast-to-ocean export region to the north of Pebane.

Returning to the analysis of Figure 10, we note that the northeastward flow along the shelf-break is well-manifested on Lines 1 to 7. At Line 8, however, the current veers seawards. At Line 9 the flow turns ninety degrees offshore. The observed offshore turning is consistent with the location of the altimetry suggested transport filament induced by the dipole H_1-L_1. At Line 10 the flow exhibits weak onshore direction, inconsistent with the dipole-induced outflow, but we bear in mind that Line 10 shifts towards the shallower regions compared with other sections. Over the shallow water, the currents would be more related to littoral rather than oceanic origin, and their detection with the onboard ADCP would less robust compared to the outer continental shelf. At Line 11 the vessel returns to the shelf break area and encounters the same flow pattern as on Line 9 with the offshore flow exceeding 0.3 m s^{-1}. Lines 12 and 13 continue to display the offshore component on their seaward sides.

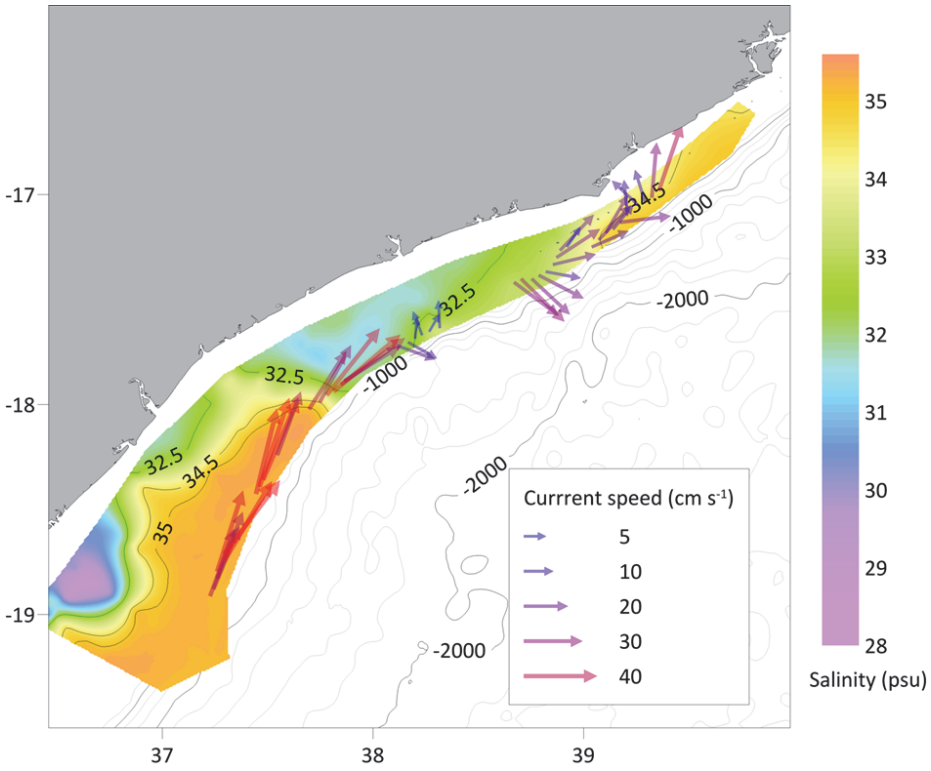


Figure 11. Distribution of sea surface salinity over the survey region in the Sofala Bank. Also presented is the current at 25 meters measured along the transect end-pieces. Salinity colour coded; the colour scale is shown to the left.

The presence of the offshore transport in the survey observation is further corroborated in Figure 11 showing the spreading of the Zambezi River plume across the Sofala Bank. The freshwater bulge (salinity less than 30 psu.) is formed at the river mouth. The freshwater entrapped in the bulge turns norhwestwards to form the coastal strip of low salinity water expanding to the left of the freshwater bulge, in the vicinity of the coast. This behaviour is consistent with the laws of the freshwater plume circulation dynamics. However, between Lines 9 and 11, the freshwater plume changes its direction to expand towards the offshore boundary of the survey region. That behaviour of the plume indicates its entrainment into the H_1-L_1 dipole dynamics and the exposure to the dipole induced offshore transport.

In summary, the presented data suggest the existence of the offshore transport in the region located between Lines 9 and 12. Because the current operates on the continuum spatiotemporal scales, e.g. in strong tidal currents, whereas our ship-based observations are aliased due to the spatiotemporal limitations of the coverage, the signature of the eddy induced offshore transport is not that obvious as in the altimetry-derived flow paths (Figure 9). Notwithstanding, after having combined our data with the altimetry, both datasets are consistent. Based on this it is concluded that along the coastal flank of the Mozambique Channel dipole induced export of coastal water masses towards the open ocean may be a commonplace.

HYDROGRAPHIC SECTIONS

The Zambezi Line

The hydrographic section off the Zambezi River Mouth was carried out on 9–10 March 2018. The results are presented in Figure 12.

At the offshore end of the section the water column exhibits a typical oligotrophic profile (st. 212 to 214). The well illuminated but nutrient poor upper mixed layer dominates the top upper 20–30 meters. The 29°C isotherm marks the base of the mixed layer and the top of the thermocline. Within the next 10 meters of the water column temperature drops down to 26°C. The buoyancy maximum (colour coded, Figure 12 top-left) marks the exact location of the strongest density gradient. The concomitant fluorescence distribution (Figure 12 bottom-right) reveals the deep chlorophyll maximum (DCM) located just below the thermocline. Conditions for photosynthesis are optimal in this part of the water column because sunlight penetration is still sufficient while nutrients increase because of the contact with sub-thermocline water masses. The oxygen concentration (Figure 12, bottom-left), on the contrary, starts to decrease at the DCM depth as the result of increased respiration and mineralisation by secondary producers. The oxygen minimum of 3.4 ml L^{-1} observed at 120–200 m is however well above the hypoxic levels, indicating a generally low productivity regime and well-aerated characteristics of central water masses along the continental slope of the Sofala Bank.

At the inshore end of the Zambezi line, the salinity distribution reveals the presence of the surface-advected freshwater plume originated at the Zambezi River. The plume is detectable at the innermost part of the hydrographic line, at stations 219 and 220. The 20 NM gap that exits mid-shelf, between the stations 218 and 219 and it does not allow to determine the offshore extent of the plume using the section's collected data. However, the extent of the surface bulge formed by the plume is well resolved in the themosalinograph-derived salinity distribution presented in Figure 7. The vertical salinity distribution shows water column underlying the bulge exhibit a strong salinity stratification.

Across the Zambezi line, the DCM layer extends shoreward to merge with the near-bottom chlorophyll maximum. Observations of similar conditions in other shelf areas suggest that the observed near-bottom chlorophyll profile configuration forms a favourable habitat for suspension feeding macrobenthos. The permanence of the near-bottom chlorophyll over the Sofala Bank may be therefore a factor sustaining the shrimp population in this area.

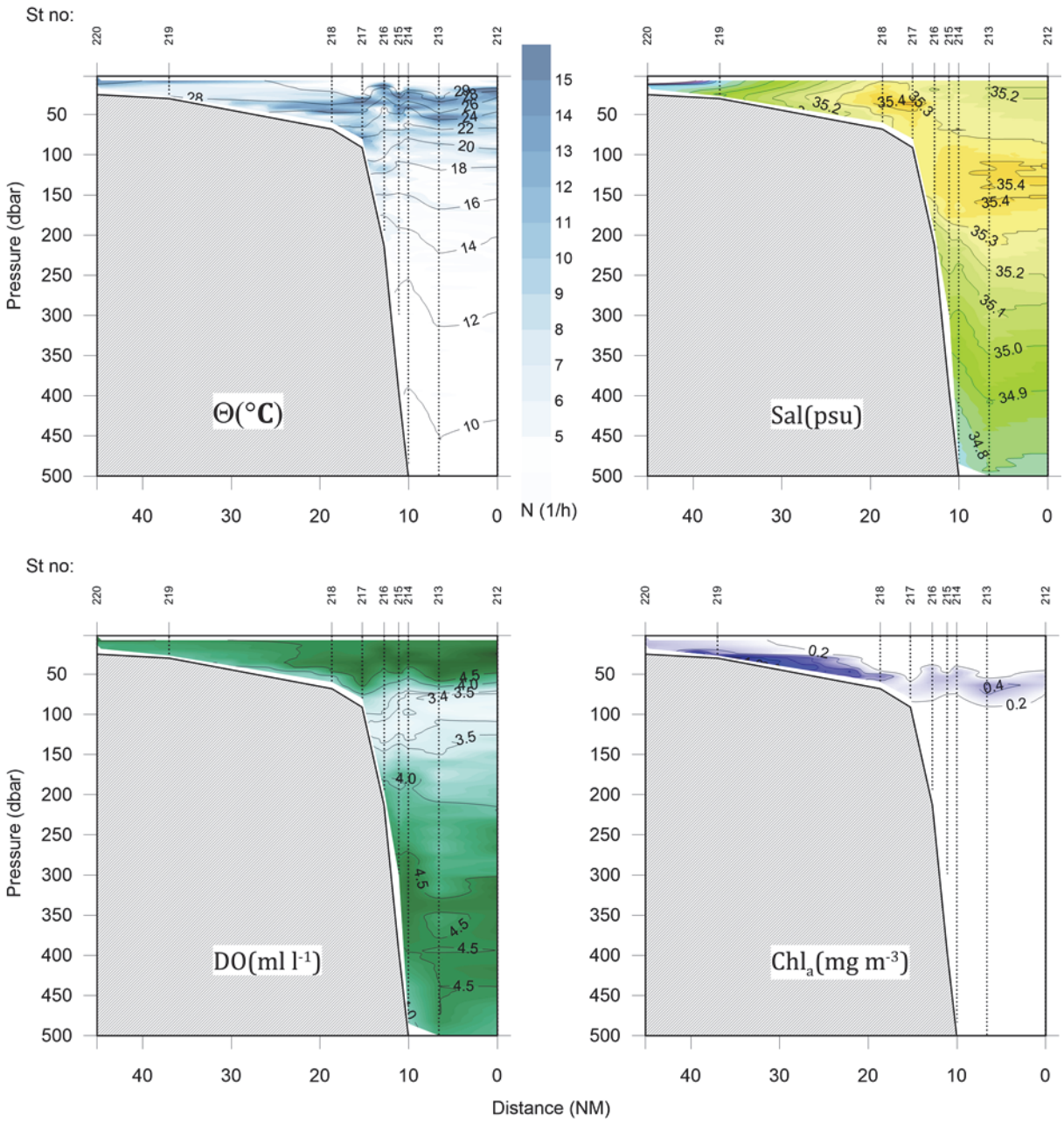


Figure 12. Distribution of seawater properties along the Zambezi Line occupied on 9–10 March 2018. From top-left to bottom right: potential temperature, salinity, dissolved oxygen and fluorescence. The buoyancy frequency distribution characterizing the stability of the water column is colour shaded in the top left figure; the colour scale shown to the left.

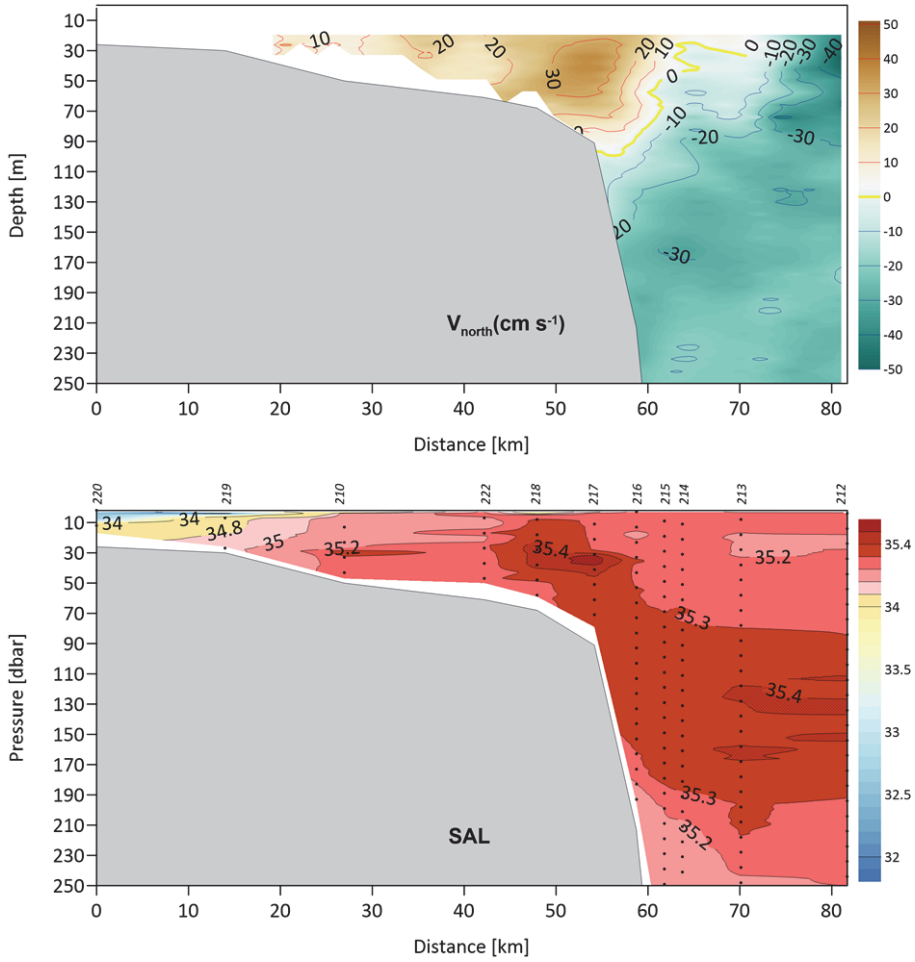


Figure 13. The vertical section of the alongshore current (top) compared to salinity (bottom) across the Zambezi River Mouth section (marked as Line 2 in Figure 10). The numbers of the occupied stations are marked over the salinity plot. The current distribution (top panel) exhibits no data above 18 m depth because in the ADCP blank zone; the no data zone near the bottom is because of the bottom bias was removed during the quality control. The presented data are colour coded with the colour scale presented to the right to the respective distribution. The current coordinates have been rotated the 25° clockwise to represent the alongshore current. The cross-shelf current was negligible after the rotation and is not shown. The positive values indicate the northeastwards (into the page), and the negative values the southwestwards (off the page) flows, respectively.

The thermocline experiences strong fluctuations at the shelf break (Figure 12, top-left). The depth of the 29°C isotherm changes from 15 m at stations 216 to over 30 m at stations 217 and 213. Such strong variations in the thermocline depth observed between the closely spaced CTD stations are an indication of internal wave activity. This would not be surprising, because cases of strong internal waves operating over the Sofala Bank are well known from the literature.

The Sofala Bank shelf-break current

The circulation observed over the Sofala Bank during the survey was dominated by northeastwards flowing shelf-break current (Figure 10). Figure 13, top panel, presents the vertical section across this current observed along the Zambezi line. Notice that the core of

the flow with velocity above 30 cm s^{-1} is confined to the shelf-break area. At the location of the core, the salinity (Figure 13, bottom panel) is higher from the surroundings, displaying local maximum (S > 35.4 psu). This shows that the observed shelf-break current provides a transport mechanism for advecting water masses originated upstream. Noteworthily, the advected water displays the same salinity characteristics as the sub-thermocline layer waters in the open Mozambique Channel, typically found in a depth range 130-150 m (e.g. stations. 212 and 213 in Figure 13). Does the water advected with the shelf break current originate from this sub-thermocline water? Which upwelling mechanism would be responsible for uplifting the sub-thermocline waters from 150 to 40 m depth? Our dataset does not provide sufficient coverage to address the above questions.

The Pemba Section

Figure 14 compares the alongshore current (top panel), salinity (middle panel) and temperature (bottom panel) along the Pemba section that was occupied on March 18. The strong surface-accelerated southward current flow across the entire section. The core of this current is confined to the first 15 km from the continental boundary and to the depth range 50-120m. The current speed in the core exceeds 80 cm s^{-1}. Its southward direction is consistent with the circulation in the cyclone H_2 impinging on the coast between Nacala and Pemba (Figure 9). However, the observed sub-surface current speed is much stronger compared to the altimetry-derived surface current. Presumably, other forcing factors beyond the eddy dynamics, such as the topographic steering, are involved to accelerate the eddy-induced flow in the vicinity of the vertical continental boundary.

The salinity distribution (Figure 14, middle) does not match spatial structure of the observed current. The salinity profile remains nearly the same across all stations occupied along this section, except of the innermost stations (stations 259-263). On those stations, the top 10 meters of the water column are dominated by low salinity layer below 34.5 psu. The observed freshening of the surface layer coincides with the rainy season off northern Mozambique in progress during the survey period.

The potential temperature distribution (Figure 14, bottom) exhibits the top mixed layer characterized by temperature approximately 29°C and dominating the top 30 m of the water column. Below the mixed layer, temperature decreases gradually with depth, but the vertical gradient the temperature change is very small. Compared to the Zambezi line where the 24°C isotherm was observed at 50 m, off Pemba the same isotherm is found 40 meters deeper, at a 90 m.

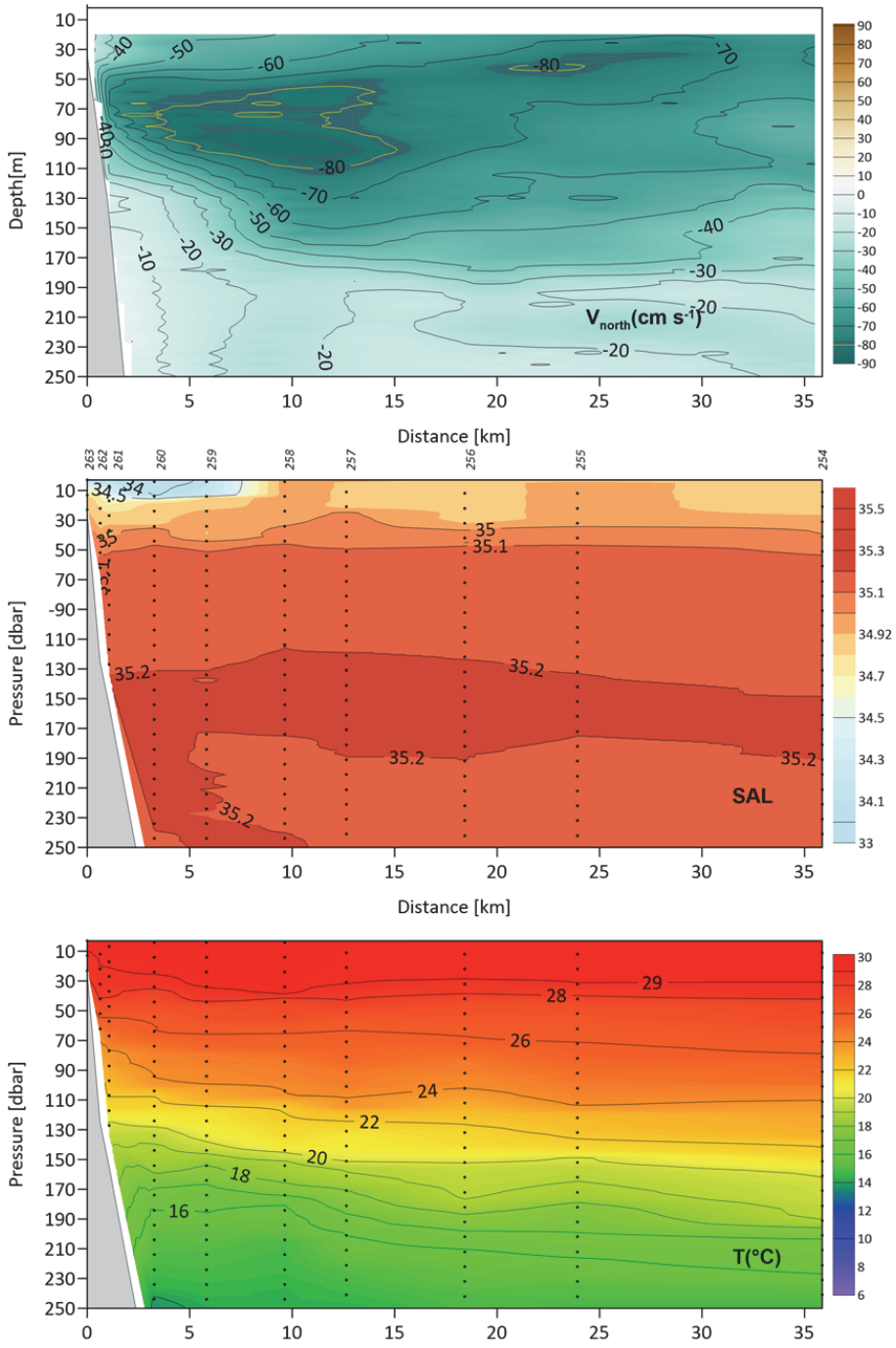


Figure 14. Distribution alongshore current (top) salinity (middle) and potential temperature (bottom) along the Pemba section occupied on 18 March 2018. Each parameter is colour shaded in the top left figure; the colour scale shown to the left of the respective figure.

The oxygen concentration and oxygen saturation distributions are presented in Figure 15, the top and middle panels, respectively, indicate oligotrophic conditions, with the top 60 m of the water column exhibiting oxygen oversaturation (> 100%). There is an oxygen minimum is observed between 210 and 230 m depth. The oxygen concentration of 2.5 ml L^{-1} indicates a reasonably well-aerated condition. However, the concentration at this minimum is approximately 1 ml L^{-1} lower from that observed along the Zambezi section.

The main feature in the chlorophyll a distribution, shown in Figure 15, bottom panel, is the pronounced DCM layer. The pigment concentrations are in the range of 0.2—0.3 mg m-3, which is typical to the oligotrophic ocean. We have observed the same pigment levels on the open ocean side of the Zambezi line (see Figure 12, bottom-right). What is different to that section, is the DCM depth, located at 70 m compared to 50 m on the Zambezi line. The DCM depth is mediated by nutrient and light availability, and its depth is typically associated with the thermocline location. In Pemba however stratification is weak, and the DCM is found deep below the region of the maximal thermal gradient that is located approximately at 30 m. Furthermore, the DCM region broadens, and its contained pigment concentration increases towards inshore where the southward flowing current accelerates. The presence of this strong, depth-varying current is likely to be a factor intensifying the coastal DCM because the strongly sheared flows enhance turbulence and that leads to an increase in nutrient supply to the euphotic zone.

Comparison of the surface and near-bottom chlorophyl distribution at the Sofala Bank

The special characteristic of the Sofala Bank as potential hot-spot of near bottom primary productivity was already mentioned in this report. It is interesting to compare the observed near bottom chlorophyll concentrations to the surface chlorophyll, as the latter is commonly used as the indicator of high primary productivity from satellite imagery. Figure 16 compares the objectively interpolated distributions of the near-bottom and surface fluorescence derived from the collected CTD data. The spatial domain has been chosen to represent the convex hull of the sampled locations, to supress extrapolations in places where there was no data.

The distribution of surface and of near-bottom chlorophyll are shown in Panel A and B, respectively. The surface values less than 0.2 RFU units (corresponding to 0.2 mg m^{-3} of chlorophyll, if the instrument was calibrated) across the entire domain. The near-bottom values are at least the double of this value. The surface fluorescence derived from the underway thermosalinograph unit (not shown) was similarly low to the CTD-derived values presented in Panel B. Noteworthily, in our surface-collected data the Zambezi River plume is manifested in the salinity distribution, but not in the fluorescence. On the other hand, the green colour of the coastal waters was clearly observed near the river mouth during this survey. The green coloured waters near river estuaries is commonly observed. It may be induced by terrestrial nutrients discharged with the river plume and enhancing the coastal primary production or may be a result of terrestrial sediments and CDROMs (coloured dissolved organic matter) transported by the river, but having no effect on coastal production. In the case of the reported observations, the low surface fluorescence levels indicate that during the survey it was this the latter scenario that operated.

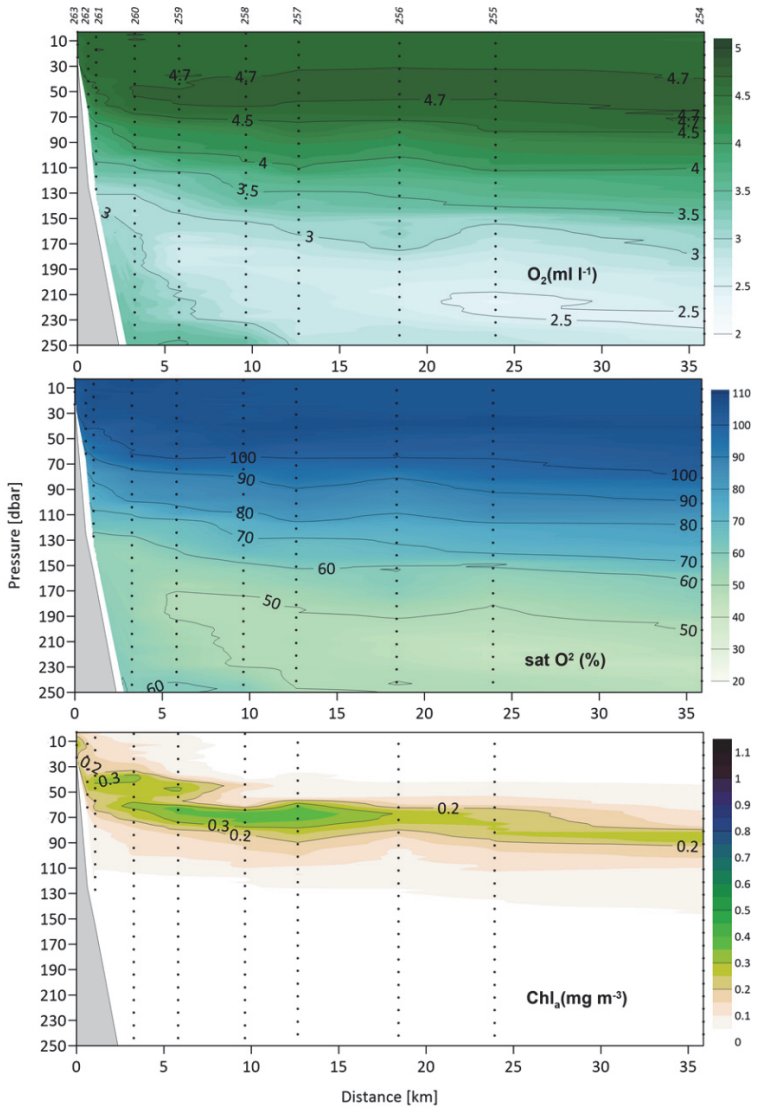


Figure 15. Dissolved oxygen (top) oxygen saturation (middle) and chlorophyll a concentration along the Pemba section occupied on 18 March 2018. Each parameter is colour shaded in the top left figure; the colour scale shown to the left of the respective figure.

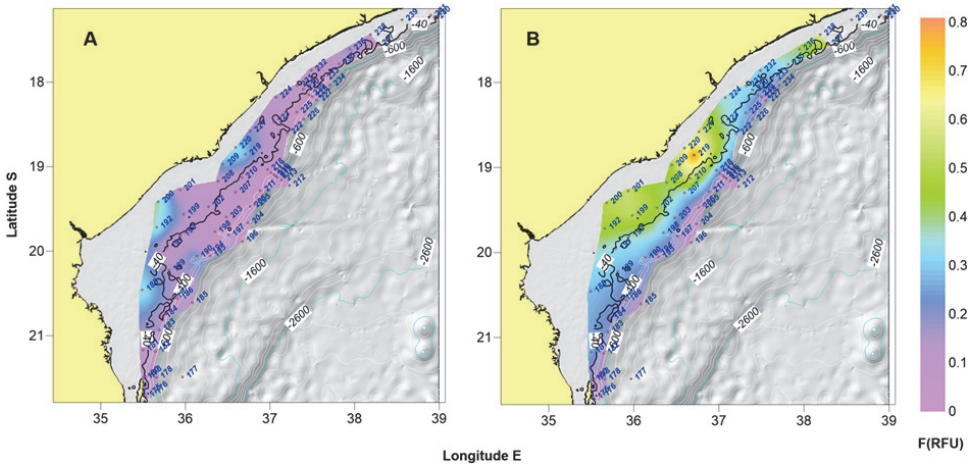


Figure 16. Distributions of surface (A) and near-bottom (B) fluorescence derived from CTD station data by the Kriging method. The fluorescence colour coded; the colour scale shown to the right.

3.2 Nutrients and chlorophyll

Nitrite concentrations proved to be highest in surface waters and decreased as deeper waters were approached. Nitrate, phosphate and silicate levels all increased with depth (Figure 17). Nitrate nad phosphate had maximas near 1000 m, whereas silicate continued to increase to 2000 m. Chlorophyll-*a* levels were highest and most concentrated in the upper 40 m througout the survey but only a few samples recorded above 3 mg/m^3 (Figure 17). Chlorophyll-*a* levels immediately began to level off just below 1 mg/m3 before depleting as water sampling exited the euphotic zone was exited. Depth stratified mean concentrations are displayed in Table 6 from 0 to 200 m.

Table 6. Depth stratified mean (±SD) concentrations of nutrients and chlorophyll-*a* and phaeopigments found at environmental stations in Mozambique, 2018.

Depth	Nitrite (µmol/L)	Nitrate (µmol/L)	Phosphate (µmol/L)	Silicate (µmol/L)	Chlorophyll-*a* (mg/m^3)	Phaeopigment (mg/m^3)
0-25 m	0.09 ± 0.07	0.18 ± 0.33	0.05 ± 0.06	2.10 ± 1.43	0.43 ± 0.62	0.22 ± 0.29
26-50 m	0.13 ± 0.11	0.64 ± 0.98	0.11 ± 0.11	2.33 ± 0.94	0.35 ± 0.44	0.25 ± 0.30
51-75 m	0.22 ± 0.13	4.42 ± 4.67	0.38 ± 0.28	4.78 ± 2.76	0.24 ± 0.15	0.32 ± 0.14
76-100 m	0.18 ± 0.09	6.00 ± 3.16	0.49 ± 0.19	5.76 ± 1.91	0.16 ± 0.14	0.28 ± 0.14
101-200 m	0.12 ± 0.11	9.24 ± 2.66	0.69 ± 0.17	7.41 ± 2.11	0.04 ± 0.07	0.08 ± 0.10

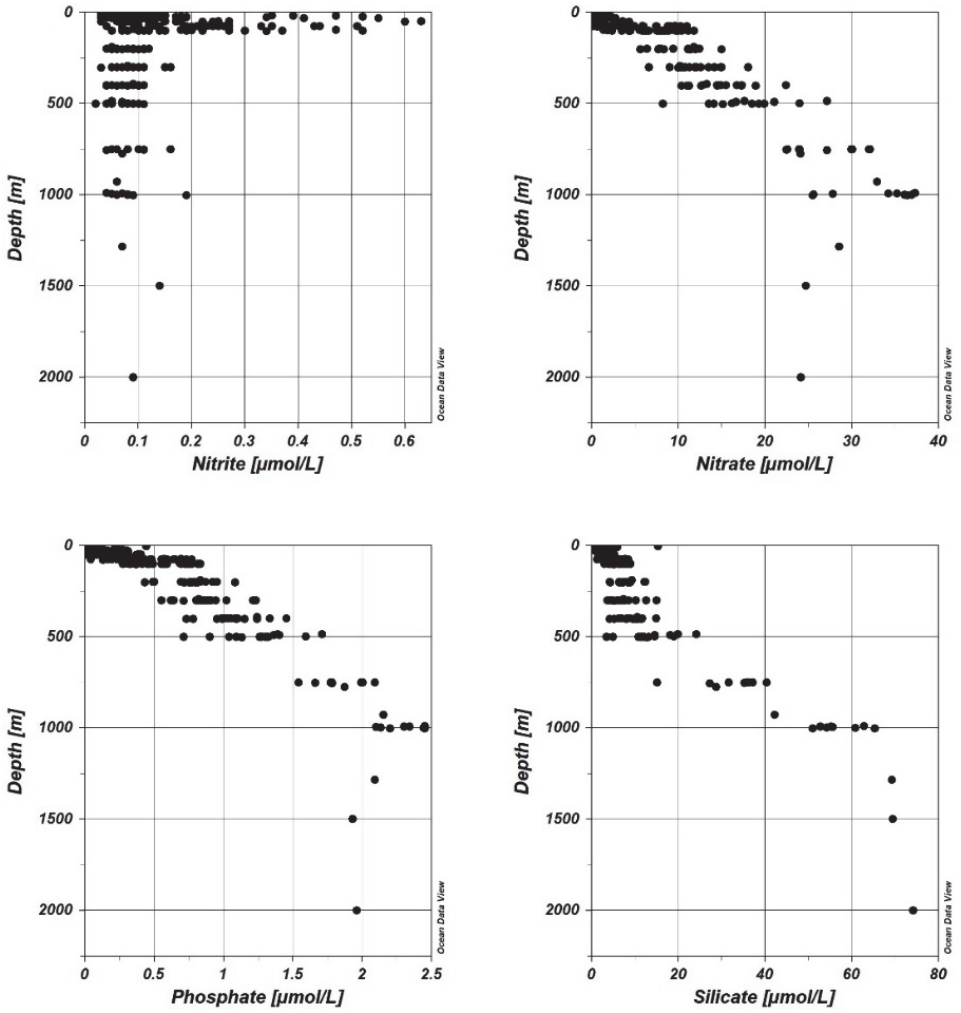


Figure 17. Nutrients concentration profiles along the coast of Mozambique.

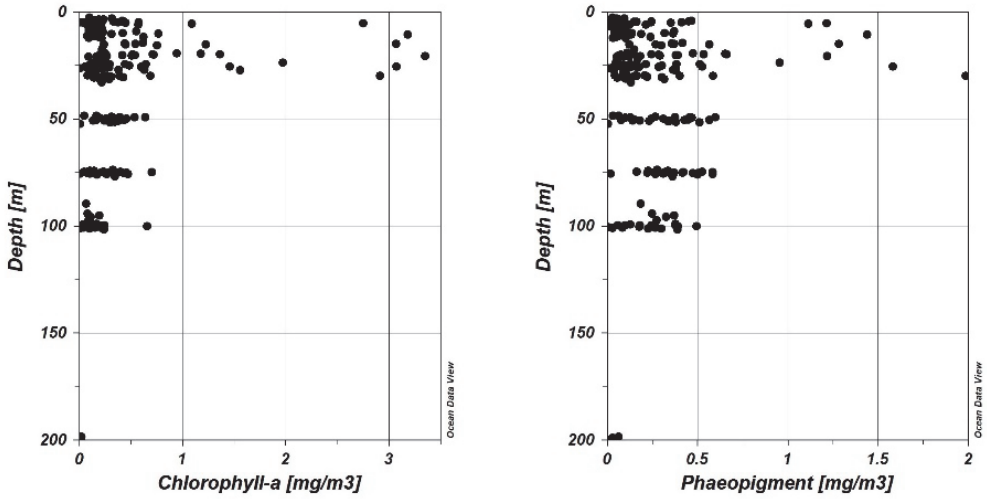


Figure 18. Chlorophyll-*a* and phaeopigment concentrations according to depth along the coast of Mozambique.

3.3 Plankton

3.3.1 Phyto- and zooplankton samples

See Table 3 for sampling effort for phyto- and zooplankton samples. These samples are being analysed as part of a regional collaborative effort.

3.3.2 Zooplankton biomass

The average zooplankton biomass for the area surveyed was 2.12 ± 1.17 (SD) g/m^2 dry weight, based on results from the WP2-net. The mean and and SD provided is based on the WP2-net hauls from the surface to 5 m above the bottom for shallow stations and from the surface to 200 m in deeper stations. These results do not include measurements from station 214, as there was an underestimation of the biomass due to mishandling of the sample taken. Detailed results from the laboratory analyses after the survey are provided in Annex VII.

High concentrations of mesozooplankton biomass were observed in four regions: (a) near Quelimane at approximately 18^o S; (b) South of the Zambezi river (between 19-20^o S); (c) around Inhambane (between 24–25^o S); and (d) to the South of Maputo (Figure 19). Such high concentrations of zooplankton are associated with the most productive areas of the Mozambican coast, where seasonal nutrient input from the Zambezi river is observed, and from other similar systems along the coast. Those variations in concentrations are also caused by the southward passage of mesoscale eddies and influence the dynamics of currents along the Mozambique channel that lead to upwelling as well as the influence of water masses of the Delagoa Bight, which drive the upwelling to the shelf. The interaction of the eddies with the continental shelf brings nutrients to the central region.

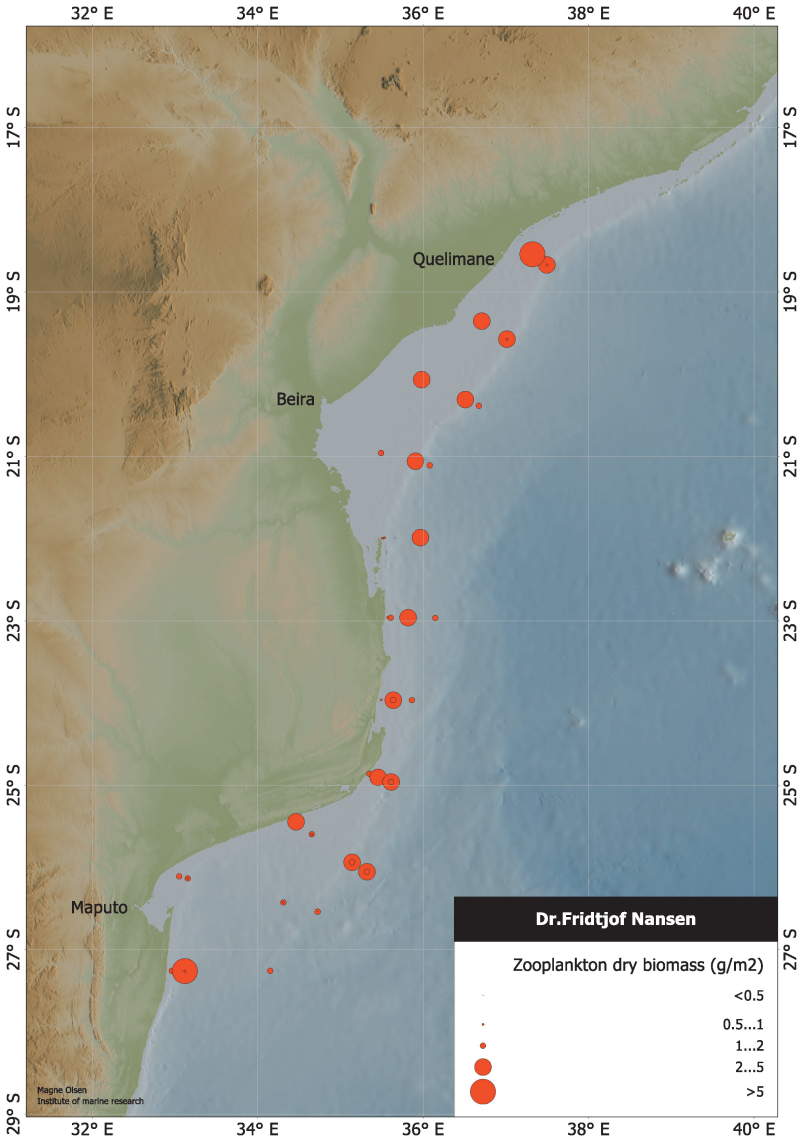


Figure 19. Zooplankton biomass (g m^{-2}) distribution in the survey area, based on WP2-net vertical hauls.

In the southern region around Maputo some few stations had higher concentration of biomass than the Inhambane and Quelimane. These differences of concentration are the result of influence of the Delagoa Bight water mass that leads to an upwelling. Moreover, it is important to mention that the eddy located South of Maputo is quasi-stationary and topographically induced, which is the reason why the same pattern is observed interannually. Eddies are also found around Inhambane but they are apparently transient structures and not stationary ones, covering a larger area. On the contrary, the Sofala Bank eddy may result from the recirculation of Zambezi River outflow, as well as the influence of Zambezi River freshwater that extends from the sea surface to 30 m water depth. At Angoche, the northern site, the biomass patterns may be the result of seasonal variability influenced by monsoon conditions and the smaller cyclonic (clockwise circulation) eddies that occurred closer to the Mozambique coast. Also the deep cool water, upwelled off Angoche can enhance chlorophyll-a concentrations and the seasonal nature of the Angoche upwelling that occurs, partly coupling with prevailing monsoon winds.

Some characteristic images of sampled mesozooplanktonic organisms are shown in Figure 20.

Figure 20. Images of sampled mezozooplanktonic organisms in Mozambique.

3.3.3 Fish eggs and fish larvae

Fish egg and larva were collected by means of the Manta-trawl, the Multinet and the Continuous Underway Fish Egg Sampler (CUFES) (Table 7). Some characteristic images of sampled fish eggs and larvae are shown in Figure 21.

Table 7. Ichthyoplankton samples obtained using different gear in the three regions surveyed in Mozambique. No samples were taken in the northern region.

Gear	Region	Samples	Samples containing fish larvae	Number of fish larvae	Samples containing fish eggs	Number of fish eggs
Manta trawl	South	20	10	243	8	309
	Central	7	6	492	4	32
	North	-	-	-	-	-
	Sub-total	27	16	735	12	341
Multinet	South	17	13	212	12	79
	Central	8	5	101	7	18
	North	-	-	-	-	-
	Sub-total	25	18	313	19	97
CUFES	South	128	14	85	971	219
	Central	51	27	38	229	90
	North	-	-	-	-	-
	Sub-total	179	41	436	1200	309

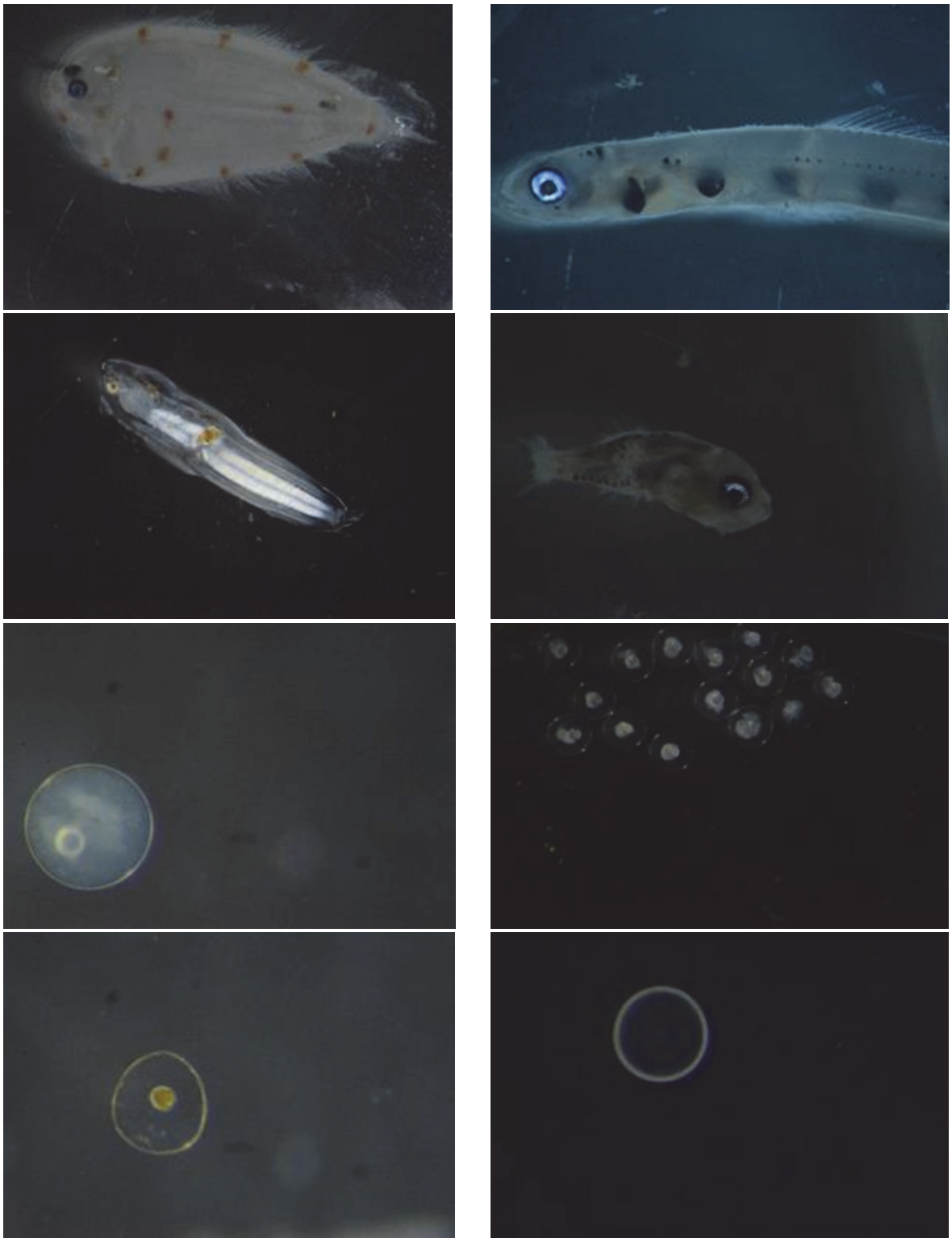


Figure 21. Characteristic fish larvae and eggs collected using different gear in Mozambique.

3.4 Microplastics and debris

3.4.1 Microplastics in fish samples

From selected species caught in the demersal trawl, a number of stomach samples of the most common species of fish were collected. The gastro-intestinal tract will be analysed ashore for presence of microplastics.

3.4.2 Microplastics collected by the Manta-trawl

A total of 25 Manta-trawls were deployed along the Mozambique coast, of which ten were sorted for visible microplastic particles. All ten sampling stations had visible microplastic particles (Table 8).

Table 8. Summary of Manta-trawl stations for microplastics.

Region	Stations sampled	Samples with visible microplastics	Total plastic objects	Samples preserved in formaldehyde (½ samples)	Samples preserved frozen
Southern region	20	7	35	7	7
Central region	5	1	1	1	1
TOTAL	**25**	**8**	**36**	**8**	**8**

3.5 Sediment samples

3.5.1 Sediment samples obtained using the bottom trawl

Sediments collected with steel pipes attached to the trawl were collected at 89 stations. The samples will be analyzed at the National Institute of Fisheries Research in Mozambique.

3.5.2 Grab stations

Grab stations were taken off the Limpopo and Zambezi rivers. A Van Veen bottom sampling grab (1000 cm^3 sample volume) was used. This was, however, replaced by a similar, but long-armed version of the same grab (with the same sample volume) in deeper waters (<200 m) that is more effective in strong current conditions. Once retrieved, all grab samples were checked for fauna on the sediment surface (particularly fragile annelids, crustaceans, molluscs) and handpicked. Each replicate was washed through a fractionated sieve system with decreasing mesh apertures of 5000 μm, 1000 μm and 500 μm. Each station (consisting of a total of 3 independent replicates) had three separate subsamples. Hand-picked and 5000 μm sub-fractions were fixed in 96 % ethanol once identified and photographed. The samples will be analyzed at the National Institute of Fisheries Research in Mozambique.

3.6 Pelagic fish distribution and abundance

The hydroacoustic survey covered the shelf and slope from roughly 20 m depth to 500 m bottom depth (1 000 m depth on the ecosystem transects). Continuous acoustic recording and analysis were carried out throughout the survey. Mozambique has relatively large shallow water areas and river mouths. Many of the species found during this survey are known to thrive in such environments and it is likely that the biomass of some of these inshore of the survey area was considerable. Summary of backscattered s_A values and biomass estimates for the two species categories can be found in Table 9 to Table 14.

3.6.1 Southern region

PEL1

The distribution of Clupeoids in the southern region of Mozambique was generally very low. A few encounters of PEL1 species were found especially in the vicinity of the Limpopo River around 25°S and between Limpopo and Tofo (Figure 22). A total acoustic abundance index of 3 500 tonnes of fish was estimated based on a set (average) total length of 14 cm (Table 9), which is lower than in 2014 in the same region. The catches of PEL1 group species in the Southern region were very scarse, so no length frequency distributions are provided.

PEL2

Most of the PEL2 group of fish was found between 20 and 50 m depth in a more or less continued band along the coast. Some few fish were also found offshore especially in the southern part of the region (Figure 23, Table 10). The densities were generally low. A total acoustic abundance index of 31 000 tonnes was estimated based on a average total length of 23 cm (Table 10). In 2014, 21 000 tonnes of fish were recorded in the same area. The most commonly caught PEL2 species in the region were *Carangoides malabaricus*, *Decapterus macrosoma* and *Decapterus russelli*. Their length frequencies can be found in Annex VIII.

The acoustic abundance estimation of PEL1 and PEL2 groups by strata in the southern region are summarized in Table 9 and Table 10, respectively.

Table 9. The acoustic abundance estimate of Clupeoid fish (PEL1) in the Southern region.

Stratum	**1**	**2**	**Total**	**Mean**
Area	78	28	107	
$<s_A>$:	53	548		100
Biomass (t):	737	2 756	3 493	

Table 10. The acoustic abundance estimate of PEL2 species in the Southern region.

Stratum	**1**	**2**	**3**	**4**	**Total**	**Mean**
Area	65	375	400	116	955	
$<s_A>$:	863	43	58	89		151
Biomass (t):	16 177	4 696	6 735	3 016	30 624	

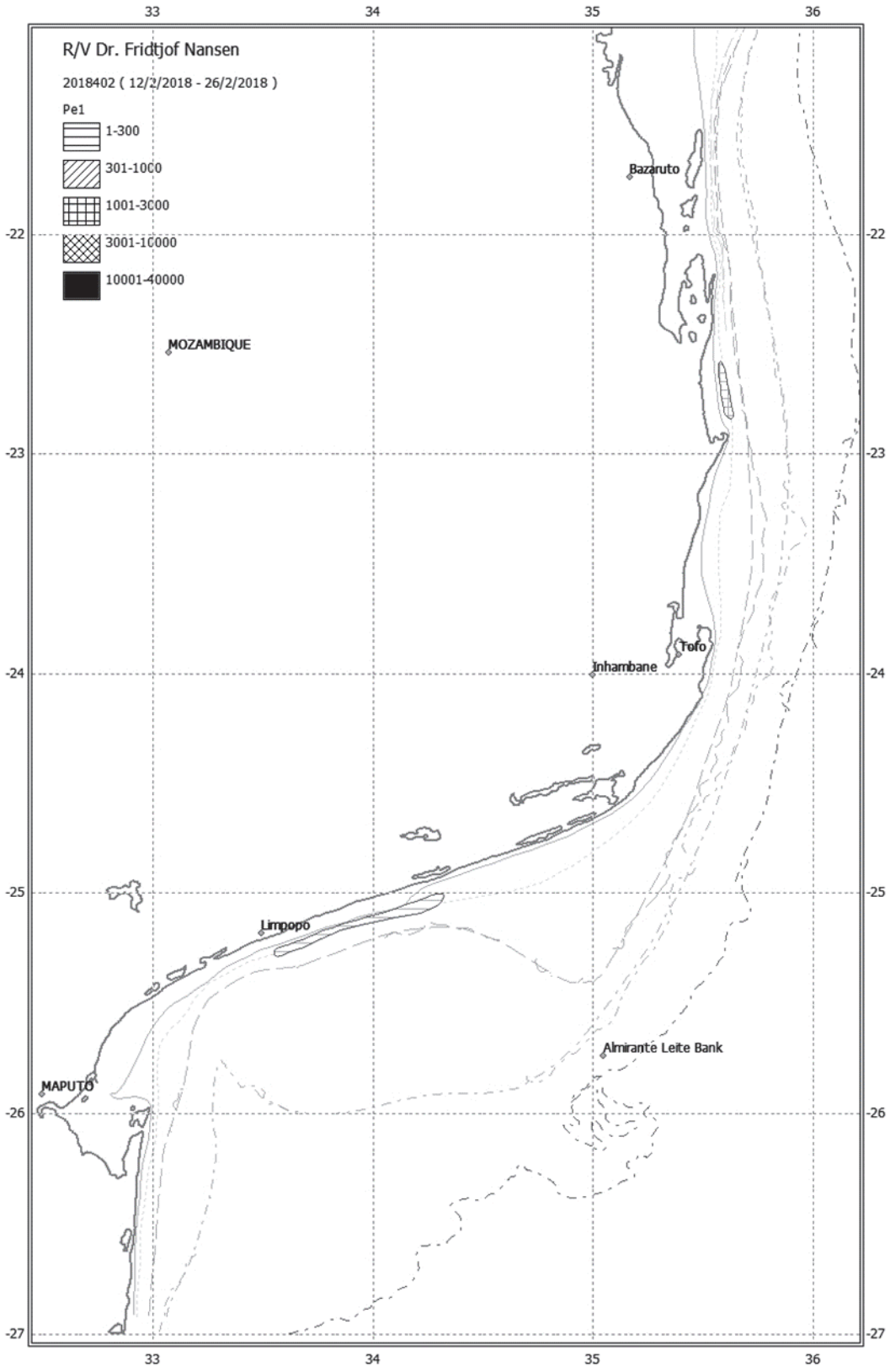


Figure 22. Distribution of acoustic backscattering of PEL1 species in the in the Southern region.

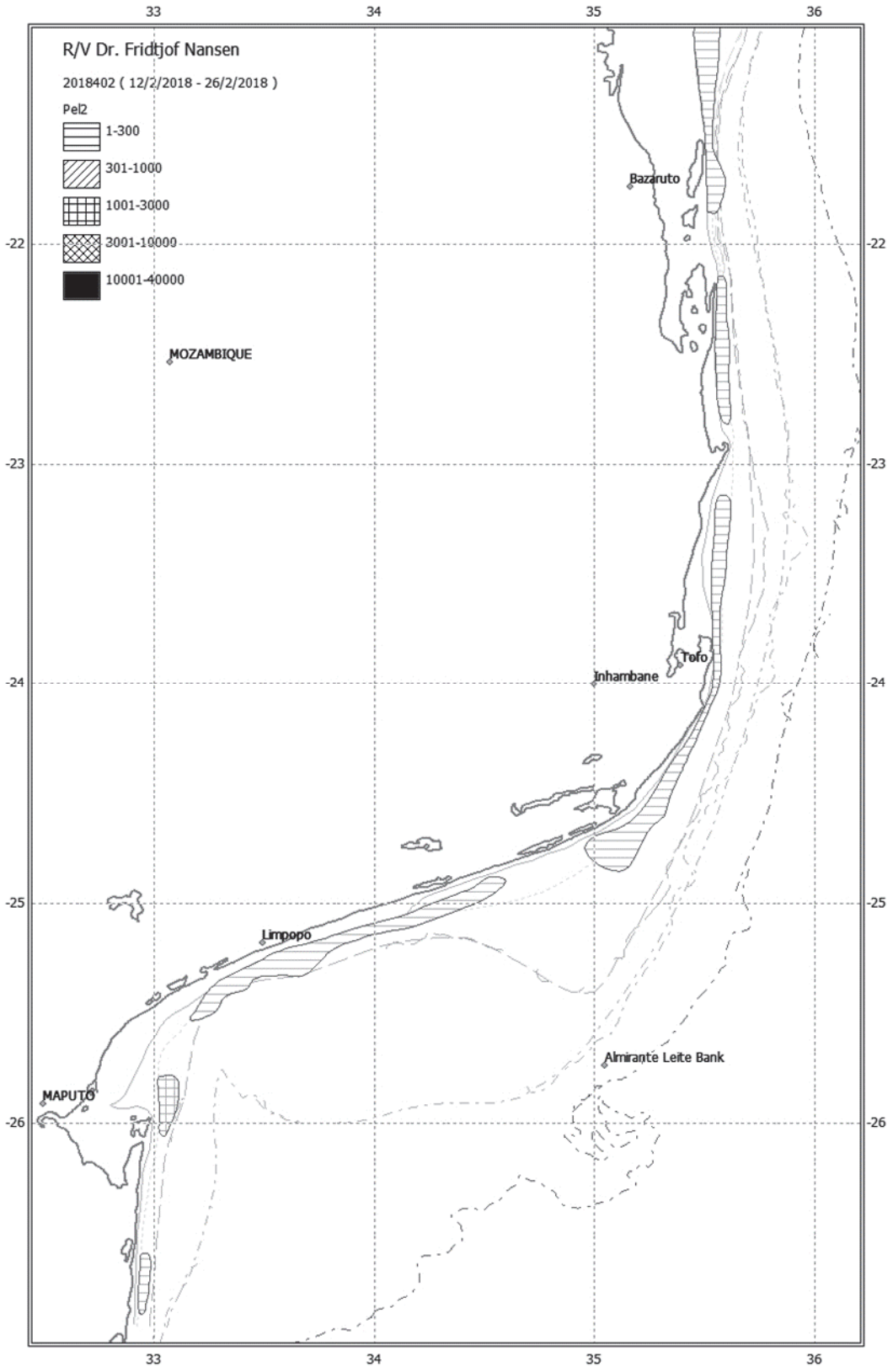


Figure 23. Distribution of acoustic backscattering of PEL2 species in the in the Southern region.

3.6.2 Central region

PEL1

The distribution of Clupeoids in the central region of Mozambique was tenfold higher than in the Southern area, reaching almost 65 000 tonnes. The area around the Zambezi river mouth was found to have the highest concentration of PEL1 species (3 strata, namely 1, 2 and 6) having a biomass of 46 000 tonnes (Figure 24, Table 11). A few encounters of PEL1 species were also made in other areas of the coast with high biomass (8 000 tonnes) found in a small area at *(17°30' S , 38°75'E).* The most commonly caught Clupeoid species in the region was *Sardinella albella*, with its length frequency provided in Annex VIII.

PEL2

The PEL2 group of fish was found across most of the surveyed area, mostly within the isobath of 50 m (Figure 25, Table 12). A total acoustic abundance index of ~112 000 tonnes of fish was estimated based on a set (average) total length of 23 cm (Table 12). The most commonly caught PEL2 species in the region were *Decapterus macrosoma*, *Decapterus russelli*, *Scomberomorus commerson* and *Trichiurus lepturus*. Their length frequencies can be found in Annex VIII.

The acoustic abundance estimation of PEL1 and PEL2 groups by strata in the central region are summarized in Table 11 and Table 12, respectively.

Table 11. The acoustic abundance estimate of Clupeoid fish (PEL1) in the Central region.

Stratum	**1**	**2**	**3**	**4**	**5**	**6**	**Total**	**Mean**
Area	722	63	66	61	137	115	1 164	
$<s_A>$:	267	218	516	776	174	467		403
Biomass (t):	34 016	2 425	6 023	8 299	4 212	9 520	64 495	

Table 12. The acoustic abundance estimate of Carangid fish (PEL2) in the Central region.

Stratum	**1**	**2**	**3**	**4**	**5**	**Total**	**Mean**
Area	927	1 158	200	377	555	3 217	
$<s_A>$:	64	63	132	476	84		117
Biomass (t):	17 221	21 309	7 657	52 010	13 586	111 783	

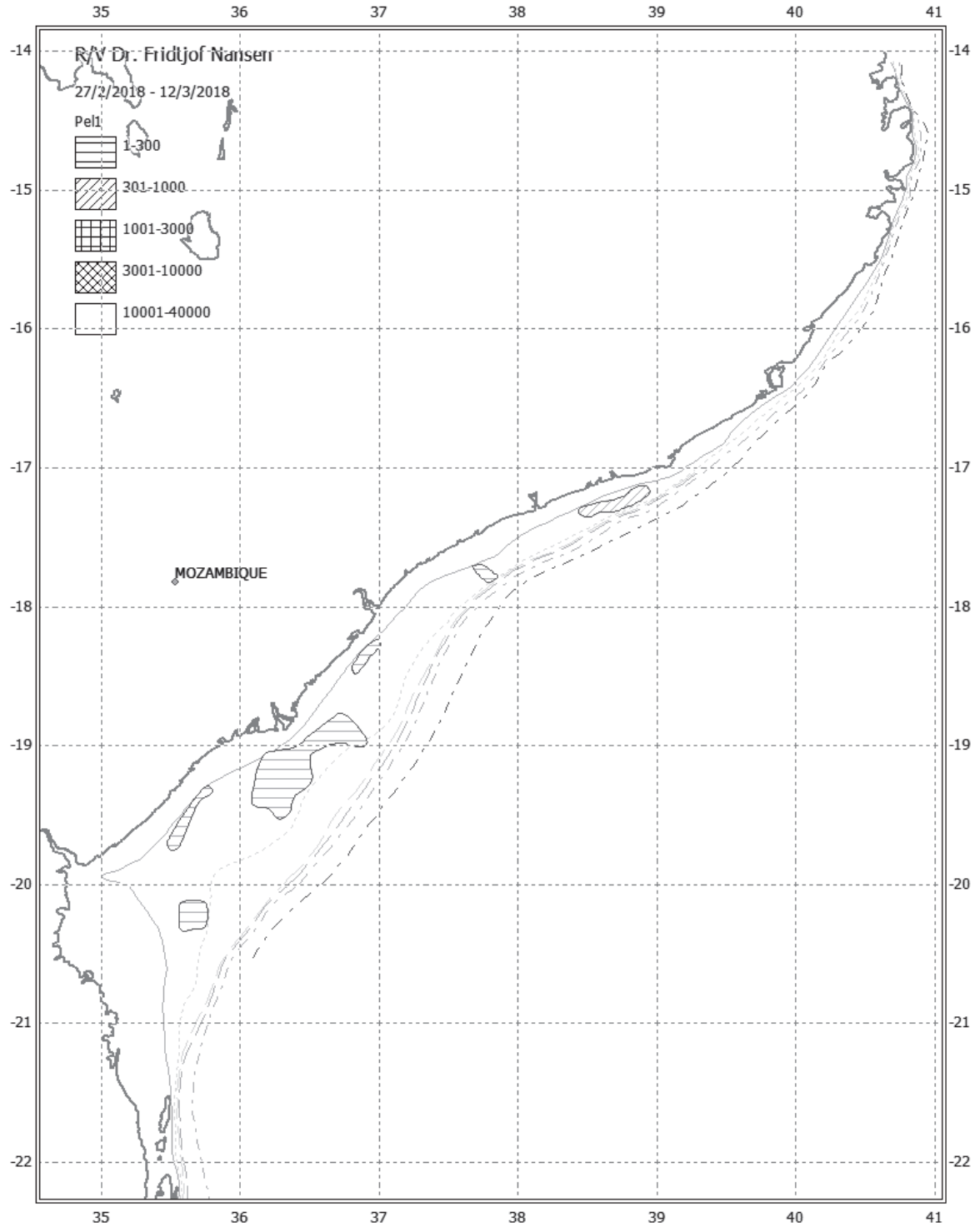


Figure 24. Distribution of acoustic backscattering of PEL1 in the in the Central region.

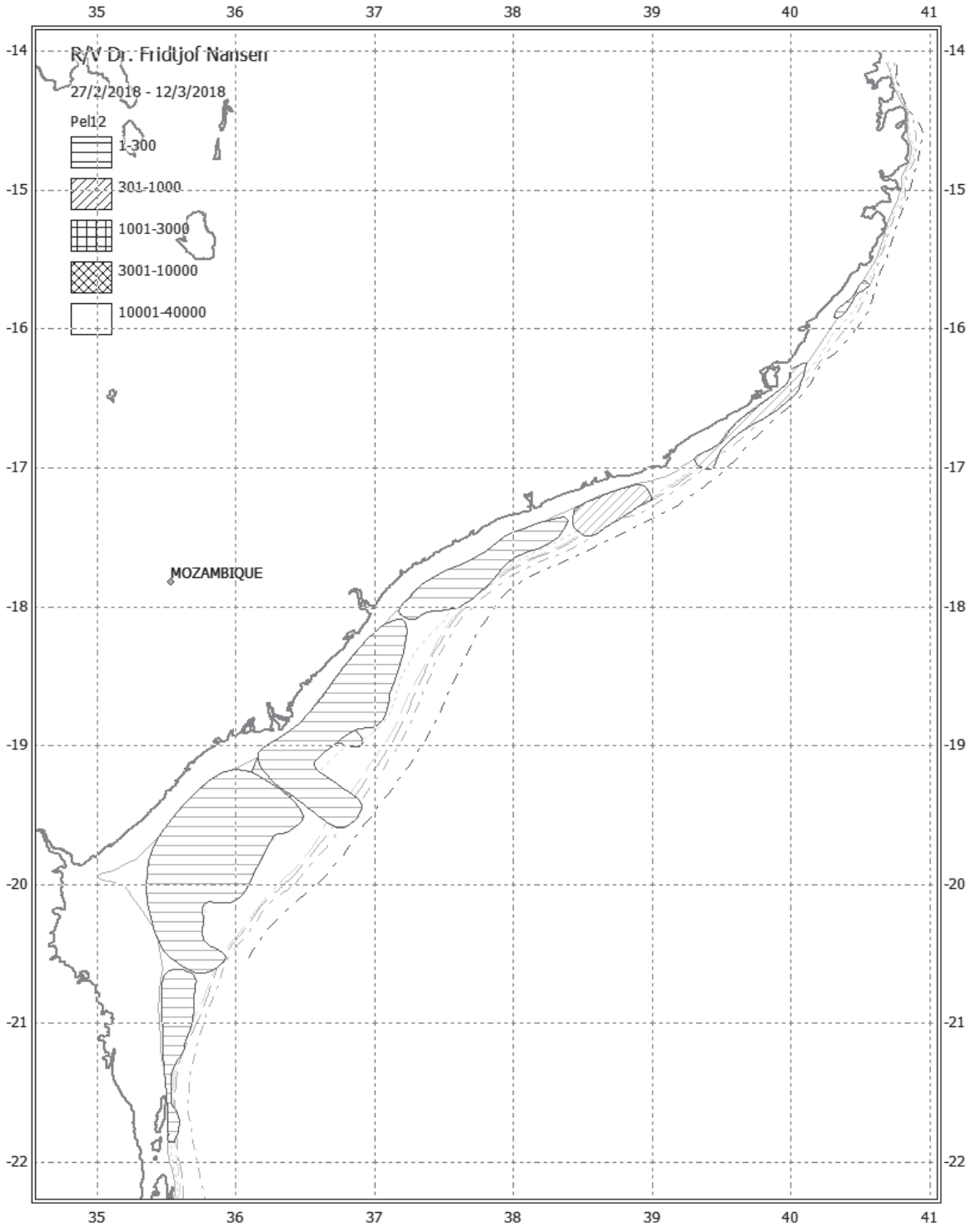


Figure 25. Distribution of acoustic backscattering of PEL2 in the Central region.

PEL1

The distribution of Clupeoids in the northern region of Mozambique was generally very low. Just one encounter of PEL1 species was registered around 13° 30'S, 40° 30'E (Figure 26). A total acoustic abundance index of 900 tonnes of fish were estimated based on a set (average) total length of 14 cm (Table 13). The most commonly caught PEL1 species in the region were *Pellona ditchela* and *Thryssa vitrirostris*. Length frequencies of the two species are provided in Annex VIII.

PEL2

The densities of the PEL2 group of fish in the area were lower, even lower than in the Southern region (Figure 27, Table 14). A total acoustic abundance index of ~26 000 tonnes was estimated based on a set (average) total length of 23 cm (Table 14). The most commonly caught PEL2 species in the region were *Carangoides malabaricus*, *Decapterus russelli*, *Selar crumenophthalmus* and *Trichiurus lepturus*. Their length frequencies can be found in Annex VIII.

Table 13. The acoustic abundance estimate of Clupeoid fish (PEL1) in the Northern region.

Stratum	**1**	**Total**	**Mean**
Area	27	27	
$<s_A>$:	189		189
Biomass (t):	899	899	

Table 14. The acoustic abundance estimate of Carangid fish (PEL2) in the Northern region.

Stratum	**1**	**2**	**3**	**4**	**Total**	**Mean**
Area	263	43	27	191	524	
$<s_A>$:	320	9	100	24		113
Biomass (t):	24 370	110	786	1 355	26 622	

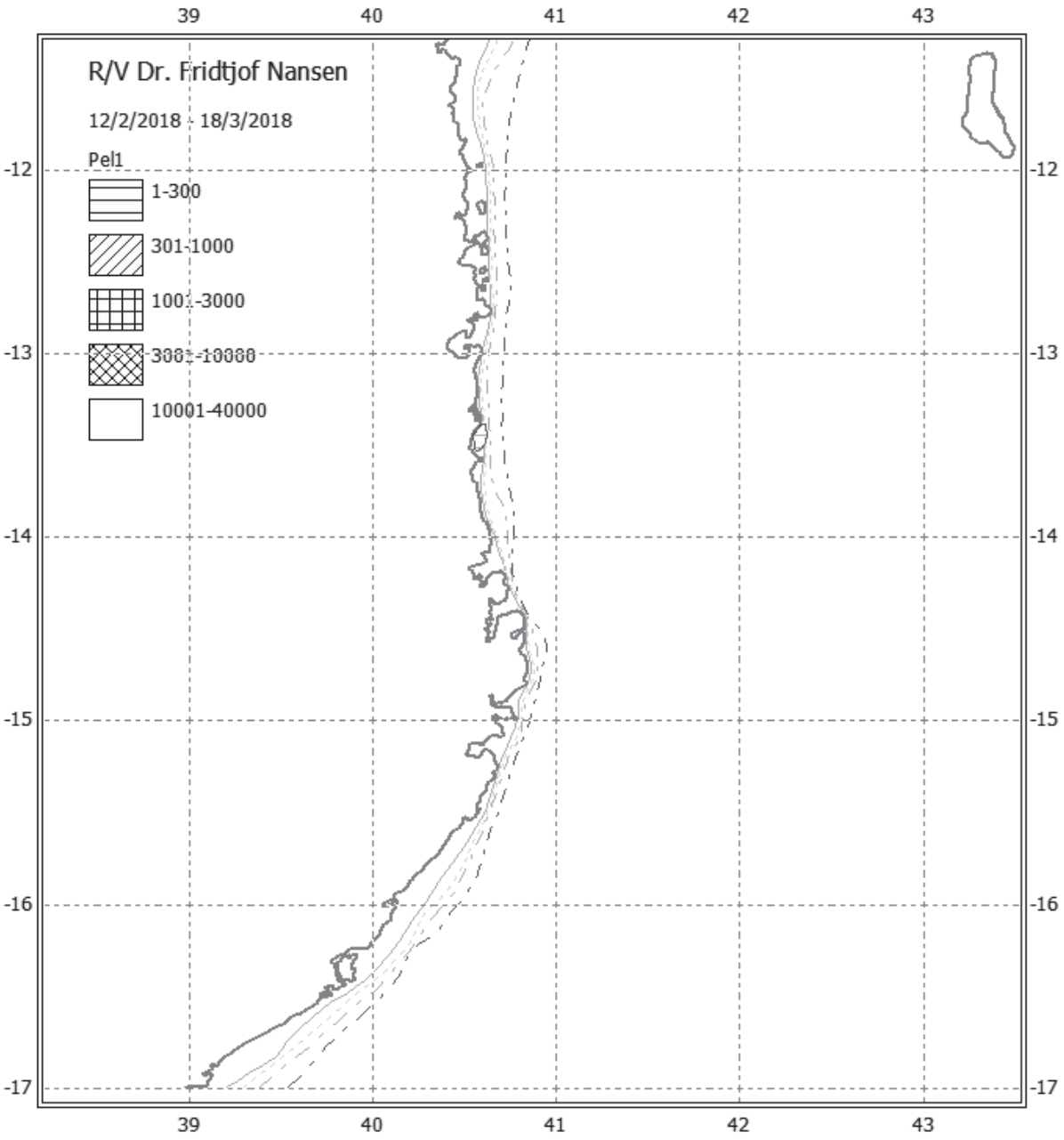


Figure 26. Distribution of acoustic backscattering of PEL1 in the Northern region.

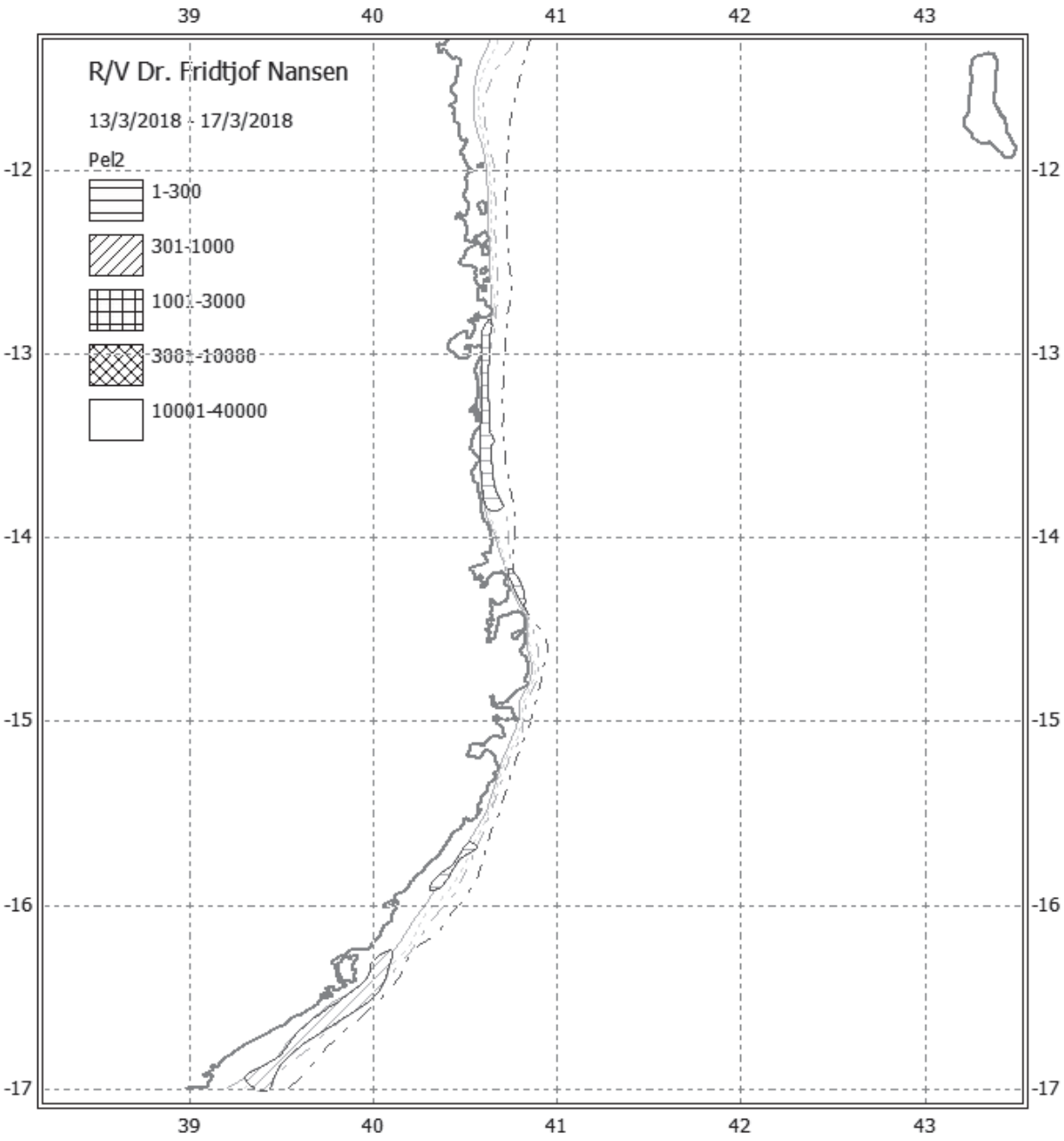


Figure 27. Distribution of acoustic backscattering of PEL2 in the Northern region.

3.7 Demersal species distribution and abundance

The trawl survey covered the shelf and slope from 20 m to 800 m bottom depth. Catch rates in kg/hour are presented per region and depth strata for main taxonomic groups found during the survey.

Four depth strata were defined prior to the survey; 20–50 m depth (inner shelf), 50–100 m depth (outer shelf) and 100–200 m depth (upper slope) and 200–1000 m (lower slope). For comparisons with previous surveys the data has been aggregated somewhat and is presented in three depth regions; 20–50 m depth (inner shelf), 50–200 m depth (outer shelf/ upper slope) and 200–800 m depth (lower slope). No trawl stations were carried out deeper than 800 m. The region between the coast and 20 m bottom depth was not covered due to safety restrictions set by the vessel. Mozambique has especially in the central region a relatively wide shelf area inshore of 20 m bottom depth (see Table 10). A considerable amount of fish is therefore expected inshore of the area covered by the vessel. The trawl positions are mapped in Figure 2. Station information and catch by species are presented in Annex V.

Catch rates are presented for the southern and central regions. Trawls conducted at night inshore of 150 m depth where excluded from the analyses since fish especially in shallow water tend to lift at night with consequently lowered catch rates. The mean catch rates were generally low but varied considerably throughout the survey. Highest average catch rates were found on the Central region between 20–50 m (663 kg/h) while the lowest average catch rates were found in the same region between 200–800 m depth (125 kg/h). In the rest of the text, when referring to pelagic species, this is the sum of the catch off all species from the taxonomic groups barracuda, carangids, clupeoids (engraulids and clupeids), hairtails and scombrids. The group demersal species consists of all species in the families croakers, groupers, grunts, hake, seabream, snappers and cusk-eels. The group of other species always reflect the remaining catch not listed in any of the other columns in the tables, and the content may therefore vary from table to table.

3.7.1 Southern region

A total of 80 bottom-trawl hauls were made in the southern region. The trawling ground in Mozambique is challenging at times and 8 trawls was excluded due to problems related to the trawling operation, a further 9 station were excluded as they were performed at night in waters inshore of 150 m. 63 stations were considered valid for analyses of catch rates (kg/h) and biomass analyses. 48% of the valid stations were placed at the depth zone of 20–200 m (shelf), with 11 stations between 20–50 m (inner shelf) and 19 between 50–200 m (outer shelf).

Highest overall catch rates in the southern region were found on the inner shelf (20–50 m depth) (Table 15). In this region, the pelagics were the group that contributed most to the total catch with 46%, followed by valuable demersal fishes (16%), rays (6.5%) and squids (5.7%) (Table **15**). Sharks (2.2%) and shrimps (0.2%) represented a small part of the catch in this depth region, while catches of lobsters were negligible (Table 15). The most common squid

group found in this depth region was *Loligo* sp., mainly *Loligo forbesi*, while shrimp species commonly found were *Penaeus latisulcatus, Megokris sedili, Trachypenaeus curvirostris* and *Penaeus japonicus*.

On the outer shelf, the overall catch rate was almost half of the catch rate found in the inner shelf (Table 15). The groups with highest contribution to the total catch in this depth region were the demersal fish and squids with 13.7% and 10.3% respectively, followed by rays and pelagic fish with 8.8% and 4.5% respectively. Catch rates of squid were similar to the inner shelf, with *Loligo* sp. and *Ommastrephes bartrami* as the most common species in this group. Lobsters became considerably more important in this region (10.9 kg/h) compared to the inner shelf, with a relatively high contribution of the slipper lobsters (Scyllaridae) mainly *Ibacus novemdentatus.* The common shrimps species found in this region were *Parapandalus brevipes, Parapenaeus longirostris, Penaeus latisulcatus* and *Penaeopsis balssi*.

On the deep slope (200–800 m depth), the groups with more contribution to the total catch were squids (9%), sharks (6.9%) and shrimps (6%). The overall catch rate and the cacth rate of pelagic, demersal and squids declined significantly compared to the shelf, while catches of shrimps increased substantially (Table 15). The most dominant squid in this region was *Ommastrephes bartrami*. The species of shrimp that most contributed were *Haliporoides triarthrus, Plesionika martia* and *Sicyonia* sp, while the most common lobsters included *Palinurus delagoae* and *Metanephrops mozambicus*.

The group of "others" consists of a number of species of less commercial importance. This represents a considerable proportion of the catch in all the three depth zones in Table 15. On the inner shelf this group contributed to 23% of the catch, while on the outer shelf and slope this increased to 55% and 66% of the total. The main taxonomic groups that contributed to the group of others (with various density depending on the depth) was Porifera (sponges), Synodontidae (Lizardfish), Mycthophids, Jellyfish, Macrouridae (grenadiers) and the Leiognathidae (ponyfishes).

Table 15. Southern region catch rates (kg/h) by main groups in swept-area bottom-trawl hauls on the a) inner shelf (20–50 m), b) outer shelf (50–200 m) and c) slope (200–800 m). The "pelagic" group consists of the groups barracuda, carangids, clupeoids (engraulids and clupeids), hairtails and scombrids. The "demersal" group consists of croakers, groupers, grunts, hake, seabream, snappers and cusk-eels, while the "other" groups summarises the catch of all species groups not mentioned in any other column.

Inner shelf: 20-50 m

Station	Gear depth	Demersal	Lobsters	Pelagic	Rays	Sharks	Shrimps	Squids	Other	Total
10	42.0	40.2	0.0	0.9	1.7	0.0	0.3	1.9	435.1	480.0
17	36.0	90.7	0.0	1 534.9	0.0	0.0	0.0	12.5	147.0	1 785.1
26	46.0	11.4	0.0	39.4	5.0	0.0	13.1	5.6	102.0	176.6
35	41.5	19.8	0.0	102.8	0.0	0.0	0.0	5.5	39.8	167.9
36	36.0	0.0	0.0	2.5	1.8	0.0	0.0	12.4	39.9	56.6
43	27.0	0.8	0.0	81.6	202.2	0.0	0.0	53.2	14.6	352.3
51	36.5	9.3	1.0	57.0	0.0	0.0	0.0	2.3	247.7	317.4
57	23.5	779.4	0.0	517.3	201.3	0.0	0.0	45.1	369.1	1 912.1
64	49.5	12.2	0.0	232.7	0.0	0.0	0.2	4.1	28.4	277.7
65	32.0	46.6	0.0	327.5	0.0	141.5	0.0	213.9	17.1	746.7
71	47.0	0.2	0.5	0.0	0.0	0.0	0.0	0.9	25.2	26.7
Mean	37.9	91.9	0.1	263.3	37.4	12.9	1.2	32.5	133.3	572.6
% catch		16.0	0.0	46.0	6.5	2.2	0.2	5.7	23.3	100.0

Outer shelf: 50-200 m

Station	Gear depth	Demersal	Lobsters	Pelagic	Rays	Sharks	Shrimps	Squids	Other	Total
1	61.5	14.1	0.0	0.0	291.5	0.0	0.0	1.3	31.9	338.7
2	143.0	305.9	115.9	0.0	0.0	0.0	0.0	1.7	7.6	431.1
15	140.5	1.9	0.0	2.5	0.7	0.0	0.0	26.5	10.9	42.4
16	61.5	24.1	0.0	13.2	1.9	0.0	0.0	25.4	855.3	920.0
25	53.0	78.0	0.0	47.7	0.0	0.0	0.0	5.4	74.9	206.0
27	88.0	5.1	0.0	5.8	0.0	1.6	12.2	11.6	279.9	316.1
33	172.0	4.8	27.9	21.9	5.5	17.7	84.0	6.4	338.9	507.2
37	78.5	6.0	0.0	88.2	0.0	51.1	0.0	4.6	72.5	222.4
41	181.5	127.3	18.2	0.0	4.3	0.0	0.0	1.8	211.8	363.4
42	63.0	0.0	0.0	3.0	0.0	1.4	0.0	25.3	19.5	49.3
46	159.5	2.6	25.1	1.5	4.7	8.9	0.7	18.7	118.2	180.4
49	122.0	33.4	9.3	0.5	6.9	12.1	0.0	24.0	48.8	134.9
50	59.0	71.7	0.0	28.6	0.0	1.2	0.0	12.3	54.6	168.4
56	122.0	10.6	5.0	0.0	2.8	0.0	0.0	50.8	69.6	138.8
58	110.0	3.1	0.0	5.0	6.6	0.0	0.0	296.2	422.6	733.4
61	150.5	0.0	2.1	0.0	4.3	10.8	0.2	11.6	307.8	336.7
67	187.5	1.6	2.4	0.2	4.3	0.0	0.3	5.7	66.4	81.0
70	117.0	73.0	0.0	4.0	0.0	1.3	0.0	33.1	16.0	127.3
78	52.5	0.0	0.6	29.9	157.3	25.9	0.0	14.0	47.8	275.4
Mean	111.7	40.2	10.9	13.3	25.8	7.0	5.1	30.3	160.8	293.3
% catch		13.7	3.7	4.5	8.8	2.4	1.7	10.3	54.8	100.0

Slope: 200 – 800 m

Station	Gear depth	Demersal	Lobsters	Pelagic	Rays	Sharks	Shrimps	Squids	Other	Total
3	206.0	0.0	8.8	0.0	0.0	0.0	0.0	3.4	12.4	24.6
4	736.5	25.5	0.0	0.0	0.2	5.9	12.0	0.2	66.4	110.3
5	689.5	21.1	0.0	0.2	1.0	7.7	2.9	0.3	99.9	133.1
6	707.0	30.0	0.1	0.0	0.0	7.3	19.2	2.6	63.9	123.1
7	210.0	3.3	1.3	0.0	0.0	3.8	0.1	2.9	42.4	53.9
11	558.0	7.9	0.0	0.0	38.7	0.5	105.1	12.6	149.8	314.7
12	634.0	10.1	0.0	0.1	0.0	0.0	3.8	0.0	97.9	111.8
13	526.0	3.6	0.0	0.0	17.8	0.0	26.5	6.3	117.7	172.0
14	465.0	2.4	3.5	25.7	0.0	1.9	32.9	18.6	92.4	177.5
18	488.0	2.5	8.6	1.6	0.0	0.0	10.3	1.3	51.4	75.7
19	462.5	0.0	0.1	5.3	56.9	0.0	34.1	61.8	129.1	287.3
20	431.5	0.0	20.8	0.2	0.0	0.0	12.7	9.6	379.1	422.4
21	507.5	52.1	0.1	0.0	16.2	0.0	17.8	21.4	85.0	192.6
22	380.5	0.0	2.3	1.1	0.4	3.9	4.1	8.5	33.0	53.3
23	427.0	0.0	3.2	0.0	6.3	0.7	6.1	32.1	203.2	251.7
24	427.0	0.0	6.2	0.0	6.4	0.1	4.7	8.9	72.4	98.7
30	340.0	0.0	0.8	1.5	0.5	208.2	0.0	13.7	70.6	295.3
31	217.5	0.0	7.9	0.0	0.0	26.4	1.1	11.8	262.6	309.8
39	222.0	0.0	20.9	0.0	0.0	3.1	0.0	9.6	209.5	243.0
40	255.0	0.1	70.5	0.0	0.0	9.2	0.0	6.0	75.8	161.6
47	238.0	0.1	17.7	0.0	0.0	19.0	0.0	21.0	54.9	112.8
48	264.0	0.0	5.9	0.0	0.0	4.1	0.0	14.4	40.3	64.6
54	224.5	0.4	14.0	0.0	0.0	2.7	0.4	7.7	57.3	82.4
55	266.5	0.0	3.1	0.0	0.0	13.2	0.0	10.3	15.7	42.2
59	428.5	0.3	0.0	8.1	0.9	12.2	1.6	73.0	448.1	544.2
62	396.5	0.0	0.0	0.6	0.2	8.1	3.4	10.2	51.2	73.7
63	235.5	40.6	2.1	0.1	0.3	0.0	0.0	4.9	16.0	64.0
68	299.0	0.0	0.3	0.3	0.2	0.0	0.1	6.6	103.2	110.8
69	245.5	0.0	0.2	0.0	0.0	0.1	0.0	10.5	45.4	56.2
72	217.0	0.0	4.4	0.4	1.6	3.4	0.0	13.0	12.2	35.0
73	230.0	0.3	2.7	1.1	0.3	0.0	0.0	8.6	40.8	53.8
77	296.0	0.6	2.3	0.7	0.3	2.5	0.0	27.1	22.1	55.5
80	313.5	0.2	0.0	1.7	0.2	0.9	0.3	12.7	71.2	87.3
Mean	380.2	6.1	6.3	1.5	4.5	10.5	9.1	13.7	99.8	151.4
% catch	158.5	4.0	4.2	1.0	3.0	6.9	6.0	9.0	65.9	100.0

Catch rates of the demersal fish category presented in Table 15 are broken down to individual families and presented in Table 16. The commercially important demersal fish groups contributed to the total catch with 16%, 13.7% and 4% on the inner shelf, outer shelf and slope respectively. The seabream was the most dominant group both on the inner and outer shelf with 86.6 kg/h and 25.6 kg/h respectively. The most dominant sparid on the inner shelf was *Pagellus natalensis* while between 50–200 m depth *Pagellus natalensis* and *Polysteganus coeruleopunctatus* dominated. Some few groupers and grunts were found in the inner shelf while groupers and snappers were more common on the outer shelf.

On the slope (200-800 m) catches of demersal fish were generally low. Hake (*M. paradoxus*) dominated with catch rates of 3.2 kg/h (2.1% of total catch), mainly in the southern part of the region, followed by groupers with 1.2 kg/h and some few seabreams. Croakers, Grunts and snappers were absent from the catches in this depth region. The “other” group summarises the catch of all species groups not mentioned in any other column. This group accounted about 97% of total catch on the slope.

Table 16. Southern region catch rates (kg/h) by main demersal species grouped by groups in swept-area bottom-trawl hauls on a) the inner shelf (20–50 m), b) outer shelf (50–200 m) and c) slope (200–800 m). The "other" group summarises the catch of all species groups not mentioned in any other column.

Inner shelf: 20 – 50m

Station	Gear depth	Croakers	Groupers	Grunts	Hake	Seabream	Snappers	Other	Total
10	42.0	0.0	36.2	0.0	0.0	0.0	0.0	443.8	480.0
17	36.0	0.0	0.0	0.0	0.0	90.7	0.0	1 694.4	1 785.1
26	46.0	0.0	0.0	0.0	0.0	11.1	0.3	165.2	176.6
35	41.5	0.0	0.0	17.0	0.0	2.9	0.0	148.1	167.9
36	36.0	0.0	0.0	0.0	0.0	0.0	0.0	56.6	56.6
43	27.0	0.0	0.0	0.8	0.0	0.0	0.0	351.5	352.3
51	36.5	0.0	0.0	0.0	0.0	9.3	0.0	308.0	317.4
57	23.5	0.0	0.0	0.0	0.0	779.4	0.0	1 132.8	1 912.1
64	49.5	0.0	0.0	0.0	0.0	12.2	0.0	265.4	277.7
65	32.0	0.0	0.0	0.0	0.0	46.5	0.1	700.1	746.7
71	47.0	0.0	0.0	0.0	0.0	0.2	0.0	26.6	26.7
Mean	37.9	0.0	3.3	1.6	0.0	86.6	0.0	481.1	572.6
% catch		0.0	0.6	0.3	0.0	15.1	0.0	84.0	100.0

Outer shelf: 50 – 200 m

Station	Gear depth	Croakers	Groupers	Grunts	Hake	Seabream	Snappers	Other	Total
1	61.5	0.0	0.0	0.0	0.0	0.0	14.1	324.6	338.7
2	143.0	0.0	1.0	0.0	0.0	250.3	54.5	125.2	431.1
15	140.5	0.0	0.0	0.0	0.0	1.8	0.1	40.6	42.4
16	61.5	0.0	0.0	0.0	0.0	10.0	14.1	895.9	920.0
25	53.0	0.0	45.2	0.0	0.0	0.0	0.0	160.8	206.0
27	88.0	0.0	0.0	0.0	0.0	0.2	0.0	315.9	316.1
33	172.0	4.5	0.0	0.0	0.0	0.0	0.0	502.7	507.2
37	78.5	0.0	6.0	0.0	0.0	0.0	0.0	216.5	222.4
41	181.5	0.0	0.0	0.0	0.0	127.3	0.0	236.1	363.4
42	63.0	0.0	0.0	0.0	0.0	0.0	0.0	49.3	49.3
46	159.5	0.0	0.2	0.0	0.0	2.4	0.0	177.8	180.4
49	122.0	0.0	13.9	0.0	0.0	19.5	0.0	101.5	134.9
50	59.0	0.0	11.6	0.0	0.0	60.1	0.0	96.7	168.4
56	122.0	0.0	0.4	0.0	0.0	10.2	0.0	128.2	138.8
58	110.0	0.0	0.0	0.0	0.0	3.1	0.0	730.3	733.4
61	150.5	0.0	0.0	0.0	0.0	0.0	0.0	336.7	336.7
67	187.5	0.0	0.6	0.0	0.0	0.9	0.0	79.4	81.0
70	117.0	0.0	72.8	0.0	0.0	0.1	0.0	54.3	127.3
78	52.5	0.0	0.0	0.0	0.0	0.0	0.0	275.4	275.4
Mean	111.7	0.2	8.0	0.0	0.0	25.6	4.4	255.2	293.3
% catch		0.1	2.7	0.0	0.0	8.7	1.5	87.0	100.0

Slope: 200 – 800 m

Station	Gear depth	Croakers	Groupers	Grunts	Hake	Seabream	Snappers	Other	Total
3	206.0	0.0	0.0	0.0	0.0	0.0	0.0	24.6	24.6
4	736.5	0.0	0.0	0.0	7.3	0.0	0.0	102.9	110.3
5	689.5	0.0	0.0	0.0	12.0	0.0	0.0	121.1	133.1
6	707.0	0.0	0.0	0.0	15.4	0.0	0.0	107.7	123.1
7	210.0	1.0	0.0	0.0	0.0	2.3	0.0	50.6	53.9
11	558.0	0.0	1.1	0.0	6.0	0.0	0.0	307.5	314.7
12	634.0	0.0	0.0	0.0	7.5	0.0	0.0	104.3	111.8
13	526.0	0.0	0.0	0.0	3.6	0.0	0.0	168.4	172.0
14	465.0	0.0	0.0	0.0	2.4	0.0	0.0	175.0	177.5
18	488.0	0.0	0.0	0.0	0.0	0.0	0.0	75.7	75.7
19	462.5	0.0	0.0	0.0	0.0	0.0	0.0	287.3	287.3
20	431.5	0.0	0.0	0.0	0.0	0.0	0.0	422.4	422.4
21	507.5	0.0	0.0	0.0	51.7	0.0	0.0	140.9	192.6
22	380.5	0.0	0.0	0.0	0.0	0.0	0.0	53.3	53.3
23	427.0	0.0	0.0	0.0	0.0	0.0	0.0	251.7	251.7
24	427.0	0.0	0.0	0.0	0.0	0.0	0.0	98.7	98.7
30	340.0	0.0	0.0	0.0	0.0	0.0	0.0	295.3	295.3
31	217.5	0.0	0.0	0.0	0.0	0.0	0.0	309.8	309.8
39	222.0	0.0	0.0	0.0	0.0	0.0	0.0	243.0	243.0
40	255.0	0.0	0.0	0.0	0.0	0.0	0.0	161.6	161.6
47	238.0	0.0	0.0	0.0	0.0	0.0	0.0	112.8	112.8
48	264.0	0.0	0.0	0.0	0.0	0.0	0.0	64.6	64.6
54	224.5	0.0	0.0	0.0	0.0	0.4	0.0	82.0	82.4
55	266.5	0.0	0.0	0.0	0.0	0.0	0.0	42.2	42.2
59	428.5	0.0	0.0	0.0	0.0	0.0	0.0	544.2	544.2
62	396.5	0.0	0.0	0.0	0.0	0.0	0.0	73.7	73.7
63	235.5	0.0	38.6	0.0	0.0	2.0	0.0	23.4	64.0
68	299.0	0.0	0.0	0.0	0.0	0.0	0.0	110.8	110.8
69	245.5	0.0	0.0	0.0	0.0	0.0	0.0	56.2	56.2
72	217.0	0.0	0.0	0.0	0.0	0.0	0.0	35.0	35.0
73	230.0	0.0	0.0	0.0	0.0	0.3	0.0	53.5	53.8
77	296.0	0.0	0.0	0.0	0.0	0.6	0.0	55.0	55.5
80	313.5	0.0	0.0	0.0	0.0	0.0	0.0	87.3	87.3
Mean	380.2	0.0	1.2	0.0	3.2	0.2	0.0	146.7	151.4
% catch	158.5	0.0	0.8	0.0	2.1	0.1	0.0	96.9	100.0

The group of pelagic species from Table 15 is broken down to family level and presented in Table 17 below. The commercially important pelagic fish groups together contributed to with 46% and and 4.5% the total catch on the inner and outer shelf respectively. These groups had a very marginal contribution to the total catch in the slope (not shown). Both on the inner and outer shelf carangids were the most dominant species with mean catch rates of 247 kg/h (43.1% of the total catch) and 9.6 kg/h (3.3%) respectively. The dominating species on the inner shelf was *D. russelli.* Other species commonly found in this depth region were *Decapterus macrosoma, Scomberoides commersonianus and Carangoides malabaricus*. On the inner shelf Scombrids was also important, *Scomberomorus commerson*, together with *Scomber japonicus* and *Rastrelliger kanagurta* contributed with a catch rate of 10.9 kg/h. Other species were found only in low abundance. On the outer shelf the carangids that contributed most to the total catch were *Decapterus tabl, Carangoides malabaricus and Decapterus russelli* followed by *Caranx papuensis* and *Selar crumenophthalmus*.

Table 17. Southern region catch rates (kg/h) by main pelagic species grouped by groups in swept-area bottom-trawl hauls on the a) inner shelf (20–50 m) and b) outer shelf (50–200 m). Slope (200–800 m) not shown because of the insignificant catches of commercial pelagic fish. The "other" group summarises the catch of all species groups not mentioned in any other columns.

Inner shelf: 20 – 50m

Station	Gear depth	Sphyraenidae	Carangidae	Clupeidae	Dussumieriidae	Engraulidae	Trichiuridae	Scombridae	Other	Total
10	42.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	479.1	480.0
17	36.0	0.0	1 520.3	0.0	0.0	0.0	0.0	14.6	250.3	1 785.1
26	46.0	1.6	31.6	0.0	0.0	5.9	0.3	0.0	137.2	176.6
35	41.5	0.1	41.5	0.1	0.7	30.7	1.1	28.6	65.1	167.9
36	36.0	0.0	2.2	0.0	0.0	0.0	0.1	0.2	54.0	56.6
43	27.0	0.0	55.4	0.0	0.0	5.0	0.0	21.2	270.8	352.3
51	36.5	0.0	13.4	0.2	0.0	0.0	0.0	43.4	260.4	317.4
57	23.5	0.0	517.3	0.0	0.0	0.0	0.0	0.0	1 394.8	1 912.1
64	49.5	10.8	209.1	0.0	2.4	0.0	0.0	10.4	44.9	277.7
65	32.0	0.0	325.5	0.0	0.0	0.0	0.0	2.0	419.1	746.7
71	47.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.7	26.7
Mean	37.9	1.1	247.0	0.0	0.3	3.8	0.1	10.9	309.3	572.6
% catch		0.2	43.1	0.0	0.0	0.7	0.0	1.9	54.0	100.0

Outer shelf: 50 – 200 m

Station	Gear depth	Sphyraenidae	Carangidae	Clupeidae	Dussumieriidae	Engraulidae	Trichiuridae	Scombridae	Other	Total
1	61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	338.7	338.7
2	143.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	431.1	431.1
15	140.5	0.0	2.5	0.0	0.0	0.0	0.0	0.0	40.0	42.4
16	61.5	0.0	1.3	0.0	0.0	0.0	0.0	11.8	906.8	920.0
25	53.0	0.0	47.7	0.0	0.0	0.0	0.0	0.0	158.3	205.9
27	88.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	310.3	316.1
33	172.0	0.0	0.0	0.0	0.0	0.0	21.8	0.0	485.3	507.1
37	78.5	0.4	86.1	0.0	0.0	0.0	1.6	0.0	134.2	222.4
41	181.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	363.4	363.4
42	63.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	46.2	49.3
46	159.5	0.0	1.5	0.0	0.0	0.0	0.0	0.0	178.8	180.4
49	122.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	134.4	134.9
50	59.0	0.4	28.2	0.0	0.0	0.0	0.0	0.0	139.7	168.4
56	122.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	138.8	138.8
58	110.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	728.4	733.4
61	150.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	336.7	336.7
67	187.5	0.0	0.2	0.0	0.0	0.0	0.0	0.0	80.7	80.9
70	117.0	0.0	0.6	0.0	0.0	0.0	0.0	3.4	123.3	127.3
78	52.5	29.8	0.1	0.0	0.0	0.0	0.0	0.0	245.6	275.4
Mean	111.7	1.6	9.6	0.0	0.0	0.0	1.2	0.8	280.0	293.3
% catch		0.5	3.3	0.0	0.0	0.0	0.4	0.3	95.5	100.0

3.7.2 Central region

A total of 41 bottom-trawl hauls were carried out in the central region. Fifteen (15) stations were excluded as they were performed at night in waters inshore of 150 m and another station was excluded as it was considered as a trial station, leaving 25 stations as valid for catch rates (kg/h) and biomass analyses. 80% of the valid stations (20 out of 25) were placed at the depth zone of 20–200 m (shelf), with 11 stations between 20–50 m (inner shelf) and 9 between 50 – 200 m (outer shelf).

Highest overall catch rates in the central region were found on the inner shelf (20–50 m depth) (Table 18). In this region, the pelagics were the group that contributed most to the total catch with 26.7%, followed by rays (9.8%), valuable demersal fishes (6.2%) and squids (4.5%) (Table **18**). Lobsters (1%) represented a small part of the catch in this depth region, while catches of sharks and shrimps were negligible (Table 18).

On the outer shelf, the overall catch rate was approximately 40% of the catch rate found in the inner shelf (Table 18). The groups with highest contribution to the total catch in this depth region were the valuable demersal fish (12.9%), the pelagics (10.1%) and the squids (7.4%), followed by sharks (6.8%) and rays (5.8%). The cacth rates of demersal fishes were slightly lower than those obtained in the inner shelf (20–50 m), whereas the catch rates of pelagics were 7-fold lower in the outer shelf when compared with the inner. Lobsters and shrimps had negligible catch rates in this area.

On the deep slope (200–800 m depth), the groups with more contribution to the total catch were squids (11.8%) and shrimps (5.9%), followed by sharks (3.9%) and lobsters (2.5%). The overall catch rate declined significantly compared to the shelf (Table 18).

The group of “others” consists of a number of species of less commercial importance. This represents a considerable proportion of the catch in all the three depth zones in Table 18. On the inner shelf this group contributed to approximately 52% of the catch, while on the outer shelf and slope this was approximately 57% and 73% of the total, respectively.

Table 18. Central region catch rates (kg/h) by main groups in swept-area bottom-trawl hauls on the a) inner shelf (20–50 m), b) outer shelf (50–200 m) and c) slope (200–800 m). The "pelagic" group consists of the groups barracuda, carangids, clupeoids (engraulids and clupeids), hairtails and scombrids. The "demersal" group consists of croakers, groupers, grunts, seabreams, snappers and cusk-eels, while the "other" groups summarises the catch of all species groups not mentioned in any other column.

Inner shelf: 20-50 m

Station	Gear depth	Demersal	Lobsters	Pelagic	Rays	Sharks	Shrimps	Squids	Other	Total
81	24.5	0.0	0.0	76.5	625.6	0.0	0.0	2.9	306.0	1011.0
82	32.5	0.0	0.0	145.0	0.0	0.0	0.0	66.5	73.1	284.7
90	31.5	0.3	0.8	73.2	0.0	1.3	0.0	39.6	38.1	153.3
91	45.5	0.0	2.2	48.9	0.0	0.0	0.0	1.3	60.8	113.3
96	20.5	265.3	0.0	595.5	0.0	0.0	4.5	2.8	1456.7	2324.8
97	23.5	0.0	0.0	32.8	0.0	0.0	0.0	1.3	100.1	134.3
98	37.0	0.0	4.2	273.4	0.0	0.0	0.0	86.2	255.6	619.3
109	22.5	15.2	0.0	41.8	0.0	0.0	3.1	1.1	131.1	192.3
113	27.5	157.2	0.0	190.0	59.3	21.2	7.0	5.0	293.3	732.9
118	27.0	0.0	0.0	14.2	0.0	0.0	0.0	10.4	49.7	74.3
120	39.0	0.0	3.5	389.2	2.7	4.6	0.0	96.4	905.2	1401.6
Mean	30.1	39.8	1.0	171.0	62.5	2.5	1.3	28.5	333.6	640.2
% catch		6.2	0.2	26.7	9.8	0.4	0.2	4.5	52.1	100.0

Outer shelf: 50-200 m

Station	Gear depth	Demersal	Lobsters	Pelagic	Rays	Sharks	Shrimps	Squids	Other	Total
86	62.5	0.0	3.2	50.1	0.0	30.9	0.0	0.4	113.1	197.7
87	54.5	79.6	0.0	6.0	121.6	47.3	0.0	0.5	636	891
92	88.5	0.0	0.5	0.0	0.0	12.2	0.0	2.4	13.4	28.5
93	163.5	0.0	3.3	7.9	0.9	0.0	0.2	14.6	48.4	75.3
99	74.0	0.0	0.0	6.7	0.0	47.3	0.0	115.4	8.3	177.7
107	72.5	191.4	0.5	13.2	0.0	14.9	0.4	0.7	9.1	230.1
111	60.5	19.4	0.0	20.6	8.3	0.0	1.7	23.2	350.5	423.7
114	75.0	0.4	0.0	89.4	0.0	0.0	0.1	6.2	16.1	112.3
119	58.5	0.0	0.3	33.8	0.0	0.0	0.0	4.1	81.5	119.7
Mean	78.8	32.3	0.9	25.3	14.5	17.0	0.3	18.6	141.8	250.7
% catch		12.9	0.3	10.1	5.8	6.8	0.1	7.4	56.6	100.0

Slope: 200 – 800 m

Station	Gear depth	Demersal	Lobsters	Pelagic	Rays	Sharks	Shrimps	Squids	Other	Total
83	255	0.6	2.5	1.9	0.6	0.4	0.0	28.4	91.7	126.1
100	642.5	1.1	5.6	0.0	0.0	2.0	13.5	0.5	141.8	164.5
101	227.5	0.0	1.0	0.6	7.0	8.1	12.2	11.8	42.5	83.3
106	622	1.6	0.9	0.0	0.0	8.0	10.5	3.6	113.9	138.5
115	322	0.4	8.7	0.7	3.8	10.7	7.3	43.1	154.3	229.1
Mean	413.8	0.7	3.7	0.6	2.3	5.8	8.7	17.5	108.8	148.3
% catch		0.5	2.5	0.4	1.5	3.9	5.9	11.8	73.4	100.0

Catch rates of the demersal fish category shown in Table 18 are broken down to important groups in Table 19. The 'croakers' was the dominant group on the inner shelf (29.6 kg/h) whereas on the outer shelf 'snappers' and 'groupers' had the highest catch rates (16.8 and 7.9 kg/h, respectively). On the slope from 200-800 m catches of demersal fish were extremely low. The "other" group summarises the catch of all species groups not mentioned in any other column of Table 19. This group accounted for almost 100% of total catch on the slope.

Table 19. Central region catch rates (kg/h) by main demersal species grouped by families in swept-area bottom-trawl hauls on the a) inner shelf (20–50 m), b) outer shelf (50–200 m) and c) slope (200–800 m). The "other" groups summarises the catch of all species groups not mentioned in any other column.

Inner shelf: 20 – 50 m

Station	Gear depth	Croakers	Groupers	Grunts	Hake	Seabream	Snappers	Other	Total
81	24.5	0.0	0.0	0.0	0.0	0.0	0.0	1 011.0	1 011.0
82	32.5	0.0	0.0	0.0	0.0	0.0	0.0	284.7	284.7
90	31.5	0.0	0.0	0.0	0.0	0.0	0.3	153.0	153.3
91	45.5	0.0	0.0	0.0	0.0	0.0	0.0	113.3	113.3
96	20.5	196.1	0.0	69.2	0.0	0.0	0.0	2 059.5	2 324.8
97	23.5	0.0	0.0	0.0	0.0	0.0	0.0	134.3	134.3
98	37.0	0.0	0.0	0.0	0.0	0.0	0.0	619.3	619.3
109	22.5	5.0	0.0	10.2	0.0	0.0	0.0	177.2	192.3
113	27.5	124.1	0.0	28.5	0.0	0.0	0.0	580.3	732.9
118	27.0	0.0	0.0	0.0	0.0	0.0	0.0	74.3	74.3
120	39.0	0.0	0.0	0.0	0.0	0.0	0.0	1 401.6	1 401.6
Mean	30.1	29.6	0.0	9.8	0.0	0.0	0.0	600.8	640.2
% catch		4.6	0.0	1.5	0.0	0.0	0.0	93.8	100.0

Outer shelf: 50 – 200 m

Station	Gear depth	Croakers	Groupers	Grunts	Hake	Seabream	Snappers	Other	Total
86	62.5	0.0	0.0	0.0	0.0	0.0	0.0	197.7	197.7
87	54.5	0.0	37.5	13.1	0.0	3.9	7.2	829.4	891.0
92	88.5	0.0	0.0	0.0	0.0	0.0	0.0	28.5	28.5
93	163.5	0.0	0.0	0.0	0.0	0.0	0.0	75.3	75.3
99	74.0	0.0	0.0	0.0	0.0	0.0	0.0	177.7	177.7
107	72.5	0.0	32.8	0.0	0.0	0.0	144.1	53.1	230.1
111	60.5	0.0	0.6	0.0	0.0	0.1	0.0	422.9	423.7
114	75.0	0.0	0.0	0.0	0.0	0.4	0.0	111.9	112.3
119	58.5	0.0	0.0	0.0	0.0	0.0	0.0	119.7	119.7
Mean	78.8	0.0	7.9	1.5	0.0	0.5	16.8	224.0	250.7
% catch		0.0	3.1	0.6	0.0	0.2	6.7	89.4	100.0

Slope: 200 – 800 m

Station	Gear depth	Croakers	Groupers	Grunts	Hake	Seabream	Snappers	Other	Total
83	255.0	0.0	0.0	0.0	0.0	0.5	0.0	125.6	126.1
100	642.5	0.0	0.0	0.0	0.0	0.0	0.0	164.5	164.5
101	227.5	0.0	0.0	0.0	0.0	0.0	0.0	83.3	83.3
106	622.0	0.0	0.0	0.0	0.0	0.0	0.0	138.5	138.5
115	322.0	0.0	0.0	0.0	0.0	0.0	0.0	229.1	229.1
Mean	413.8	0.0	0.0	0.0	0.0	0.1	0.0	148.2	148.3
% catch		0.0	0.0	0.0	0.0	0.1	0.0	99.9	100.0

The group of pelagic species from Table 18 is broken down to groups level and presented in Table 20 below.

Both on the inner and outer shelf, carangids were the dominant group with mean catch rates of 86.8 kg/h (13.1% of the total catch) and 23.4 kg/h (9.3%) respectively (Table 20). On the inner shelf Engraulidae were also important, contributing with a mean catch rate of 63.9 kg/h, followed by scombrids (16.1 kg/h). Other species were found only in low abundances (Table **20**). On the outer shelf apart from the carangids only scombrids and barracudas contributed marginally to the catches in this depth region (Table 20).

Table 20. Central region catch rates (kg/h) by main pelagic species grouped by families in swept-area bottom-trawl hauls on the a) inner shelf (20–50 m) and b) outer shelf (50–200 m). Slope (200–800 m) not shown because of the insignificant catches of commercial pelagic fish. The "other" group summarises the catch of all species groups not mentioned in any other columns.

Inner shelf: 20 – 50 m

Station	Gear depth	Sphyraenidae	Carangidae	Clupeidae	Dussumieriidae	Engraulidae	Trichuridae	Scombridae	Other	Total
81	24.5	0.5	75.0	0.8	0.0	0.0	0.0	0.1	934.5	1 011.0
82	32.5	0.0	144.6	0.4	0.0	0.0	0.0	0.0	139.6	284.7
90	31.5	0.0	16.3	0.0	0.0	0.0	0.0	56.9	80.1	153.3
91	45.5	6.9	27.8	0.0	0.0	0.0	0.6	13.7	64.4	113.3
96	20.5	24.1	61.5	35.6	0.0	447.5	8.9	18.0	1 729.3	2 324.8
97	23.5	0.0	22.7	0.0	0.0	0.0	0.0	10.1	101.5	134.3
98	37.0	0.0	259.8	0.0	0.0	0.0	0.0	13.6	345.9	619.3
109	22.5	0.3	8.9	0.4	0.0	25.9	1.8	4.6	150.5	192.3
113	27.5	5.3	3.2	69.0	0.0	29.9	80.4	2.2	542.9	732.9
118	27.0	0.0	14.2	0.0	0.0	0.0	0.0	0.0	60.1	74.3
120	39.0	0.0	33.3	0.0	0.0	351.6	0.0	4.3	1 012.5	1 401.6
Mean	30.7	4.5	86.8	5.3	0.0	63.9	1.4	16.1	485.0	663.0
% catch		0.7	13.1	0.8	0.0	9.6	0.2	2.4	73.2	100.0

Outer shelf: 50 – 200 m

Station	Gear depth	Sphyraenidae	Carangidae	Clupeidae	Dussumieriidae	Engraulidae	Trichuridae	Scombridae	Other	Total
86	62.5	0.0	50.1	0.0	0.0	0.0	0.0	0.0	147.6	197.7
87	54.5	4.3	1.7	0.0	0.0	0.0	0.0	0.0	885.0	891.0
92	88.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.5	28.5
93	163.5	0.0	7.9	0.0	0.0	0.0	0.0	0.0	67.3	75.3
99	74.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	171.0	177.7
107	72.5	0.0	1.1	0.0	0.0	0.0	0.0	12.0	216.9	230.1
111	60.5	0.0	20.6	0.0	0.0	0.0	0.0	0.0	403.0	423.7
114	75.0	0.0	89.3	0.0	0.0	0.0	0.1	0.0	22.9	112.3
119	58.5	0.0	33.0	0.0	0.0	0.0	0.8	0.0	85.9	119.7
Mean	78.8	0.5	23.4	0.0	0.0	0.0	0.1	1.3	225.3	250.7
% catch		0.2	9.3	0.0	0.0	0.0	0.0	0.5	89.9	100.0

3.7.3 Overall biomass index

For the swept-area biomass estimates, the shelf and slope in the southern and central region were stratified by depth; 20–50 m, 50–200 m and 200–800 m. The biomass and density estimates of the various groups of fish and invertebrates can be found in Table 21.

In the southern region the total estimate was 106 754 tonnes, of this 20 832 tonnes were found between 20–50 m depth, 27 213 tonnes between 50–200 m depth while 58 709 tonnes were found between 200–800 m depth.

In the central region the total estimate was 159 981 tonnes of which 124 508 tonnes were found between 20–50 m depth, 22 753 tonnes between 50–200 m depth while 12 721 tonnes was found on the slope between 200–800 m depth.

It should be noted that the group with the highest biomass based on the catches in the bottom trawl were pelagic species. Usually biomass estimates of pelagic species are not calculated based on bottom trawl catches. It was done in this case due to their dominance in the bottom trawl and to show their relative importance in relation to demersal catches. None of the groups in Table 21 were dominant. This is characteristic of highly diverse and low productive tropical systems. Due to the large contribution of the "other" group to the total, the biomass is broken down into different families in Table 22 that shows the biomass per taxonomic family. In the Central region the family Mullidae was important, followed by the Synodontidae, whereas in the South, Myctophidae, Sparidae and Synodontidae were the families that contributed most to the group of 'others'.

Table 21. Biomass and density estimates for the main groups based on the swept area method (excluding the trawl where increased abundance of jellyfish was registered).

Region	Depth region	Area size	Parameter	Demersal	Lobsters	Pelagic	Rays	Sharks	Shrimps	Squids	Other	Total
Central	20-50	6 505.1	t/NM^2	1.13	0.04	5.33	1.72	0.07	0.04	0.99	9.83	19.14
			Biomass	7 351	260	34 672	11 189	455	260	6 440	63 945	124 508
Central	50-200	2 997.7	t/NM^2	1	0.02	0.74	0.46	0.51	0	0.56	4.28	7.59
			Biomass	2 998	60	2 218	1 379	1 529	0	1 679	12 830	22 753
Central	200-800	2 564.7	t/NM^2	0	0.12	0.02	0.06	0.2	0.3	0.58	3.62	4.96
			Biomass	0	308	51	154	513	769	1 488	9 284	12 721
Total Biomass Central				10 348	628	36 942	12 722	2 497	1 030	9 606	86 060	159 981
% contribution Central				6.5	0.4	23.1	8.0	1.6	0.6	6.0	53.8	100.0
South	20-50	1 193.9	t/NM^2	2.723	0.005	8.249	1.067	0.319	0.045	0.873	4.168	17.449
			Biomass	3 251	6	9 848	1 274	381	54	1 042	4 976	20 832
South	50-200	2 754.4	t/NM^2	1.35	0.366	0.442	0.92	0.229	0.169	1.013	5.392	9.88
			Biomass	3 717	1 009	1 216	2 533	630	466	2 791	14 851	27 213
South	200-800	11 256.2	t/NM^2	0.225	0.22	0.048	0.15	0.335	0.307	0.465	3.468	5.216
			Biomass	2 529	2 472	535	1 684	3 765	3 457	5 232	39 035	58 709
Total Biomass Southern				9 497	3 487	11 599	5 491	4 776	3 976	9 065	58 862	106 754
% contribution Southern				8.9	3.3	10.9	5.1	4.5	3.7	8.5	55.1	100.0
Overall Total Biomass				19 846	4 115	48 541	18 213	7 273	5 006	18 671	144 922	266 735
Overall % contribution				7.44	1.54	18.2	6.83	2.73	1.88	7	54.33	100

Table 22. Biomass and density estimates for the main taxonomic groups found during the Mozambique survey based on the swept area method.

Region	Depth region	Area size	Parameter	Acropomatidae	Apogonidae	Ariidae	Ariommidae	Balistidae	Bothidae	Carangids
Central	20-50	6 505.1	t/NM^2	0	0	0	0.3	0	0.1	3.6
			Biomass	0	0	65	1 821	65	716	23 223
Central	50-200	2 997.7	t/NM^2	0	0	0	0	0.3	0	0.6
			Biomass	0	30	0	0	869	0	1 918
Central	200-800	2 564.7	t/NM^2	0.4	0	0	0	0	0	0
			Biomass	975	0	0	0	0	0	0
Total Biomass Central				975	30	65	1 821	934	716	25 142
% contribution Central				0	0	0	0	0	0	0.7
South	20-50	1 193.9	t/NM^2	0	0.1	0	0	0	0	7.7
			Biomass	0	60	0	28	21	16	9 223
South	50-200	2 754.4	t/NM^2	0.3	0	0	0.2	0	0	0.3
			Biomass	734	20	23	533	43	19	870
South	200-800	11 256.2	t/NM^2	0.1	0	0	0	0	0	0
			Biomass	1 096	0	0	43	0	38	3
Total Biomass Southern				1 830	80	23	603	65	58	10 096
% contribution Southern				1.7	0.1	0	0.6	0.1	0.1	9.5
Overall Total Biomass				2 805	110	88	2 425	999	774	35 238
Overall % contribution				0.1	0	0	0.1	0	0	0.9

Table 22. Continued.

Cephalopoda	Champsodontidae	Chlorophthalmidae	Clupeidae	Corals	Crabs	Dactylopteridae	Dussumieriidae	Engraulidae	Fistulariidae	Gempylidae
2.4	0	0	0.3	0	1.1	0	0	1.9	0	0
15 677	65	0	2 017	0	6 830	0	0	12 360	65	0
0.2	0	0	0	0.4	0	0	0	0	0	0
719	0	0	0	1 229	0	30	0	0	30	0
0.6	0	0.5	0	0	0	0	0	0	0	0.1
1 488	0	1 385	0	0	0	0	0	0	0	359
17 884	65	1 385	2 017	1 229	6 830	30	0	12 360	95	359
0.5	0	0	0.1	0	0.2	0	0	0.3	0	0
0.9	0	0	0	0	0	0	0	0.1	0	0
1 042	0	0	1	35	5	3	11	149	10	0
1	0.1	0	0	0.5	0	0	0	0	0	0
2 791	186	0	0	1 296	74	21	0	0	108	3
0.5	0.1	0.1	0	0	0.3	0	0	0	0	0.1
5 232	1 084	1 204	0	131	3 073	3	0	47	1	1 466
9 065	1 270	1 204	1	1 461	3 152	27	11	196	119	1 468
8.5	1.2	1.1	0	1.4	3	0	0	0.2	0.1	1.4
26 949	1 335	2 589	2 018	2 690	9 983	57	11	12 556	214	1 827
0.7	0	0.1	0.1	0.1	0.3	0	0	0.3	0	0

Table 22. Continued.

Haemulidae	Jellyfish	Lactariidae	Leiognathidae	Letrinidae	Lobsters	Lutjanidae	Macrouridae	Merlucciidae	Mullidae	Myctophidae
0.4	1.2	0	1.4	0	0.1	0	0	0	7	0
2 602	8 001	0	9 042	0	390	0	0	0	45 276	0
300	0	0	210	1 619	180	2 308	0	0	2 728	0
0	154	0	0	0	308	0	2 616	0	0	308
2 902	8 155	0	9 252	1 619	878	2 308	2 616	0	48 003	308
64	169	0	564	13	6	2	0	0	1 328	0
0	154	0	335	173	1 009	409	1	0	358	61
0	403	0	0	0	2 472	0	3 945	1 350	6	8 378
64	726	0	899	186	3 487	410	3 946	1 350	1 692	8 439
2 965	8 881	0	10 151	1 805	4 365	2 719	6 562	1 350	49 695	8 746
0.1	0.2	0	0.3	0	0.1	0.1	0.2	0	1.3	0.2

Table 22. Continued.

Nemipteridae	Ophidiidae	Ostraciidae	Peristediidae	Polynemidae	Porifera	Priacanthidae	Rays	Sciaenidae	Scombrids	Serranidae	Sharks
0.1	0	0	0	0.2	0	0	1.4	0.9	0.3	0	0.1
390	0	260	0	1 236	0	65	8 782	5 659	1 887	0	390
300	0	1 199	30	0	30	90	480	0	180	420	719
0	0	0	103	0	103	0	154	0	0	0	513
690	0	1 459	133	1 236	133	155	9 415	5 659	2 066	420	1 623
96	0	10	0	0	97	29	1 274	0	416	117	381
145	2	269	77	0	1 054	90	2 533	22	74	726	630
0	621	0	1 264	0	24	11	1 684	11	98	485	3 765
242	624	278	1 341	0	1 175	130	5 491	33	587	1 328	4 776
932	624	1 738	1 473	1 236	1 307	285	14 906	5 692	2 654	1 748	6 399
0	0	0	0	0	0	0	0.4	0.2	0.1	0	0.2

Table 22. Continued.

Shrimps	Sillaginidae	Soles	Sparidae	Sphyraenidae	Synodontidae	Tetradontidae	Trichiuridae	Triglidae	Uranoscopidae	Other	Total
0.6	0	0.1	0	0.1	4.3	0	0.8	0	0	529.6	558.1
3 708	65	716	0	455	27 842	130	5 009	0	0	3 445 166*	3 630 431*
0	0	0	0	0	1 529	180	0	0	0	2 188	19 965
769	0	103	0	0	616	51	0	103	0	2 308	12 721
4 477	65	818	0	455	29 986	361	5 009	103	0	3 449 663*	3 663 117*
54	741	1	3 056	43	207	38	6	0	0	1 534	20 832
466	56	78	2 363	161	1 764	105	112	62	41	7 165	27 213
3 457	0	970	64	3	3 509	132	382	390	501	11 365	58 709
3 976	797	1 049	5 483	207	5 480	274	499	451	542	20 064	106 754
8 454	862	1 867	5 483	663	35 466	636	5 508	554	542	3 469 726	3 769 871
0.2	0	0	0.1	0	0.9	0	0.1	0	0	92	100[1]

*
The increased biomass in the 20–50 m depth stratum, and as a result to the Total Biomass, in the Central region is hugely inflatted due to the category of Others, reflecting the increased catch of jellyfish in one trawl station (Station 108). Thus, it should not be considered as representative of the fish biomass in the stratum (and region).

Table 23. Percent Biomass contribution of main families and groups in the catches for the South, the Central and the two regions combined summarized from Table 22.

Central		South		Overall	
Mullidae	1.3	Carangids	9.5	Mullidae	1.3
Synodontidae	0.8	Cephalopoda	8.5	Carangids	0.9
Carangids	0.7	Myctophidae	7.9	Synodontidae	0.9
Cephalopoda	0.5	Rays	5.1	Cephalopoda	0.7
Engraulidae	0.3	Sparidae	5.1	Rays	0.4
Leiognathidae	0.3	Synodontidae	5.1	Crabs	0.3
Rays	0.3	Sharks	4.5	Engraulidae	0.3
Crabs	0.2	Macrouridae	3.7	Leiognathidae	0.3
Jellyfish	0.2	Shrimps	3.7	Jellyfish	0.2

3.7.4 Taxonomy

During the survey fish and invertebrate species identification was made to the lowest taxonomic level possible by experienced taxonomists and followed FAO species identification sheets for Fishery purposes, Fishing Area 51 (Fisher and Bianchi, 1984), and Smith's Sea Fishes (Smith *et al*. 2003) and several online databases especially the Eschmeyer database (Eschmeyer 2014), WoRMS database (WoRMS Ed. Board 2013) and FishBase (Froese and Pauly 2013).

High resolution pictures of uncommon species of both fish and some invertebrates were taken for the photo database onboard *Dr Fridtjof Nansen* and for help in identification by specialists. Unknown specimens have been sent to SAIAB, Grahamstown for further expert identification by specialist taxonomists. Reports on these are still pending.

Around 460 different species of bony fish belonging to 130 different families, 25 different ray species and 25 different shark species were recorded during the survey, in addition to a high number of various invertebrate species. Of these several shrimp and lobster species are of high commercial importance. The Carangidae was the most important family of the bony fish with 36 different species recorded, followed by the family Serranidae (15 species), Mullidae (14 species) and Lutjanidae (13 species). Large abundance of jellyfish of several different species, most notably the *Chirodropus gorilla* was observed over parts of the Sofala Bank and this has been reported to be an increasing phenomenon in recent years. There are indications of a regime shift when looking at comparisons between the historic surveys carried out in the 1970s and 1980s compared with the more recent surveys from 2007 and onwards and especially the small clupeoid species seem to have become less abundant in the system while species like the Mullidae have become more important. This should be investigated further.

3.8 Nutrition and food safety analyses

The samples obtained for this analysis are presented in Table 24. The laboratory analysis of these samples has not yet been finalized.

Table 24. Number of samples taken for the different kinds of analyses of fish for food safety and nutrition for a) big fish and b) small fish in Mozambique during on survey 2018402.

Date	Station	Species	Specimens	Journal ref.	Sample / Tissue	Freeze-dried samples
13.02.2018	2	*Polysteganus coeruleopunctatus*	25	2018-74	fillet	30
15.02.2018	10	*Upeneus bensasi*	150	2018-74	fillet+fish	6
16.02.2018	15	*Ommastrephes bartrami*	150	2018-173	fillet+fish	6
15.02.2018	11	*Merluccius paradoxus*	8	2018-75	fillet	9
15.02.2018	12	*Merluccius paradoxus*	7	2018-75	fillet	8
17.02.2018	21	*Merluccius paradoxus*	10	2018-75	fillet	12
19.02.2018	28	*Saurida undosquamis*	6	2018-75	fillet+fish	6
20.02.2018	35	*Saurida undosquamis*	6	2018-86	fillet+fish	6
16.02.2018	17	*Decapterus russelli*	6	2018-84	fillet+fish	6
21.02.2018	42	*Carangoides malabaricus*	5	2018-84	fillet	6
21.02.2018	43	*Scomberomorus commerson*	5	2018-84	fillet	6
22.02.2018	51	*Scomberomorus commerson*	5	2018-84	fillet	6
22.02.2018	50	*Selar crumenophthalmus*	5	2018-173	fillet	6
27.02.2018	82	*Ommastrephes bartrami*	150	2018874	fillet+fish	6
01.03.2018	90	*Saurida undosquamis*	150	2018874	fillet+fish	6
01.03.2018	90	*Scomberomorus commerson*	8	2018874	fillet	9

CHAPTER 4. SUMMARY OF SURVEY RESULTS

This survey came about after a request from the Ministry of Fisheries of Mozambique to the Food and Agriculture Organization (FAO) of the United Nations for assistance to update the information from the 2014 *Dr Fridtjof Nansen* survey of the marine living resources in Mozambican waters and was part of a regional coverage of the fishery resources and ecosystems of South East Africa. The survey aimed at collecting data on oceanographic conditions, pelagic and demersal resources, on the presence of pollutants (microplastics and marine debris) and to collect samples for analysis of nutritional value and contaminants in seafood.

4.1 Oceanography, plankton and nutrients

The water column at the Central Mozambique Channel and the Sofala Bank was highly influenced by the terrestrial outflow of numerous rivers along this section of the coast. Strong tidal currents and storm surges also may have caused the strong mixing at the shallow bottom observed. Dominant features of the surface water masses in the southernmost section of the Mozambique Channel were influenced by the subtropical climate regime. The chlorophyll maximum (DCM), was typically located deep near the coast and just above the thermocline in the open sea because supply of nutrients is the highest here and light intensity still sufficient. Low chlorophyll concentrations were found at the surface. In Mozambique the more productive waters are found near the coast and plankton production is likely a concomitant result of upwelling, rivers discharge, and current flows that supply nutrients to the upper water layers.

The deep water off the Mozambique coast displayed low pH values due to the high content of CO_2, produced by the degradation of sinking organic material. The upwelling water along particularly in the southern region consequently had low pH values, and pH decreased gradually with depth.

Total alkalinity, on the other hand, is closely related to the salinity of the waters. In the southern most region, increased levels of total alkalinity and salinity were observed throughout most of the water column before lower values were shown in deeper waters. However, as the Zambezi River was approached, low salinity and total alkalinity values were observed at the surface with an increase in both parameters in the central water column before decreasing again at greater depths.

4.2 Biomass estimates

4.2.1 Pelagic species

Acoustic biomass estimates were calculated for clupeoids (PEL1) and a group consisting of carangids, barracudas, hairtails and scombrids (PEL2). Altogether ~69 000 tonnes of PEL1

species were found; of this 3 500 tonnes was found in the south while the rest was found in the central region, with only a minor contribution in the north (<1000 tonnes). In 2014 about 15 000 tonnes of PEL1species were found along the coast of Mozambique. Of the PEL2 group a total estimate of 170 000 tonnes were recorded, compared with 67 000 along the whole coast of Mozambique in 2014. Of this the larger part (112 000 tonnes) was found in the central region while about 30 000 tonnes and 27 000 tonnes were found in the southern and northern regions, respectively. The distribution of PEL1 species was associated with the Limpopo and Zambezi rivers while the PEL2 species had a wider distribution inshore in most of the southern region and over the Sofala Bank. Both the PEL1 and PEL2 species show a considerable increase in biomass compared to past surveys, i.e. 2007 and 2014.

It is highly recommended that these results are examined in greater depths and jointly with information from the fishery to understand these important fluctuations and for a realistic estimate of a sustainable potential.

4.2.2 Demersal species

The overall swept area biomass estimated for the survey was 165 000 tonnes compared with 212 000 tonnes found in the south and central region in 2014. In 2018, 107 000 tonnes were found in the south and almost 60 000 tonnes were found in the central area compared with 110 000 tonnes and 102 000 tonnes, respectively, in 2014. Figure 28 illustrates the distribution of CPUE (kg h^{-1}) for all trawls during the three last surveys in Mozambican waters, excluding mesopelagic fish species, non-commercial invertebrates, jellyfish, sponges and corals in the catch. In comparison to the 2007 survey, the general pattern is the same with higher catches mainly found near the river mouths of Zambezi and Limpopo. During the current survey, however, CPUE was more pronounced outside the Zambezi River, something that largely contributes to the higher biomass estimates in 2018, compared to previous surveys.

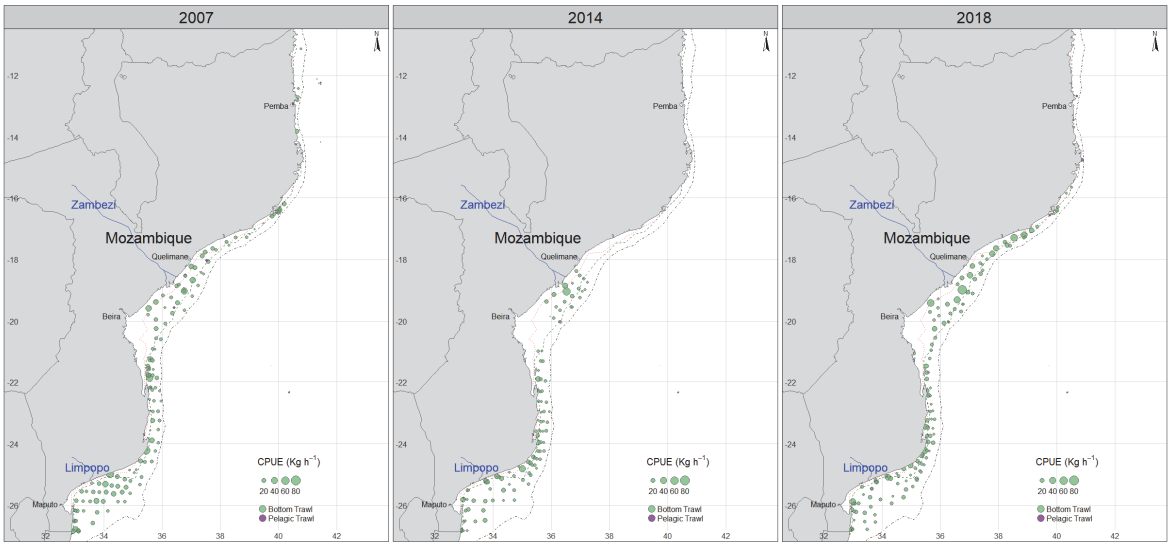


Figure 28. Distribution of Catch per Unit of Effort, CPUE (Kg h^{-1}, square root transformed values) during the last 3 surveys in the area. Note that in 2014, an engine failure did not allow for coverage of the northern region of Mozambican waters.

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ANNEX I. DESCRIPTION OF SAMPLING AT HYDROGRAPHFIC TRANSECTS

Superstation transect: 3 stations at 30 m, 100 m, 500 m.

1. CTD to bottom, close bottles for water collection at standard depths
2. Phytoplankton net to 30 m (or 25 m at inner station) - max haul speed 0.1 ms^{-1}, not in bad weather!
3. WP2 to 25 m (inner station), 100 m or 200 m – max haul speed 0.5 ms^{-1}
4. WP2 to 30 m, at the 100 m and 500 m station – max haul speed 0.5 ms^{-1}
5. Multinet to bottom (inner and middle stations) or 200 m (outer station), 5 nets released at (200-120, 120-80, 80 to below Fmax, through Fmax, above Fmax to surface) – max speed 1.5 ms^{-1}
6. Manta trawl at surface for 15 minutes - maks speed 1-1.5 ms^{-1}, not in bad weather! (usually simultaneous with multinet)

CTD transect: at bottom depths (20 m, 50 m, 75 m, 100 m, 200 m, 500 m and deeper if possible.

ANNEX II. DESCRIPTION OF ACOUSTIC INSTRUMENTS AND FISHING GEAR

Acoustic instruments

The Simrad EK80/18, 38, 70,120, 200 and 333 kHz scientific sounder was run during the survey. Scrutinizing was done in LSSS using the data from the 38-kHz transducer. Last standard sphere calibrations were checked on the 23.01.2017 in Sandviksflaket, Bergen, Norway using Cu64 for the 18 kHz, Cu60 for the 38 kHz, WC38.1 for the 70, 120 and 200 kHz, and the WC22 for the 333 kHz. The details of the settings for the 38-kHz echo sounder were as follows:

Transceiver2 menu (38 kHz)	
Transducer depth	5 8 m
Absorption coeff.	8.3 dB/km
Pulse duration	medium (1,024ms)
Bandwidth	2.43 kHz
Max power	2000 Watt
2way beam angle	20,6dB
gain	26,95 dB
SA correction	0.03 dB
Angle sensitivity	21.9
3 dB beamwidth	6.22º along ship
	6.28 athwart ship
Alongship offset	0.10º
Athwardship offset	0.06º
Bottom detection menu	Minimum level 50 Db

Fishing gear

The vessel has one small four-panel Åkrahamn pelagic trawl, one MultPelt 624 trawl (Figure II.1, new in 2017) and one 'Gisund super bottom trawl'. The multpelt trawl was not used during the survey due to a problem on the winch system. The smallest pelagic trawl has 8 to 12 m vertical opening under normal operation, whereas the MultPelt 624 trawl has 25 to 35 m opening.

The bottom trawl has a 31-m headline and a 47-m footrope fitted with a 12" rubber bobbins gear. The codend has 20 mm meshes, and has an inner net with 10 mm mesh size. The vertical opening is about 5.5 m. The distance between the wing tips is about 18 m during towing. The sweeps are 40 m long. The trawl doors are 'Thyborøen' combi, 8 m^2 and weigh 2000 kg. The door spreading is about 45 m when using restraining rope. Trawling was conducted for species identification only and no restraining rope was therefore used during the survey.

The SCANMAR system was used during all trawl hauls. This equipment consists of sensors,

a hydrophone, a receiver, a display unit and a battery charger. Communication between sensors and ship is based on acoustic transmission. The doors are fitted with sensors to provide information on their interdistance and angle, while a height sensor is fitted on the bottom trawl to measure the trawl opening and provide information on clearance and bottom contact.

The all trawls are equipped with a trawl eye that provides information about the trawl opening and the distance of the footrope to the bottom. A pressure sensor is used to show the depth on the headline.

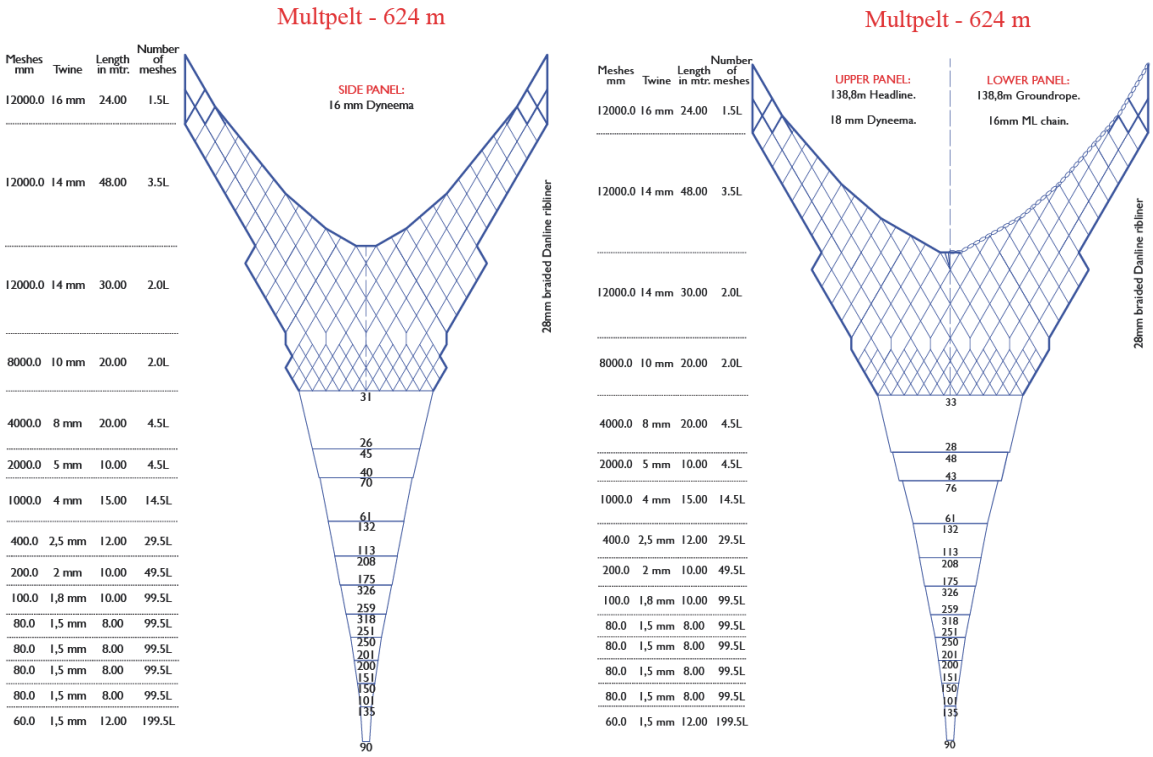
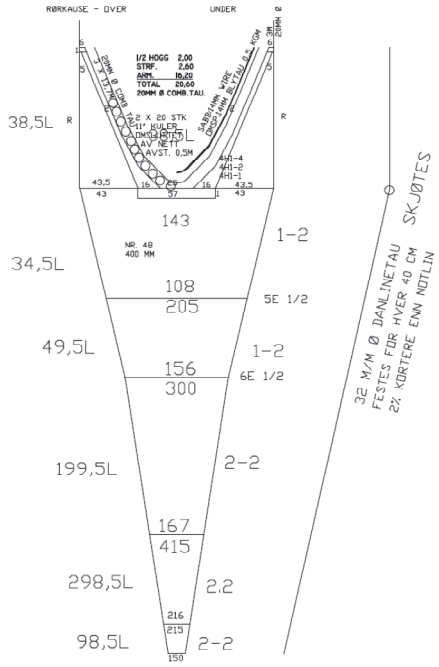


Figure II.1. Schematic drawing of the MultPelt 624.

LITEN PELAGISK ÅKRATRÅL

HEL MASKER M/M	TRÅD NR.	LENGDE I METER	MASKER I EVING
400	64	38,5	4
400	48	14	4
200	32	10,0	4
100	24	20,0	4
38	12	11,4	4
38	18	3,76	4



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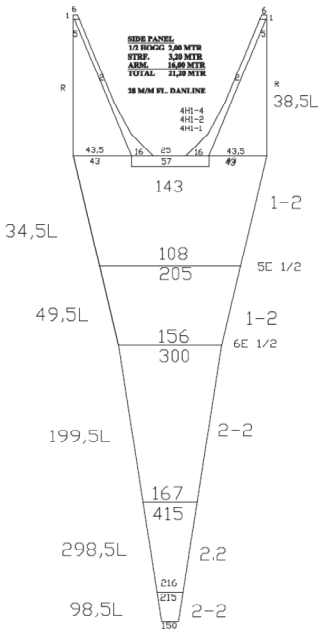
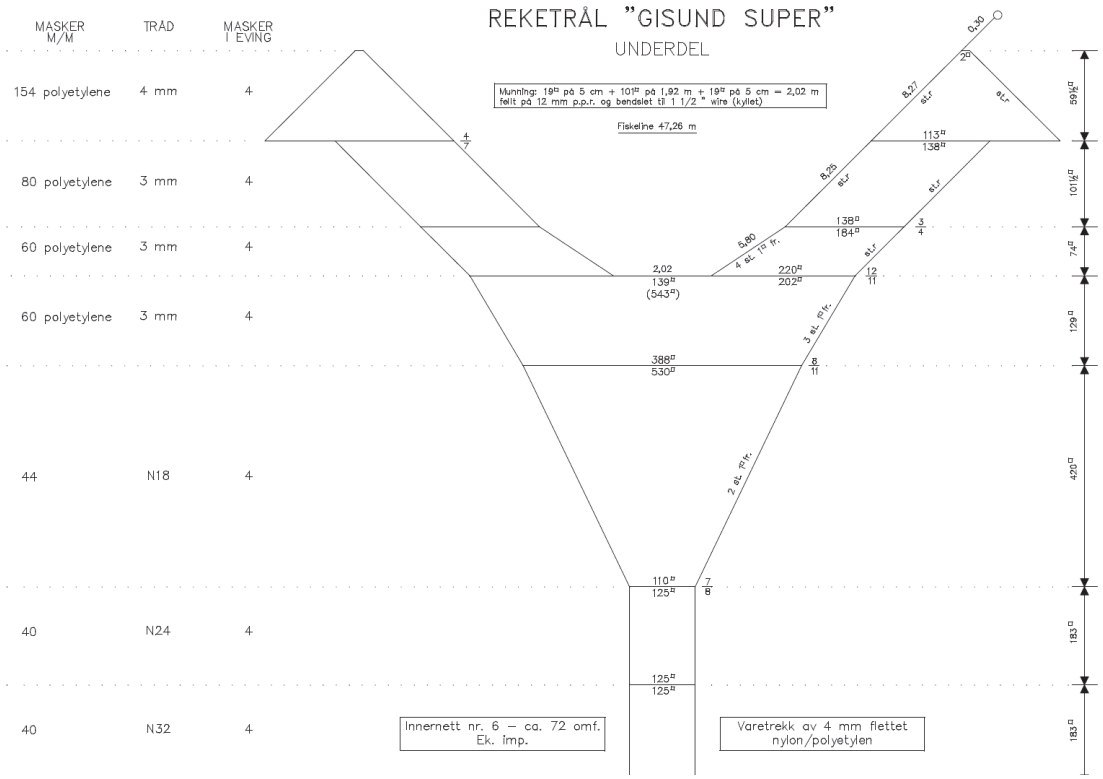


Figure II.2. Schematic drawing of the small pelagic Åkratrawl.



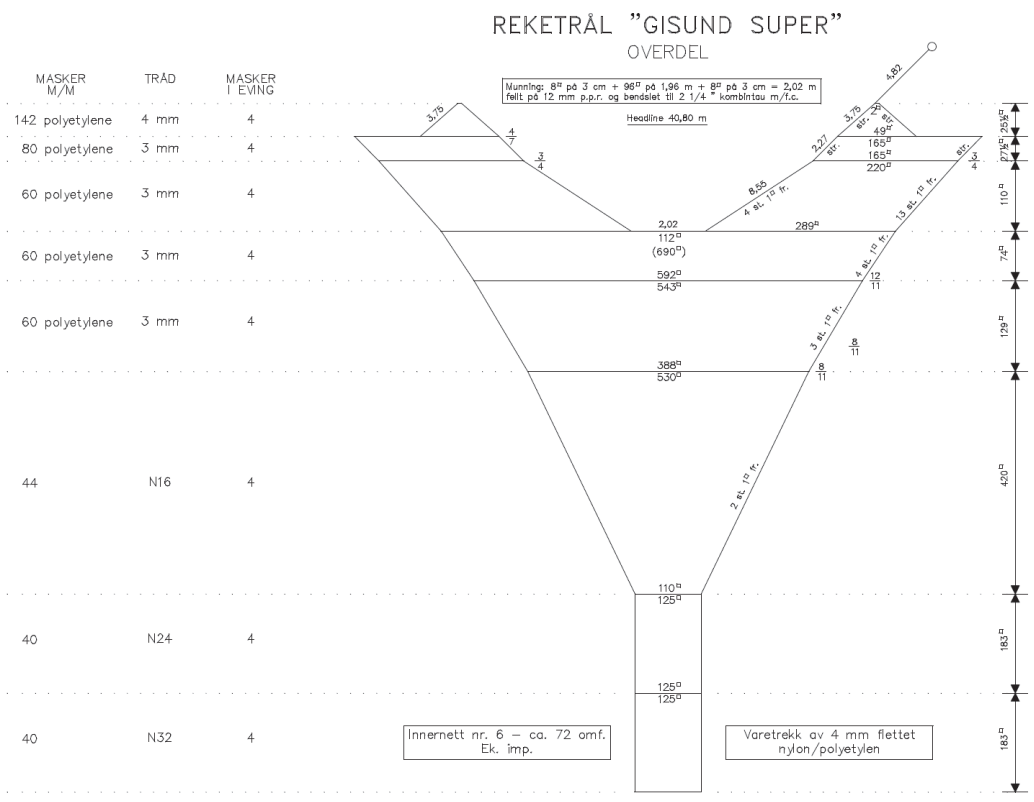
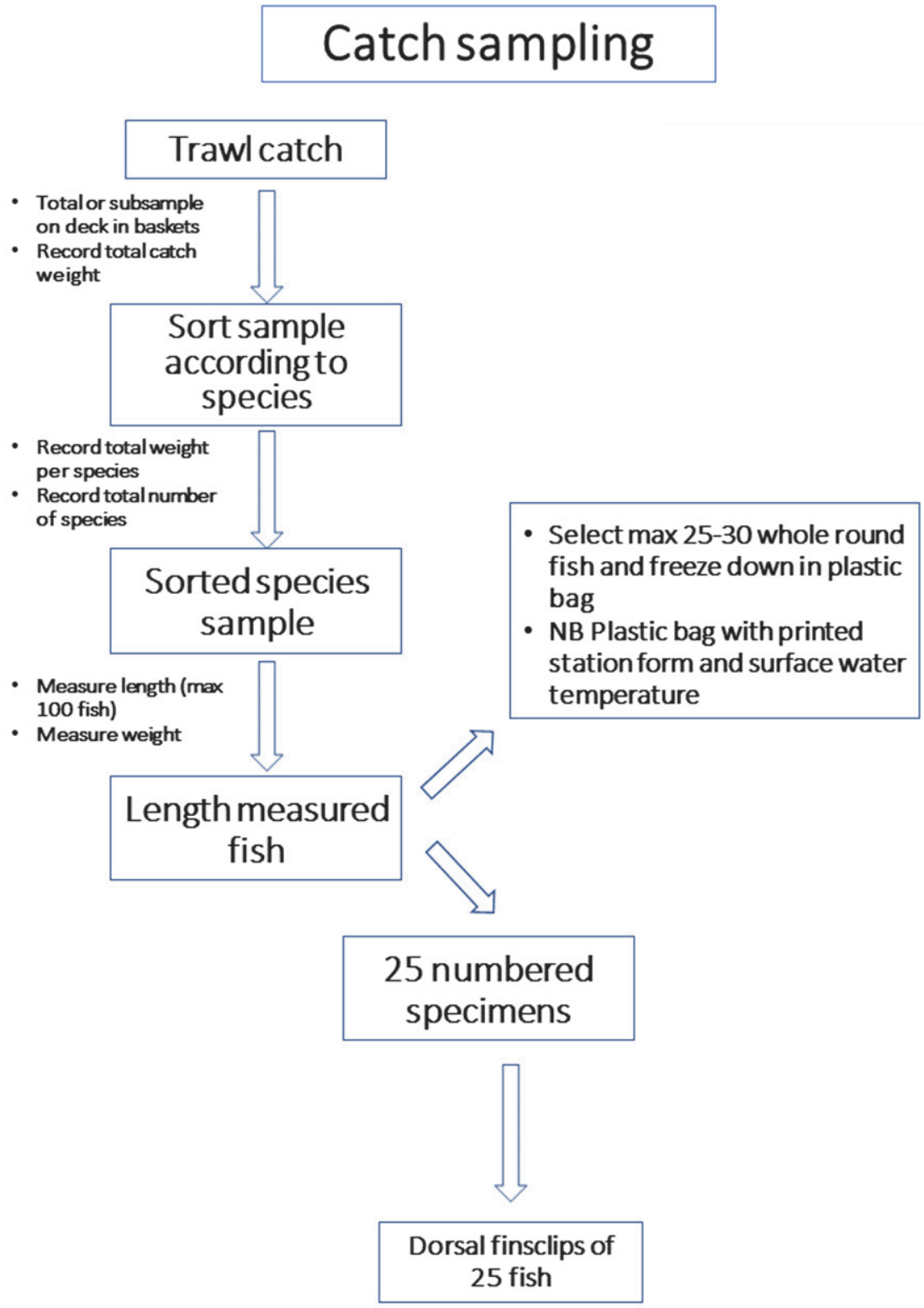


Figure II.3. Schematic drawing of the Super Gisund bottom trawl.

ANNEX III. SAMPLING PROCEDURES IN THE FISH LAB



Annex IV. BIOLOGICAL SCALES

Sexual maturity

Stage	State	Description
I	Immature	Ovary and testis about 1/3rd length of body cavity. Ovaries pinkish, translucent, testis whitish. Ova not visible to naked eye.
II	Maturing virgin and recovering spent	Ovary and testis about ½ length of body cavity. Ovary pinkish, translucent, testis whitish, symmetrical. Ova not visible to naked eye.
III	Ripening	Ovary and testis is about 2/3rds length of body cavity. Ovary pinkish yellow colour with granular appearance, testis whitish to creamy. No transparent or translucent ova visible.
IV	Ripe	Ovary and testis from 2/3rds to full length of body cavity. Ovary orange-pink in colour with conspicuous superficial blood vessels. Large transparent, ripe ova visible. Testis whitish-creamy, soft.
V	Spent	Ovary and testis shrunken to about ½ length of body cavity. Walls loose. Ovary may contain remnants of disintegrating opaque and ripe Ova, darkened or translucent. Testis bloodshot and flabby

Stomach content

Scale	Designation	Description
0	Empty	Stomach empty except for water.
1	Very little content	Stomach is almost empty. Only traces of small organisms can be found.
2	Some content	Stomach not completely full and not dilated.
3	Stomach full	Stomach full, but not bloated/dilated.
4	Bloated/dilated	The stomach is visibly expanded and tight. Content can be observed from the outside.

ANNEX V. RECORDS OF FISHING STATIONS

Area: Mozambique South

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 1
DATE :13/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°47.91
start stop duration Lon E 32°56.31
TIME :06:40:03 07:03:56 23.9 (min) Purpose : 3
LOG : 4267.35 4268.46 1.1 Region : 7431
FDEPTH: 63 60 Gear cond.: 0
BDEPTH: 63 60 Validity : 0
Towing dir: 0° Wire out : 200 m Speed : 2.8 kn
Sorted : 135 Total catch: 134.81 Catch/hour: 338.73

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Dasyatis brevicaudata	291.46	5	86.04	
Tetrosomus concatenatus	14.42	35	4.26	
Lutjanus sebae	14.07	3	4.15	
Holothuria scabra	6.03	5	1.78	
Chilomycterus reticulatus	2.61	3	0.77	
Diodon hystrix	1.56	3	0.46	
Odonus niger	1.51	3	0.45	
Teixeirichthys jordani	1.46	374	0.43	
Starfish	1.06	3	0.31	
Synodus variegatus	0.90	60	0.27	
Sepia australis	0.70	60	0.21	0
Astropyga radiata	0.70	28	0.21	
Sepia sp.	0.55	8	0.16	
Hoplolatilus fronticinctus	0.50	3	0.15	
APOGONIDAE	0.40	25	0.12	
Tripneustes gratilla	0.20	13	0.06	
UNIDENTIFIED FISH	0.10	13	0.03	0
Prionocidaris sp	0.10	5	0.03	
Anampses lineatus	0.10	3	0.03	
Ranina ranina	0.06	3	0.02	
Salmacis bicolor	0.05	3	0.01	
MONACANTHIDAE	0.04	5	0.01	
Pagellus natalenses	0.03	3	0.01	
Pseudanthias fasciatus	0.02	3	0.01	
Monocentris japonica	0.02	3	0.01	
Cociella heemstrai	0.01	3	0.00	
B I V A L V E S	0.01	3	0.00	
SOLEIDAE	0.01	3	0.00	
Labroides dimidiatus	0.01	3	0.00	
Chaetodon dolosus	0.01	3	0.00	
PORTUNIDAE	0.01	3	0.00	
Clypeaster	0.01	3	0.00	
Shrimps unidentified	0.01	3	0.00	
Menaethius monoceros	0.00	3	0.00	
Total	338.73		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 2
DATE :13/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°46.44
start stop duration Lon E 32°58.39
TIME :09:27:14 09:57:06 29.9 (min) Purpose : 3
LOG : 4276.77 4278.25 1.5 Region : 7431
FDEPTH: 143 143 Gear cond.: 0
BDEPTH: 143 143 Validity : 0
Towing dir: 0° Wire out : 400 m Speed : 3.0 kn
Sorted : 215 Total catch: 214.54 Catch/hour: 431.10

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Polysteganus coeruleopunctatus	237.51	689	55.09	2
Ibacus novemdentatus	115.90	868	26.89	
Pristipomoides filamentosus	54.53	109	12.65	1
Chrysoblephus laticeps	9.48	2	2.20	
Scorpaena scrofa	3.50	8	0.81	
Cheimerius nufar	2.85	2	0.66	
Pristigenys niphonia	2.21	6	0.51	
Aulacocephalus temminckii	1.00	2	0.23	
Sepia prashadi	0.92	10	0.21	
Sepia australis	0.80	16	0.19	
Uranoscopus archionema	0.48	4	0.11	
Pagellus natalenses	0.48	6	0.11	
Halieutaea fitzsimonsi	0.40	4	0.09	
Monocentris japonica	0.40	4	0.09	
Aluterus monoceros	0.36	8	0.08	
Zeus faber	0.08	2	0.02	
Thamnaconus fajardoi	0.08	2	0.02	
SYNODONTIDAE	0.08	2	0.02	
Parapercis maritzi	0.00	2	0.00	
Total	431.10		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 3
DATE :13/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°47.70
start stop duration Lon E 32°59.66
TIME :11:43:10 12:14:21 31.2 (min) Purpose : 3
LOG : 4285.68 4287.04 1.4 Region : 7431
FDEPTH: 204 208 Gear cond.: 0
BDEPTH: 204 208 Validity : 0
Towing dir: 0° Wire out : 615 m Speed : 2.6 kn
Sorted : 13 Total catch: 12.77 Catch/hour: 24.58

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Ibacus novemdentatus	7.16	73	29.13	
Sphoeroides pachgaster	4.70	15	19.11	
Unidentified	3.12	0	12.69	
Sepia prashadi	2.89	48	11.75	
Scyllarides elisabethae	1.66	4	6.73	
Ateleopus natalensis	0.92	4	3.76	
Chelidonichthys kumu	0.81	13	3.29	
Sepia australis	0.50	15	2.04	
Macrorhamphosus scolopax	0.42	19	1.72	
Uranoscopus archionema	0.38	6	1.57	
Champsodon capensis	0.31	33	1.25	
J E L L Y F I S H	0.27	2	1.10	
Emmelichthys nitidus	0.23	6	0.94	
Dactyloptena orientalis	0.23	2	0.94	
Sea cucumbers	0.23	2	0.94	
Kentrocapros rosapinto	0.19	4	0.78	
Pseudorhombus elevatus	0.15	4	0.63	
E C H I N O D E R M A T A	0.15	4	0.63	
Uroconger lepturus	0.08	2	0.31	
Callionymus cf persicus	0.08	4	0.31	
PAGUROIDEA	0.04	4	0.16	
Antigonia rubescens	0.04	4	0.16	
Lophius upiscephalus	0.02	2	0.08	
Total	24.58		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 4
DATE :13/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°46.34
start stop duration Lon E 33°29.49
TIME :18:55:50 19:26:23 30.6 (min) Purpose : 3
LOG : 4325.02 4326.35 1.3 Region : 7431
FDEPTH: 742 731 Gear cond.: 0
BDEPTH: 742 731 Validity : 0
Towing dir: 0° Wire out : 1750 m Speed : 2.6 kn
Sorted : 38 Total catch: 56.16 Catch/hour: 110.25

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Caelorinchus parallelus	41.73	805	37.85	
Neobythites analis	18.16	289	16.47	
Merluccius paradoxus	7.35	6	6.67	
Coloconger sp.	6.58	41	5.97	
Platymaia turbynei	5.88	338	5.33	
Hydrolagus sp.	4.23	31	3.84	
Nansenia macrolepis	2.76	53	2.51	
Aristaeomorpha foliacea	2.64	436	2.40	
Plesionika martia	2.35	540	2.13	
Sicyonia sp.	1.59	342	1.44	
Etmopterus sculptus	1.53	96	1.39	
Etmopterus sp.	1.53	94	1.39	
Satyrichthys adeni	1.35	2	1.23	
Aristeus antennatus	1.23	153	1.12	
Stomias boa boa	0.94	14	0.85	
ANTHOZOA (Sea anemones)	0.91	12	0.83	
Shrimps unidentified	0.82	295	0.75	
Holostylis sp	0.82	12	0.75	
Myctophidae sp. Z	0.82	220	0.74	
Coloconger sp.	0.76	71	0.69	0
Heterocarpus woodmasoni	0.70	37	0.64	
Gonorynchus abbreviatus	0.65	2	0.59	
Plesiopenaeus edwardsianus	0.53	18	0.48	
Notostomus elegans	0.50	55	0.45	
Gymnoscopelus sp.	0.47	41	0.43	
Glyphus marsupialis	0.47	41	0.43	
Malacosteus sp.	0.41	49	0.37	
Neoscopelus macrolepidotus	0.41	14	0.37	
Unidentified	0.41	14	0.37	
Gorgonocephalus eucnemis	0.29	2	0.27	
Raja sp., juvenile	0.24	2	0.21	
Pasiphaea sp.	0.18	41	0.16	
Etmopterus brachyurus	0.15	2	0.13	
Cubiceps cf. pauciradiatus	0.12	2	0.11	
Cubiceps sp.	0.12	2	0.11	
Psilaster acuminatus	0.12	2	0.11	
Octopus sp.	0.12	2	0.11	
Heterocarpus laevigatus	0.06	14	0.05	
Glyphus marsupialis	0.06	8	0.05	0
Loligo sp.	0.06	2	0.05	
PAGUROIDEA	0.03	2	0.03	
Taeniopsetta ocellata	0.03	2	0.03	
Munida sp.	0.03	6	0.03	
Hymenopenaeus sp.	0.03	2	0.03	
Hoplostethus cadenati	0.02	2	0.02	
Champsodon capensis	0.02	2	0.02	
**	0.01	2	0.01	
Ectreposebastes imus	0.01	2	0.01	
Polyipnus spinosus	0.00	2	0.00	
Lactoria sp., juvenile	0.00	2	0.00	
Stereomastis sculpta	0.00	2	0.00	
Sepia sp	0.00	2	0.00	
Total	110.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 5
DATE :14/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°32.22
start stop duration Lon E 33°46.27
TIME :10:57:42 11:28:48 31.1 (min) Purpose : 3
LOG : 4417.56 4418.91 1.4 Region : 7431
FDEPTH: 687 692 Gear cond.: 0
BDEPTH: 687 692 Validity : 0
Towing dir: 0° Wire out : 1675 m Speed : 2.6 kn
Sorted : 69 Total catch: 68.97 Catch/hour: 133.07

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Coelorinchus braueri	82.77	876	62.20	
Merluccius paradoxus	11.96	17	8.99	3
Neobythites analis	9.11	154	6.84	
Hydrolagus sp.	5.98	1568	4.49	
Gonorhynchus gonorhynchus	2.66	12	2.00	
Neoscombrops cynodon	2.28	27	1.71	
Coloconger scholesi	1.77	10	1.33	
Squalus sp.	1.72	2	1.29	
Venefica proboscidea	1.50	14	1.13	
Nansenia macrolepis	1.20	31	0.90	
Malacocephalus laevis	1.20	17	0.90	
Sicyonia sp.	1.16	878	0.87	
Chaunax 'pink'	1.08	2	0.81	
Neolithodes capensis	1.08	4	0.81	
PORIFERA (Sponges)	1.00	0	0.75	
Rostroraja alba	0.96	2	0.72	

Chaeceon macphersoni	0.77	4	0.58	
Plesionika martia	0.46	17	0.35	
MYCTOPHIDAE	0.46	37	0.35	
Aristeus antennatus	0.42	2	0.32	
Nettastoma parviceps	0.42	8	0.32	
Setarches guentheri	0.35	10	0.26	
SEPIOLIDAE	0.35	8	0.26	
Aristaeomorpha foliacea	0.31	147	0.23	
ANTHOZOA (Sea anemones)	0.31	10	0.23	
Sicyonia sp.	0.27	4	0.20	
Heterocarpus laevigatus	0.19	133	0.14	
Polymetme corythaeola	0.19	2	0.14	
Lepidopus caudatus	0.15	2	0.12	
Malacosteus sp.	0.12	2	0.09	
Hoplostethus mediterraneus	0.11	2	0.09	
Chlorophthalmus agassizi	0.10	87	0.07	
Myctophidae sp. C	0.08	10	0.06	0
Diaphus effulgens	0.08	10	0.06	
Haliporoides triarthrus	0.08	35	0.06	
Sea pens	0.08	41	0.06	
Hoplobrotula gnathopus	0.07	2	0.05	
JELLYFISH	0.06	2	0.04	
Myctophidae sp. D	0.04	4	0.03	0
ISOPODS	0.04	6	0.03	
Munida sp.	0.04	10	0.03	
Nemichthys curvirostris	0.04	8	0.03	
P O L Y C H A E T A	0.02	0	0.01	
Myctophid sp. B	0.01	2	0.01	0
Myctophid sp. A	0.01	2	0.01	0
Pasiphae sp.	0.00	27	0.00	
E C H I N O D E R M A T A	0.00	2	0.00	
Total	133.07		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 6
DATE :14/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°31.38
start stop duration Lon E 33°24.04
TIME :15:42:57 16:14:08 31.2 (min) Purpose : 3
LOG : 4443.45 4444.87 1.4 Region : 7431
FDEPTH: 702 712 Gear cond.: 0
BDEPTH: 702 712 Validity : 0
Towing dir: 0° Wire out : 1500 m Speed : 2.7 kn
Sorted : 29 Total catch: 64.01 Catch/hour: 123.14

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Coloconger scholesi	15.66	50	12.72	
Merluccius paradoxus	15.41	19	12.51	
Neobythites analis	14.64	227	11.89	
Bathyuroconger vicinus	11.85	164	9.62	
Gnatophausia ingens	10.54	4	8.56	
Hydrolagus sp.	7.27	19	5.91	
Nansenia macrolepis	6.52	108	5.30	
Malacocephalus laevis	5.25	0	4.26	
J E L L Y F I S H	4.91	4	3.98	
Shrimps unidentified	3.46	8	2.81	
Chaeceon macphersoni	2.71	12	2.20	
Synagrops japonicus	2.54	25	2.06	
Rossia enigmatica	2.29	37	1.86	
Neolithodes capensis	2.04	88	1.66	
ANTHOZOA (Sea anemones)	1.87	50	1.52	
Sea pens	1.87	252	1.52	
Notacanthus sexspinis	1.77	8	1.44	
Heterocarpus sp.	1.44	25	1.17	
Diplophos taenia	1.35	146	1.09	
Sicyonia sp.	1.19	400	0.97	
Aristaeomorpha foliacea	1.02	50	0.83	
Diaphus effulgens	1.02	71	0.83	
Diaphus cf. brachycephalus	0.77	252	0.62	
SALPS	0.67	12	0.55	
PORIFERA (Sponges)	0.50	0	0.41	
ARISTEIDAE	0.42	2	0.34	
Chlorophthalmus agassizi	0.42	4	0.34	
Plesionika martia	0.37	4	0.30	0
Polymetme corythaeola	0.35	8	0.28	
Bathypolypus valdiviae	0.35	4	0.28	
Munida sp.	0.29	8	0.23	
Bolinichthys photothorax	0.25	13	0.20	
Diretmus argenteus	0.25	8	0.20	
Plesionika martia	0.25	58	0.20	
Sergia sp.	0.25	177	0.20	
E C H I N O D E R M A T A	0.21	4	0.17	
Pagurus cuanensis	0.21	4	0.17	
Heterocarpus grimaldii	0.19	4	0.16	
Kuronezumia leonis	0.17	4	0.14	
Maurolicus muelleri	0.17	12	0.14	
Stereomastis sp.	0.12	4	0.09	
Parapagurus dimorphus	0.10	4	0.08	
Holothuria sp.	0.08	4	0.06	
Avocettina sp.	0.08	8	0.06	
Plesiopenaeus edwardsianus	0.04	4	0.03	
Solenocera sp.	0.02	4	0.02	
Total	123.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 7
DATE :14/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°28.55
start stop duration Lon E 33°2.12
TIME :20:08:07 20:38:23 30.3 (min) Purpose : 3
LOG : 4473.61 4475.23 1.6 Region : 7431
FDEPTH: 214 206 Gear cond.: 0
BDEPTH: 214 206 Validity : 0
Towing dir: 0° Wire out : 590 m Speed : 3.2 kn
Sorted : 27 Total catch: 27.21 Catch/hour: 53.93

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	23.71	3950	43.96	
Squalus megalops	3.81	4	7.06	
Trigla sp.	3.25	117	6.03	
Ophiuroidea	2.66	0	4.93	
Pagellus natalenses	2.30	4	4.26	
Uranoscopus archionema	1.82	8	3.38	
Ommastrephes bartrami	1.80	40	3.34	
Saurida undosquamis	1.55	14	2.87	4
Macrorhamphosus scolopax	1.47	182	2.72	
Kentrocapros rosapinto	1.35	20	2.50	
Ibacus novemdentatus	1.35	14	2.50	
Histiopterus typus	1.19	2	2.21	
Umbrina canariensis	1.03	6	1.91	
Cubiceps whiteleggii	0.95	14	1.76	
Gonorhynchus gonorhynchus	0.95	36	1.76	
Citharoides macrolepis	0.87	14	1.62	
Bothus swio	0.59	50	1.10	
Lagocephalus sceleratus	0.59	2	1.10	
Sepia latimanus	0.48	8	0.88	
Neoscombrops cynodon	0.44	10	0.81	
Sepia australis	0.36	8	0.66	
Satyrichthys adeni	0.28	2	0.51	
Sepia pharaonis	0.28	2	0.51	
Bleekeria sp.	0.16	8	0.29	
Callionymus sp.	0.12	6	0.22	
Saurida tumbil	0.12	6	0.22	
Bathyurocongrus sp.	0.08	2	0.15	
Sea pens	0.08	63	0.15	
Argentina sphyraena	0.08	14	0.15	
Parapandalus narval	0.08	44	0.15	
Antigonia rubescens	0.08	4	0.15	
Sicyonia sp.	0.04	20	0.07	
Ostracods	0.02	6	0.04	
Parapagurus cf pilosimanus	0.01	2	0.01	
Cynoglossus durbanensis	0.00	2	0.01	
Total	53.93		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 8
DATE :15/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°11.57
start stop duration Lon E 33°1.72
TIME :02:22:34 02:52:55 30.4 (min) Purpose : 3
LOG : 4514.77 4516.23 1.5 Region : 7431
FDEPTH: 104 103 Gear cond.: 0
BDEPTH: 104 103 Validity : 2
Towing dir: 0° Wire out : 290 m Speed : 2.9 kn
Sorted : 54 Total catch: 53.75 Catch/hour: 106.23

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Dactyloptena peterseni	22.81	275	21.47	
Squatina africana	19.72	2	18.57	
Triodon macropterus	9.49	8	8.93	
Synodus CF dermatogenys	8.50	184	8.00	
Lagocephalus guentheri	4.03	26	3.80	
Tetrosomus sp.	3.68	10	3.46	
Gorgonians	3.44	2	3.24	
Priacanthus hamrur	3.44	16	3.24	
Uranoscopus archionema	3.36	12	3.16	
Sepia pharaonis	3.32	38	3.13	
Pagellus natalenses	2.89	53	2.72	
Tetrosomus concatenatus	2.85	14	2.68	
Fistularia petimba	2.49	14	2.34	
Sepia australis	2.17	20	2.05	
Halaelurus lineatus	1.74	16	1.64	
Octopus vulgaris	1.74	14	1.64	
Halieutaea sp.	1.28	2	1.21	
Lepidotrigla alcocki	1.11	51	1.04	
Loligo sp.	1.11	16	1.04	
Gonorhynchus gonorhynchus	0.87	26	0.82	
Ariomma bondi	0.79	12	0.74	
Penaeus latisulcatus	0.71	12	0.67	
Thamnaconus modestoides	0.71	20	0.67	
Ariomma indicum	0.63	4	0.60	
Saurida undosquamis	0.59	8	0.56	
Cidaroidae indetCV1	0.36	4	0.33	
Serranus novemcinctus	0.32	14	0.30	
Scorpaena scrofa	0.32	2	0.30	
Ophichthus unicolor	0.26	6	0.24	
Halieutaea fitzsimonsi	0.26	6	0.24	0
Monocentris japonica	0.20	2	0.19	
Beryx splendens	0.20	20	0.19	
Thamnaconus fajardoi	0.16	10	0.15	
Carybdis sp.	0.12	4	0.11	
Pseudorhombus elevatus	0.12	8	0.11	
Callionymus cf persicus	0.08	2	0.07	
Asteroidea indetCV1	0.06	4	0.06	
Parapercis cf nebulosa	0.04	2	0.04	
Samaris costae	0.04	4	0.04	
Phyllophichthus xenodontus	0.04	6	0.04	
Canthigaster rivulata	0.04	4	0.04	
Torquigener hypselogenion	0.04	2	0.04	
Cynoglossus capensis	0.02	2	0.02	
Callionymus regani	0.02	2	0.02	
Antigonia cf rubescens	0.02	2	0.02	
Nemichthys scolopaceus	0.02	6	0.02	
Tylerius spinosissimus	0.02	2	0.02	
Octopus sp.	0.02	2	0.02	
HOLUTHUROIDEA	0.02	0	0.02	
Philine aperta	0.01	2	0.01	
Total	106.23		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 9
DATE :15/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°12.88
start stop duration Lon E 33°6.37
TIME :04:52:51 05:25:16 32.4 (min) Purpose : 3
LOG : 4526.26 4528.08 1.8 Region : 7431
FDEPTH: 345 347 Gear cond.: 0
BDEPTH: 345 347 Validity : 3
Towing dir: 0° Wire out : 870 m Speed : 3.4 kn
Sorted : 138 Total catch: 137.64 Catch/hour: 254.81

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trichiurus lepturus	108.08	268	42.41	
Unidentified	93.19	0	36.57	
Loliolus sp.	33.47	320	13.14	
Squalus sp.	11.29	20	4.43	
Parapandalus spinifer	2.85	115	1.12	
TORPEDINIDAE	2.48	2	0.97	
Cynoglossoides sp.	2.04	70	0.80	
Palinurus delagoae	0.48	6	0.19	
Ovalipes sp	0.41	6	0.16	
Halieutaea sp.	0.17	2	0.07	
LITHODIDAE	0.17	2	0.07	
Chaunax atimovatae	0.15	2	0.06	

Starfish	0.04	2	0.01
Total	254.81		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 10
DATE :15/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°9.10
start stop duration Lon E 32°58.33
TIME :07:51:18 08:13:50 22.5 (min) Purpose : 3
LOG : 4538.90 4540.16 1.3 Region : 7431
FDEPTH: 41 43 Gear cond.: 0
BDEPTH: 41 43 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.4 kn
Sorted : 10 Total catch: 180.35 Catch/hour: 480.09

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Chelonia mydas	266.19	3	55.45	
SEAWEED	61.73	0	12.86	
Upeneus bensasi	38.54	1608	8.03	
SERRANIDAE	36.15	5	7.53	
Teixeirichthys jordani	12.56	532	2.62	
Parupeneus heptacanthus	11.50	234	2.40	
PORIFERA (Sponges)	7.56	3	1.57	
Diodon holocanthus	5.75	11	1.20	
LABRIDAE	4.90	149	1.02	
Arothron stellatus	3.99	13	0.83	
Paramonacanthus pusillus	3.62	170	0.75	
Apogon aureus	3.62	21	0.75	
Parupeneus macronemus	2.98	53	0.62	
Fistularia petimba	2.77	21	0.58	
Choerodon gymnogenys	2.13	32	0.44	
Sepia pharaonis	1.92	11	0.40	
Lethrinus harak	1.70	21	0.35	
Rhinobatos holcorhynchus	1.65	3	0.34	
Lethrinus xanthochilus	1.28	11	0.27	
Lethrinus mahsena	1.06	21	0.22	
Dactyloptena peterseni	0.93	11	0.19	
Remora australis	0.91	5	0.19	
Ostorhinchus apogonoides	0.85	64	0.18	
Decapterus macrosoma	0.85	85	0.18	
Chaetodon dolosus	0.64	32	0.13	
Tetrosomus concatenatus	0.64	32	0.13	
Priacanthus cf. hamrur	0.64	21	0.13	
Sufflamen fraenatum	0.56	11	0.12	
Trachinocephalus myops	0.43	11	0.09	
Dascyllus trimaculatus	0.43	11	0.09	
Pseudobalistes fuscus	0.32	11	0.07	
Penaeus latisulcatus	0.27	11	0.06	
Amblyrhynchotes honkenii	0.21	11	0.04	
Synodus sp.	0.21	11	0.04	
Torquigener hypselogenion	0.19	11	0.04	
Cyprinocirrhites polyactis	0.13	11	0.03	
Cheilio inermis	0.11	11	0.02	
Lutjanus kasmira	0.03	11	0.01	
Labroides dimidiatus	0.03	11	0.01	
Decapterus russelli	0.01	11	0.00	
Total	479.98		99.98	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 11
DATE :15/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°14.46
start stop duration Lon E 33°24.46
TIME :12:13:27 12:52:10 38.7 (min) Purpose : 3
LOG : 4571.15 4573.10 2.0 Region : 7431
FDEPTH: 559 557 Gear cond.: 0
BDEPTH: 559 557 Validity : 0
Towing dir: 0° Wire out : 1350 m Speed : 3.0 kn
Sorted : 24 Total catch: 203.11 Catch/hour: 314.74

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Haliporoides triarthrus	91.15	3655	28.96	6
Cubiceps sp.	48.27	660	15.34	
Plesiobatis daviesi	38.74	3	12.31	
Unidentified	18.05	0	5.74	
Chlorophthalmus agassizi	15.34	201	4.87	
Caelorinchus braueri	14.21	335	4.51	
Neoepinnula orientalis	11.05	79	3.51	
Ommastrephes bartrami	11.05	45	3.51	
Malacocephalus laevis	10.38	324	3.30	0
Nansenia macrolepis	8.57	146	2.72	
Sicyonia sp.	7.90	1811	2.51	
MYCTOPHIDAE	6.09	1677	1.93	
Merluccius paradoxus	6.04	12	1.92	5
Chaunax pictus	5.08	34	1.61	
Synagrops japonicus	3.38	0	1.07	
Aristaeomorpha foliacea	3.16	101	1.00	7
Plesionika heterocarpus	2.93	0	0.93	
Neoscopelus microchir	2.71	67	0.86	
Algaes	2.28	0	0.72	
Histioteuthis dofleini	1.58	11	0.50	
Malacocephalus laevis	1.58	5	0.50	
Holanthias sp.	1.15	22	0.36	
Gonorhynchus gonorhynchus	0.93	3	0.30	
Neobythites analis	0.74	11	0.24	
Halieutaea fitzsimonsi	0.56	11	0.18	
Squalus megalops	0.53	2	0.17	
Synaphobranchus affinis	0.43	0	0.14	
Balanophyllia (hard coral)	0.28	0	0.09	
Peristedion weberi	0.23	11	0.07	
Chaunax sp.	0.19	45	0.06	
Lestrolepis intermedia	0.12	11	0.04	
Isopod	0.02	11	0.00	
Cynoglossus zanzibarensis	0.02	11	0.00	
Total	314.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 12
DATE :15/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°17.78
start stop duration Lon E 33°45.01
TIME :17:38:39 18:08:43 30.1 (min) Purpose : 3
LOG : 4600.71 4602.29 1.6 Region : 7431
FDEPTH: 632 636 Gear cond.: 0
BDEPTH: 632 636 Validity : 0
Towing dir: 0° Wire out : 1450 m Speed : 3.2 kn
Sorted : 56 Total catch: 56.04 Catch/hour: 111.82

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Coelorinchus parallelus	83.47	1040	74.64	
Merluccius paradoxus	7.48	14	6.69	8
Malacocephalus laevis	4.11	76	3.68	
MYCTOPHIDAE	3.63	1022	3.25	
Nansenia cf macrolepis	3.05	64	2.73	
Neobythites analis	2.57	36	2.30	
Haliporoides triarthrus	2.00	124	1.78	
Gonorhynchus sp.	1.76	6	1.57	
Aristaeomorpha foliacea	1.42	130	1.27	
Bathyclupea sp.	0.94	6	0.84	
Coloconger scholesi	0.48	6	0.43	
Hoplostethus mediterraneus	0.48	6	0.43	
Plesionika martia	0.18	52	0.16	
Sergia sp.	0.18	100	0.16	
Scomber colias	0.06	6	0.05	
Munida sp.	0.02	6	0.02	
Total	111.82		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 13
DATE :16/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 26°3.05
start stop duration Lon E 33°37.68
TIME :03:11:23 03:41:20 30.0 (min) Purpose : 3
LOG : 4654.60 4656.10 1.5 Region : 7431
FDEPTH: 531 521 Gear cond.: 0
BDEPTH: 531 521 Validity : 0
Towing dir: 0° Wire out : 1280 m Speed : 3.0 kn
Sorted : 31 Total catch: 85.84 Catch/hour: 171.97

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Caelorinchus parallelus	50.36	855	29.29	
Cubiceps capensis	18.77	549	10.92	
Plesiobatis daviesi	17.83	2	10.37	
Haliporoides triarthrus	16.23	847	9.44	9
Chlorophthalmus agassizi	9.74	198	5.66	
J E L L Y F I S H	9.48	0	5.51	
Sicyonia sp.	8.95	1865	5.21	
Neoepinnula orientalis	6.31	144	3.67	
Synagrops japonicus	5.09	166	2.96	
Malacocephalus laevis	4.13	118	2.40	
Loligo sp.	4.13	18	2.40	
Merluccius paradoxus	3.61	4	2.10	
Sebastes capensis	2.20	18	1.28	
Hoplostethus atlanticus	1.84	44	1.07	
Octopus sp.	1.76	8	1.03	
Gonorhynchus gonorhynchus	1.58	4	0.92	
Malacocephalus sp.	1.40	18	0.82	
Plesionika sp.	1.32	369	0.77	
MYCTOPHIDAE	1.32	258	0.77	
Bathyclupea sp.	1.32	14	0.77	
Neoscopelus macrolepidotus	1.06	14	0.62	
Diaphus knappi	1.06	18	0.62	
Nansenia macrolepis	0.62	62	0.36	
Nettastoma melanurum	0.44	18	0.26	
Parapagurus cf pilosimanus	0.42	8	0.24	
Sepia sp.	0.36	4	0.21	
Chaunax pictus	0.36	26	0.21	
Munida sp.	0.12	26	0.07	
Polymetme corythaeola	0.08	4	0.05	
Oplophorus spinosus	0.04	18	0.02	
Henricia abyssalis	0.02	4	0.01	
Total	171.97		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 14
DATE :16/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°56.37
start stop duration Lon E 33°12.39
TIME :08:21:19 08:51:05 29.8 (min) Purpose : 3
LOG : 4686.14 4687.74 1.6 Region : 7431
FDEPTH: 467 463 Gear cond.: 0
BDEPTH: 467 463 Validity : 0
Towing dir: 0° Wire out : 1000 m Speed : 3.2 kn
Sorted : 40 Total catch: 88.06 Catch/hour: 177.47

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Cubiceps whiteleggii	34.95	578	19.70	
Haliporoides triarthrus	31.32	2114	17.65	12
Trichiurus lepturus	25.70	24	14.48	13
Neoepinnula orientalis	19.61	341	11.05	
Loligo sp.	16.08	159	9.06	
Chlorophthalmus agassizi	9.38	238	5.28	
Synagrops japonicus	5.85	139	3.29	
Malacocephalus laevis	4.99	115	2.81	
Diaphus knappi	4.75	159	2.68	
MYCTOPHIDAE	2.80	1199	1.58	
Merluccius paradoxus	2.44	6	1.37	
Malacocephalus sp.	2.19	54	1.24	
Palinurus delagoae	2.07	12	1.17	11
Octopus sp.	1.77	6	0.99	
Metanephrops mozambicus	1.46	12	0.82	10
Heptranchias perlo	1.37	2	0.77	
Plesionika martia	1.34	524	0.76	
Chascanopsetta lugubris	1.34	24	0.76	
Chlorophthalmus agassizi	1.22	615	0.69	0
Ophisurus serpens	0.83	6	0.47	
Cynoglossus cf lida	0.79	30	0.44	
Sepia sp.	0.73	30	0.41	
Austrorossia enigmatica	0.61	18	0.34	
Bythaelurus sp.	0.55	6	0.31	
Hoplostethus mediterraneus	0.46	36	0.26	
Chaunax sp.	0.43	30	0.24	
Xenolepidichthys dagleishi	0.38	18	0.22	
Peristedion weberi	0.33	54	0.19	
Polymetme corythaeola	0.28	12	0.16	
Astronesthes martensii	0.28	18	0.16	
Ophiuroidea	0.18	6	0.10	
SICYONIIDAE	0.18	24	0.10	
Nansenia macrolepis	0.17	12	0.09	
Champsodon capensis	0.13	18	0.07	
Chaunax cf. pictus	0.12	12	0.07	
Argyropelecus sp.	0.10	79	0.06	
Pasiphaea sp.	0.06	6	0.03	

Munida sp.	0.06	6	0.03
Paratriacanthodes retrospinis	0.05	6	0.03
SCORPAENIDAE	0.04	6	0.02
Nettastoma parviceps	0.02	6	0.01
PECTINIDAE	0.02	6	0.01
Parabembras robinsoni, juvenile	0.01	6	0.01
Funchalia sp	0.01	6	0.01
Fistularia petimba	0.01	6	0.00
Total	177.47		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 15
DATE :16/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°56.99
start stop duration Lon E 33°5.03
TIME :10:57:55 11:23:46 25.9 (min) Purpose : 3
LOG : 4700.72 4701.94 1.2 Region : 7431
FDEPTH: 141 140 Gear cond.: 0
BDEPTH: 141 140 Validity : 0
Towing dir: 0° Wire out : 325 m Speed : 2.8 kn
Sorted : 18 Total catch: 18.28 Catch/hour: 42.44

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Ommastrephes bartrami	25.53	1476	60.16	14
Satyrichthys adeni	2.92	0	6.89	
Thamnaconus fajardoi	1.76	0	4.16	
Polysteganus coeruleopunctatus	1.76	12	4.16	15
Triodon macropterus	1.44	0	3.39	
Decapterus tabl	1.30	0	3.06	17
Trachinocephalus sp.	1.21	0	2.84	
Decapterus kurroides	1.16	0	2.73	16
Dactyloptena orientalis	1.02	0	2.41	
Sepia sp	0.97	16	2.30	
Gymnothorax sp.	0.74	0	1.75	
Rostroraja alba	0.70	0	1.64	
Lepidotrigla alcocki	0.46	0	1.09	
Scorpaena scrofa	0.46	0	1.09	
Zeus faber	0.32	0	0.77	
Fistularia petimba	0.28	0	0.66	
DROMIIDAE	0.14	0	0.32	
Etelis carbunculus	0.09	0	0.22	
Halieutaea sp. A	0.05	0	0.11	
Antigonia cf rubescens	0.05	0	0.11	
Peristedion weberi	0.03	0	0.07	
Munida sp.	0.02	0	0.05	
Malthopsis tiarella	0.01	0	0.02	
Total	42.44		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 16
DATE :16/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°56.66
start stop duration Lon E 33°3.45
TIME :13:47:08 14:19:45 32.6 (min) Purpose : 3
LOG : 4713.45 4715.04 1.6 Region : 7431
FDEPTH: 60 63 Gear cond.: 0
BDEPTH: 60 63 Validity : 0
Towing dir: 0° Wire out : 190 m Speed : 2.9 kn
Sorted : 27 Total catch: 500.00 Catch/hour: 919.96

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
SEAWEED	778.44	0	84.62	
Teixeirichthys jordani	20.75	970	2.26	
Plotosus lineatus	20.08	4786	2.18	
Sepia hieronis	18.74	134	2.04	
Fistularia petimba	14.72	469	1.60	
Pristipomoides filamentosus	14.06	167	1.53	
Scomberomorus commerson	11.85	2	1.29	18
Pagellus natalenses	6.69	134	0.73	
Arothron stellatus	4.86	2	0.53	
Octopus selene	4.69	66	0.51	
Upeneus bensasi	4.02	101	0.44	
Argyrops filamentosus	3.35	66	0.36	
Tetrosomus concatenatus	2.72	6	0.30	
Dactyloptena peterseni	2.47	6	0.27	
Trachinocephalus myops	2.01	33	0.22	
Ommastrephes bartrami	2.01	134	0.22	
Rhinobatos sp.	1.91	6	0.21	
Torquigener hypselogenion	1.34	66	0.15	
Decapterus russelli	1.34	33	0.15	
Pterois miles	0.77	2	0.08	
Canthigaster rivulata	0.67	66	0.07	
Paramonacanthus pusillus	0.67	66	0.07	
Actinoptilum molle	0.67	134	0.07	
Chaetodon dolosus	0.67	33	0.07	
Diodon holocanthus	0.44	2	0.05	
Halieutaea sp.	0.03	33	0.00	
Total	919.97		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 17
DATE :16/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°53.80
start stop duration Lon E 33°0.30
TIME :15:54:57 16:25:12 30.3 (min) Purpose : 3
LOG : 4724.23 4725.75 1.5 Region : 7431
FDEPTH: 39 33 Gear cond.: 0
BDEPTH: 39 33 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.0 kn
Sorted : 34 Total catch: 900.00 Catch/hour: 1785.12

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Decapterus russelli	1512.02	90768	84.70	19
Pagellus natalenses	90.72	5111	5.08	
Upeneus bensasi	54.23	3703	3.04	
SEAWEED	44.85	0	2.51	
Nemipterus bipunctatus	20.85	105	1.17	
Sillago sihama	20.85	678	1.17	
Scomber japonicus	14.60	208	0.82	
Loligo sp.	12.52	208	0.70	
Decapterus macrosoma	7.30	730	0.41	
Torquigener hypselogenion	3.13	313	0.18	
Equulites elongatus	3.13	365	0.18	
Carangoides armatus	0.93	105	0.05	
Total	1785.12		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 18
DATE :17/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°39.19
start stop duration Lon E 33°22.25
TIME :02:08:06 02:35:02 26.9 (min) Purpose : 3
LOG : 4787.84 4789.15 1.3 Region : 7431
FDEPTH: 486 490 Gear cond.: 0
BDEPTH: 486 490 Validity : 0
Towing dir: 0° Wire out : 1160 m Speed : 2.9 kn
Sorted : 34 Total catch: 33.98 Catch/hour: 75.67

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Chaunax 'pink'	17.24	0	22.78	
Haliporoides triarthrus	9.67	468	12.77	21
Metanephrops mozambicus	8.51	0	11.24	20
Polymetme corythaeola	4.50	0	5.95	
Austrorossia enigmatica	3.47	0	4.59	
Malacocephalus sp.	3.39	0	4.47	
Nansenia macrolepis	3.34	0	4.41	
Spatangus capensis	2.85	307	3.77	
Neobythites analis	2.14	0	2.83	
Gonorhynchus gonorhynchus	2.09	0	2.77	
Polyipnus indicus	2.05	0	2.71	
ISOPODS	2.00	136	2.65	
Cubiceps sp.	1.96	0	2.59	
Lepidopus sp.	1.56	42	2.06	
Hoplostethus mediterraneus	1.51	0	2.00	
Polymetme corythaeola	1.51	36	2.00	0
Chlorophthalmus agassizi	1.07	0	1.41	
Ommastrephes bartrami	0.85	0	1.12	
Bathyclupea sp.	0.76	0	1.00	
Plesionika martia	0.53	0	0.71	
LAMINARIA SP.	0.53	0	0.71	
Cynoglossus marleyi	0.49	0	0.65	
Neobythites cf somaliaensis	0.40	0	0.53	
MYCTOPHIDAE	0.36	0	0.47	
SEAWEED	0.31	0	0.41	
Nettastoma parviceps	0.22	0	0.29	
Sepia australis	0.22	11	0.29	
OCTOPODIDAE	0.22	4	0.29	
Paramonacanthus pusillus	0.20	0	0.26	
Coronaster sp	0.18	0	0.24	
Caelorinchus braueri	0.18	0	0.24	
Munida sp.	0.18	0	0.24	
Uroconger lepturus	0.16	0	0.21	
Chascanopsetta lugubris	0.13	0	0.18	
SEAWEED	0.13	0	0.18	0
Neoscombrops cynodon	0.09	2	0.12	
Plesionika sp.	0.09	0	0.12	
Lyreidus brevifrons	0.09	11	0.12	
Bregmaceros sp.	0.09	100	0.12	
Stereomastis sculpta	0.04	2	0.06	
HALOSAURIDAE	0.04	2	0.06	
Lophodiodon calori	0.04	4	0.06	
Champsodon capensis	0.04	0	0.06	
Astronesthes martensii	0.04	0	0.06	
Scorpaena scrofa	0.04	0	0.06	
J E L L Y F I S H	0.04	2	0.06	
PECTINIDAE	0.04	0	0.05	
G A S T R O P O D S	0.03	2	0.04	
UNIDENTIFIED FISH	0.01	2	0.01	
Maurolicus muelleri	0.00	4	0.01	
Plastic	0.00	2	0.00	
Total	75.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 19
DATE :17/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°44.03
start stop duration Lon E 33°35.52
TIME :05:42:47 06:12:20 29.5 (min) Purpose : 3
LOG : 4806.14 4807.68 1.5 Region : 7431
FDEPTH: 464 461 Gear cond.: 0
BDEPTH: 464 461 Validity : 0
Towing dir: 0° Wire out : 1050 m Speed : 3.1 kn
Sorted : 31 Total catch: 141.43 Catch/hour: 287.26

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Ommastrephes bartrami	60.49	6	21.06	
Plesiobatis daviesi	48.99	8	17.05	
Haliporoides triarthrus	30.32	217	10.56	22
Chaunax pictus	22.20	506	7.73	
MYCTOPHIDAE	21.98	8557	7.65	
Synagrops japonicus	14.79	362	5.15	
Chaeceon macphersoni	12.78	43	4.45	23
Malacocephalus sp.	12.33	49	4.29	
Neoepinnula orientalis	11.76	217	4.09	
Torpedo nobiliana	7.88	2	2.74	
Trichiurus lepturus	5.28	4	1.84	
Lestrolepis intermedia	4.79	319	1.67	
Nansenia macrolepis	4.65	268	1.62	
Plesionika sp.	3.78	1050	1.32	
Chlorophthalmus agassizi	3.64	144	1.27	
Gonorhynchus gonorhynchus	3.47	20	1.21	
Malacocephalus laevis	3.05	35	1.06	
Neoscombrops cynodon	2.62	20	0.91	
Munida sp.	2.17	43	0.76	
Hoplostethus mediterraneus	2.17	100	0.76	
Astronesthes martensii	1.60	85	0.56	
Diaphus knappi	1.30	43	0.45	
Coelorinchus sp.	1.16	20	0.40	
Small squids unident.	0.87	6	0.30	
CALLIONYMIDAE	0.59	35	0.21	
Champsodon capensis	0.59	71	0.21	
Bregmaceros sp.	0.43	209	0.15	
Sepia australis	0.43	28	0.15	
Polymetme corythaeola	0.28	2	0.10	
Cynoglossus marleyi	0.28	6	0.10	
Xenolepidichthys dagleishi	0.28	6	0.10	
Satyrichthys adeni	0.14	14	0.05	
Metanephrops mozambicus	0.12	6	0.04	
PORIFERA (Sponges)	0.04	35	0.01	
Total	287.26		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 20
DATE :17/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°49.21
start stop duration Lon E 33°56.80
TIME :09:37:57 10:09:12 31.3 (min) Purpose : 3
LOG : 4827.51 4828.94 1.4 Region : 7431
FDEPTH: 432 431 Gear cond.: 0
BDEPTH: 432 431 Validity : 0
Towing dir: 0° Wire out : 980 m Speed : 2.7 kn
Sorted : 36 Total catch: 220.00 Catch/hour: 422.40

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Myctophid sp. B	216.31	490	51.21	
Chaunax 'pink'	38.86	136	9.20	
Cubiceps sp.	31.55	10	7.47	
Champsodon capensis	28.59	182	6.77	
Neoepinnula orientalis	18.07	628	4.28	
Metanephrops thomsoni	17.38	33	4.11	
Myctophid sp. A	12.35	92	2.92	
Plesionika martia	8.01	3564	1.90	
Octopus macropus	7.55	10	1.79	
Chlorophthalmus agassizi	7.32	238	1.73	
Chaeceon macphersoni	5.45	10	1.29	24
Balanophyllia (hard coral)	4.57	113	1.08	
Haliporoides triarthrus	4.11	2661	0.97	27
Munida sp.	3.67	981	0.87	
Psenes sp.	3.65	90	0.86	
Metanephrops mozambicus	3.00	44	0.71	25
Lestrolepis intermedia	2.98	10	0.70	
CALLIONYMIDAE	2.28	33	0.54	
Sepia australis	1.59	10	0.38	
Gonorhynchus gonorhynchus	1.36	10	0.32	
Cubiceps sp.	0.92	102	0.22	0
Austrorossia sp.	0.73	10	0.17	
Oplophoris sp.	0.46	44	0.11	
Ommastrephes bartrami	0.46	148	0.11	
Palinurus delagoae	0.42	69164	0.10	26
PLEURONECTIFORMES	0.23	296	0.05	
Stolephorus indicus	0.23	33	0.05	
Austrorossia enigmatica	0.23	21	0.05	
Oplophoris sp.	0.10	44	0.02	0
Total	422.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 21
DATE :17/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°55.95
start stop duration Lon E 34°20.28
TIME :14:43:39 15:14:49 31.2 (min) Purpose : 3
LOG : 4853.97 4855.31 1.3 Region : 7431
FDEPTH: 505 510 Gear cond.: 0
BDEPTH: 505 510 Validity : 0
Towing dir: 0° Wire out : 1100 m Speed : 2.6 kn
Sorted : 60 Total catch: 100.00 Catch/hour: 192.55

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius paradoxus	51.68	123	26.84	28
Chlorophthalmus agassizi	18.75	239	9.74	
Octopus vulgaris	16.73	42	8.69	
Plesiobatis daviesi	16.17	2	8.40	
MYCTOPHIDAE	14.77	3231	7.67	
Haliporoides triarthrus	11.90	472	6.18	29
Setarches guentheri	9.47	110	4.92	
Polymetme corythaeola	8.68	395	4.51	
Gonorhynchus gonorhynchus	6.85	46	3.56	
Synagrops japonicus	6.49	144	3.37	
Neoepinnula orientalis	6.12	108	3.18	
Aristeus antennatus	3.22	198	1.67	
Loligo sp.	2.98	37	1.55	
Cubiceps whiteleggii	2.93	73	1.52	
Malacocephalus laevis	2.25	19	1.17	
Lophius piscatorius	1.96	4	1.02	
Nansenia macrolepis	1.60	64	0.83	
Plesionika martia	1.42	520	0.74	
Symplectoteuthys oualaniensis	1.31	13	0.68	
Sicyonia sp.	1.19	370	0.62	
Chaeceon macphersoni	0.94	4	0.49	
Austrorossia enigmatica	0.87	15	0.45	
Diaphus knappi	0.71	37	0.37	
Ophichthus marginatus	0.54	4	0.28	
Chaunax cf. pictus	0.48	10	0.25	
Champsodon capensis	0.48	67	0.25	
Neobythites analis	0.42	8	0.22	
Ommastrephes bartrami	0.39	4	0.20	
Xenolepidichthys dagleishi	0.37	8	0.19	
Munida sp.	0.23	40	0.12	
Parapagurus cf pilosimanus	0.12	4	0.06	
Stereomastis sculpta	0.10	4	0.05	
Satyrichthys adeni	0.10	4	0.05	
Chaunax sp.	0.08	15	0.04	
HALOSAURIDAE	0.06	4	0.03	
ISOPODS	0.06	8	0.03	
Nettastoma parviceps	0.06	4	0.03	
Cynoglossus sp.	0.04	4	0.02	
Oplophoris sp.	0.04	10	0.02	
Vinciguerria cf. nimbaria	0.00	96	0.00	
Total	192.57		100.01	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 22
DATE :17/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°41.88
start stop duration Lon E 34°22.53
TIME :23:10:41 23:41:04 30.4 (min) Purpose : 3
LOG : 4904.87 4906.40 1.5 Region : 7431
FDEPTH: 380 381 Gear cond.: 0
BDEPTH: 380 381 Validity : 0
Towing dir: 0° Wire out : 880 m Speed : 3.0 kn
Sorted : 27 Total catch: 26.98 Catch/hour: 53.29

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
J E L L Y F I S H	5.49	0	10.30	
Histioteuthis meleagroteuthis	5.45	95	10.23	
Chlorophthalmus agassizi	4.42	132	8.30	
MYCTOPHIDAE	4.19	804	7.86	0
Eridacnis radcliffei	3.95	38	7.41	
MYCTOPHIDAE	3.36	211	6.30	
Plesionika martia	3.00	1286	5.63	
Cubiceps sp.	2.76	83	5.19	
Chaunax sp.	2.73	69	5.11	
Dorhynchus thomsoni	1.94	6	3.63	
Champsodon capensis	1.70	172	3.19	
Metanephrops mozambicus	1.62	14	3.04	30
Ommastrephes bartrami	1.58	18	2.96	33
Synagrops japonicus	1.07	10	2.00	
Bathypolypus valdiviae	1.07	8	2.00	
Opistobranch	0.71	8	1.33	
Polyipnus indicus	0.67	239	1.26	
Aristeus antennatus	0.67	39	1.26	32
Cubiceps sp.	0.55	24	1.04	0
Chelidonichthys kumu	0.55	4	1.04	
Trichiurus lepturus	0.55	30	1.04	34
Stolephorus indicus	0.51	26	0.96	
ISOPODS	0.47	39	0.89	
PLEURONECTIFORMES	0.47	6	0.89	
Rostroraja alba	0.43	6	0.82	
Gonorhynchus gonorhynchus	0.36	2	0.67	
Philine aperta	0.36	61	0.67	
Palinurus delagoae	0.36	2	0.67	31
Heterocarpus sp.	0.32	115	0.59	
Cynoglossus sp.	0.28	14	0.52	
Stereomastis sp.	0.28	4	0.52	
Octopus sp.	0.28	6	0.52	
Austrorossia enigmatica	0.22	4	0.41	
Uroconger lepturus	0.16	2	0.30	
Sicyonia lancifer	0.12	39	0.22	
Sepia sp.	0.12	2	0.22	
Malacocephalus laevis	0.08	8	0.15	
Munida sp.	0.08	10	0.15	
Nettastoma parviceps	0.08	6	0.15	
PECTINIDAE	0.08	28	0.15	
TONNIDAE	0.08	12	0.15	
Peristedion weberi	0.04	2	0.07	
Lestrolepis intermedia	0.02	2	0.04	
Bregmaceros sp.	0.02	4	0.04	
LAMINARIA SP.	0.02	0	0.04	
Starfish	0.02	2	0.04	
Nansenia macrolepis	0.01	2	0.03	
PORIFERA (Sponges)	0.00	2	0.01	
Hoplostethus sp., juvenile	0.00	4	0.01	
Haliporoides triarthrus	0.00	2	0.00	
Total	53.29		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 23
DATE :18/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°27.55
start stop duration Lon E 33°38.85
TIME :07:17:48 07:50:02 32.2 (min) Purpose : 3
LOG : 4955.45 4957.14 1.7 Region : 7431
FDEPTH: 433 421 Gear cond.: 0
BDEPTH: 433 421 Validity : 0
Towing dir: 0° Wire out : 970 m Speed : 3.1 kn
Sorted : 29 Total catch: 135.19 Catch/hour: 251.67

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	79.77	5257	31.70	
Diaphus knappi	51.83	2869	20.59	
Cubiceps whiteleggii	18.65	475	7.41	
Chaeceon macphersoni	16.53	47	6.57	35
Octopus vulgaris	16.20	4	6.44	
Champsodon capensis	15.25	1674	6.06	
Loligo sp.	7.26	86	2.88	
Torpedo sp.	6.26	6	2.49	
Plesionika martia	6.03	599	2.40	
Synagrops japonicus	5.92	45	2.35	
Ommastrephes bartrami	3.70	15	1.47	
Loligo duvauceli	3.56	60	1.41	
Neoepinnula orientalis	3.48	60	1.38	
Metanephrops mozambicus	3.20	52	1.27	36
Lestrolepis intermedia	2.81	177	1.12	
Nansenia macrolepis	1.92	141	0.76	
Neoscombrops cynodon	1.62	30	0.64	
Polymetme corythaeola	1.27	52	0.50	
Octopus sp.	1.19	15	0.47	
Squalus megalops	0.74	2	0.30	
Cynoglosus cf marlei	0.60	15	0.24	
Ophichthus marginatus	0.60	7	0.24	
Polyipnus spinosus	0.47	184	0.18	
Chlorophthalmus agassizi	0.47	22	0.18	
Austrorossia enigmatica	0.45	22	0.18	
Ophisurus serpens	0.34	2	0.13	
Chaunax cf. pictus	0.22	22	0.09	
Malacocephalus sp.	0.22	67	0.09	
Bregmaceros sp.	0.22	15	0.09	
Chascanopsetta lugubris	0.22	15	0.09	
Sepia sp.	0.22	15	0.09	
Xenolepidichthys dagleishi	0.15	15	0.06	
CALLIONYMIDAE	0.15	15	0.06	
Cynoglossus lida	0.09	7	0.04	
Haliporoides triarthrus	0.07	7	0.03	
Total	251.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 24
DATE :18/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°27.55
start stop duration Lon E 33°38.85
TIME :07:17:48 07:50:02 32.2 (min) Purpose : 3
LOG : 4955.45 4957.14 1.7 Region : 7431
FDEPTH: 433 421 Gear cond.: 0
BDEPTH: 433 421 Validity : 0
Towing dir: 0° Wire out : 970 m Speed : 3.1 kn
Sorted : 53 Total catch: 53.00 Catch/hour: 98.67

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Chaeceon macphersoni	16.23	0	16.45	0
Myctophid sp. B	14.45	0	14.64	
Myctophid sp. A	11.21	0	11.36	
Chaeceon macphersoni	8.15	20	8.26	
Chlorophthalmus agassizi	7.26	108	7.36	
Torpedo nobiliana	6.11	6	6.19	
Plesionika martia	4.62	246	4.68	
Rossia enigmatica	4.24	13	4.30	

Polyipnus spinosus	4.13	169	4.19	
Metanephrops mozambicus	3.39	52	3.43	0
Loligo duvauceli	3.16	50	3.21	
Metanephrops mozambicus	2.49	22	2.53	
Opistobranch	1.56	11	1.58	
Neoepinnula orientalis	1.27	39	1.28	
Callionymus sp.	1.19	106	1.21	
Neoscombrops sp.	0.93	63	0.94	
Malacocephalus sp.	0.93	26	0.94	
Cubiceps whiteleggii	0.82	26	0.83	
Ommastrephes bartrami	0.82	4	0.83	
Champsodon capensis	0.56	56	0.57	
Sepia sp.	0.47	32	0.47	
Merhippolyte agulhasensis	0.37	121	0.38	
ISOPODS	0.34	32	0.34	
Palinurus delagoae	0.32	2	0.32	
Synagrops japonicus	0.30	11	0.30	
Stegnobrisinga splendens	0.28	4	0.28	
Cruriraja parcomaculata, juvenile	0.26	4	0.26	
Chaunax pictus	0.26	9	0.26	
Cynoglossus lida	0.22	11	0.23	
Platymaia sp	0.22	2	0.23	
Argentina sphyraena	0.19	7	0.19	
Pisodonophis boro	0.19	4	0.19	
Polymixia berndti	0.19	2	0.19	
OCTOPODIDAE	0.19	2	0.19	
Nansenia macrolepis	0.15	13	0.15	
Ophichthus marginatus	0.15	2	0.15	
C R A B S	0.15	4	0.15	
UNIDENTIFIED FISH	0.11	7	0.11	
Malacocephalus laevis	0.11	11	0.11	
Bythalaelurus lutarius	0.09	2	0.09	
Cynoglossus marleyi	0.07	2	0.08	
PECTINIDAE	0.07	15	0.08	
Hoplostethus mediterraneus	0.07	2	0.08	
J E L L Y F I S H	0.07	7	0.08	
MYCTOPHIDAE	0.07	4	0.08	
Chascanopsetta lugubris	0.06	6	0.06	
Funchalia woodwardi	0.04	4	0.04	
Octopus vulgaris	0.04	2	0.04	
Satyrichthys adeni	0.04	4	0.04	
Philine aperta	0.02	7	0.02	
Coelorinchus sp.	0.02	2	0.02	
Starfish	0.02	2	0.02	
Total	98.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 25
DATE :18/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°23.72
start stop duration Lon E 33°18.98
TIME :10:17:51 10:39:28 22.5 (min) Purpose : 3
LOG : 4977.00 4978.03 1.0 Region : 7431
FDEPTH: 52 54 Gear cond.: 0
BDEPTH: 52 54 Validity : 0
Towing dir: 0° Wire out : 158 m Speed : 3.0 kn
Sorted : 77 Total catch: 77.23 Catch/hour: 205.95

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Equulites elongatus	60.21	17709	29.24	
Epinephelus malabaricus	45.17	3	21.93	41
Caranx papuensis	41.01	8	19.91	37
Gymnocranius grandoculis	16.27	3	7.90	
Lethrinus nebulosus	11.68	3	5.67	40
Abalistes stellatus	6.72	5	3.26	
Carangoides chrysophrys	6.45	3	3.13	38
Gymnocranius euanus	4.85	13	2.36	39
Upeneus bensasi	4.16	840	2.02	
Sepia hieronis	2.88	45	1.40	
Tetrosomus concatenatus	2.67	5	1.29	
Ommastrephes bartrami	1.65	85	0.80	
Opistotheutis rossi	0.80	11	0.39	
Nemipterus bipunctatus	0.32	85	0.16	
Torquigener hypselogenion	0.21	3	0.10	
Trachinocephalus myops	0.16	11	0.08	
Saurida sp.	0.16	3	0.08	
Bothus myriaster	0.12	11	0.06	
Decapterus russelli	0.11	19	0.05	
Decapterus macrosoma	0.11	13	0.05	
Bathypolypus valdiviae	0.05	3	0.03	
CALLIONYMIDAE	0.04	3	0.02	
Echinus spCV1	0.03	3	0.02	
Halieutaea sp. A	0.03	19	0.01	
PECTINIDAE	0.02	5	0.01	
Thamnaconus fajardoi	0.02	3	0.01	
Heniochus acuminatus	0.01	3	0.01	
E C H I N O D E R M A T A	0.01	3	0.01	
Alectis ciliaris	0.01	3	0.00	
PORTUNIDAE	0.00	3	0.00	
Total	205.95		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 26
DATE :18/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°11.29
start stop duration Lon E 33°46.77
TIME :22:40:30 23:11:08 30.6 (min) Purpose : 3
LOG : 5029.34 5030.73 1.4 Region : 7431
FDEPTH: 46 46 Gear cond.: 0
BDEPTH: 46 46 Validity : 0
Towing dir: 0° Wire out : 140 m Speed : 2.7 kn
Sorted : 45 Total catch: 90.14 Catch/hour: 176.57

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus russelli	28.29	0	16.02	42
Pterois miles	25.07	4	14.20	
Trachinocephalus myops	16.92	1826	9.59	
Apogon sp.	11.30	3957	6.40	
Leiognathus splendens	11.13	929	6.30	
Pagellus natalenses	11.05	274	6.26	
Penaeus japonicus	7.05	196	3.99	
Priacanthus hamrur	6.50	74	3.68	
Saurida undosquamis	5.88	149	3.33	
Pseudorhombus arsius	5.25	458	2.97	
Torpedo nobiliana	5.01	8	2.84	
Upeneus bensasi	4.39	157	2.49	
Trachypenaeus sp.	4.23	850	2.40	
Thryssa setirostris	3.76	200	2.13	
Carangoides malabaricus	3.29	24	1.86	
Apistus carinatus	3.06	270	1.73	
Sepia pharaonis	3.06	35	1.73	
PORIFERA (Sponges)	2.27	4	1.29	0
Thryssa vitrirostris	2.12	121	1.20	
Sepia hieronis	1.96	501	1.11	
Ariomma indicum	1.80	12	1.02	
Penaeus latisulcatus	1.80	161	1.02	
Tetrosomus concatenatus	1.76	8	1.00	
Sphyraena obtusata	1.65	24	0.93	
Equulites elongatus	1.02	392	0.58	
Chromis sp.	0.98	16	0.55	
Portunus sp.	0.94	509	0.53	
Paramonacanthus pusillus	0.71	149	0.40	
Ommastrephes bartrami	0.63	20	0.36	
Lophius upiscephalus	0.53	4	0.30	
Arothron immaculatus	0.47	4	0.27	
Cociella crocodila	0.39	20	0.22	
Torquigener hypselogenion	0.35	24	0.20	
Aesopia cornuta	0.31	8	0.18	
Trichiurus lepturus	0.31	4	0.18	
UNIDENTIFIED FISH, juvenile	0.24	243	0.13	
Lutjanus sp.	0.16	12	0.09	0
Lutjanus sp.	0.16	27	0.09	
Fistularia petimba	0.16	35	0.09	
Parupeneus macronemus	0.10	8	0.06	
OPHIDIIDAE	0.08	16	0.04	
Cynoglossus capensis	0.08	8	0.04	
Polydactylus sextarius	0.06	4	0.03	
Lagocephalus guentheri	0.06	20	0.03	
Uranoscopus archionema	0.06	4	0.03	
Apogon sp.	0.04	8	0.02	0
Calappa hepatica	0.04	12	0.02	
Samaris cristatus	0.04	4	0.02	
Squilla mantis	0.04	12	0.02	
Trichonotus marleyi	0.02	4	0.01	
Heniochus acuminatus	0.00	4	0.00	
Bregmaceros sp.	0.00	4	0.00	
ISOPODS	0.00	16	0.00	
CARANGIDAE, juvenile	0.00	4	0.00	
Total	176.57		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 27
DATE :19/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°13.52
start stop duration Lon E 33°47.55
TIME :00:55:43 01:18:58 23.3 (min) Purpose : 3
LOG : 5039.78 5040.96 1.2 Region : 7431
FDEPTH: 89 87 Gear cond.: 0
BDEPTH: 89 87 Validity : 0
Towing dir: 0° Wire out : 220 m Speed : 3.0 kn
Sorted : 68 Total catch: 122.54 Catch/hour: 316.11

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ariomma indicum	109.60	859	34.67	
Saurida undosquamis	96.50	3062	30.53	44
Monocentris japonica	24.87	134	7.87	
Nemipterus japonicus	12.24	199	3.87	
Psettodes erumei	8.87	5	2.81	
Penaeopsis balssi	7.23	1065	2.29	0
Benthoctopus berryi	6.12	173	1.94	
Decapterus russelli	5.59	111	1.77	
Plicofollis tenuispinis	4.85	3	1.53	
Champsodon capensis	4.63	1021	1.46	
Penaeopsis balssi	3.57	289	1.13	43
Lophiodes insidiator	3.13	28	0.99	
Priacanthus hamrur	2.89	44	0.91	
Pseudorhombus elevatus	2.70	743	0.85	
Scorpaena sp.	2.65	217	0.84	
Apogon sp.	2.60	555	0.82	0
Sepia australis	2.22	49	0.70	
Sepia sp.	2.02	34	0.64	
Heterodontus ramalheira	1.60	3	0.51	
Fistularia petimba	1.30	116	0.41	
Parapenaeus longirostris	1.30	139	0.41	
UNIDENTIFIED FISH	1.16	15	0.37	
PORIFERA (Sponges)	1.16	39	0.37	
Starfish	1.11	34	0.35	
Loligo sp.	1.11	23	0.35	
Carybdis sp.	0.72	23	0.23	
ANGUILLIDAE	0.58	15	0.18	0
Pterocaesio marri	0.43	10	0.14	
Torquigener hypselogenion	0.43	77	0.14	
Amanses cf. scopas	0.34	49	0.11	
Gymnothorax sp.	0.29	5	0.09	
Hoplostethus sp.	0.28	5	0.09	
Decapterus macrosoma	0.24	15	0.08	
Tylerius spinosissimus	0.24	18	0.08	
Canthigaster rivulata	0.19	34	0.06	
Callionymus sp.	0.19	18	0.06	
Nettastoma parviceps	0.19	18	0.06	
Pagellus natalenses	0.19	5	0.06	
ANGUILLIDAE	0.14	15	0.05	
Sepia sp.	0.10	5	0.03	0
Philine aperta	0.10	49	0.03	
PORTUNIDAE	0.06	23	0.02	
CARIDEA	0.05	49	0.02	
Branchiostegus doliatus	0.05	5	0.02	
LEUCOSIIDAE	0.05	15	0.02	
Apogon sp.	0.05	5	0.02	
UNIDENTIFIED FISH	0.05	5	0.02	0
Uranoscopus archionema	0.05	10	0.02	
Xiphasia setifer	0.03	5	0.01	
Portunus sp.	0.02	15	0.01	
C R A B S	0.01	5	0.00	0
Neobythites kenyaensis	0.01	5	0.00	
Total	316.11		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 28
DATE :19/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°14.91
start stop duration Lon E 33°49.48
TIME :03:12:44 03:39:24 26.7 (min) Purpose : 3
LOG : 5048.95 5050.23 1.3 Region : 7431
FDEPTH: 137 139 Gear cond.: 0

BDEPTH: 137 139 Validity : 2
Towing dir: 0° Wire out : 370 m Speed : 2.9 kn
Sorted : 42 Total catch: 251.00 Catch/hour: 564.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Carybdis sp.	159.24	4972	28.20	
Ariomma indicum	130.47	1015	23.10	
CARCHARHINIDAE	81.35	38	14.41	
Loligo sp.	54.64	4013	9.68	
Sepia sp	30.55	223	5.41	
Ibacus novemdentatus	25.65	457	4.54	
Champsodon capensis	17.39	445	3.08	
Saurida undosquamis	16.73	790	2.96	45
Squatina africana	10.03	2	1.78	
Parapenaeus longirostris	7.14	657	1.26	
Mustelus sp.	6.97	4	1.24	
Uranoscopus archionema	6.02	189	1.07	
Chelidonichthys kumu	4.91	144	0.87	
Citharoides macrolepis	3.01	54	0.53	
Hoplichthys cf. acanthopleurus	1.78	245	0.32	
Tylerius spinosissimus	1.34	121	0.24	
Lagocephalus guentheri	1.34	9	0.24	
Lagocephalus sp.	1.23	9	0.22	
Lagocephalus lunaris	1.23	9	0.22	
Citharichthys sp.	1.00	76	0.18	
Halieutaea fitzsimonsi	0.89	121	0.16	
Zeus faber	0.67	9	0.12	
Amanses scopas	0.34	9	0.06	
Pisodonophis boro	0.25	9	0.04	
Oratosquilla oratoria	0.11	9	0.02	
Acanthocarpus brevipinnis	0.11	9	0.02	
MONACANTHIDAE	0.11	31	0.02	
Medorippe sp	0.09	9	0.02	
Fussinus sp.	0.04	9	0.01	
Squilla mantis	0.03	9	0.00	
Hiplyra platycheir	0.02	20	0.00	
Total	564.68		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 29
DATE :19/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°16.81
start stop duration Lon E 33°54.82
TIME :05:07:08 05:14:51 7.7 (min) Purpose : 3
LOG : 5059.13 5059.48 0.4 Region : 7431
FDEPTH: 298 293 Gear cond.: 7
BDEPTH: 298 293 Validity : 5
Towing dir: 0° Wire out : 710 m Speed : 2.7 kn
Sorted : 0 Total catch: 0.00 Catch/hour: 0.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
N O C A T C H	0.00	0	0.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 30
DATE :19/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°44.46
start stop duration Lon E 34°44.61
TIME :13:34:42 14:06:05 31.4 (min) Purpose : 3
LOG : 5116.91 5118.68 1.8 Region : 7431
FDEPTH: 338 342 Gear cond.: 0
BDEPTH: 338 342 Validity : 0
Towing dir: 0° Wire out : 780 m Speed : 3.4 kn
Sorted : 155 Total catch: 154.50 Catch/hour: 295.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dalatias licha	202.19	23	68.47	46
Cubiceps whiteleggii	16.21	319	5.49	
Ommastrephes bartrami	13.69	185	4.63	
Ovalipes sp	13.61	122	4.61	
Neoepinnula orientalis	7.88	183	2.67	
Peristedion weberi	7.57	23	2.56	
Squalus mitsukurii	5.62	6	1.90	
Synagrops japonicus	4.05	75	1.37	
Champsodon capensis	3.52	335	1.19	
MYCTOPHIDAE	3.21	698	1.09	
Chlorophthalmus agassizi	2.06	48	0.70	
Citharichthys sp.	2.03	32	0.69	
Coronaster volsellatus	1.99	50	0.67	
Opistobranch	1.61	8	0.54	
Trichiurus lepturus	1.53	8	0.52	
Neoscombrops cynodon	0.99	13	0.34	
Synaphobranchus affinis	0.84	10	0.28	
Palinurus delagoae	0.80	4	0.27	
Ateleopus natalensis	0.80	2	0.27	
LITHODIDAE	0.73	2	0.25	
Cynoglossus capensis	0.65	25	0.22	
Peristedion weberi	0.50	32	0.17	0
Ophisurus serpens	0.48	4	0.16	
Torpedo nobiliana	0.46	2	0.16	
Squatina africana	0.42	2	0.14	
Mediaster capensis	0.34	2	0.12	
Lophiomus setigerus	0.31	2	0.10	
Xenolepidichthys dagleishi	0.31	27	0.10	
Lophiodes insidiator	0.27	2	0.09	
Coelorinchus parallelus	0.27	6	0.09	
Parazen pacificus	0.21	2	0.07	
Callionymus sp.	0.10	2	0.03	
Hoplichthys cf. acanthopleurus	0.06	4	0.02	
Malthopsis tiarella	0.02	2	0.01	
Philine aperta	0.02	8	0.01	
Total	295.32		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 31
DATE :19/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°29.11
start stop duration Lon E 34°48.92
TIME :18:51:30 19:23:22 31.9 (min) Purpose : 3
LOG : 5154.19 5155.64 1.5 Region : 7431
FDEPTH: 222 213 Gear cond.: 0
BDEPTH: 222 213 Validity : 0
Towing dir: 0° Wire out : 570 m Speed : 2.7 kn
Sorted : 58 Total catch: 164.51 Catch/hour: 309.81

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	48.96	11599	15.80	
Citharoides macrolepis	31.19	337	10.07	0
Citharoides macrolepis	31.11	337	10.04	
Saurida undosquamis	26.59	284	8.58	47
Squatina sp.	26.40	4	8.52	
Uranoscopus sp.	22.94	175	7.40	
Acropoma japonicum	12.22	701	3.95	0
Champsodon capensis	11.90	750	3.84	
Halieutaea sp. A	10.90	190	3.52	
Argentina sphyraena	10.09	896	3.26	
Macrorhamphosus scolopax	8.06	28	2.60	
Sepia australis	7.59	56	2.45	
Branchiostegus doliatus	6.97	38	2.25	
Scyllarides herklotsii	6.82	203	2.20	
Satyrichthys adeni	6.44	100	2.08	
Platycephalus sp.	5.07	166	1.64	
Chelidonichthys kumu	4.75	28	1.53	
Acropoma japonicum	4.16	341	1.34	
Loligo sp.	3.22	119	1.04	
Kentrocapros rosapinto	3.22	28	1.04	
Lophius sp.	2.84	24	0.92	
Spicara australis	2.28	15	0.74	
Chaunax sp.	1.71	15	0.55	
RANELLIDAE (=CYMATIIDAE)	1.22	6	0.40	
Platymaia turbynei	1.13	19	0.36	
Ibacus novemdentatus	1.04	9	0.33	
ISOPODS	1.04	66	0.33	
Cynoglossus cf marleyi	1.04	24	0.33	
Cynoglossus marleyi	1.04	9	0.33	
Ovalipes iridescens	1.04	6	0.33	
Antigonia cf rubescens	1.04	38	0.33	
UNIDENTIFIED FISH	0.94	15	0.30	
GERYONIDAE	0.75	38	0.24	
Parapenaeus longirostris	0.66	47	0.21	
SCORPAENIDAE	0.56	9	0.18	
Cynoglossus cf marleyi	0.56	15	0.18	0
Ommastrephes bartrami	0.53	28	0.17	
Sepia prashadi	0.47	9	0.15	
Plesionika heterocarpus	0.38	9	0.12	
SEAWEED	0.28	0	0.09	
Malthopsis tiarella	0.19	9	0.06	
Poecilopsetta zanzibarensis	0.19	6	0.06	
Carybdis sp.	0.17	15	0.05	
Parapandalus narval	0.06	6	0.02	
Solenocera africana	0.06	9	0.02	
Total	309.81		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 32
DATE :19/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°17.17
start stop duration Lon E 34°31.91
TIME :22:34:39 22:42:30 7.8 (min) Purpose : 3
LOG : 5179.67 5180.06 0.4 Region : 7431
FDEPTH: 248 245 Gear cond.: 0
BDEPTH: 248 245 Validity : 3
Towing dir: 0° Wire out : 525 m Speed : 3.0 kn
Sorted : 12 Total catch: 12.41 Catch/hour: 94.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Uranoscopus archionema	12.55	77	13.21	
Myctophid sp. A	10.26	0	10.80	
Synagrops japonicus	8.27	658	8.70	
Trichiurus lepturus	7.81	46	8.22	50
Physiculus natalensis	6.43	122	6.77	
Branchiostegus doliatus	5.97	23	6.28	
Lepidotrigla alcocki	4.74	23	5.00	
Champsodon capensis	4.74	260	5.00	
Halieutaea sp.	3.67	8	3.87	
Penaeopsis balssi	3.37	390	3.55	48
Umbrina canariensis	2.91	8	3.06	
GERYONIDAE	2.45	138	2.58	
Neobythites cf somaliaensis	2.45	84	2.58	
Chaunax sp.	2.30	15	2.42	
Peristedion weberi	2.30	31	2.42	
Dorhynchus thomsoni	1.68	8	1.77	
Isopod	1.68	153	1.77	
Saurida undosquamis	1.68	15	1.77	49
Citharoides macrolepis	1.38	15	1.45	
Hoplichthys cf. acanthopleurus	1.22	138	1.29	
Solenocera africana	1.22	99	1.29	
Loligo reynaudi	1.22	8	1.29	
Uroconger lepturus	1.07	8	1.13	
Ibacus novemdentatus	0.92	77	0.97	
Sepia sp.	0.77	8	0.81	
SEPIADARIIDAE	0.46	8	0.48	
Carybdis sp.	0.31	8	0.32	
Acropoma japonicum	0.31	23	0.32	
G A S T R O P O D S	0.23	54	0.24	
J E L L Y F I S H	0.16	8	0.17	
Synchiropus sp.	0.15	15	0.16	
Halieutaea sp. A	0.15	8	0.16	
Nettastoma parviceps	0.15	15	0.16	
Total	94.98		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 33
DATE :20/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°8.36
start stop duration Lon E 34°18.02
TIME :02:21:49 02:52:34 30.8 (min) Purpose : 3
LOG : 5205.21 5206.76 1.6 Region : 7431
FDEPTH: 172 172 Gear cond.: 0
BDEPTH: 172 172 Validity : 0
Towing dir: 0° Wire out : 450 m Speed : 3.0 kn
Sorted : 27 Total catch: 260.00 Catch/hour: 507.15

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Acropoma japonicum	135.21	13124	26.66	
Saurida undosquamis	70.37	550	13.88	52
Parapandalus brevipes	57.95	26302	11.43	
Champsodon capensis	30.01	3431	5.92	
Ibacus ciliatus	27.94	328	5.51	
Parapenaeus longirostris	25.87	2397	5.10	
Trichiurus lepturus	16.85	18	3.32	
Lophiodes mutilus	15.70	16	3.10	

Squatina africana	14.28	4	2.82	
Citharoides macrolepis	10.86	154	2.14	51
Myctophid sp. B	9.30	0	1.83	0
Carybdis sp.	8.97	240	1.77	0
Tylerius spinosissimus	8.62	222	1.70	
Uranoscopus sp.	7.24	119	1.43	
Ateleopus natalensis	6.73	809	1.33	
Bathyuroconger vicinus	5.34	51	1.05	
Cruriraja parcomaculata	5.07	2	1.00	
Trichiurus lepturus	4.99	68	0.98	0
Otolithes ruber	4.48	33	0.88	
Loligo sp.	4.31	154	0.85	
Cynoglossus cf marleyi	4.14	172	0.82	
Peristedion weberi	3.45	68	0.68	
Lepidotrigla alcocki	2.93	51	0.58	
Callionymus sp.	2.76	207	0.54	
TRIAKIDAE	2.73	2	0.54	
Scombrops sp.	2.07	16	0.41	
Myctophid sp. A	1.89	1724	0.37	0
Malthopsis tiarella	1.89	189	0.37	
ISOPODS	1.72	137	0.34	
Sepia australis	1.56	31	0.31	
Nettastoma parviceps	1.56	51	0.31	
Chaunax pictus	1.03	33	0.20	
Lagocephalus sp.	1.03	33	0.20	
MYCTOPHIDAE	0.92	86	0.18	
Antigonia cf rubescens	0.86	86	0.17	
Citharichthys sp.	0.86	119	0.17	
Paramonacanthus pusillus	0.68	33	0.13	
Macrorhamphosus scolopax	0.68	328	0.13	
Chascanopsetta lugubris	0.68	33	0.13	
Centroscymnus sp.	0.68	189	0.13	
Sepia sp	0.53	33	0.10	
Rhinobatos sp.	0.43	2	0.08	
OPHIDIIDAE	0.35	16	0.07	
Carybdis sp.	0.35	1861	0.07	
Homola barbata	0.18	51	0.03	
Munida sp.	0.18	103	0.03	
HOMOLIDAE	0.18	16	0.03	
Balanophyllia (hard coral)	0.18	51	0.03	
Shrimps unidentified	0.18	51	0.03	
Halieutaea sp.	0.18	33	0.03	
Neoepinnula orientalis	0.18	16	0.03	
Lithodidae	0.00	0	0.00	
Total	507.15		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 34
DATE :20/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°5.16
start stop duration Lon E 34°12.65
TIME :04:31:52 04:56:01 24.2 (min) Purpose : 3
LOG : 5215.06 5216.21 1.1 Region : 7431
FDEPTH: 93 90 Gear cond.: 0
BDEPTH: 93 90 Validity : 3
Towing dir: 0° Wire out : 255 m Speed : 2.9 kn
Sorted : 17 Total catch: 500.00 Catch/hour: 1241.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ariomma indicum	508.34	6387	40.94	
Starfish	193.11	15974	15.55	
Saurida undosquamis	123.53	1987	9.95	288
Brissidae	109.35	6246	8.81	
Psettodes erumei	66.73	70	5.37	
Sepia sp	49.69	425	4.00	
Equulites elongatus	35.49	4259	2.86	
Nemipterus metopias	19.87	353	1.60	
Hoplichthys sp.	15.62	2767	1.26	
OPHIDIIDAE	14.21	142	1.14	
Parapenaeus longirostris	12.79	3549	1.03	
Loligo sp.	12.79	638	1.03	
Trichiurus lepturus, juvenile	11.35	211	0.91	
Tylerius spinosissimus	11.35	638	0.91	
OCTOPODIDAE	9.93	211	0.80	
LEUCOSIIDAE	9.24	70	0.74	
Bothus swio	4.27	70	0.34	
Carybdis sp.	4.27	1490	0.34	0
Carybdis sp.	4.27	1490	0.34	
Philyra sp.	4.27	3904	0.34	
Oxyurichthys petersii	2.83	211	0.23	
Penaeus latisulcatus	2.83	70	0.23	
Champsodon capensis	2.83	425	0.23	
Torquigener hypselogenion	2.83	211	0.23	
Apogon sp.	2.83	425	0.23	
Lophiodes mutilus	2.83	142	0.23	
Saurida tumbil	1.42	70	0.11	
Scorpaena sp.	1.42	211	0.11	
Bothus sp.	0.57	70	0.05	
Upeneus moluccensis	0.50	70	0.04	
Bregmaceros sp.	0.27	70	0.02	
SICYONIIDAE	0.07	70	0.01	
Total	1241.70		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 35
DATE :20/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°3.70
start stop duration Lon E 34°9.09
TIME :06:28:40 07:01:09 32.5 (min) Purpose : 3
LOG : 5223.43 5225.06 1.6 Region : 7431
FDEPTH: 41 42 Gear cond.: 0
BDEPTH: 41 42 Validity : 0
Towing dir: 0° Wire out : 160 m Speed : 3.0 kn
Sorted : 91 Total catch: 90.93 Catch/hour: 167.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Carangoides malabaricus	40.89	4	24.35	53
Engraulis capensis	30.66	829	18.26	55
Scomberomorus commerson	28.55	4	17.00	57
Pomadasys maculatus	16.95	137	10.10	56
J E L L Y F I S H	16.03	18	9.55	
Saurida undosquamis	10.01	103	5.96	58
Gazza minuta	7.42	116	4.42	
Loligo reynaudi	3.95	57	2.35	
Nemipterus bipunctatus	3.62	37	2.16	
Argyrops spinifer	2.88	28	1.72	
E C H I N O D E R M A T A	1.70	129	1.01	
Sepia pharaonis	1.26	9	0.75	
Trichiurus lepturus	1.11	30	0.66	
Dussumieria acuta	0.74	13	0.44	
Decapterus russelli	0.63	15	0.37	54
Pseudorhombus elevatus	0.33	15	0.20	
Sepia sp.	0.30	7	0.18	
Secutor insidiator	0.18	11	0.11	
Sphyraena jello	0.15	2	0.09	
Trachinocephalus myops	0.09	4	0.05	
Bothus pantherinus	0.09	4	0.05	
Upeneus bensasi	0.07	2	0.04	
Amblygaster sirm	0.07	2	0.04	
Apogon nitidus	0.07	2	0.04	
Metapenaeus monoceros	0.04	2	0.02	
Nemipterus zysron	0.04	4	0.02	
Upeneus moluccensis	0.04	2	0.02	
G A S T R O P O D S	0.02	4	0.01	
Fistularia petimba	0.02	2	0.01	
Philyra sp.	0.02	7	0.01	
Total	167.92		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 36
DATE :20/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°57.74
start stop duration Lon E 34°30.23
TIME :10:19:26 10:53:03 33.6 (min) Purpose : 3
LOG : 5244.80 5246.50 1.7 Region : 7431
FDEPTH: 37 35 Gear cond.: 0
BDEPTH: 37 35 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.0 kn
Sorted : 32 Total catch: 31.68 Catch/hour: 56.55

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	25.60	37	45.27	
Saurida undosquamis	8.93	61	15.78	61
Sepia hieronis	6.14	66	10.86	
Loligo reynaudi	6.07	93	10.73	
Gazza minuta	2.93	45	5.18	
Carangoides malabaricus	2.04	14	3.60	59
Rhinobatos holcorhynchus	1.57	2	2.78	
Trachinocephalus myops	0.75	25	1.33	
PORIFERA (Sponges)	0.71	2	1.26	
Terapon puta	0.54	4	0.95	
Torpedo nobiliana	0.18	2	0.32	
Rastrelliger kanagurta	0.18	2	0.32	60
Octopus aegina	0.18	4	0.32	
Starfish	0.14	12	0.25	
Trichiurus lepturus	0.11	5	0.19	
Alepes kleinii	0.11	9	0.19	
Portunus sp.	0.11	5	0.19	
Nettastoma parviceps	0.07	2	0.13	
Torquigener hypselogenion	0.07	7	0.13	
Alectis ciliaris	0.07	0	0.13	
Apistus carinatus	0.04	2	0.06	
Carangoides armatus	0.04	4	0.06	
Total	56.55		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 37
DATE :20/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°3.64
start stop duration Lon E 34°34.03
TIME :13:35:12 14:05:07 29.9 (min) Purpose : 3
LOG : 5261.20 5262.85 1.7 Region : 7431
FDEPTH: 79 78 Gear cond.: 0
BDEPTH: 79 78 Validity : 0
Towing dir: 0° Wire out : 220 m Speed : 3.3 kn
Sorted : 111 Total catch: 110.88 Catch/hour: 222.43

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Carangoides malabaricus	78.19	0	35.16	62
Upeneus sulphureus	44.17	0	19.86	
Parageleus leucolomatus	36.23	70	16.29	
Sphyrna lewini	14.88	2	6.69	
J E L L Y F I S H	8.99	136	4.04	
Saurida undosquamis	6.26	96	2.81	64
Epinephelus andersoni	5.98	4	2.69	
Carangoides chrysophrys	5.94	0	2.67	
Starfish	5.82	518	2.62	
Loligo forbesi	3.89	215	1.75	
Psettodes bennettii	3.61	4	1.62	
Trichiurus lepturus	1.64	60	0.74	
Decapterus russelli	1.60	2	0.72	
Nemipterus bipunctatus	1.12	24	0.51	63
Bothus swio	1.08	26	0.49	
Champsodon capensis	0.56	152	0.25	
Sepia hieronis	0.44	4	0.20	
Sphyraena obtusata	0.44	4	0.20	
Selar crumenophthalmus	0.40	2	0.18	
Torquigener hypselogenion	0.24	22	0.11	
Canthigaster rivulata	0.24	26	0.11	
Octopus aegina	0.24	2	0.11	
Lagocephalus laevigatus	0.20	2	0.09	
Tylerius spinosissimus	0.12	6	0.05	
Ostorhinchus fasciatus	0.12	30	0.05	
Total	222.43		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 38
DATE :20/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°12.81
start stop duration Lon E 34°49.77
TIME :17:10:29 17:40:39 30.2 (min) Purpose : 3
LOG : 5278.81 5280.39 1.6 Region : 7431
FDEPTH: 134 129 Gear cond.: 0
BDEPTH: 134 129 Validity : 2
Towing dir: 0° Wire out : 305 m Speed : 3.1 kn
Sorted : 36 Total catch: 36.49 Catch/hour: 72.57

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Monocentris japonica	15.75	109	21.70	
Branchiostegus doliatus	8.35	72	11.51	
Saurida undosquamis	6.60	32	9.10	66
Ibacus novemdentatus	4.22	80	5.81	
Polysteganus coeruleopunctatus	3.94	197	5.43	

Hoplichthys cf. acanthopleurus	3.74	615	5.15	
Beryx splendens	3.30	54	4.55	
Tylerius spinosissimus	2.74	58	3.78	
Chelidonichthys kumu	2.55	32	3.51	
Scorpaena scrofa	2.15	4	2.96	
E C H I N O D E R M A T A	1.99	245	2.74	
Trichiurus lepturus	1.91	2	2.63	
Branchiostegus sawakinensis	1.71	2	2.36	
Parapenaeus longirostris	1.47	195	2.03	
Priacanthus cf. hamrur	1.31	4	1.81	
Sepia pharaonis	1.23	10	1.70	
Uranoscopus archionema	0.99	18	1.37	
Carybdis sp.	0.91	396	1.26	
Halieutaea sp. A	0.76	12	1.04	
Epinephelus epistictus	0.76	4	1.04	
Solenocera africana	0.72	163	0.99	
Sepia australis	0.68	12	0.93	
Plesionika edwardsii	0.64	199	0.88	
Citharichthys sp.	0.56	58	0.77	
Bathyuroconger vicinus	0.42	6	0.58	
PORTUNIDAE	0.40	4	0.55	
STOMATOPODA	0.40	16	0.55	
Uroconger lepturus	0.40	10	0.55	
LEUCOSIIDAE	0.34	56	0.47	
Nemipterus japonicus	0.28	34	0.38	65
Synaphobranchus affinis	0.26	10	0.36	
Loligo sp.	0.24	24	0.33	
Umbrina canariensis	0.24	2	0.33	
Lophius sp.	0.12	4	0.16	
Champsodon capensis	0.08	14	0.11	
Soft corals	0.08	0	0.11	
Apogon queketti	0.08	34	0.11	
Laemonema globiceps	0.06	6	0.08	
Chaceon sp.	0.06	4	0.08	
Squilla sp.	0.06	16	0.08	
Acropoma japonicum	0.04	18	0.05	
Isopod	0.04	34	0.05	
Parapandalus narval	0.02	6	0.03	
Total	72.57		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 39
DATE :20/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°22.86
start stop duration Lon E 35°3.41
TIME :20:54:41 21:15:22 20.7 (min) Purpose : 3
LOG : 5299.74 5300.68 0.9 Region : 7431
FDEPTH: 223 221 Gear cond.: 0
BDEPTH: 223 221 Validity : 0
Towing dir: 0° Wire out : 590 m Speed : 2.7 kn
Sorted : 84 Total catch: 83.83 Catch/hour: 242.99

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Portunus sp.	104.93	46	43.18	
Saurida undosquamis	54.55	664	22.45	69
Mursia sp.	16.23	3	6.68	
Ibacus novemdentatus	8.46	217	3.48	68
Halieutaea sp. A	8.35	157	3.44	
Sepia sp	7.71	420	3.17	
Peristedion weberi	6.67	281	2.74	
Chelidonichthys kumu	5.51	93	2.27	
Scyllarides elisabethae	4.99	3	2.05	
Thenus sp.	4.29	238	1.77	
Palinurus delagoae	3.13	6	1.29	67
Squalus megalops	3.07	3	1.26	
Triacanthodes ethiops	1.86	58	0.76	
Citharoides macrolepis	1.80	23	0.74	
Cynoglossus capensis	1.68	58	0.69	
ECHINOMETRIDAE	1.22	41	0.50	
Sepia hieronis	1.16	46	0.48	
Hoplichthys cf. acanthopleurus	0.93	142	0.38	
Synagrops japonicus	0.93	9	0.38	
Citharichthys sp.	0.75	20	0.31	
Priacanthus hamrur	0.70	3	0.29	
Octopus vulgaris	0.70	3	0.29	
Kentrocapros rosapinto	0.64	9	0.26	
MYCTOPHIDAE	0.43	29	0.18	
Upeneus sp.	0.35	116	0.14	
Tylerius spinosissimus	0.35	6	0.14	
Ariomma cf. melanum	0.29	3	0.12	
Acropoma japonicum	0.29	14	0.12	
Lophiodes insidiator	0.27	3	0.11	
LITHODIDAE	0.23	20	0.10	
Ophichthus sp.	0.17	6	0.07	
Antigonia cf rubescens	0.12	12	0.05	
Taeniopsetta ocellata	0.10	3	0.04	
Champsodon capensis	0.06	9	0.03	
Gonorhynchus gonorhynchus	0.06	3	0.02	
Macrorhamphosus scolopax	0.03	9	0.01	
Total	242.98		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 40
DATE :21/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°11.19
start stop duration Lon E 35°12.65
TIME :06:04:19 06:35:32 31.2 (min) Purpose : 3
LOG : 5346.92 5348.45 1.5 Region : 7431
FDEPTH: 259 251 Gear cond.: 0
BDEPTH: 259 251 Validity : 0
Towing dir: 0° Wire out : 600 m Speed : 2.9 kn
Sorted : 84 Total catch: 84.08 Catch/hour: 161.64

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Palinurus delagoae	68.48	160	42.36	70
Saurida undosquamis	40.41	450	25.00	71
Macrorhamphosus scolopax	12.77	996	7.90	
Squatina africana	6.54	2	4.04	
Loligo duvauceli	5.31	0	3.28	
Peristedion weberi	4.34	25	2.69	
Ariomma cf. melanum	2.54	23	1.57	
Ibacus novemdentatus	2.04	37	1.26	
Satyrichthys adeni	2.00	87	1.24	
Squalus megalops	1.85	2	1.14	
Halieutaea sp. A	1.42	31	0.88	
Scorpaena scrofa	1.27	4	0.78	
Lepidotrigla alcocki	1.15	35	0.71	
Cynoglossus marleyi	1.12	12	0.69	
Citharoides macrolepis	1.12	12	0.69	
J E L L Y F I S H	1.08	12	0.67	
Cynoglossus lida	0.88	19	0.55	
Lithodes sp.	0.88	25	0.55	
Pliotrema warreni	0.81	2	0.50	
Tylerius spinosissimus	0.69	12	0.43	
Chaunax sp.	0.65	8	0.40	
Sepia australis	0.58	19	0.36	
Champsodon capensis	0.46	83	0.29	
Uranoscopus archionema	0.35	2	0.21	
Starfish	0.33	13	0.20	
Neoscombrops cynodon	0.29	4	0.18	
LITHODIDAE	0.27	2	0.17	
Holothuria sp.	0.27	2	0.17	
Scleractinia	0.27	125	0.17	
Triacanthodes ethiops	0.23	8	0.14	
Gonorhynchus gonorhynchus	0.23	6	0.14	
Lagocephalus sp.	0.15	2	0.10	
Loligo sp.	0.13	4	0.08	
Ariomma indicum, juvenile	0.10	6	0.06	
Acropoma japonicum	0.10	6	0.06	
Hoplichthys cf. acanthopleurus	0.10	15	0.06	
OPHIDIIDAE	0.08	2	0.05	
Malthopsis tiarella	0.08	8	0.05	
Coronaster volsellatus	0.08	10	0.05	
Argentina sphyraena	0.06	8	0.04	
ISOPODS	0.06	4	0.04	
Parapagurus pilosimanus	0.06	2	0.04	
Solenocera sp.	0.02	13	0.01	
Antigonia cf rubescens	0.02	2	0.01	
UNIDENTIFIED FISH	0.01	2	0.01	
Carybdis sp.	0.01	2	0.00	
CALAPPIDAE	0.00	2	0.00	
Total	161.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 41
DATE :21/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°8.44
start stop duration Lon E 35°10.83
TIME :08:09:55 08:42:57 33.0 (min) Purpose : 3
LOG : 5355.81 5357.48 1.7 Region : 7431
FDEPTH: 185 178 Gear cond.: 0
BDEPTH: 185 178 Validity : 0
Towing dir: 0° Wire out : 460 m Speed : 3.0 kn
Sorted : 47 Total catch: 200.00 Catch/hour: 363.42

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Saurida undosquamis	140.84	2161	38.75	73
Pagellus natalenses	127.33	2255	35.04	
Sea urchin	31.85	1292	8.76	
J E L L Y F I S H	16.66	7	4.58	
Ibacus novemdentatus	14.14	222	3.89	72
Peristedion weberi	7.89	7	2.17	
PORIFERA (Sponges)	4.62	2	1.27	
Cruriraja parcomaculata	4.32	4	1.19	
Scyllarides elisabethae	4.09	7	1.13	
TRIGLIDAE	3.65	116	1.00	
LITHODIDAE	2.63	7	0.72	
Satyrichthys adeni	1.17	44	0.32	
Lagocephalus sp.	1.02	15	0.28	
Loligo sp.	0.73	29	0.20	
Sepia australis	0.73	15	0.20	
Citharoides macrolepis	0.44	7	0.12	
Cynoglossus lida	0.37	7	0.10	
Platymaia sp	0.29	15	0.08	
Sepia sp	0.29	7	0.08	
Uranoscopus archionema	0.22	7	0.06	
Tylerius spinosissimus	0.15	22	0.04	
Total	363.42		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 42
DATE :21/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 25°1.35
start stop duration Lon E 34°58.84
TIME :11:15:07 11:47:28 32.4 (min) Purpose : 3
LOG : 5375.19 5376.78 1.6 Region : 7431
FDEPTH: 63 63 Gear cond.: 0
BDEPTH: 63 63 Validity : 0
Towing dir: 0° Wire out : 160 m Speed : 3.0 kn
Sorted : 27 Total catch: 26.57 Catch/hour: 49.26

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Sepia pharaonis	23.70	145	48.11	
Saurida undosquamis	8.53	198	17.32	74
Nettastoma parviceps	6.01	102	12.20	
Carangoides malabaricus	3.04	13	6.17	
Loligo forbesi	1.59	37	3.24	
Squalus megalops	1.41	2	2.86	
Pseudorhombus elevatus	1.30	50	2.63	
Fistularia petimba	1.22	50	2.48	
Tetrosomus concatenatus	0.93	2	1.88	
Cociella crocodila	0.52	6	1.05	
Trachinocephalus myops	0.22	7	0.45	
Callionymus cf persicus	0.19	13	0.38	
Synodus binotatus	0.19	9	0.38	
Nemipterus bipunctatus	0.15	6	0.30	
Champsodon capensis	0.11	17	0.23	
Soft corals	0.09	11	0.17	
Torquigener hypselogenion	0.07	11	0.15	
Total	49.26		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 43
DATE :21/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°48.77
start stop duration Lon E 34°45.48
TIME :15:04:40 15:34:24 29.7 (min) Purpose : 3
LOG : 5400.36 5402.15 1.8 Region : 7431
FDEPTH: 26 28 Gear cond.: 0
BDEPTH: 26 28 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.6 kn
Sorted : 174 Total catch: 174.31 Catch/hour: 351.79

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP

	weight	numbers		
Himantura cf gerrardi	201.01	8	57.14	
Decapterus russelli	54.73	977	15.56	75
Loligo sp.	51.50	718	14.64	
Scomberomorus commerson	21.15	10	6.01	76
Gazza minuta	8.90	129	2.53	
Stolephorus sp.	5.05	1312	1.43	
Saurida undosquamis	2.62	36	0.75	77
Sepia sp	1.33	16	0.38	
Upeneus bensasi	1.21	0	0.34	
Acroteriobatus leucospilus	1.15	2	0.33	
Pomadasys maculatus	0.81	8	0.23	
Carangoides malabaricus	0.65	6	0.18	
Actinoptilum	0.57	22	0.16	
Lagocephalus lunaris	0.48	6	0.14	
Octopus cyaneus	0.32	2	0.09	
Trachinocephalus myops	0.24	10	0.07	
Terapon jarbua	0.18	2	0.05	
Charybdis smithii	0.16	2	0.05	
Priacanthus hamrur	0.10	4	0.03	
Pseudorhombus arsius	0.08	4	0.02	
Stephanolepis auratus	0.04	2	0.01	
Nemipterus japonicus	0.03	6	0.01	
Carangoides armatus	0.01	4	0.00	
Total	352.34		100.15	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 44
DATE :21/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°42.41
start stop duration Lon E 34°59.39
TIME :18:17:27 18:48:39 31.2 (min) Purpose : 3
LOG : 5421.41 5423.06 1.7 Region : 7431
FDEPTH: 27 28 Gear cond.: 0
BDEPTH: 27 28 Validity : 2
Towing dir: 0° Wire out : 140 m Speed : 3.2 kn
Sorted : 62 Total catch: 410.00 Catch/hour: 788.21

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Rhinoptera sp.	207.05	15	26.27	
Himantura uarnak	192.25	2	24.39	
Decapterus russelli	168.64	2080	21.40	80
Saurida undosquamis	55.89	596	7.09	89
Equulites elongatus	26.68	62269	3.39	
Pomadasys olivaceus	19.80	377	2.51	
Upeneus bensasi	19.67	815	2.50	
Sphyraena jello	16.67	194	2.11	
Trachypenaeus curvirostris	10.77	1792	1.37	
Selar crumenophthalmus	8.40	63	1.07	81
Pomadasys maculatus	7.77	50	0.99	83
Carangoides malabaricus	7.40	25	0.94	78
Sepia pharaonis	6.63	63	0.84	
Megokris sedili	5.88	1415	0.75	
Decapterus macrosoma	4.88	94	0.62	79
Torquigener hypselogenion	3.77	25	0.48	
Leiognathus equulus	3.63	38	0.46	84
Rastrelliger kanagurta	3.00	38	0.38	86
Charybdis smithii	2.88	108	0.37	
Trachinocephalus myops	2.75	377	0.35	
Gazza minuta	2.63	0	0.33	
Secutor insidiator	1.88	88	0.24	85
Cociella crocodila	1.50	106	0.19	
Penaeus japonicus	1.50	31	0.19	87
Priacanthus hamrur	1.50	6	0.19	
Sardinella albella	1.00	19	0.13	82
Loligo forbesi	0.88	19	0.11	
Ophichthus sp.	0.63	31	0.08	
Apistus carinatus	0.63	108	0.08	
Pagellus natalenses	0.56	19	0.07	88
Synodus sp.	0.50	19	0.06	
Terapon jarbua	0.38	6	0.05	
Engyprosopon grandisquama	0.25	25	0.03	
Total	788.27		100.01	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 45
DATE :21/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°46.94
start stop duration Lon E 35°8.42
TIME :21:04:25 21:25:54 21.5 (min) Purpose : 3
LOG : 5438.70 5440.03 1.3 Region : 7431
FDEPTH: 60 59 Gear cond.: 0
BDEPTH: 60 59 Validity : 2
Towing dir: 0° Wire out : 180 m Speed : 3.7 kn
Sorted : 35 Total catch: 34.75 Catch/hour: 97.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Apistus carinatus	11.90	1188	12.26	
Cyclichthys sp.	11.46	3	11.80	
Trachypenaeus curvirostris	9.22	1154	9.50	
Trachinocephalus myops	7.94	162	8.17	
Decapterus russelli	5.53	98	5.70	90
Nemipterus bipunctatus	5.42	59	5.58	92
Saurida undosquamis	5.25	156	5.41	
Lepidotrigla alcocki	4.86	279	5.01	
Gymnura sp.	3.58	3	3.68	
Bothus swio	2.96	92	3.05	
Sepia pharaonis	2.68	11	2.76	
Amblygaster sirm	2.57	50	2.65	91
Carangoides malabaricus	2.57	11	2.65	
Priacanthus hamrur	2.57	31	2.65	
Penaeus latisulcatus	2.35	61	2.42	94
Carybdis sp.	2.12	626	2.19	
UNIDENTIFIED FISH	1.82	475	1.87	
Ostorhinchus apogonoides	1.56	447	1.61	
Upeneus bensasi	1.40	45	1.44	
Cociella crocodila	1.23	34	1.27	
Trachypenaeus sp.	1.23	769	1.27	
Loligo forbesi	1.01	56	1.04	
Engyprosopon grandisquama	0.56	45	0.58	
Penaeus semisulcatus	0.50	11	0.52	93
Halieutaea sp. A	0.45	48	0.46	
Engraulis sp., juvenile	0.42	106	0.43	
Apogon aureus	0.39	73	0.40	
Stephanolepis auratus	0.34	17	0.35	
Diodon holocanthus	0.28	3	0.29	
Samaris cristatus	0.28	17	0.29	
Bothus myriaster	0.28	11	0.29	
Torquigener hypselogenion	0.28	20	0.29	
Octopus vulgaris	0.22	6	0.23	
Pagellus natalenses	0.22	6	0.23	
Tunicata	0.20	14	0.20	
Nettastoma parviceps	0.17	20	0.17	
Lagocephalus guentheri	0.17	3	0.17	
Rhinobatos holcorhynchus	0.17	3	0.17	
Opistobranch	0.14	6	0.14	
Cynoglossus capensis	0.14	14	0.14	
Xiphasia setifer	0.11	3	0.12	
Armatus sp	0.11	39	0.12	
Starfish	0.08	3	0.09	
UNIDENTIFIED FISH, juvenile	0.07	59	0.07	
Antennarius sp.	0.06	3	0.06	
Callionymus cf persicus	0.06	3	0.06	
Ophichthus sp.	0.06	11	0.06	
Heterocarpus sp.	0.03	34	0.03	
OPHICHTHIDAE	0.03	3	0.03	
Phaeophyceae	0.03	0	0.03	
Etelis sp., juvenile	0.02	8	0.02	
G A S T R O P O D S	0.01	6	0.01	
J E L L Y F I S H	0.01	3	0.01	
Sea urchin	0.00	3	0.00	
Total	97.12		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 46
DATE :22/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°52.88
start stop duration Lon E 35°18.25
TIME :00:03:38 00:34:00 30.4 (min) Purpose : 3
LOG : 5458.98 5460.39 1.4 Region : 7431
FDEPTH: 167 152 Gear cond.: 0
BDEPTH: 167 152 Validity : 0
Towing dir: 0° Wire out : 370 m Speed : 2.8 kn
Sorted : 91 Total catch: 91.26 Catch/hour: 180.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
PORIFERA (Sponges)	46.44	0	25.75	
Ibacus novemdentatus	23.28	221	12.91	96
Saurida undosquamis	22.21	769	12.32	99
Brissidae	13.08	1308	7.25	
Acropoma japonicum	11.23	1168	6.22	
TRIAKIDAE	6.72	2	3.73	
Sepia australis	6.64	249	3.68	
Ommastrephes bartrami	6.09	247	3.37	
Halieutaea sp. A	5.89	57	3.27	
Sepia sp	5.89	192	3.27	
Rhinobatos holcorhynchus	4.70	32	2.61	
Monocentris japonica	3.36	28	1.86	
Scorpaena scrofa	3.00	6	1.67	
Lepidotrigla alcocki	2.29	109	1.27	
Squalus megalops	2.21	2	1.23	
Polysteganus coeruleopunctatus	1.78	24	0.99	98
Scyllarides elisabethae	1.78	4	0.99	
Decapterus macrosoma	1.54	20	0.85	95
Bothus swio	1.26	67	0.70	
Nettastoma parviceps	1.19	6	0.66	
Histiopterus typus	1.19	0	0.66	
Citharoides macrolepis	0.95	24	0.53	
Pagellus natalenses	0.59	6	0.33	97
Uranoscopus archionema	0.51	8	0.28	
Portunus sp.	0.49	55	0.27	
Plesionika edwardsii	0.49	140	0.27	
Lophiodes insidiator	0.47	4	0.26	
Synagrops japonicus	0.42	0	0.23	
Cynoglossus capensis	0.40	12	0.22	
Tylerius spinosissimus	0.40	0	0.22	
Gonorhynchus gonorhynchus	0.36	10	0.20	
Ariomma bondi	0.32	4	0.18	
Macrorhamphosus scolopax	0.32	4	0.18	
Homola barbata	0.30	4	0.16	
Peristedion weberi	0.28	8	0.15	
Rexea prometheoides	0.24	6	0.13	
Physiculus natalensis	0.24	10	0.13	
Chelidoperca sp.	0.22	8	0.12	
Zeus faber	0.20	4	0.11	
Kentrocapros rosapinto	0.20	2	0.11	
SQUILLIDAE	0.18	6	0.10	
OPHICHTHIDAE	0.16	10	0.09	
Branchiostegus doliatus	0.15	2	0.08	
Penaeus latisulcatus	0.12	2	0.07	
LAGANIDAE	0.10	16	0.05	
CALAPPIDAE	0.08	2	0.04	
Champsodon capensis	0.08	10	0.04	
OCTOPODIDAE	0.06	2	0.03	
Scorpaena sp.	0.06	2	0.03	
Medorippe sp	0.04	6	0.02	
STOMATOPODA	0.04	2	0.02	
Solenocera africana	0.04	2	0.02	
Lagocephalus guentheri	0.04	2	0.02	
Paramonacanthus pusillus	0.02	2	0.01	
UNIDENTIFIED FISH	0.02	8	0.01	
Parapagurus pilosimanus	0.02	2	0.01	
Malthopsis cf. tiarella	0.00	2	0.00	
Total	180.36		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 47
DATE :22/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°55.26
start stop duration Lon E 35°20.52
TIME :02:38:30 03:09:47 31.3 (min) Purpose : 3
LOG : 5470.14 5471.64 1.5 Region : 7431
FDEPTH: 243 233 Gear cond.: 0
BDEPTH: 243 233 Validity : 0
Towing dir: 0° Wire out : 590 m Speed : 2.9 kn
Sorted : 59 Total catch: 58.80 Catch/hour: 112.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Squatina africana	17.07	2	15.14	
Saurida undosquamis	14.39	115	12.76	100
Ibacus novemdentatus	11.32	169	10.03	
Loligo sp.	10.24	211	9.08	
Sepia australis	6.33	211	5.61	
Cynoglossus cf lida	4.76	140	4.22	

Spicara australis	4.76	50	4.22
Satyrichthys adeni	4.76	215	4.22
Halieutaea sp.	4.76	50	4.22
Sepia sp.	4.41	54	3.91
Scyllarus batei	4.41	169	3.91
Uranoscopus archionema	3.72	52	3.30
Tylerius spinosissimus	2.46	33	2.18
Citharus linguatula	2.46	29	2.18
Chaunax sp.	2.23	4	1.97
Chelidonichthys kumu	2.15	10	1.90
Centrophorus sp.	1.82	2	1.62
Argentina sphyraena	1.80	226	1.60
Palinurus delagoae	1.23	4	1.09
LAGANIDAE	1.15	46	1.02
Uroconger sp.	0.96	19	0.85
Neoscombrops cynodon	0.92	19	0.82
Peristedion weberi	0.81	4	0.71
Platymaia sp	0.81	33	0.71
Scyllarides elisabethae	0.79	0	0.70
Branchiostegus doliatus	0.77	4	0.68
Bathyuroconger sp.	0.33	4	0.29
Champsodon capensis	0.31	59	0.27
Ariomma cf. melanum	0.23	2	0.20
Neobythites kenyaensis	0.13	6	0.12
Holohalaelurus punctatus	0.12	2	0.10
Squillidae	0.10	2	0.09
Antigonia cf rubescens	0.10	4	0.09
Ophichthus sp.	0.06	2	0.05
Ateleopus natalensis	0.06	2	0.05
Macrorhamphosus scolopax	0.04	4	0.03
Chaceon sp.	0.04	2	0.03
Solenocera africana	0.02	4	0.02
Trachypenaeus sp.	0.01	2	0.01
Ostracods	0.00	2	0.00
Total	112.78		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 48
DATE :22/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°41.80
start stop duration Lon E 35°27.45
TIME :06:48:20 07:20:46 32.4 (min) Purpose : 3
LOG : 5497.95 5499.41 1.5 Region : 7431
FDEPTH: 265 263 Gear cond.: 0
BDEPTH: 265 263 Validity : 0
Towing dir: 0° Wire out : 600 m Speed : 2.7 kn
Sorted : 35 Total catch: 34.91 Catch/hour: 64.59

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Champsodon capensis	10.43	1710	16.16	
Loligo sp.	10.18	78	15.75	
Saurida undosquamis	10.16	70	15.73	102
Palinurus delagoae	5.22	13	8.08	101
Sepia sp.	4.18	43	6.47	
Cynoglossus cf lida	3.11	80	4.81	
Peristedion weberi	2.89	15	4.47	
Centrophorus moluccensis	2.81	4	4.35	
Chaunax sp.	2.63	7	4.07	
Macrorhamphosus japonicus	2.07	178	3.21	
Neoscombrops cynodon	1.44	24	2.23	
Uranoscopus sp.	1.33	19	2.06	
Ovalipes iridescens	1.15	4	1.78	
Pliotrema warreni	1.11	4	1.72	
Satyrichthys adeni	1.04	15	1.60	
LAGANIDAE	0.74	43	1.15	
Synagrops japonicus	0.70	50	1.09	
Ibacus novemdentatus	0.59	4	0.92	
LITHODIDAE	0.48	17	0.74	
Chelidonichthys kumu	0.37	2	0.57	
Gonorhynchus gonorhynchus	0.33	6	0.52	
Argentina sphyraena	0.33	24	0.52	
Citharoides macrolepis	0.19	2	0.29	
Rexea prometheoides	0.19	4	0.29	
Ophichthus sp.	0.15	70	0.23	
Holohalaelurus punctatus	0.15	2	0.23	
Halieutaea sp.	0.15	4	0.23	
Lepidotrigla alcocki	0.13	6	0.20	
Taeniopsetta ocellata	0.11	2	0.17	
Acropoma japonicum	0.06	4	0.09	
Neoepinnula orientalis	0.06	4	0.09	
SCYLLARIDAE	0.06	4	0.09	
Laeops pectoralis	0.06	2	0.09	
Malthopsis tiarella	0.02	2	0.03	
Total	64.59		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 49
DATE :22/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°39.43
start stop duration Lon E 35°22.38
TIME :08:42:36 09:07:46 25.2 (min) Purpose : 3
LOG : 5506.23 5507.45 1.2 Region : 7431
FDEPTH: 126 118 Gear cond.: 0
BDEPTH: 126 118 Validity : 0
Towing dir: 0° Wire out : 320 m Speed : 2.9 kn
Sorted : 57 Total catch: 56.58 Catch/hour: 134.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
CORAL	32.28	0	23.93	
Loligo forbesi	23.03	2093	17.07	
Polysteganus coeruleopunctatus	14.61	0	10.83	108
Epinephelus albomarginatus	13.87	2	10.29	106
Squatina africana	12.11	2	8.98	
LOVENIIDAE	11.42	572	8.47	
Rhinobatos cf annulatus	6.87	2	5.09	
Palinurus delagoae	6.67	17	4.95	105
Diplodus vulgaris	4.05	7	3.00	
Scyllarides elisabethae	2.34	5	1.73	
Gymnothorax sp.	1.57	2	1.17	
Monocentris japonica	1.19	10	0.88	
Pagellus natalenses	0.81	12	0.60	107
Sepia pharaonis	0.52	5	0.39	
Histiopterus typus	0.52	5	0.39	
Sepia sp	0.48	5	0.35	
Lactoria diaphana	0.48	2	0.35	
Thamnaconus fajardoi	0.33	2	0.25	
Ibacus novemdentatus	0.24	2	0.18	
Decapterus tabl	0.24	7	0.18	103
Decapterus kurroides	0.21	2	0.16	104
Tylerius spinosissimus	0.19	2	0.14	
J E L L Y F I S H	0.19	0	0.14	
Saurida undosquamis	0.19	2	0.14	
LITHODIDAE	0.12	2	0.09	
Ijimaia loppei	0.11	2	0.08	
Rochinia sp.	0.06	2	0.04	
Ophiuroidae	0.05	2	0.04	
Peristedion weberi	0.05	2	0.04	
Echinasteridae indetCV1	0.03	2	0.02	
Champsodon capensis	0.02	7	0.02	
COMATULIDAE	0.02	2	0.01	
Total	134.88		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 50
DATE :22/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°37.68
start stop duration Lon E 35°17.46
TIME :10:21:41 10:46:50 25.1 (min) Purpose : 3
LOG : 5513.54 5514.77 1.2 Region : 7431
FDEPTH: 74 44 Gear cond.: 0
BDEPTH: 74 44 Validity : 0
Towing dir: 0° Wire out : 170 m Speed : 2.9 kn
Sorted : 71 Total catch: 70.54 Catch/hour: 168.35

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus natalenses	50.64	2024	30.08	111
Selar crumenophthalmus	28.21	189	16.76	109
Nemipterus bipunctatus	14.13	205	8.39	110
Tetrosomus concatenatus	12.55	41	7.46	
Gracila albomarginata	11.60	2	6.89	
Chrysoblephus anglicus	8.11	2	4.82	
Priacanthus hamrur	7.83	112	4.65	
Loligo forbesi	6.49	167	3.86	
PORIFERA (Sponges)	5.87	138	3.49	
Sepia hieronis	5.78	272	3.43	
Saurida undosquamis	3.91	45	2.32	113
Monocentris japonica	2.39	14	1.42	
CORAL	2.29	55	1.36	0
GORGONOCEPHALIDAE	1.24	2	0.74	
Heterodontus ramalheira	1.24	2	0.74	
Ostorhinchus apogonoides	0.91	72	0.54	
Argyrops filamentosus	0.86	33	0.51	
Dactyloptena peterseni	0.72	2	0.43	
Diodon holocanthus	0.67	2	0.40	
Fistularia petimba	0.53	29	0.31	
CIDARIDAE	0.53	10	0.31	
Sphyraena forsteri	0.43	5	0.26	112
Cheimerius nufar	0.43	2	0.26	
Ariomma indicum	0.33	2	0.20	
Lepidotrigla alcocki	0.29	10	0.17	
CORAL	0.19	12	0.11	
Canthigaster rivulata	0.19	17	0.11	
Total	168.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 51
DATE :22/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°34.34
start stop duration Lon E 35°12.72
TIME :12:04:36 12:39:03 34.5 (min) Purpose : 3
LOG : 5521.74 5523.48 1.7 Region : 7431
FDEPTH: 36 37 Gear cond.: 0
BDEPTH: 36 37 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.0 kn
Sorted : 55 Total catch: 182.22 Catch/hour: 317.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Upeneus bensasi	240.52	6850	75.79	115
Scomberomorus commerson	43.02	12	13.56	117
Decapterus russelli	12.75	361	4.02	114
Pagellus natalenses	9.34	366	2.94	118
Stephanolepis auratus	2.83	14	0.89	
Loligo forbesi	2.17	45	0.68	
Torquigener hypselogenion	1.79	108	0.57	
Gazza minuta	1.79	17	0.57	
Ibacus novemdentatus	1.04	3	0.33	
Saurida undosquamis	0.66	14	0.21	
Selar crumenophthalmus	0.57	9	0.18	
Rastrelliger kanagurta	0.38	9	0.12	116
Sardinella albella	0.19	3	0.06	
CORAL	0.14	0	0.04	
Bathypolypus valdiviae	0.09	3	0.03	
Carangoides dinema	0.07	3	0.02	
Total	317.36		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 52
DATE :22/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°21.48
start stop duration Lon E 35°21.44
TIME :15:38:20 15:51:34 13.2 (min) Purpose : 3
LOG : 5543.12 5543.87 0.8 Region : 7431
FDEPTH: 41 44 Gear cond.: 0
BDEPTH: 41 44 Validity : 3
Towing dir: 0° Wire out : 140 m Speed : 3.4 kn
Sorted : 60 Total catch: 280.00 Catch/hour: 1268.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus russelli	1008.99	42041	79.52	120
Loligo sp.	75.27	1985	5.93	
Decapterus macrosoma	57.96	1350	4.57	119
Nemipterus bipunctatus	30.45	358	2.40	122
Upeneus bensasi	30.05	929	2.37	
Rastrelliger kanagurta	16.50	145	1.30	
Sardinella sp.	15.63	381	1.23	
Sardinella albella	11.83	675	0.93	121
Sepia pharaonis	9.52	63	0.75	
Saurida undosquamis	8.88	145	0.70	
Scomber japonicus	1.68	18	0.13	
Penaeus latisulcatus	1.27	41	0.10	
Ariomma indicum	0.41	41	0.03	
Carangoides armatus	0.23	18	0.02	
Torquigener hypselogenion	0.23	104	0.02	

Total	1268.88	100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 53
DATE :22/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°23.90
start stop duration Lon E 35°23.77
TIME :17:59:46 18:23:44 24.0 (min) Purpose : 3
LOG : 5551.93 5553.06 1.1 Region : 7431
FDEPTH: 69 70 Gear cond.: 0
BDEPTH: 69 70 Validity : 2
Towing dir: 0° Wire out : 185 m Speed : 2.8 kn
Sorted : 17 Total catch: 17.25 Catch/hour: 43.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Saurida undosquamis	8.36	33	19.36	125
Bothus sp.	5.78	0	13.39	
Dipterygonotus balteatus	4.36	581	10.09	
Trachinocephalus myops	3.41	148	7.88	
Penaeus japonicus	2.60	0	6.03	123
Apistus carinatus	2.40	160	5.57	
Penaeus latisulcatus	2.30	0	5.33	124
Acropoma japonicum	2.05	148	4.75	
Lepidotrigla alcocki	1.25	0	2.90	
Priacanthus cf. hamrur	1.25	0	2.90	
Solenocera choprai	1.10	0	2.55	
Pseudorhombus elevatus	1.05	0	2.43	
Lactoria cornuta	1.00	0	2.32	
Callionymus sp.	0.90	0	2.09	
Cociella heemstrai	0.60	0	1.39	
Penaeus marginatus	0.60	0	1.39	
Sepia pharaonis	0.60	0	1.39	
Halieutaea sp. A	0.50	0	1.16	
Sepia australis	0.40	0	0.93	
Nemipterus bipunctatus	0.40	0	0.93	
Aesopia cornuta	0.35	0	0.81	
PORIFERA (Sponges)	0.35	3	0.81	
Octopus sp.	0.35	3	0.81	
Sicyonia lancifer	0.25	0	0.58	
Monocentris japonica	0.25	0	0.58	
Loligo sp.	0.20	0	0.46	
Champsodon capensis	0.20	0	0.46	
Pagellus natalenses	0.13	0	0.29	
ANGUILLIFORMES	0.13	3	0.29	
Metapenaeus sp.	0.05	0	0.12	
Total	43.20		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 54
DATE :22/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°27.00
start stop duration Lon E 35°31.65
TIME :21:24:00 21:54:39 30.7 (min) Purpose : 3
LOG : 5564.98 5566.37 1.4 Region : 7431
FDEPTH: 224 225 Gear cond.: 0
BDEPTH: 224 225 Validity : 0
Towing dir: 0° Wire out : 580 m Speed : 2.7 kn
Sorted : 42 Total catch: 42.11 Catch/hour: 82.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Saurida undosquamis	20.87	215	25.31	128
Cynoglossus capensis	8.93	260	10.83	
Ibacus novemdentatus	6.81	92	8.26	127
Sepia hieronis	4.66	63	5.65	
Peristedion weberi	4.54	235	5.51	
Halieutaea fitzsimonsi	3.68	65	4.46	
Scyllarides elisabethae	3.56	8	4.32	
Myctophid sp. A	3.13	215	3.80	
Scyllarus batei	3.09	159	3.75	
Ommastrephes bartrami	3.05	43	3.70	
Chelidonichthys kumu	2.74	94	3.32	
Pliotrema warreni	2.54	6	3.09	
Satyrichthys adeni	2.08	10	2.52	
Uranoscopus archionema	1.84	35	2.23	
Chaunax sp.	1.53	4	1.85	
Synagrops japonicus	1.29	25	1.57	
Citharoides macrolepis	1.25	18	1.52	
Ovalipes iridescens	1.10	4	1.33	
Champsodon capensis	0.55	74	0.66	
Palinurus delagoae	0.55	2	0.66	126
Neolithodes asperrimus	0.51	10	0.62	
Gonorhynchus gonorhynchus	0.51	12	0.62	
Macrorhamphosus scolopax	0.43	35	0.52	
Maurolicus muelleri	0.43	301	0.52	
Ophichthus sp.	0.39	14	0.47	
Polysteganus coeruleopunctatus	0.39	2	0.47	
Aristeus sp.	0.35	70	0.43	
LAGANIDAE	0.31	31	0.38	
Ophididae 'spot nose'	0.20	8	0.24	
Tylerius spinosissimus	0.14	16	0.17	
Starfish	0.12	4	0.14	
Holohalaelurus punctatus	0.12	2	0.14	
Engyprosopon grandisquama	0.12	8	0.14	
Acropoma japonicum	0.08	4	0.09	
Nansenia macrolepis	0.08	10	0.09	
PORIFERA (Sponges)	0.06	4	0.08	
Apistus carinatus	0.04	4	0.05	
Monacanthus sp.	0.04	2	0.05	
J E L L Y F I S H	0.04	0	0.05	
Uroconger lepturus	0.04	2	0.05	
Callionymus sp.	0.04	6	0.05	
Trachinocephalus myops	0.04	2	0.05	
Dipterygonotus balteatus	0.04	8	0.05	
Hoplostethus mediterraneus	0.03	2	0.03	
CALAPPIDAE	0.02	2	0.03	
Nettastoma parviceps	0.02	2	0.02	
Parapriacanthus ransonneti	0.02	4	0.02	
Coral - mixed	0.02	0	0.02	
G A S T R O P O D S	0.01	2	0.02	
Ostracods	0.01	29	0.01	
UNIDENTIFIED FISH, juvenile	0.01	2	0.01	
Total	82.44		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 55
DATE :23/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°14.08
start stop duration Lon E 35°37.42
TIME :05:44:24 06:14:41 30.3 (min) Purpose : 3
LOG : 5609.92 5611.39 1.5 Region : 7431
FDEPTH: 267 266 Gear cond.: 0
BDEPTH: 267 266 Validity : 0
Towing dir: 0° Wire out : 630 m Speed : 2.9 kn
Sorted : 21 Total catch: 21.30 Catch/hour: 42.21

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Squalus megalops	12.96	12	30.70	
Ommastrephes bartrami	8.96	121	21.22	
J E L L Y F I S H	3.69	8	8.73	
Palinurus delagoae	2.73	6	6.48	
Champsodon capensis	2.46	382	5.82	
Saurida undosquamis	2.42	14	5.73	129
Sepia pharaonis	1.35	14	3.19	
Peristedion cf weberi	1.19	63	2.82	
Nudibranch sp	1.11	2	2.63	
Peristedion sp.	0.91	4	2.16	
Cynoglossus cf lida	0.71	16	1.69	
Halieutaea sp.	0.63	14	1.50	
LAGANIDAE	0.59	24	1.41	
Argentina aliceae	0.48	22	1.13	
Macrorhamphosus scolopax	0.36	32	0.85	
Uranoscopus archionema	0.34	6	0.80	
Ibacus novemdentatus	0.32	2	0.75	
CALAPPIDAE	0.26	4	0.61	
PORIFERA (Sponges)	0.20	2	0.47	
Holohalaelurus punctatus	0.20	2	0.47	
Rexea prometheoides	0.12	2	0.28	
LITHODIDAE	0.12	4	0.28	
Malthopsis cf. tiarella	0.08	2	0.19	
Ophichthus sp.	0.02	14	0.05	
Trachypenaeus sp.	0.02	2	0.05	
Total	42.21		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 56
DATE :23/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°12.73
start stop duration Lon E 35°31.80
TIME :07:35:59 07:58:42 22.7 (min) Purpose : 3
LOG : 5618.75 5619.95 1.2 Region : 7431
FDEPTH: 123 121 Gear cond.: 0
BDEPTH: 123 121 Validity : 0
Towing dir: 0° Wire out : 350 m Speed : 3.2 kn
Sorted : 53 Total catch: 52.57 Catch/hour: 138.77

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Loligo sp.	48.25	3550	34.77	
Monocentris japonica	35.58	436	25.64	
Coral - mixed	13.99	0	10.08	
Polysteganus coeruleopunctatus	9.56	74	6.89	
Parupeneus sp.	7.07	74	5.10	
Scorpaena scrofa	5.75	8	4.15	
Scyllarides elisabethae	4.96	11	3.58	
Rhinobatos cf annulatus	2.80	3	2.02	
Sepia australis	2.59	11	1.86	
Tetrosomus concatenatus	2.27	11	1.64	
Saurida undosquamis	1.79	24	1.29	130
Holothuria sp.	1.06	3	0.76	
Fistularia petimba	1.00	5	0.72	
Thamnaconus modestoides	0.74	3	0.53	
Pagellus natalenses	0.63	8	0.46	
Serranus sp.	0.40	8	0.29	
Bodianus trilineatus	0.26	8	0.19	
Ariomma indicum	0.04	5	0.03	
SEAWEED	0.01	3	0.01	
Total	138.77		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 57
DATE :23/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 24°13.56
start stop duration Lon E 35°26.70
TIME :08:56:58 09:26:47 29.8 (min) Purpose : 3
LOG : 5625.29 5626.99 1.7 Region : 7431
FDEPTH: 25 22 Gear cond.: 0
BDEPTH: 25 22 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.4 kn
Sorted : 127 Total catch: 950.00 Catch/hour: 1912.11

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus natalenses	733.67	67960	38.37	133
Decapterus russelli	516.13	57408	26.99	131
Sillago sihama	209.81	16927	10.97	
Aetobatus narinari	201.27	2	10.53	
Leiognathus lineolatus	135.16	35076	7.07	
Lithognathus mormyrus	45.69	258	2.39	
Ommastrephes bartrami	45.05	1803	2.36	
Upeneus bensasi	16.73	1095	0.87	132
Ariomma indicum	6.44	580	0.34	
Carangoides armatus	1.19	322	0.06	
Coral	0.38	0	0.02	
Stephanolepis auratus	0.24	64	0.01	
Priacanthus cf. hamrur	0.18	64	0.01	
Sea pens	0.18	0	0.01	
Total	1912.11		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 58
DATE :23/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°57.05
start stop duration Lon E 35°34.89
TIME :12:31:41 13:02:46 31.1 (min) Purpose : 3
LOG : 5648.92 5650.47 1.6 Region : 7431
FDEPTH: 109 111 Gear cond.: 0
BDEPTH: 109 111 Validity : 0
Towing dir: 0° Wire out : 260 m Speed : 3.0 kn
Sorted : 60 Total catch: 380.00 Catch/hour: 733.35

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ommastrephes bartrami	270.88	13532	36.94	137
CORAL	203.74	0	27.78	
PORIFERA (Sponges)	140.15	0	19.11	

GORGONOCEPHALIDAE	25.59	160	3.49	
Sepia pharaonis	25.28	320	3.45	
Tetrosomus concatenatus	15.34	35	2.09	
Parupeneus cinnabaricus	10.38	124	1.42	
Monocentris japonica	10.23	95	1.39	
RHINOBATIDAE	6.60	2	0.90	
Scorpaena scrofa	4.25	6	0.58	
Zeus faber	3.24	2	0.44	
Pagellus natalenses	3.07	58	0.42	136
Parupeneus rubescens	2.78	6	0.38	
Decapterus macrosoma	2.62	79	0.36	134
Decapterus russelli	2.34	100	0.32	135
Gymnothorax sp.	1.78	2	0.24	
Saurida undosquamis	1.76	21	0.24	138
COMATULIDAE	1.02	66	0.14	
Priacanthus hamrur	0.73	6	0.10	
Halieutaea sp. A	0.66	6	0.09	
Fistularia petimba	0.29	14	0.04	
CIDARIDAE	0.29	21	0.04	
Echinus spCV1	0.15	35	0.02	
Thamnaconus modestoides	0.15	6	0.02	
BRACHIOPODA	0.02	27	0.00	
Starfish	0.02	6	0.00	
Total	733.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 59
DATE :23/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°58.12
start stop duration Lon E 35°45.18
TIME :15:16:15 15:46:01 29.8 (min) Purpose : 3
LOG : 5662.69 5664.09 1.4 Region : 7431
FDEPTH: 444 413 Gear cond.: 0
BDEPTH: 444 413 Validity : 0
Towing dir: 0° Wire out : 960 m Speed : 2.8 kn
Sorted : 65 Total catch: 270.00 Catch/hour: 544.17

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Myctophid sp. A	196.55	51719	36.12	
Lestrolepis intermedia	76.83	4513	14.12	
Ommastrephes bartrami	72.98	369	13.41	
Neoepinnula orientalis	40.53	1453	7.45	
Diaphus knappi	28.26	790	5.19	
Saurida undosquamis	27.73	67	5.10	139
Ovalipes iridescens	24.21	167	4.45	
Cubiceps whiteleggii	22.37	353	4.11	
Chlorophthalmus agassizi	11.11	284	2.04	
Gonorhynchus gonorhynchus	9.75	67	1.79	
Scomber japonicus	8.06	133	1.48	
Centrophorus moluccensis	7.24	8	1.33	
Squalus megalops	4.53	8	0.83	
Neoscombrops cynodon	3.37	16	0.62	
Polymetme corythaeola	1.51	50	0.28	
Cynoglossus lida	1.35	75	0.25	
LITHODIDAE	1.01	16	0.19	
Cruriraja parcomaculata	0.93	8	0.17	
Funchalia woodwardi	0.85	75	0.16	
Astronesthes sp.	0.85	8	0.16	
Polyipnus spinosus	0.67	133	0.12	
Heterocarpus woodmasoni	0.67	8	0.12	
Beryx splendens	0.67	58	0.12	
Holohalaelurus punctatus	0.42	24	0.08	
Chascanopsetta lugubris	0.42	24	0.08	
Neobythites analis	0.34	16	0.06	
Champsodon capensis	0.26	24	0.05	
Coelorinchus parallelus	0.26	8	0.05	
Zeus sp.	0.26	8	0.05	
Argentina sphyraena	0.16	8	0.03	
Plesionika sp.	0.08	24	0.01	
Total	544.21		100.01	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 60
DATE :23/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°44.68
start stop duration Lon E 35°32.68
TIME :18:12:35 18:44:06 31.5 (min) Purpose : 3
LOG : 5681.30 5682.92 1.6 Region : 7431
FDEPTH: 46 44 Gear cond.: 0
BDEPTH: 46 44 Validity : 2
Towing dir: 0° Wire out : 160 m Speed : 3.1 kn
Sorted : 59 Total catch: 115.45 Catch/hour: 219.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sillago sihama	78.72	6084	35.80	
Trachinocephalus myops	30.50	848	13.87	
Pagellus natalenses	30.02	1457	13.65	
Arothron stellatus	11.70	2	5.32	
Penaeus latisulcatus	8.55	501	3.89	141
Saurida undosquamis	7.85	213	3.57	142
Nemipterus bipunctatus	6.04	32	2.75	
Upeneus bensasi	5.43	295	2.47	
Ommastrephes bartrami	4.51	112	2.05	
Priacanthus hamrur	4.51	154	2.05	
Trachypenaeus curvirostris	4.04	893	1.84	
Decapterus russelli	3.89	154	1.77	140
Sea urchin	3.68	261	1.67	
Megokris sedili	2.99	0	1.36	
J E L L Y F I S H	2.78	8	1.26	
Samaris cristatus	2.65	133	1.20	
PORIFERA (Sponges)	1.31	4	0.60	
Bothus sp.	1.10	139	0.50	
Lactoria cornuta	0.97	4	0.44	
Pterois miles	0.84	2	0.38	
Acropoma japonicum	0.84	234	0.38	
Callionymus cf spiniceps	0.84	32	0.38	
Lagocephalus guentheri	0.80	4	0.36	
Pterois russelii	0.70	4	0.32	
Dipterygonotus balteatus	0.67	84	0.30	
Bothus swio	0.59	74	0.27	
Sepia sp.	0.55	57	0.25	
Cociella crocodila	0.55	15	0.25	
Callionymus sp.	0.42	25	0.19	
Anemones, coral	0.42	15	0.19	
Decapterus macrosoma	0.29	8	0.13	
Coral	0.21	0	0.10	
Penaeus semisulcatus	0.17	8	0.08	
Torquigener hypselogenion	0.10	8	0.04	
Sicyonia lancifer	0.10	19	0.04	
Aesopia cornuta	0.08	4	0.03	
Equulites elongatus	0.08	8	0.03	
Apistus carinatus	0.08	8	0.03	
Charybdis smithii	0.08	4	0.03	
Portunus sp.	0.08	36	0.03	
Tetrosomus sp.	0.07	8	0.03	
Stephanolepis auratus	0.04	19	0.02	
Heniochus acuminatus	0.04	4	0.02	
Canthigaster rivulata	0.02	4	0.01	
Metapenaeus monoceros	0.02	4	0.01	
G A S T R O P O D S	0.02	4	0.01	
Total	219.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 61
DATE :23/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°44.83
start stop duration Lon E 35°38.88
TIME :20:29:56 20:50:58 21.0 (min) Purpose : 3
LOG : 5693.45 5694.52 1.1 Region : 7431
FDEPTH: 153 148 Gear cond.: 0
BDEPTH: 153 148 Validity : 0
Towing dir: 0° Wire out : 400 m Speed : 3.1 kn
Sorted : 49 Total catch: 118.02 Catch/hour: 336.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Cubiceps sp.	265.34	3635	78.80	
PORIFERA (Sponges)	15.92	9	4.73	
Heptranchias perlo	10.78	3	3.20	
Saurida undosquamis	5.99	237	1.78	143
Sepia sp.	5.22	29	1.55	
Octopus sp.	4.71	9	1.40	
Torpedo cf. panthera	4.28	9	1.27	
Priacanthus hamrur	3.79	20	1.13	
Lophius upiscephalus	3.65	3	1.08	
Neoscombrops cynodon	3.25	20	0.97	
Scyllarides elisabethae	2.08	9	0.62	
Ommastrephes bartrami	1.68	9	0.50	
Saurida gracilis	1.68	74	0.50	
Ariomma indicum	1.57	29	0.47	
Acropoma japonicum	1.43	9	0.42	
Lepidotrigla alcocki	1.43	80	0.42	
Thamnaconus modestoides	1.06	9	0.31	
Halieutaea sp. A	1.06	9	0.31	
Macrorhamphosus scolopax	0.51	86	0.15	
Gonorhynchus sp.	0.40	9	0.12	
Callionymus sp.	0.26	14	0.08	
Portunus sp.	0.20	9	0.06	
Plesionika sp.	0.14	9	0.04	
Ovalipes sp	0.14	9	0.04	
SERGESTIDAE	0.06	9	0.02	
Callionymus sp. 92	0.04	9	0.01	
Tylerius spinosissimus	0.04	9	0.01	
Total	336.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 62
DATE :23/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°42.17
start stop duration Lon E 35°47.65
TIME :23:29:35 23:56:10 26.6 (min) Purpose : 3
LOG : 5709.63 5710.69 1.1 Region : 7431
FDEPTH: 387 406 Gear cond.: 0
BDEPTH: 387 406 Validity : 0
Towing dir: 0° Wire out : 820 m Speed : 2.4 kn
Sorted : 33 Total catch: 32.66 Catch/hour: 73.69

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Saurida undosquamis	22.66	68	30.74	147
Ommastrephes bartrami	10.15	54	13.78	
MYCTOPHIDAE	9.21	690	12.49	
Centrophorus sp.	8.12	2	11.02	
Chlorophthalmus agassizi	7.22	133	9.80	
Portunus sp.	4.51	50	6.12	
Gonorhynchus gonorhynchus	1.81	2	2.45	
Haliporoides triarthrus	1.31	43	1.78	146
Peristedion weberi	1.31	14	1.78	
Synagrops japonicus	1.17	11	1.59	
Lophiodes insidiator	0.63	5	0.86	
SERGESTIDAE	0.59	584	0.80	
Caelorinchus trunovi	0.45	16	0.61	
Trichiurus lepturus	0.45	29	0.61	
Aristeus antennatus	0.45	32	0.61	145
Plesionika martia	0.41	151	0.55	
Nematopalaemon hastatus	0.36	194	0.49	
Lestrolepis intermedia	0.36	18	0.49	
Citharichthys sp.	0.36	7	0.49	
Aristaeomorpha foliacea	0.27	9	0.37	144
Cynoglossus capensis	0.27	14	0.37	
Xenolepidichthys dagleishi	0.23	32	0.31	
Dipturus cf lanceorostratus	0.23	7	0.31	
Hoplichthys acanthopleurus	0.23	5	0.31	
Brama orcini	0.20	2	0.28	
Stolephorus indicus	0.18	7	0.24	
Acropoma japonicum	0.14	16	0.18	
Antigonia cf rubescens	0.14	5	0.18	
Champsodon capensis	0.14	9	0.18	
Polymetme corythaeola	0.09	5	0.12	
Nemichthys scolopaceus	0.02	2	0.03	
Argyropelecus gigas	0.02	2	0.03	
Triacanthodes ethiops	0.01	2	0.02	
Total	73.69		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 63
DATE :24/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°30.32
start stop duration Lon E 35°44.72
TIME :09:08:17 09:36:53 28.6 (min) Purpose : 3
LOG : 5761.97 5763.30 1.3 Region : 7431
FDEPTH: 235 236 Gear cond.: 0
BDEPTH: 235 236 Validity : 0
Towing dir: 0° Wire out : 500 m Speed : 2.8 kn
Sorted : 0 Total catch: 30.52 Catch/hour: 64.01

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Epinephelus chabaudi	38.59	2	60.29	
Satyrichthys adeni	5.79	10	9.04	
Saurida undosquamis	5.54	48	8.65	151
Ommastrephes bartrami	2.98	40	4.65	
Polysteganus coeruleopunctatus	1.97	2	3.08	150
Sepia hieronis	1.76	23	2.75	
Palinurus delagoae	1.30	2	2.03	149
Ovalipes iridescens	1.09	6	1.70	148
Citharoides macrolepis	1.09	10	1.70	
Synagrops japonicus	0.80	15	1.25	
Scyllarides elisabethae	0.75	2	1.18	
Champsodon capensis	0.50	55	0.79	
Narcine rierai	0.34	2	0.52	
Macrorhamphosus scolopax	0.29	25	0.46	
Ariomma indicum	0.25	2	0.39	
Loligo forbesi	0.21	6	0.33	
Uranoscopus archionema	0.17	2	0.26	
Scorpaenid 'smallspots'	0.17	2	0.26	
Stolephorus indicus	0.13	6	0.20	
Cubiceps sp.	0.08	2	0.13	
Peristedion weberi	0.08	4	0.13	
Ophichthus sp.	0.04	2	0.07	
Coral	0.04	0	0.07	
Chelidonichthys kumu	0.02	2	0.03	
J E L L Y F I S H	0.02	0	0.03	
Antigonia cf rubescens	0.01	4	0.01	
Total	64.01		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 64
DATE :24/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°28.32
start stop duration Lon E 35°34.01
TIME :13:00:00 13:30:53 30.9 (min) Purpose : 3
LOG : 5778.75 5780.44 1.7 Region : 7431
FDEPTH: 49 50 Gear cond.: 0
BDEPTH: 49 50 Validity : 0
Towing dir: 0° Wire out : 150 m Speed : 3.3 kn
Sorted : 62 Total catch: 142.85 Catch/hour: 277.66

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus russelli	183.07	0	65.93	153
Decapterus macrosoma	26.03	1429	9.37	152
PORIFERA (Sponges)	18.41	4	6.63	
Pagellus natalenses	12.24	393	4.41	155
Sphyraena putnamae	10.81	4	3.89	
Scomber japonicus	10.38	95	3.74	154
Saurida undosquamis	5.13	107	1.85	156
Ommastrephes bartrami	4.14	152	1.49	
Upeneus bensasi	3.91	237	1.41	
Etrumeus teres	2.45	29	0.88	
Algaes	0.31	0	0.11	
Soft corals	0.16	0	0.06	
Pristotis cyanostigma	0.16	27	0.06	
Sicyonia sp.	0.08	23	0.03	
Heniochus acuminatus	0.08	16	0.03	
Halieutaea sp.	0.08	14	0.03	
Sea urchin	0.08	4	0.03	
Starfish	0.08	10	0.03	
Penaeus latisulcatus	0.08	4	0.03	
Paramonacanthus pusillus	0.02	4	0.01	
Total	277.66		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 65
DATE :24/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°27.45
start stop duration Lon E 35°29.69
TIME :15:24:05 15:50:37 26.5 (min) Purpose : 3
LOG : 5788.82 5790.61 1.8 Region : 7431
FDEPTH: 32 32 Gear cond.: 0
BDEPTH: 32 32 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 4.0 kn
Sorted : 68 Total catch: 330.00 Catch/hour: 746.61

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Loligo sp.	213.94	13796	28.65	
Decapterus russelli	150.97	5543	20.22	158
Scomberoides commersonianus	147.51	5	19.76	
Loxodon macrorhinus	73.57	129	9.85	
Stegostoma fasciatum	67.87	2	9.09	
Pagellus natalenses	46.47	1855	6.22	
Decapterus macrosoma	24.50	3095	3.28	157
Abalistes stellatus	6.92	18	0.93	
Trachinocephalus myops	4.00	5	0.54	
Nemipterus bipunctatus	2.67	25	0.36	
Rastrelliger kanagurta	1.99	165	0.27	
Seriolina nigrofasciata	1.36	2	0.18	
Chirocentrus nudus	1.36	2	0.18	
Carangoides armatus	1.20	100	0.16	
Remora remora	0.95	5	0.13	
Upeneus bensasi	0.59	32	0.08	
Equulites elongatus	0.48	5	0.06	
Lactoria cornuta	0.16	0	0.02	
Lutjanus sanguineus	0.14	5	0.02	
Total	746.65		100.01	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 66
DATE :24/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°14.22
start stop duration Lon E 35°32.69
TIME :17:36:42 18:06:42 30.0 (min) Purpose : 3
LOG : 5803.05 5804.49 1.5 Region : 7431
FDEPTH: 40 37 Gear cond.: 0
BDEPTH: 40 37 Validity : 2
Towing dir: 0° Wire out : 140 m Speed : 2.9 kn
Sorted : 57 Total catch: 124.04 Catch/hour: 248.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus natalenses	64.12	2912	25.85	163
Upeneus bensasi	42.32	2030	17.06	
Penaeus latisulcatus	25.44	1816	10.25	161
Trachinocephalus myops	23.36	518	9.42	
Priacanthus hamrur	22.34	1022	9.01	
Megokris sedili	11.56	2064	4.66	
PORIFERA (Sponges)	7.88	0	3.18	
Saurida undosquamis	6.52	138	2.63	164
Apistus carinatus	6.36	552	2.56	
Stephanolepis auratus	5.70	620	2.30	
J E L L Y F I S H	4.18	0	1.68	
Loligo sp.	4.18	154	1.68	
Torquigener hypselogenion	3.44	196	1.39	
Bothus sp.	3.34	172	1.35	
Nemipterus bipunctatus	3.34	30	1.35	
Cociella crocodila	2.60	96	1.05	
Lactoria cornuta	2.52	6	1.02	
Thenus sp.	2.34	8	0.94	
Soft corals	1.68	20	0.68	
Trachypenaeus sp.	1.08	184	0.44	
Decapterus russelli	0.92	46	0.37	160
Pristotis cf. cyanostigma	0.84	234	0.34	
Charybdis smithii	0.34	12	0.14	
Synodus CF dermatogenys	0.30	4	0.12	
Plotosus lineatus	0.20	50	0.08	
Tetrosomus concatenatus	0.20	4	0.08	
Lutjanus lutjanus	0.16	4	0.06	
Samaris cristatus	0.16	12	0.06	
Carangoides armatus	0.12	12	0.05	
Equulites elongatus	0.12	42	0.05	
Alepes djedaba	0.08	46	0.03	
Lagocephalus sceleratus	0.08	4	0.03	
Dactyloptena orientalis	0.08	4	0.03	
Decapterus macrosoma	0.08	16	0.03	159
Dipterygonotus balteatus	0.04	54	0.02	
Gnathophis sp., juvenile	0.04	58	0.02	
Metapenaeus monoceros	0.02	8	0.01	162
Total	248.08		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 67
DATE :24/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°12.39
start stop duration Lon E 35°42.49
TIME :20:01:28 20:23:11 21.7 (min) Purpose : 3
LOG : 5817.07 5818.25 1.2 Region : 7431
FDEPTH: 187 188 Gear cond.: 0
BDEPTH: 187 188 Validity : 0
Towing dir: 0° Wire out : 480 m Speed : 3.3 kn
Sorted : 29 Total catch: 29.29 Catch/hour: 80.95

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Argentina sphyraena	14.48	906	17.89	
CORAL	13.82	0	17.07	
LOVENIIDAE	13.76	882	17.00	
Narcine rierai	4.31	17	5.33	
Champsodon capensis	3.65	155	4.51	
Hoplostethus mediterraneus	3.12	279	3.86	
Antigonia cf. rubescens	3.10	271	3.82	
Scyllarides elisabethae	2.43	6	3.00	
Halieutaea sp.	2.27	17	2.80	
Paramonacanthus pusillus	2.21	287	2.73	
Ommastrephes bartrami	1.66	61	2.05	
Sepia pharaonis	1.66	28	2.05	
Monocentris japonica	1.22	6	1.50	
Echeneis naucrates	1.19	3	1.47	
Saurida undosquamis	1.11	28	1.37	166
Chelidonichthys kumu	0.99	11	1.23	
Loligo forbesi	0.88	28	1.09	
Polysteganus coeruleopunctatus	0.88	8	1.09	165
Lepidotrigla alcocki	0.83	50	1.02	
Macrorhamphosus scolopax	0.72	61	0.89	
Sepia sp.	0.66	3	0.82	0
Serranus africanus	0.61	61	0.75	
Gonorhynchus gonorhynchus	0.61	17	0.75	
Diaphus knappi	0.55	36	0.68	
Sepia sp.	0.55	6	0.68	
Neoscombrops cynodon	0.44	6	0.55	
Scorpaena scrofa	0.41	8	0.51	
Taeniopsetta ocellata	0.28	11	0.34	
Sepia australis	0.28	14	0.34	
MACROURIDAE	0.22	11	0.27	
TRIODONTIDAE	0.22	3	0.27	
DIODONTIDAE	0.19	11	0.24	
Plesionika edwardsii	0.19	11	0.24	
Synagrops japonicus	0.17	19	0.20	
Rexea prometheoides	0.17	3	0.20	
Decapterus russelli	0.17	6	0.20	
Engyprosopon grandisquama	0.11	6	0.14	
Parapagurus pilosimanus	0.08	6	0.10	
Tylerius spinosissimus	0.08	3	0.10	
Uroconger lepturus, juvenile	0.08	3	0.10	
OPHIDIIDAE	0.06	3	0.07	
Ophichthus sp.	0.06	6	0.07	
Priacanthus hamrur	0.06	3	0.07	
Samaris cristatus	0.06	3	0.07	
Nudibranch sp	0.06	6	0.07	
SOLENOCERIDAE	0.06	6	0.07	
Pagellus natalenses	0.06	3	0.07	
Decapterus macrosoma	0.06	3	0.07	
Synagrops japonicus, juvenile	0.06	6	0.07	
Nettastoma parviceps	0.03	3	0.03	
ACHIRIDAE	0.02	3	0.03	
CONGRIDAE	0.02	0	0.02	
Pristotis cf. cyanostigma	0.01	3	0.01	
Total	80.95		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 68
DATE :24/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 23°12.52
start stop duration Lon E 35°47.99
TIME :22:16:58 22:48:12 31.2 (min) Purpose : 3
LOG : 5828.72 5830.36 1.6 Region : 7431
FDEPTH: 303 295 Gear cond.: 0
BDEPTH: 303 295 Validity : 0
Towing dir: 0° Wire out : 695 m Speed : 3.2 kn
Sorted : 58 Total catch: 57.70 Catch/hour: 110.85

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Saurida undosquamis	45.65	373	41.18	168

Maurolicus muelleri	15.98	13435	14.42	
MYCTOPHIDAE	4.96	290	4.47	
Halieutaea sp.	4.84	44	4.37	
Satyrichthys adeni	4.65	4	4.19	
Cynoglossus capensis	4.50	152	4.06	
Champsodon capensis	3.57	300	3.22	
Sepia australis	3.42	40	3.09	
Ommastrephes bartrami	3.17	46	2.86	
Peristedion weberi	2.80	134	2.53	
Chelidonichthys kumu	2.61	23	2.36	
Macrorhamphosus scolopax	2.42	209	2.18	
Ovalipes iridescens	2.19	15	1.98	
Synagrops japonicus	1.84	35	1.66	
Chlorophthalmus agassizi	1.19	277	1.07	
Uranoscopus archionema	0.96	10	0.87	
Citharoides macrolepis	0.50	6	0.45	
Chaunax sp.	0.42	4	0.38	
Monacanthus sp.	0.42	52	0.38	
Hoplichthys acanthopleurus	0.42	25	0.38	
Brama orcini	0.40	17	0.36	
Ateleopus natalensis	0.38	2	0.35	
Lophiodes insidiator	0.38	2	0.35	
Palinurus delagoae	0.35	2	0.31	167
Trachurus delagoa	0.35	2	0.31	
Nansenia macrolepis	0.31	13	0.28	
Lestrolepis intermedia	0.27	15	0.24	
E C H I N O D E R M A T A	0.23	8	0.21	
Ophichthus sp.	0.23	8	0.21	
J E L L Y F I S H	0.23	8	0.21	
Poecilopsetta zanzibarensis	0.19	8	0.17	
Narcine rierai	0.19	2	0.17	
Citharichthys sp.	0.15	4	0.14	
Upeneus bensasi	0.12	6	0.10	
Neolithodes capensis	0.12	71	0.10	
Plesionika martia	0.09	50	0.08	
Malthopsis tiarella	0.08	6	0.07	
Gonorhynchus gonorhynchus	0.08	2	0.07	
Bothus myriaster	0.04	2	0.03	
Antigonia cf rubescens	0.04	4	0.03	
Pagellus natalenses	0.04	2	0.03	
OPHICHTHIDAE	0.04	2	0.03	
HOMOLIDAE	0.02	2	0.02	
Total	110.85		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 69
DATE :25/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 22°56.64
start stop duration Lon E 35°44.75
TIME :03:42:35 04:13:12 30.6 (min) Purpose : 3
LOG : 5867.30 5868.80 1.5 Region : 7431
FDEPTH: 248 243 Gear cond.: 0
BDEPTH: 248 243 Validity : 0
Towing dir: 0° Wire out : 600 m Speed : 2.9 kn
Sorted : 29 Total catch: 28.70 Catch/hour: 56.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Satyrichthys adeni	19.67	29	34.98	
Ommastrephes bartrami	8.50	147	15.12	
Saurida undosquamis	4.98	43	8.85	169
Peristedion weberi	4.23	200	7.53	
Champsodon capensis	3.02	533	5.37	
Macrorhamphosus scolopax	2.00	170	3.55	
Sepia pharaonis	2.00	27	3.55	
Antigonia rubescens	1.80	71	3.21	
Cynoglossus lida	1.45	41	2.58	
Argentina sphyraena	1.41	104	2.51	
Lepidotrigla alcocki	1.21	39	2.16	
Citharus linguatula	1.14	14	2.02	
Ovalipes iridescens	1.06	8	1.88	
Uranoscopus archionema	1.02	6	1.81	
LAGANIDAE	0.67	10	1.18	
Chelidonichthys kumu	0.67	6	1.18	
Kentrocapros rosapinto	0.18	2	0.31	
Priacanthus hamrur	0.16	2	0.28	
Ibacus novemdentatus	0.16	2	0.28	
Hoplichthys acanthopleurus	0.16	18	0.28	
Ophichthus sp.	0.12	6	0.21	
Gonorhynchus gonorhynchus	0.12	2	0.21	
Bothus swio	0.12	2	0.21	
Halieutaea sp.	0.12	2	0.21	
Holohalaelurus punctatus	0.08	2	0.14	
J E L L Y F I S H	0.04	0	0.07	
CORAL	0.04	8	0.07	
Synagrops japonicus, juvenile	0.04	2	0.07	
Scyllarus batei	0.04	2	0.07	
PORIFERA (Sponges)	0.04	2	0.07	
CONIDAE	0.02	0	0.03	
Total	56.22		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 70
DATE :25/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 22°57.20
start stop duration Lon E 35°38.82
TIME :05:54:44 06:24:22 29.6 (min) Purpose : 3
LOG : 5878.57 5880.18 1.6 Region : 7431
FDEPTH: 121 113 Gear cond.: 0
BDEPTH: 121 113 Validity : 0
Towing dir: 0° Wire out : 320 m Speed : 3.3 kn
Sorted : 63 Total catch: 62.86 Catch/hour: 127.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Epinephelus albomarginatus	71.12	10	55.87	
Loligo sp.	20.74	877	16.29	
Sepia australis	12.35	142	9.70	
Parupeneus sp.	4.74	69	3.72	
Auxis thazard	3.36	2	2.64	
Scorpaena scrofa	2.83	6	2.23	
Gymnothorax sp.	1.58	2	1.24	
Cephaloscyllium sufflans	1.30	2	1.02	
Saurida undosquamis	1.09	16	0.86	170
Priacanthus hamrur	1.05	22	0.83	
Epinephelus poecilonotus	1.05	2	0.83	
Carybdis sp.	0.81	22	0.64	
Variola sp.	0.61	24	0.48	
Decapterus tabl	0.61	30	0.48	
Chaetodon dolosus	0.57	18	0.45	
Holothuria sp.	0.53	2	0.41	
Monocentris japonica	0.49	4	0.38	
UNIDENTIFIED FISH	0.49	26	0.38	
Fistularia petimba	0.45	6	0.35	
Thamnaconus fajardoi	0.32	6	0.25	
Bodianus trilineatus	0.18	2	0.14	
Ovalipes iridescens	0.18	2	0.14	
Tetrosomus concatenatus	0.17	6	0.13	
Pagellus natalenses	0.14	2	0.11	
Synodus 'yellowpectoral'	0.12	6	0.10	
Scolopsis vosmeri	0.10	2	0.08	
CORAL	0.10	0	0.08	
Nemipterus sp.	0.08	2	0.06	
Lutjanus lutjanus	0.04	6	0.03	
PAGUROIDEA	0.04	2	0.03	
Halieutaea sp.	0.02	2	0.02	
Canthigaster rivulata	0.02	2	0.02	
Alepes djedaba	0.01	2	0.01	
Total	127.28		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 71
DATE :25/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 22°42.46
start stop duration Lon E 35°34.55
TIME :10:37:51 11:00:07 22.3 (min) Purpose : 3
LOG : 5904.53 5905.60 1.1 Region : 7431
FDEPTH: 48 46 Gear cond.: 0
BDEPTH: 48 46 Validity : 0
Towing dir: 0° Wire out : 145 m Speed : 2.9 kn
Sorted : 10 Total catch: 9.90 Catch/hour: 26.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
CORAL	8.46	0	31.72	
J E L L Y F I S H	5.12	0	19.19	
Starfish	5.01	3	18.79	
SEAWEED	1.40	0	5.25	
Saurida undosquamis	1.13	54	4.24	173
Upeneus bensasi	0.92	154	3.43	171
Equulites elongatus	0.81	135	3.03	
Starfish (pentagon)	0.81	0	3.03	
Ommastrephes bartrami	0.54	350	2.02	172
Pterois miles	0.49	3	1.82	
Thenus orientalis	0.49	3	1.82	
Sepia australis	0.32	11	1.21	
Pristotis cf. cyanostigma	0.29	75	1.09	
Pagellus natalenses	0.16	13	0.59	
Tripneustes gratilla	0.11	30	0.40	
Fistularia petimba	0.11	13	0.40	
Ostorhinchus fasciatus	0.11	162	0.40	
Lagocephalus sceleratus	0.08	3	0.30	
Tetrosomus concatenatus	0.05	3	0.20	
Halieutaea sp. A	0.05	5	0.20	
Bothus myriaster	0.05	3	0.20	
Hippocampus sp.	0.05	3	0.20	
PAGUROIDEA	0.05	3	0.20	
Parribacus antarcticus	0.03	3	0.10	
Engyprosopon grandisquama	0.03	3	0.10	
Nemipterus bipunctatus	0.03	3	0.10	
Antennarius sp.	0.01	3	0.04	
Total	26.71		100.10	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 72
DATE :25/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 22°43.52
start stop duration Lon E 35°41.60
TIME :13:13:52 13:33:55 20.1 (min) Purpose : 3
LOG : 5919.48 5920.56 1.1 Region : 7431
FDEPTH: 220 214 Gear cond.: 0
BDEPTH: 220 214 Validity : 0
Towing dir: 0° Wire out : 560 m Speed : 3.3 kn
Sorted : 12 Total catch: 11.70 Catch/hour: 35.01

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ommastrephes bartrami	9.16	284	26.15	
Sepia hieronis	3.86	42	11.03	
Scyllarides elisabethae	3.41	6	9.74	174
Pliotrema warreni	3.41	6	9.74	
Satyrichthys adeni	1.68	3	4.79	
Antigonia cf rubescens	1.56	48	4.44	
Rhinobatos annulatus	1.56	3	4.44	
Saurida undosquamis	1.38	9	3.93	
Jellyfish	1.08	0	3.08	
Chelidonichthys kumu	0.96	27	2.74	
Sphoeroides pachgaster	0.90	6	2.56	
Cynoglossus capensis	0.78	21	2.22	
Champsodon capensis	0.72	200	2.05	
Ibacus novemdentatus	0.60	6	1.71	
Peristedion weberi	0.48	24	1.37	
Thenus orientalis	0.42	18	1.20	
Algaes	0.42	0	1.20	
Citharoides macrolepis	0.36	6	1.03	
Brown sand dollar	0.36	15	1.03	
Sphyraena forsteri	0.36	3	1.03	
Tylerius spinosissimus	0.30	6	0.85	
Ariomma cf. melanum	0.24	3	0.68	
Macrorhamphosus scolopax	0.24	21	0.68	
Uranoscopus archionema	0.18	3	0.51	
Halieutaea sp. A	0.18	3	0.51	
Fistularia petimba	0.12	12	0.34	
Hoplichthys acanthopleurus	0.06	3	0.17	
CORAL	0.06	0	0.17	
Starfish	0.06	3	0.17	
Priacanthus hamrur	0.06	6	0.17	
Ariomma indicum	0.05	15	0.14	
Bothus myriaster	0.02	3	0.05	
Carangoid 'bars' juvenile	0.01	3	0.03	
MONACANTHIDAE, juvenile	0.01	3	0.02	
Acropoma japonicum	0.00	3	0.01	
STOMATOPODA	0.00	3	0.01	
Sea pens	0.00	3	0.01	
Total	35.01		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 73
DATE :26/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 22°27.19
start stop duration Lon E 35°39.96
TIME :00:42:58 01:13:18 30.3 (min) Purpose : 3
LOG : 5989.97 5991.46 1.5 Region : 7431
FDEPTH: 236 224 Gear cond.: 0
BDEPTH: 236 224 Validity : 0
Towing dir: 0° Wire out : 540 m Speed : 3.0 kn
Sorted : 27 Total catch: 27.22 Catch/hour: 53.85

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Peristedion weberi	14.24	40	26.45	
Sepia prashadi	5.62	97	10.43	
Chelidonichthys kumu	5.30	140	9.85	
Uranoscopus archionema	5.10	51	9.48	
Cynoglossus capensis	3.80	156	7.05	
Satyrichthys adeni	3.68	2	6.83	
Parribacus antarcticus	2.57	111	4.78	
Ommastrephes bartrami	1.66	40	3.09	
Hoplichthys acanthopleurus	1.58	73	2.94	
Champsodon capensis	1.19	135	2.20	
Halieutaea sp.	1.15	18	2.13	
Saurida undosquamis	0.95	10	1.76	176
Citharoides macrolepis	0.83	12	1.54	
Stolephorus indicus	0.71	89	1.32	
Octopus vulgaris	0.55	2	1.03	
OPHICHTHIDAE	0.53	6	0.99	
Sepia sp.	0.44	8	0.81	
SALPS	0.40	135	0.73	
Trichiurus lepturus	0.36	2	0.66	177
Sepia hieronis	0.36	2	0.66	
Polysteganus coeruleopunctatus	0.32	2	0.59	175
Macrorhamphosus scolopax	0.32	26	0.59	
Antigonia cf rubescens	0.28	8	0.51	
Narcine rierai	0.28	6	0.51	
LAGANIDAE	0.24	6	0.44	
Tylerius spinosissimus	0.24	6	0.44	
Ophichthus sp.	0.20	12	0.37	
Calappa hepatica	0.20	18	0.37	
Neoscombrops cynodon	0.20	14	0.37	
Ibacus novemdentatus	0.16	2	0.29	
Bothus swio	0.12	4	0.22	
CORAL	0.08	6	0.15	
Phaeophyceae	0.08	0	0.15	
Ostracods	0.05	113	0.08	
Dorhynchus thomsoni	0.04	6	0.07	
Megokris sedili	0.03	30	0.06	
Ateleopus natalensis, juvenile	0.01	2	0.02	
Rexea prometheoides	0.01	2	0.01	
Priacanthus hamrur, juvenile	0.00	2	0.01	
Total	53.85		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 74
DATE :26/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 22°26.55
start stop duration Lon E 35°35.81
TIME :02:53:58 03:24:43 30.7 (min) Purpose : 3
LOG : 5999.98 6001.66 1.7 Region : 7431
FDEPTH: 91 91 Gear cond.: 0
BDEPTH: 91 91 Validity : 2
Towing dir: 0° Wire out : 260 m Speed : 3.3 kn
Sorted : 172 Total catch: 250.05 Catch/hour: 488.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus tabl	210.78	98	43.19	178
Saurida undosquamis	148.09	8227	30.34	181
Loligo sp.	78.76	4077	16.14	
Saurida tumbil	15.52	763	3.18	
Penaeus latisulcatus	7.96	279	1.63	180
Torquigener hypselogenion	4.78	232	0.98	
Gorgonocephalus eucnemis	4.65	14	0.95	
Penaeus marginatus	3.04	121	0.62	179
Tetrosomus concatenatus	2.79	14	0.57	
Trachinocephalus myops	2.24	47	0.46	
Upeneus bensasi	1.19	80	0.24	
PORIFERA (Sponges)	1.05	8	0.22	
Psilaster acuminatus	0.94	21	0.19	
Lophius upiscephalus	0.66	14	0.14	
Decapterus kurroides	0.61	14	0.12	
Synodus sp.	0.53	21	0.11	
CORAL	0.53	8	0.11	
Priacanthus hamrur	0.53	27	0.11	
Lepidotrigla alcocki	0.47	33	0.10	
Carybdis sp.	0.47	8	0.10	
Samaris cristatus	0.39	61	0.08	
Sepia australis	0.39	14	0.08	
Nemipterus japonicus	0.33	8	0.07	
Callionymus cf persicus	0.27	21	0.06	
Pristotis cf. cyanostigma	0.20	27	0.04	
Cociella crocodila	0.20	14	0.04	
Paramonacanthus pusillus	0.14	8	0.03	
Hoplichthys cf. acanthopleurus	0.14	8	0.03	
Dactyloptena peterseni	0.14	21	0.03	
Sicyonia lancifer	0.06	14	0.01	
Portunus sp.	0.06	21	0.01	
Canthigaster rivulata	0.06	14	0.01	
Pterois russelii	0.06	8	0.01	
Champsodon capensis	0.06	8	0.01	
Total	488.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 75
DATE :26/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 22°26.88
start stop duration Lon E 35°34.29
TIME :05:30:29 05:51:14 20.8 (min) Purpose : 3
LOG : 6009.33 6010.39 1.1 Region : 7431
FDEPTH: 33 30 Gear cond.: 0
BDEPTH: 33 30 Validity : 3
Towing dir: 0° Wire out : 140 m Speed : 3.1 kn
Sorted : 29 Total catch: 8000.00 Catch/hour: 23132.53

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	23028.36	23237	99.55	
Equulites elongatus	56.09	12020	0.24	182
Ophiuroidea, juvenile	16.03	80125	0.07	
Upeneus bensasi, juvenile	16.03	2403	0.07	
Fistularia petimba, juvenile	8.01	801	0.03	
Alepes djedaba, juvenile	4.01	801	0.02	
Loligo sp., juvenile	4.01	801	0.02	
Total	23132.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 76
DATE :26/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 22°16.62
start stop duration Lon E 35°33.41
TIME :08:19:00 08:41:58 23.0 (min) Purpose : 3
LOG : 6023.58 6024.94 1.4 Region : 7431
FDEPTH: 24 25 Gear cond.: 0
BDEPTH: 24 25 Validity : 3
Towing dir: 0° Wire out : 130 m Speed : 3.5 kn
Sorted : 0 Total catch: 300.00 Catch/hour: 783.97

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	556.93	0	71.04	
Caretta caretta	195.99	3	25.00	
Upeneus bensasi	10.56	771	1.35	
Decapterus macrosoma	4.81	274	0.61	183
Carangoides armatus	4.76	303	0.61	
Echeneis naucrates	3.76	16	0.48	
Starfish	3.24	3	0.41	0
Sardinops sp.	1.86	209	0.24	
Starfish	1.20	5	0.15	
Gnathanodon speciosus, juvenile	0.18	39	0.02	
Equulites elongatus	0.18	42	0.02	
Loligo sp.	0.13	10	0.02	
Parupeneus sp.	0.10	5	0.01	
Selar crumenophthalmus, juvenile	0.10	5	0.01	
Trachinocephalus myops	0.10	5	0.01	
Fistularia petimba	0.05	5	0.01	
Total	783.97		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 77
DATE :26/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 22°11.69
start stop duration Lon E 35°40.65
TIME :11:07:12 11:32:52 25.7 (min) Purpose : 3
LOG : 6039.72 6041.07 1.4 Region : 7431
FDEPTH: 306 286 Gear cond.: 0
BDEPTH: 306 286 Validity : 0
Towing dir: 0° Wire out : 635 m Speed : 3.2 kn
Sorted : 24 Total catch: 23.75 Catch/hour: 55.53

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ommastrephes bartrami	14.36	222	25.85	
Sepia hieronis	12.72	171	22.91	
Saurida undosquamis	5.28	21	9.52	187
Champsodon capensis	4.44	400	8.00	
Squalus megalops	2.46	2	4.42	
Palinurus delagoae	2.34	9	4.21	184
J E L L Y F I S H	1.78	0	3.20	
SALPS	1.78	0	3.20	
Cynoglossus capensis	1.17	40	2.11	
Uranoscopus archionema	1.17	9	2.11	
Citharoides macrolepis	1.12	9	2.02	
Dorhynchus thomsoni	0.98	2	1.77	186
Synagrops japonicus	0.84	37	1.52	
Ateleopus natalensis	0.84	7	1.52	
LITHODIDAE	0.75	7	1.35	
Stolephorus indicus	0.65	35	1.18	
Polymixia berndti	0.56	26	1.01	
Polysteganus coeruleopunctatus	0.56	2	1.01	185
Chaunax sp.	0.42	2	0.76	
Narcine rierai	0.28	2	0.51	
Halieutaea sp. A	0.23	2	0.42	
Brisingidae	0.19	2	0.34	
Macrorhamphosus scolopax	0.14	9	0.25	
Peristedion weberi	0.14	5	0.25	
Ophichthus sp.	0.09	5	0.17	
Hoplichthys acanthopleurus	0.09	5	0.17	
Lepidotrigla alcocki	0.09	2	0.17	
Holohalaelurus sp.	0.05	2	0.08	
Total	55.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 78
DATE :26/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 21°54.26
start stop duration Lon E 35°32.65
TIME :16:01:19 16:26:37 25.3 (min) Purpose : 3
LOG : 6079.86 6081.02 1.2 Region : 7431
FDEPTH: 52 53 Gear cond.: 0
BDEPTH: 52 53 Validity : 0
Towing dir: 0° Wire out : 180 m Speed : 2.8 kn
Sorted : 116 Total catch: 116.09 Catch/hour: 275.41

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pastinachus sephen	154.21	2	55.99	
Sphyraena qenie	28.66	5	10.41	
Loxodon macrorhinus	25.91	14	9.41	
Loligo sp.	13.76	1528	5.00	
Pseudalutarius nasicornis	12.38	474	4.50	
Sillago sihama	10.58	1174	3.84	
J E L L Y F I S H	6.41	0	2.33	
Equulites elongatus	3.32	1843	1.21	
Lactoria cornuta	2.23	5	0.81	
Rhinobatos sp.	2.23	2	0.81	
Fistularia commersonii	1.90	9	0.69	
Starfish	1.76	0	0.64	
Nemipterus japonicus	1.66	33	0.60	
CORAL	1.52	93	0.55	
Sphyraena forsteri	1.09	5	0.40	
Upeneus bensasi	1.09	560	0.40	
Lagocephalus sceleratus	0.95	2	0.34	
Ovalipes iridescens	0.90	2	0.33	
Dipturus stenorhynchus	0.85	2	0.31	
LITHODIDAE	0.81	5	0.29	
Argentina sphyraena	0.71	17	0.26	
Pterois miles	0.71	2	0.26	

Thenus orientalis	0.62	2	0.22
Bothus swio	0.43	7	0.16
Sepia pharaonis	0.19	2	0.07
Fistularia petimba	0.14	2	0.05
PORIFERA (Sponges)	0.12	0	0.04
Decapterus russelli	0.09	7	0.03
Echeneis naucrates	0.09	2	0.03
Torquigener hypselogenion	0.05	2	0.02
Synodus binotatus	0.02	7	0.01
Trachinocephalus myops	0.01	5	0.01
Carangoides armatus	0.01	5	0.00
Total	275.41		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 79
DATE :26/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 21°41.59
start stop duration Lon E 35°31.75
TIME :18:18:00 18:25:48 7.8 (min) Purpose : 3
LOG : 6094.63 6094.98 0.4 Region : 7431
FDEPTH: 57 57 Gear cond.: 0
BDEPTH: 57 57 Validity : 3
Towing dir: 0° Wire out : 170 m Speed : 2.7 kn
Sorted : 130 Total catch: 130.00 Catch/hour: 998.72

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP
CORAL	595.98	0 59.67	
Diagramma pictum	124.46	38 12.46	
J E L L Y F I S H	116.31	0 11.65	
Gymnocranius griseus	32.73	85 3.28	
Neotrygon kuhlii	17.36	15 1.74	
Tetrosomus concatenatus	14.75	31 1.48	
Lutjanus bengalensis	11.83	307 1.18	
Plectorhinchus flavomaculatus	9.07	8 0.91	
Ostorhinchus apogonoides	5.69	346 0.57	
Lutjanus lutjanus	5.53	115 0.55	
Apogon spilurus	5.38	599 0.54	
Apogon sp.	4.92	338 0.49	
Parupeneus rubescens	4.15	15 0.42	
Sphyraena forsteri	3.99	108 0.40	
Upeneus bensasi	3.84	376 0.38	189
Dardanus megistos	3.76	8 0.38	
Synodus sp.	3.07	38 0.31	
Decapterus russelli	3.07	200 0.31	188
Nemipterus japonicus	2.61	15 0.26	190
Parapriacanthus ransonneti	2.54	492 0.25	
Decapterus macrosoma	2.30	108 0.23	
Penaeus latisulcatus	2.30	131 0.23	191
Thysanoteuthis rhombus	2.30	38 0.23	
Gymnothorax nudivomer	2.23	8 0.22	
Pseudalutarius nasicornis	2.00	92 0.20	
Priacanthus hamrur	1.69	131 0.17	
Canthigaster rivulata	1.69	100 0.17	
Apogon aureus	1.54	85 0.15	
Cyprinocirrhites polyactis	1.46	115 0.15	
Dipterygonotus balteatus	1.31	238 0.13	
Lactoria cornuta	1.08	38 0.11	
Pristotis cyanostigma	1.08	54 0.11	
Chaetodon dolosus	0.92	46 0.09	
Synodus binotatus	0.54	77 0.05	
Inioteuthis capensis	0.54	69 0.05	
Apogon frenatus	0.46	54 0.05	
Parupeneus macronemus	0.46	23 0.05	
Parupeneus heptacanthus	0.46	8 0.05	
Sillago sihama	0.38	46 0.04	
Epinephelus areolatus	0.31	8 0.03	
Megokris sedili	0.31	115 0.03	
Choridactylus natalensis	0.23	8 0.02	
Pseudanthias sp.	0.23	8 0.02	
Sicyonia lancifer	0.23	131 0.02	
Myripristis sp.	0.23	8 0.02	
Torquigener hypselogenion	0.15	8 0.02	
Sepia australis	0.15	23 0.02	
Oxycheilinus bimaculatus	0.15	8 0.02	
Equulites elongatus	0.15	31 0.02	
Cociella crocodila	0.15	8 0.02	
Loligo reynaudi	0.15	8 0.02	
Portunus sp.	0.08	31 0.01	
Trachypenaeus curvirostris	0.08	15 0.01	
Chaetodon kleinii	0.08	8 0.01	
Sepia sp.	0.08	8 0.01	
XANTHIDAE	0.08	8 0.01	
Ariomma indicum	0.05	8 0.00	
XANTHIDAE	0.03	8 0.00	0
STOMATOPODA	0.02	8 0.00	
PORTUNIDAE	0.01	8 0.00	
Total	998.72		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 80
DATE :26/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 21°41.48
start stop duration Lon E 35°36.12
TIME :20:34:28 21:04:53 30.4 (min) Purpose : 3
LOG : 6105.56 6107.13 1.6 Region : 7431
FDEPTH: 318 309 Gear cond.: 0
BDEPTH: 318 309 Validity : 0
Towing dir: 0° Wire out : 700 m Speed : 3.1 kn
Sorted : 44 Total catch: 44.24 Catch/hour: 87.28

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP
Maurolicus muelleri	24.98	448 28.62	
Diaphus effulgens	7.66	460 8.77	
Ommastrephes bartrami	7.26	51 8.32	192
MYCTOPHIDAE	6.95	1736 7.96	
J E L L Y F I S H	6.87	0 7.87	
Sepia hieronis	5.45	110 6.24	
Saurida undosquamis	5.25	39 6.01	193
Synagrops japonicus	4.77	109 5.47	
Cynoglossus capensis	3.75	256 4.30	
Chaunax sp.	1.82	6 2.08	
Stolephorus indicus	1.74	71 1.99	
Halieutaea sp. A	1.10	8 1.27	
Polymixia berndti	1.03	45 1.18	
Satyrichthys adeni	1.03	2 1.18	
Eridacnis radcliffei	0.87	20 0.99	
Ophichthus sp.	0.79	2 0.90	
Chelidonichthys kumu	0.63	18 0.72	
Lestrolepis intermedia	0.51	30 0.59	
Cubiceps sp.	0.47	6 0.54	
Citharoides macrolepis	0.39	4 0.45	
Champsodon capensis	0.36	37 0.41	
Ijimaia loppei	0.36	6 0.41	
SALPS	0.36	0 0.41	
Lagocephalus guentheri	0.32	2 0.36	
Chlorophthalmus agassizi	0.32	77 0.36	
Neoscombrops cynodon	0.28	10 0.32	
Hoplichthys acanthopleurus	0.28	22 0.32	
Gonorhynchus gonorhynchus	0.28	16 0.32	
Solenocera sp.	0.24	24 0.27	
Narcine rierai	0.24	2 0.27	
Neobythites cf somaliaensis	0.16	6 0.18	
Citharichthys sp.	0.16	4 0.18	
Nettastoma parviceps	0.12	4 0.14	
Neoepinnula orientalis	0.12	2 0.14	
Plesionika martia	0.08	47 0.09	
Holohalaelurus punctatus	0.08	2 0.09	
ISOPODS	0.08	12 0.09	
Rexea prometheoides	0.08	2 0.09	
Acropoma japonicum	0.06	2 0.07	
Uroconger lepturus	0.04	2 0.05	
Portunus sp.	0.01	2 0.01	
Caelorinchus braueri	0.00	4 0.00	
Total	87.28		100.00

Area: Mozambique Central

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 81
DATE :27/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 21°28.05
start stop duration Lon E 35°30.85
TIME :08:29:26 08:59:24 30.0 (min) Purpose : 3
LOG : 6168.15 6170.01 1.9 Region : 7420
FDEPTH: 25 24 Gear cond.: 0
BDEPTH: 25 24 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.7 kn
Sorted : 53 Total catch: 505.00 Catch/hour: 1011.01

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP
Himantura gerrardi	619.80	6 61.30	
Chelonia mydas	140.14	2 13.86	
Leiognathus lineolatus	122.10	67836 12.08	
Decapterus macrosoma	54.55	9097 5.40	194
J E L L Y F I S H	19.00	0 1.88	
Echeneis naucrates	17.70	14 1.75	
Scomberoides commersonianus	12.93	6 1.28	
Decapterus russelli	7.25	282 0.72	195
Acroteriobatus leucospilus	5.85	6 0.58	
Starfish	4.92	10 0.49	
Ommastrephes bartrami	2.54	138 0.25	197
Upeneus bensasi	1.60	344 0.16	196
Sardinops sagax	0.84	118 0.08	
Sphyraena forsteri	0.46	10 0.05	
Sepioteuthis sp.	0.34	6 0.03	
Halieutaea sp.	0.32	6 0.03	
Carangoides hedlandensis	0.28	66 0.03	
Rastrelliger kanagurta	0.10	10 0.01	
Bothus myriaster	0.10	6 0.01	
Sphyraena sp., juvenile	0.06	6 0.01	
Ammodytoides renniei	0.04	6 0.00	
CALAPPIDAE	0.04	10 0.00	
CORAL	0.04	10 0.00	
Total	1011.01		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 82
DATE :27/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 21°2.00
start stop duration Lon E 35°5.00
TIME :12:01:38 12:46:00 24.0 (min) Purpose : 3
LOG : 6190.17 6191.38 1.2 Region : 7420
FDEPTH: 33 32 Gear cond.: 0
BDEPTH: 33 32 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.0 kn
Sorted : 54 Total catch: 113.87 Catch/hour: 284.68

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP
Decapterus russelli	81.70	6048 28.70	199
Loligo sp.	66.20	3805 23.25	
Decapterus macrosoma	60.55	3482 21.27	198
Leiognathus lineolatus	60.05	11548 21.09	
Echeneis naucrates	10.15	10 3.57	200
Calappa hepatica	2.53	8 0.89	
Alepes djedaba	1.33	8 0.47	
CARANGIDAE, juvenile	1.02	22 0.36	
Amblygaster sirm	0.40	8 0.14	
Upeneus bensasi	0.40	38 0.14	
Sepia hieronis	0.30	8 0.11	
Carangoides armatus, juvenile	0.05	12 0.02	
Total	284.67		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 83
DATE :27/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 21°12.02
start stop duration Lon E 35°38.05
TIME :15:03:12 15:34:01 30.8 (min) Purpose : 3
LOG : 6205.67 6207.24 1.6 Region : 7420
FDEPTH: 254 256 Gear cond.: 0
BDEPTH: 254 256 Validity : 0
Towing dir: 0° Wire out : 600 m Speed : 3.1 kn
Sorted : 65 Total catch: 64.82 Catch/hour: 126.23

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP
Acropoma japonicum	34.24	2129 27.12	
Ommastrephes bartrami	19.20	288 15.21	201
Rexea prometheoides	10.98	405 8.70	
Sepia pharaonis	9.15	327 7.25	
Saurida undosquamis	8.72	55 6.91	202
J E L L Y F I S H	6.62	0 5.25	
Argentina sphyraena	4.13	220 3.27	

LOVENIIDAE	3.74	86	2.96
Cynoglosus cf marlei	2.77	113	2.19
Citharoides macrolepis	2.61	29	2.07
Chaunax sp.	2.57	8	2.04
Tylerius spinosissimus	2.45	31	1.94
Peristedion weberi	2.41	105	1.91
Palinurus delagoae	2.22	6	1.76
Neoscombrops cynodon	1.83	12	1.45
Decapterus macrosoma	1.29	72	1.02
Synagrops japonicus	0.90	49	0.71
Champsodon capensis	0.90	150	0.71
LITHODIDAE	0.78	8	0.62
Uranoscopus archionema	0.74	4	0.59
Antigonia cf rubescens	0.74	41	0.59
Macrorhamphosus scolopax	0.70	60	0.56
Narcine rierai	0.62	4	0.49
Chaunax pictus	0.62	10	0.49
Lagocephalus guentheri	0.55	8	0.43
Sphyraena forsteri	0.51	2	0.40
Polysteganus coeruleopunctatus	0.51	2	0.40
Priacanthus hamrur	0.43	4	0.34
Scorpaena scrofa	0.43	6	0.34
Branchiostegus doliatus	0.43	2	0.34
CALAPPIDAE	0.31	4	0.25
Scyllarus batei	0.27	10	0.22
Hoplichthys cf. acanthopleurus	0.21	14	0.17
Eridacnis radcliffei	0.19	8	0.15
Lepidotrigla alcocki	0.19	6	0.15
Holohalaelurus punctatus	0.19	2	0.15
CIDARIDAE	0.18	2	0.14
Ateleopus natalensis	0.16	4	0.12
Herklotsichthys quadrimaculat.	0.16	2	0.12
Spicara australis	0.12	2	0.09
Rochinia sp.	0.08	2	0.06
Neobythites cf somaliaensis	0.08	2	0.06
Equulites elongatus	0.04	14	0.03
Ophichthus sp.	0.04	2	0.03
Bathyuroconger vicinus	0.04	2	0.03
Gonorhynchus gonorhynchus	0.02	2	0.02
Total	126.06		99.86

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 84
DATE :27/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 20°56.42
start stop duration Lon E 35°41.37
TIME :19:11:38 19:41:45 30.1 (min) Purpose : 3
LOG : 6237.31 6238.78 1.5 Region : 7420
FDEPTH: 68 73 Gear cond.: 0
BDEPTH: 68 73 Validity : 2
Towing dir: 0° Wire out : 195 m Speed : 2.9 kn
Sorted : 60 Total catch: 59.69 Catch/hour: 118.91

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Plotosus lineatus	33.03	892	27.78	
MYCTOPHIDAE	26.97	8428	22.68	
Sphyraena forsteri	11.55	86	9.72	
J E L L Y F I S H	9.04	0	7.61	
Ariomma indicum	5.38	42	4.52	
Priacanthus hamrur	3.47	38	2.91	
Synodus sp.	3.11	382	2.61	
Callionymus sp.	2.23	22	1.88	
Tetrosomus concatenatus	2.19	8	1.84	
Decapterus russelli	2.15	92	1.81	204
Lagocephalus guentheri	2.11	62	1.78	
Ostorhinchus apogonoides	2.03	347	1.71	
Trachinocephalus myops	1.67	54	1.41	
Penaeus latisulcatus	1.67	50	1.41	205
Upeneus bensasi	1.47	349	1.24	
Gonorhynchus gonorhynchus	1.31	38	1.11	
Dipturus lanceorostratus	1.24	4	1.04	
Nemipterus bipunctatus	1.16	48	0.97	
Trachypenaeus curvirostris	0.84	104	0.70	
Inioteuthis capensis	0.60	70	0.50	
Sepia prashadi	0.56	4	0.47	
Lutjanus lutjanus	0.48	8	0.40	
Octopus vulgaris	0.44	8	0.37	
Decapterus macrosoma	0.40	16	0.34	203
Ommastrephes bartrami	0.40	24	0.34	
Sepia hieronis	0.32	20	0.27	
Megokris sedili	0.32	84	0.27	
Apistus carinatus	0.32	16	0.27	
LITHODIDAE	0.28	2	0.23	
Pristotis cf. cyanostigma	0.28	80	0.23	
Sicyonia sp.	0.28	62	0.23	
CIDARIDAE	0.24	16	0.20	
Portunus sp.	0.24	56	0.20	
Bothus sp.	0.16	26	0.13	
Dactyloptena orientalis	0.16	2	0.13	
Charybdis smithii	0.16	26	0.13	
Ophichthus sp.	0.12	8	0.10	
Equulites elongatus	0.12	36	0.10	
Cociella crocodila	0.08	4	0.07	
Lestrolepis intermedia	0.08	6	0.07	
Dipterygonotus balteatus	0.08	14	0.07	
Hoplichthys cf. acanthopleurus	0.04	2	0.03	
Sepia australis	0.04	4	0.03	
Samaris cristatus	0.04	6	0.03	
Chelidonichthys kumu	0.04	4	0.03	
Amanses cf. scopas	0.01	4	0.01	
Fistularia petimba, juvenile	0.01	4	0.01	
Lysiosquilla hoevenii	0.00	2	0.00	
Uranoscopus archionema, juvenile	0.00	2	0.00	
Total	118.91		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 85
DATE :28/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 20°45.81
start stop duration Lon E 35°43.12
TIME :00:21:18 00:47:17 26.0 (min) Purpose : 3
LOG : 6277.70 6278.99 1.3 Region : 7420
FDEPTH: 55 56 Gear cond.: 0
BDEPTH: 55 56 Validity : 2
Towing dir: 0° Wire out : 170 m Speed : 3.0 kn
Sorted : 42 Total catch: 68.13 Catch/hour: 157.27

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachinocephalus myops	41.92	1318	26.66	
Nemipterus bipunctatus	14.04	434	8.92	208
Rhynchobatus djiddensis	12.47	2	7.93	
Lagocephalus sceleratus	9.83	420	6.25	
MYCTOPHIDAE	9.10	1471	5.78	
Ommastrephes bartrami	6.83	374	4.34	210
LAGANIDAE	6.79	898	4.32	
Abalistes stellatus	6.60	7	4.20	
Lactoria cornuta	5.75	16	3.65	
Solenocera sp.	5.61	1346	3.57	
Portunus sp.	4.27	1484	2.72	
Megokris sedili	4.16	748	2.64	
Tetrosomus concatenatus	3.67	18	2.33	
Torquigener hypselogenion	3.49	224	2.22	
Decapterus russelli	3.09	152	1.97	206
Pterois russelii	2.33	9	1.48	
Thenus orientalis	2.01	12	1.28	
Upeneus bensasi	1.71	956	1.09	207
J E L L Y F I S H	1.59	0	1.01	
PENAEIDAE	1.48	252	0.94	
Synodus binotatus	1.11	81	0.70	
Ophichthus sp.	0.97	81	0.62	
Sepia hieronis	0.92	9	0.59	
Equulites elongatus	0.92	148	0.59	
Pristotis cf. cyanostigma	0.85	390	0.54	
Charybdis feriata	0.85	2	0.54	
Penaeus latisulcatus	0.83	32	0.53	209
Bothus sp.	0.74	67	0.47	
Echeneis naucrates	0.67	2	0.43	
Apistus carinatus	0.55	39	0.35	
Saurida undosquamis	0.48	16	0.31	
Decapterus macrosoma	0.30	12	0.19	
Inioteuthis capensis	0.30	55	0.19	
Leiognathus sp., juvenile	0.25	21	0.16	
MONACANTHIDAE	0.18	39	0.12	
Apogon sp.	0.08	81	0.05	
Nettastoma parviceps	0.07	28	0.04	
Sicyonia lancifer	0.07	7	0.04	
Octopus vulgaris	0.07	2	0.04	
Fistularia commersonii	0.07	12	0.04	
Nudibranch sp	0.06	18	0.04	
STOMATOPODA	0.06	21	0.04	
Cociella sp.	0.04	2	0.03	
Samaris cristatus	0.03	2	0.02	
Callionymus sp.	0.02	2	0.01	
Uranoscopus archionema, juvenile	0.02	2	0.01	
Priacanthus sp., juvenile	0.01	2	0.01	
Bregmaceros sp.	0.00	2	0.00	
Total	157.27		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 86
DATE :28/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 20°32.55
start stop duration Lon E 35°50.40
TIME :08:43:32 09:13:34 30.0 (min) Purpose : 3
LOG : 6322.30 6324.19 1.9 Region : 7420
FDEPTH: 62 63 Gear cond.: 0
BDEPTH: 62 63 Validity : 0
Towing dir: 0° Wire out : 180 m Speed : 3.8 kn
Sorted : 0 Total catch: 99.00 Catch/hour: 197.74

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Decapterus russelli	48.12	2567	24.33	212
Carcharhinus sealei	30.92	10	15.64	
Upeneus bensasi	25.89	4045	13.09	213
Pristotis cf. cyanostigma	24.87	4933	12.58	
Equulites elongatus	18.42	5525	9.31	
Echeneis naucrates	13.22	20	6.69	
Abalistes stellatus	13.10	10	6.63	
Lactoria diaphana	6.01	20	3.04	
Lophodiodon calori	5.61	20	2.84	
Thenus orientalis	3.22	20	1.63	
Diodon hystrix	3.08	2	1.56	
Decapterus macrosoma	2.00	82	1.01	211
Nemipterus bipunctatus	1.20	20	0.61	
Cociella sp.	0.80	20	0.40	
Portunus sp.	0.80	282	0.40	
Sepia hieronis	0.40	2	0.20	
Heniochus acuminatus	0.08	20	0.04	
Total	197.72		99.99	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 87
DATE :28/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 20°14.61
start stop duration Lon E 35°48.49
TIME :15:22:05 15:47:24 25.3 (min) Purpose : 3
LOG : 6373.47 6374.80 1.3 Region : 7420
FDEPTH: 55 54 Gear cond.: 0
BDEPTH: 55 54 Validity : 0
Towing dir: 0° Wire out : 170 m Speed : 3.2 kn
Sorted : 376 Total catch: 376.00 Catch/hour: 891.00

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
CORAL	347.76	0	39.03	
Abalistes stellatus	261.75	277	29.38	
R A Y S	118.48	2	13.30	
Carcharhinus sealei	47.35	21	5.31	
Epinephelus coioides	19.72	2	2.21	
Epinephelus sp.	17.75	2	1.99	
Diagramma pictum	13.08	2	1.47	
Lethrinus crocineus	11.04	2	1.24	
Lutjanus sanguineus	7.16	2	0.80	
Gymnocranius griseus	5.50	28	0.62	
Sphyraena jello	4.31	2	0.48	
Argyrops filamentosus	3.91	2	0.44	
Nemipterus japonicus	3.60	52	0.40	
Acroteriobatus leucospilus	3.08	2	0.35	
Diodon hystrix	2.61	5	0.29	
ASTEROIDEA	2.35	5	0.26	0
Lactoria cornuta	2.32	5	0.26	
Ostracion cubicus	2.18	2	0.24	
Diodon holocanthus	2.04	5	0.23	
Tetrosomus concatenatus	1.99	5	0.22	
Carangoides malabaricus	1.66	12	0.19	

Lethrinus nebulosus	1.37	26	0.15
Lagocephalus lunaris	1.18	2	0.13
Lagocephalus guentheri	1.09	14	0.12
Cociella crocodila	1.04	28	0.12
Upeneus moluccensis	1.04	59	0.12
Fistularia commersonii	0.95	14	0.11
Ophidiasteridae	0.62	9	0.07
Nemipterus bipunctatus	0.57	19	0.06
Parupeneus sp.	0.55	2	0.06
Sepia sp.	0.47	17	0.05
E C H I N O D E R M A T A	0.47	2	0.05
ASTEROIDEA	0.35	5	0.04
PTERASTERIDAE	0.33	5	0.04
Aluterus monoceros	0.24	2	0.03
Pristotis cf. cyanostigma	0.24	31	0.03
Canthigaster jantinoptera	0.19	7	0.02
Heniochus acuminatus	0.17	2	0.02
Calappa sp.	0.13	2	0.01
Priacanthus hamrur	0.12	5	0.01
Lethrinus sp.	0.07	9	0.01
Pseudalutarius nasicornis	0.05	5	0.01
Fistularia petimba	0.05	2	0.01
Paramonacanthus pusillus	0.02	2	0.00
TETRAODONTIDAE, juvenile	0.02	2	0.00
Arothron stellatus, juvenile	0.01	2	0.00
Synodus sp.	0.01	2	0.00
Labroides dimidiatus	0.01	2	0.00
Ophiuroidea	0.00	2	0.00
Total	891.00		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 88
DATE :28/02/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 20°4.01
start stop duration Lon E 36°7.69
TIME :20:37:26 20:58:53 21.5 (min) Purpose : 3
LOG : 6416.53 6417.49 1.0 Region : 7420
FDEPTH: 63 65 Gear cond.: 0
BDEPTH: 63 65 Validity : 2
Towing dir: 0° Wire out : 190 m Speed : 2.7 kn
Sorted : 20 Total catch: 148.14 Catch/hour: 414.38

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Upeneus bensasi	114.57	1169	27.65	216
Abalistes stellatus	46.15	28	11.14	
Lethrinus nebulosus	34.97	8	8.44	
Gymnocranius grandoculis	32.28	6	7.79	
Rhina ancylostoma	24.00	3	5.79	
Selar crumenophthalmus	22.69	176	5.47	215
Diagramma pictum	18.85	3	4.55	
Lutjanus sebae	16.73	3	4.04	
Decapterus russelli	12.70	327	3.06	214
Ommastrephes bartrami	9.34	151	2.25	218
Synodus binotatus	9.34	607	2.25	
Gymnocranius griseus	9.17	31	2.21	
Nemipterus bipunctatus	8.90	129	2.15	217
Trachinocephalus myops	7.72	199	1.86	
Lutjanus malabaricus	6.55	151	1.58	
Thenus orientalis	6.07	22	1.46	
CIDARIDAE	5.62	11	1.36	
Lagocephalus sp.	4.67	22	1.13	
Plotosus lineatus	4.45	165	1.07	
Diodon holocanthus	3.75	11	0.90	
Priacanthus hamrur	2.10	92	0.51	
Ostorhinchus apogonoides	2.10	280	0.51	
Cyclichthys sp.	1.65	11	0.40	
Saurida undosquamis	1.17	36	0.28	
Torquigener hypselogenion	0.95	11	0.23	
Pristotis cyanostigma	0.92	129	0.22	
Gonorhynchus gonorhynchus	0.92	22	0.22	
Starfish	0.92	11	0.22	
Charybdis smithii	0.70	22	0.17	
Sepia hieronis	0.70	70	0.17	
Lutjanus bengalensis	0.70	11	0.17	
Penaeus latisulcatus	0.70	22	0.17	
Equulites elongatus	0.48	70	0.11	
Portunus sp.	0.25	81	0.06	
Octopus vulgaris	0.22	11	0.05	
Chelidonichthys kumu	0.22	11	0.05	
Dactyloptena orientalis	0.22	11	0.05	
Decapterus macrosoma	0.22	11	0.05	0
Decapterus macrosoma	0.22	22	0.05	
Paramonacanthus pusillus	0.14	22	0.03	
Scorpaena scrofa	0.14	11	0.03	
Upeneus cf. guttatus	0.11	59	0.03	
Starfish	0.06	22	0.01	0
LEUCOSIIDAE	0.03	11	0.01	
Total	414.38		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 89
DATE :01/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°57.18
start stop duration Lon E 35°47.24
TIME :00:08:00 00:29:24 21.4 (min) Purpose : 3
LOG : 6444.43 6445.60 1.2 Region : 7420
FDEPTH: 49 46 Gear cond.: 0
BDEPTH: 49 46 Validity : 2
Towing dir: 0° Wire out : 170 m Speed : 3.3 kn
Sorted : 43 Total catch: 43.36 Catch/hour: 121.52

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Saurida undosquamis	39.74	869	32.70	227
Nemipterus bipunctatus	12.22	163	10.05	224
Upeneus bensasi	11.94	502	9.83	223
Stephanolepis auratus	8.46	1250	6.96	
Trachinocephalus myops	6.67	261	5.49	
Decapterus russelli	4.92	199	4.05	221
Loligo forbesi	4.60	62	3.78	
Parapriacanthus ransonneti	4.48	1020	3.69	
Carangoides malabaricus	2.91	95	2.40	219
Rastrelliger kanagurta	2.86	34	2.35	225
Thenus orientalis	2.75	14	2.26	
Trachypenaeus curvirostris	2.19	443	1.80	
Selar crumenophthalmus	2.02	17	1.66	222
J E L L Y F I S H	2.02	0	1.66	
Lagocephalus sceleratus	1.91	87	1.57	
Lutjanus lutjanus	1.57	45	1.29	
Apistus carinatus	1.57	149	1.29	
Paramonacanthus nematophorus	1.18	182	0.97	
Torquigener hypselogenion	1.06	70	0.88	
Funchalia woodwardi	0.95	137	0.78	
Stichopus sp.	0.78	6	0.65	
Thamnaconus modestoides	0.67	78	0.55	
Soft corals	0.56	0	0.46	
Leiognathus lineolatus	0.39	50	0.32	
Decapterus macrosoma	0.35	14	0.29	220
Sepia hieronis	0.34	34	0.28	
Priacanthus hamrur	0.34	8	0.28	
Penaeus latisulcatus	0.28	17	0.23	226
Bothus myriaster	0.25	6	0.21	
Engyprosopon grandisquama	0.25	59	0.21	
Cociella sp.	0.22	11	0.18	
Gymnocranius griseus	0.17	14	0.14	
Ophichthus sp.	0.14	6	0.12	
Bothus swio	0.14	6	0.12	
Loligo sp.	0.11	14	0.09	
Octopus vulgaris	0.08	6	0.07	
Pterois miles	0.06	3	0.05	
Synodus CF dermatogenys	0.06	6	0.05	
Inioteuthis capensis	0.06	25	0.05	
Bregmaceros sp.	0.03	87	0.03	
Callionymus cf persicus	0.03	3	0.03	
Cynoglossus cf marleyi	0.03	3	0.02	
Abalistes stellatus	0.03	3	0.02	
Hippocampus sp.	0.03	3	0.02	
Alectis ciliaris	0.03	3	0.02	
Dipterygonotus balteatus	0.03	8	0.02	
Argonauta sp.	0.02	3	0.01	
Portunus sp.	0.02	3	0.01	
Philine aperta	0.01	6	0.01	
Fistularia petimba	0.00	6	0.00	
Heniochus acuminatus	0.00	3	0.00	
Total	121.52		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 90
DATE :01/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°42.69
start stop duration Lon E 35°39.48
TIME :04:47:24 05:17:47 30.4 (min) Purpose : 3
LOG : 6486.14 6487.60 1.5 Region : 7420
FDEPTH: 34 29 Gear cond.: 0
BDEPTH: 34 29 Validity : 0
Towing dir: 0° Wire out : 145 m Speed : 2.9 kn
Sorted : 78 Total catch: 77.67 Catch/hour: 153.35

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Scomberomorus commerson	56.94	20	37.13	231
Loligo sp.	39.01	1654	25.44	
Nemipterus bipunctatus	14.81	419	9.66	
Saurida undosquamis	8.13	444	5.30	232
Portunus sanguinolento	5.80	34	3.79	229
Upeneus bensasi	3.75	225	2.45	230
Carangoides coeruleopinnatus	2.92	195	1.91	
Decapterus russelli	2.92	195	1.91	228
Carangoides malabaricus	2.84	75	1.85	
Priacanthus hamrur	2.65	53	1.73	
Fistularia commersonii	2.65	180	1.73	
Carangoides sp.	1.74	203	1.13	
Rhizoprionodon acutus	1.30	2	0.85	
UNIDENTIFIED FISH	1.22	237	0.80	
Psettodes erumei	1.07	1	0.70	
Lagocephalus guentheri	1.03	61	0.67	
Sepia pharaonis	0.63	8	0.41	
Thenus orientalis	0.59	6	0.39	
Ariomma indicum	0.51	32	0.33	
Chirocentrus sp.	0.47	2	0.31	
J E L L Y F I S H	0.47	24	0.31	
Torquigener sp.	0.36	28	0.23	
Lutjanus sebae	0.32	18	0.21	
Upeneus moluccensis	0.28	18	0.18	
Charybdis natator	0.24	2	0.15	
Trachinocephalus myops	0.18	4	0.12	
SCYLLARIDAE	0.16	16	0.10	
Cociella crocodila	0.12	24	0.08	
SEAWEED	0.12	0	0.08	
Apistus carinatus	0.04	4	0.03	
Echeneis naucrates	0.02	2	0.01	
Carangoides ferdau	0.02	4	0.01	
Trichiurus lepturus	0.02	2	0.01	
Alepes djedaba	0.02	2	0.01	
Total	153.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 91
DATE :01/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°48.95
start stop duration Lon E 35°57.66
TIME :07:33:08 08:03:18 30.2 (min) Purpose : 3
LOG : 6506.94 6508.49 1.6 Region : 7420
FDEPTH: 44 47 Gear cond.: 0
BDEPTH: 44 47 Validity : 0
Towing dir: 0° Wire out : 150 m Speed : 3.1 kn
Sorted : 0 Total catch: 56.98 Catch/hour: 113.32

SPECIES	CATCH/HOUR weight	% OF TOT. C numbers		SAMP
Saurida undosquamis	42.52	6	37.52	234
Decapterus macrosoma	18.16	6	16.02	233
Scomberomorus commerson	13.68	6	12.07	
Decapterus russelli	8.45	141	7.46	
Nemipterus bipunctatus	7.54	0	6.65	
Sphyraena putnamae	6.88	0	6.07	
Abalistes stellatus	6.46	424	5.70	
Thenus orientalis	2.25	14	1.98	
Lagocephalus lunaris	1.65	6	1.46	
Sepia pharaonis	1.33	6	1.18	
J E L L Y F I S H	0.84	10	0.74	
Carangoides coeruleopinnatus	0.76	68	0.67	
Upeneus bensasi	0.66	14	0.58	
Trichiurus lepturus	0.58	46	0.51	
SEAWEED	0.38	0	0.33	
Carangoides malabaricus	0.30	22	0.26	
Torquigener hypselogenion	0.16	6	0.14	

Trachinocephalus myops	0.16	10	0.14
Fistularia commersonii	0.12	18	0.11
Carangoides ferdau	0.12	6	0.11
Parabothus cf. coarctus	0.12	6	0.11
Cociella crocodila	0.08	6	0.07
Halieutaea sp.	0.08	10	0.07
Trachypenaeus curvirostris	0.04	14	0.04
G A S T R O P O D S	0.02	6	0.02
Total	113.32		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 92
DATE :01/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 20°0.16
start stop duration Lon E 36°16.51
TIME :11:05:07 11:35:42 30.6 (min) Purpose : 3
LOG : 6530.94 6532.54 1.6 Region : 7420
FDEPTH: 89 88 Gear cond.: 0
BDEPTH: 89 88 Validity : 0
Towing dir: 0° Wire out : 260 m Speed : 3.1 kn
Sorted : 0 Total catch: 14.51 Catch/hour: 28.49

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Parageleus leucolomatus	12.17	12	42.72	
Dactyloptena peterseni	4.32	4	15.16	
Upeneus bensasi	2.24	255	7.85	235
PORIFERA (Sponges)	1.57	4	5.51	
Synodus binotatus	1.41	84	4.96	
Tetrosomus concatenatus	1.30	6	4.55	
Sepia pharaonis	1.06	29	3.72	
SALPS	0.82	0	2.89	
Ommastrephes bartrami	0.75	90	2.62	237
Leiognathus lineolatus	0.59	80	2.07	
Nemipterus bipunctatus	0.59	8	2.07	236
Sepia hieronis	0.59	27	2.07	
Thenus orientalis	0.55	2	1.93	
Brissidae	0.24	27	0.83	
Fistularia petimba	0.12	4	0.41	
Soft corals	0.08	0	0.28	
Paramonacanthus pusillus	0.04	16	0.14	
Ariomma indicum	0.02	2	0.07	
Sea urchin	0.02	2	0.07	
Dipterygonotus balteatus	0.02	2	0.07	
Portunus sp.	0.01	2	0.03	
Total	28.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 93
DATE :01/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 20°2.39
start stop duration Lon E 36°18.17
TIME :12:58:58 13:27:49 28.8 (min) Purpose : 3
LOG : 6539.27 6540.78 1.5 Region : 7420
FDEPTH: 162 165 Gear cond.: 0
BDEPTH: 162 165 Validity : 0
Towing dir: 0° Wire out : 430 m Speed : 3.1 kn
Sorted : 36 Total catch: 36.19 Catch/hour: 75.29

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ateleopus natalensis	16.35	75	21.72	
Loligo forbesi	13.23	343	17.57	
Upeneus vittatus	11.19	795	14.87	239
Decapterus kurroides	7.95	79	10.56	238
Saurida undosquamis	4.91	50	6.52	241
Satyrichthys adeni	3.04	10	4.03	
Tylerius spinosissimus	2.62	135	3.48	
Lophiodes insidiator	2.41	2	3.21	
Scyllarides elisabethae	2.29	4	3.04	0
Chelidonichthys kumu	1.29	62	1.71	
J E L L Y F I S H	1.25	0	1.66	
Dactyloptena peterseni	1.21	2	1.60	
Sphoeroides pachgaster	1.12	4	1.49	
Rhinobatos sp.	0.92	2	1.22	
Ommastrephes bartrami	0.67	50	0.88	240
Sepia prashadi	0.58	4	0.77	
Halieutaea sp.	0.50	12	0.66	
Scyllarides elisabethae	0.50	31	0.66	
Ibacus novemdentatus	0.50	12	0.66	
Branchiostegus doliatus	0.50	4	0.66	
Ariomma indicum	0.33	4	0.44	
Champsodon capensis	0.33	64	0.44	
Citharoides macrolepis	0.29	6	0.39	
Ophichthus sp.	0.17	2	0.22	
Sepia sp.	0.14	2	0.18	
Caryophilidae indetCV1	0.12	54	0.17	
Starfish	0.12	56	0.17	
PORIFERA (Sponges)	0.10	0	0.14	
CIDARIDAE	0.10	4	0.14	
Penaeus marginatus	0.08	2	0.11	
Parapenaeus sp.	0.08	8	0.11	
Antigonia cf. rubescens	0.08	10	0.11	
Echinocardium sp.	0.08	8	0.11	
Rexea prometheoides	0.05	2	0.06	
Chaunax sp.	0.04	2	0.06	
Paramonacanthus pusillus	0.04	8	0.06	
Citharichthys sp.	0.04	2	0.06	
Flabellum	0.02	2	0.03	
Starfish	0.01	0	0.02	0
Soft corals	0.00	0	0.00	
Priacanthus hamrur	0.00	2	0.00	
Naso brevirostris, juvenile	0.00	2	0.00	
LOVENIIDAE	0.00	4	0.00	
Brama orcini, juvenile	0.00	2	0.00	
Total	75.29		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 94
DATE :01/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°45.69
start stop duration Lon E 36°20.78
TIME :21:59:38 22:27:49 28.2 (min) Purpose : 3
LOG : 6590.41 6591.98 1.6 Region : 7420
FDEPTH: 70 22 Gear cond.: 0
BDEPTH: 70 22 Validity : 2
Towing dir: 0° Wire out : 220 m Speed : 3.3 kn
Sorted : 102 Total catch: 102.45 Catch/hour: 217.99

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Rhizoprionodon acutus	67.49	21	30.96	
Saurida undosquamis	33.02	862	15.15	249
Rhynchobatus sp.	26.60	2	12.20	
Decapterus russelli	16.26	543	7.46	244
Nemipterus bipunctatus	13.06	287	5.99	247
Trachinocephalus myops	12.38	321	5.68	
Loligo forbesi	5.70	149	2.62	
Sepia pharaonis	4.06	43	1.86	
Leiognathus lineolatus	4.00	668	1.83	
Sphyraena barracuda	3.19	2	1.46	
Lepidotrigla alcocki	3.09	160	1.42	
Diodon hystrix	2.47	2	1.13	
Penaeus latisulcatus	2.21	60	1.02	248
Synodus binotatus	2.19	302	1.01	
Lagocephalus guentheri	2.17	40	1.00	
Upeneus bensasi	2.04	87	0.94	246
Decapterus macrosoma	1.79	43	0.82	243
Stephanolepis auratus	1.70	287	0.78	
Remora remora	1.45	2	0.66	
Abalistes stellaris	1.32	4	0.61	
Priacanthus hamrur	1.23	19	0.57	
Ostorhinchus apogonoides	1.19	487	0.55	
Tetrosomus concatenatus	1.19	6	0.55	
Gonorhynchus gonorhynchus	1.11	28	0.51	
Apogon spilurus	0.96	387	0.44	
Trachypenaeus curvirostris	0.60	68	0.27	
Octopus vulgaris	0.53	9	0.24	
Dactyloptena orientalis	0.51	13	0.23	
Carangoides malabaricus	0.47	2	0.21	242
CIDARIDAE	0.45	6	0.20	
Callionymus sp.	0.38	28	0.18	
Champsodon capensis	0.36	117	0.17	
Fistularia petimba	0.28	40	0.13	
Portunus sp.	0.28	60	0.13	
Scorpaena sp.	0.26	9	0.12	
Samaris cristatus	0.26	26	0.12	
Lophiodes insidiator	0.23	2	0.11	
Inioteuthis capensis	0.23	123	0.11	
Apistus carinatus	0.21	11	0.10	
Selar crumenophthalmus	0.21	2	0.10	245
J E L L Y F I S H	0.19	0	0.09	
Echinus gilchristi ?	0.15	6	0.07	
Philine aperta	0.13	55	0.06	
Choridactylus natalensis	0.13	4	0.06	
Starfish	0.11	2	0.05	
Torquigener hypselogenion	0.04	2	0.02	
Sicyonia lancifer	0.04	9	0.02	
Ommastrephes bartrami	0.04	2	0.02	
Ophichthus sp.	0.01	2	0.00	
PECTINIDAE	0.01	2	0.00	
RANELLIDAE (=CYMATIIDAE)	0.01	2	0.00	
Bregmaceros sp.	0.00	9	0.00	
Citharichthys sp.	0.00	2	0.00	
Total	217.99		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 95
DATE :02/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°34.35
start stop duration Lon E 35°55.15
TIME :03:21:07 03:44:05 23.0 (min) Purpose : 3
LOG : 6630.64 6631.83 1.2 Region : 7420
FDEPTH: 35 32 Gear cond.: 0
BDEPTH: 35 32 Validity : 2
Towing dir: 0° Wire out : 140 m Speed : 3.1 kn
Sorted : 31 Total catch: 30.92 Catch/hour: 80.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
LOLIGINIDAE	58.12	2234	71.93	
Saurida undosquamis	5.33	115	6.60	251
Sepia pharaonis	5.28	44	6.53	
Alepes djedaba	3.19	110	3.95	
J E L L Y F I S H	1.36	0	1.68	
Trachinocephalus myops	1.31	60	1.62	
Torquigener hypselogenion	1.05	29	1.29	
Nemipterus bipunctatus	1.05	39	1.29	
Bothus sp.	0.57	65	0.71	
Paramonacanthus pusillus	0.52	97	0.65	
Selar crumenophthalmus	0.42	8	0.52	
Octopus cyaneus	0.37	5	0.45	
ECHINOMETRIDAE	0.26	5	0.32	
Decapterus russelli	0.26	24	0.32	250
Rastrelliger kanagurta	0.26	8	0.32	
Terapon jarbua	0.24	3	0.29	
Carangoides coeruleopinnatus	0.21	24	0.26	
Lagocephalus guentheri	0.21	10	0.26	
Ariomma indicum	0.16	10	0.19	
Upeneus bensasi	0.16	10	0.19	
Charybdis natator	0.10	3	0.13	
Priacanthus cf. hamrur	0.10	3	0.13	
Fistularia commersonii	0.05	0	0.06	
Penaeus latisulcatus	0.05	5	0.06	
Callionymus sp.	0.05	3	0.06	
TURBINIDAE	0.03	3	0.03	
Callionymus cf persicus	0.03	3	0.03	
SCORPAENIDAE, juvenile	0.03	3	0.03	
Samaris cristatus	0.03	3	0.03	
Cociella crocodila	0.03	3	0.03	
Total	80.80		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 96
DATE :02/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°24.76
start stop duration Lon E 35°40.30
TIME :06:12:52 06:43:50 31.0 (min) Purpose : 3
LOG : 6650.42 6652.46 2.0 Region : 7420
FDEPTH: 21 20 Gear cond.: 0
BDEPTH: 21 20 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 4.0 kn
Sorted : 0 Total catch: 1200.00 Catch/hour: 2324.83

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pellona ditchela	1060.67	109430	45.62	257
Thryssa vitrirostris	447.49	75123	19.25	254

Secutor insidiator	251.99	5270	10.84	
Otolithes ruber	191.70	1048	8.25	258
Pomadasys maculatus	69.18	1461	2.98	255
Upeneus taeniopterus	68.54	3588	2.95	256
Scomberoides tol	37.45	510	1.61	
Sphyraena flavicauda	24.12	223	1.04	
J E L L Y F I S H	24.12	33	1.04	
Ariomma indicum	22.84	572	0.98	
Sardinops sp.	19.68	1968	0.85	
Sardinella albella	15.87	1746	0.68	253
Polydactylus sextarius	15.23	541	0.66	
Carangoides malabaricus	10.79	128	0.46	252
Scomberoides commersonianus	9.42	2	0.41	
Trichiurus lepturus	8.89	192	0.38	265
Scomberomorus plurilineatus	8.37	4	0.36	261
Psettodes erumei	5.08	33	0.22	
Johnius amblycephalus	4.44	64	0.19	
Gazza minuta	4.44	159	0.19	
Rastrelliger kanagurta	4.44	97	0.19	
Parastromateus niger	3.82	382	0.16	
Scomber japonicus	2.85	351	0.12	259
Loligo duvauceli	2.85	128	0.12	
Scomberomorus commerson	2.32	19	0.10	260
Metapenaeus monoceros	2.23	97	0.10	264
Saurida undosquamis	1.90	64	0.08	
Penaeus indicus	1.59	33	0.07	262
Terapon jarbua	1.59	33	0.07	
Penaeus semisulcatus	0.64	33	0.03	263
Matuta cf lunaris	0.15	33	0.01	
Lagocephalus lunaris	0.14	33	0.01	
Total	2324.81		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 97
DATE :02/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°16.80
start stop duration Lon E 35°56.67
TIME :09:08:53 09:38:48 29.9 (min) Purpose : 3
LOG : 6672.83 6674.43 1.6 Region : 7420
FDEPTH: 25 22 Gear cond.: 0
BDEPTH: 25 22 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.2 kn
Sorted : 0 Total catch: 66.96 Catch/hour: 134.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	75.24	1123	56.03	
Alectis indica	19.81	76	14.75	
Upeneus vittatus	18.69	1199	13.92	266
Scomberomorus commerson	10.07	10	7.50	
Alepes djedaba	2.61	217	1.94	
Saurida undosquamis	2.61	40	1.94	
Loligo forbesi	1.32	78	0.99	
Chirocentrus dorab	1.28	2	0.96	
Ariomma indicum	0.68	48	0.51	267
Matuta cf lunaris	0.52	60	0.39	
Portunus sanguinolentus	0.44	2	0.33	
Gerres filamentosus	0.28	14	0.21	
Lagocephalus guentheri	0.16	2	0.12	
Carangoides malabaricus	0.16	4	0.12	
Parastromateus niger	0.12	10	0.09	
Secutor insidiator	0.12	8	0.09	
PORIFERA (Sponges)	0.10	4	0.07	
Metapenaeus monoceros	0.04	2	0.03	
Upeneus bensasi	0.02	2	0.01	
Alectis ciliaris	0.01	2	0.00	
Total	134.28		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 98
DATE :02/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°27.69
start stop duration Lon E 36°15.11
TIME :12:08:23 12:39:02 30.6 (min) Purpose : 3
LOG : 6693.43 6694.69 1.3 Region : 7420
FDEPTH: 37 37 Gear cond.: 0
BDEPTH: 37 37 Validity : 0
Towing dir: 0° Wire out : 125 m Speed : 2.5 kn
Sorted : 31 Total catch: 316.30 Catch/hour: 619.39

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus russelli	235.73	17348	38.06	269
J E L L Y F I S H	179.55	0	28.99	
Loligo forbesi	85.42	4480	13.79	
Equulites elongatus	63.78	10629	10.30	
Scomberoides commersonianus	20.87	4	3.37	
Scomberomorus commerson	8.62	2	1.39	
Upeneus bensasi	6.07	950	0.98	270
Rastrelliger kanagurta	4.93	323	0.80	271
Thenus orientalis	4.17	20	0.67	
Decapterus macrosoma	2.94	323	0.47	268
Lactoria fornasini	2.43	6	0.39	
Nemipterus bipunctatus	1.90	20	0.31	
Paramonacanthus pusillus	1.14	286	0.18	
Sepia pharaonis	0.76	20	0.12	
Ariomma indicum	0.51	59	0.08	
Alectis ciliaris	0.29	59	0.05	
Matuta cf lunaris	0.20	20	0.03	
Total	619.31		99.99	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 99
DATE :02/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°36.42
start stop duration Lon E 36°29.82
TIME :14:58:05 15:29:28 31.4 (min) Purpose : 3
LOG : 6709.94 6711.65 1.7 Region : 7420
FDEPTH: 69 79 Gear cond.: 0
BDEPTH: 69 79 Validity : 0
Towing dir: 0° Wire out : 200 m Speed : 3.3 kn
Sorted : 93 Total catch: 92.92 Catch/hour: 177.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ommastrephes bartrami	113.08	21202	63.62	
Rhizoprionodon acutus	47.32	25	26.63	
Nemipterus bipunctatus	4.36	153	2.45	274
Decapterus russelli	4.28	237	2.41	273
Decapterus macrosoma	2.41	19	1.36	272
Sepia pharaonis	2.10	11	1.18	
Abalistes stellaris	1.72	2	0.97	
CORAL	0.80	27	0.45	
SEA URCHINS	0.42	2	0.24	
Synodus 'yellowpectoral'	0.31	19	0.17	
Octopus cyaneus	0.19	2	0.11	
Glass sponge	0.19	2	0.11	
Nemipterus japonicus	0.15	2	0.09	
Trachinocephalus myops	0.11	4	0.06	
Equulites elongatus	0.08	6	0.04	
Lagocephalus guentheri	0.06	2	0.03	
Upeneus moluccensis	0.04	2	0.02	
Fistularia commersonii	0.04	2	0.02	
Ariomma indicum	0.04	2	0.02	
Callionymus sp.	0.02	2	0.01	
Total	177.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 100
DATE :02/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°41.17
start stop duration Lon E 36°43.47
TIME :18:24:38 18:55:59 31.4 (min) Purpose : 3
LOG : 6729.60 6731.08 1.5 Region : 7420
FDEPTH: 643 642 Gear cond.: 0
BDEPTH: 643 642 Validity : 0
Towing dir: 0° Wire out : 1400 m Speed : 2.8 kn
Sorted : 38 Total catch: 86.00 Catch/hour: 164.54

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Coelorinchus sp.	50.78	1092	30.86	
Chlorophthalmus agassizi	26.29	364	15.98	
Coloconger scholesi	22.77	138	13.84	
Malacocephalus laevis	15.15	166	9.21	
MACROURIDAE	8.72	111	5.30	
Haliporoides triarthrus	5.82	232	3.53	276
Metanephrops andamanicus	5.40	115	3.28	
PORIFERA (Sponges)	5.36	107	3.26	
J E L L Y F I S H	2.91	4	1.77	
Aristeus antennatus	2.32	107	1.41	275
Hydrolagus sp.	2.01	4	1.22	
Neoscopelus sp.	1.66	65	1.01	
Sicyonia sp.	1.28	69	0.78	
ANTHOZOA (Sea anemones)	1.11	21	0.67	
Neobythites analis	1.11	31	0.67	
Heterocarpus sp.	1.07	31	0.65	
Aristaeopsis edwardsiana	1.03	4	0.63	
Nettastoma parviceps	0.94	8	0.57	
Laemonema globiceps	0.82	4	0.50	
Neoscombrops cynodon	0.82	4	0.50	
Plesionika martia	0.77	180	0.47	
Austrorossia enigmatica	0.69	17	0.42	
Hoplostethus mediterraneus	0.59	8	0.36	
UNIDENTIFIED FISH	0.52	4	0.31	
ISOPODS	0.52	25	0.31	
Histioteuthis bonnellii	0.52	4	0.31	
MYCTOPHIDAE	0.48	197	0.29	
Starfish	0.42	8	0.26	
Ophichthus marginatus	0.42	4	0.26	
Sicyonia sp.	0.42	159	0.26	0
Aristaeomorpha foliacea	0.38	17	0.23	
Heterocarpus sp.	0.28	21	0.17	0
INACHIDAE	0.25	4	0.15	
Neolithodes capensis	0.25	17	0.15	
Satyrichthys adeni	0.21	8	0.13	
Stereomastis sculpta	0.17	13	0.10	
Oplophoris sp.	0.17	55	0.10	
Stomias boa boa	0.08	4	0.05	
Total	164.49		99.97	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 101
DATE :02/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°27.75
start stop duration Lon E 36°48.33
TIME :21:57:24 22:30:44 33.3 (min) Purpose : 3
LOG : 6752.39 6754.10 1.7 Region : 7420
FDEPTH: 232 223 Gear cond.: 0
BDEPTH: 232 223 Validity : 0
Towing dir: 0° Wire out : 550 m Speed : 3.1 kn
Sorted : 46 Total catch: 46.25 Catch/hour: 83.25

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia hieronis	10.59	257	12.71	
Haliporoides triarthrus	10.41	261	12.50	278
Saurida undosquamis	8.93	68	10.73	279
MYCTOPHIDAE	8.06	295	9.69	
Squalus megalops	7.96	9	9.56	
Narcine rierai	6.91	67	8.30	
MYCTOPHIDAE	4.79	997	5.75	0
Citharoides macrolepis	3.24	43	3.89	
Synagrops japonicus	2.68	41	3.22	
Satyrichthys adeni	1.91	2	2.29	
Aristaeomorpha foliacea	1.80	88	2.16	277
Malacocephalus laevis	1.33	65	1.60	
Chelidonichthys kumu	1.31	41	1.58	
Ommastrephes bartrami	1.12	13	1.34	
Rexea prometheoides	1.08	13	1.30	
Antigonia cf rubescens	1.01	59	1.21	
LAGANIDAE	0.99	16	1.19	
Lophiodes insidiator	0.97	2	1.17	
Peristedion weberi	0.86	45	1.04	
Cynoglossus capensis	0.72	34	0.86	
Ibacus novemdentatus	0.59	34	0.71	
Stolephorus indicus	0.59	90	0.71	
Halieutaea sp.	0.50	9	0.61	
Caelorinchus braueri	0.45	9	0.54	
Chaunax sp.	0.43	5	0.52	
Tylerius spinosissimus	0.40	11	0.48	
Citharichthys sp.	0.32	14	0.39	
Scyllarus batei	0.29	29	0.35	
Champsodon capensis	0.23	36	0.28	
Clypeaster	0.22	2	0.26	
Taeniopsetta ocellata	0.22	5	0.26	
Uranoscopus archionema	0.20	2	0.24	
Ophichthus sp.	0.20	7	0.24	

Uroconger lepturus	0.18	5	0.22	
Chlorophthalmus agassizi	0.14	2	0.17	
Neoscombrops cynodon	0.13	2	0.15	
Dipturus cf lanceorostratus	0.13	2	0.15	
Holohalaelurus punctatus	0.13	2	0.15	
Austrorossia enigmatica	0.11	4	0.13	
Triacanthodes ethiops	0.11	4	0.13	
Lithodes ferox	0.11	9	0.13	
Sepia pharaonis	0.11	2	0.13	
Pterygosquilla armata capensis	0.11	4	0.13	
Ophichthus sp.	0.09	4	0.11	0
Pterocaesio marri	0.09	2	0.11	
Stereomastis sp.	0.07	2	0.09	
Unidentified crab	0.06	2	0.07	
Nephropsis stewarti	0.05	7	0.06	
Gonorhynchus gonorhynchus	0.05	2	0.06	
Physiculus natalensis	0.05	2	0.06	
Rochinia sp.	0.04	13	0.05	
LOVENIIDAE	0.04	4	0.04	
PORIFERA (Sponges)	0.04	0	0.04	
Lestrolepis intermedia	0.04	2	0.04	
Kuronezumia leonis	0.02	2	0.02	
Polymixia berndti	0.02	2	0.02	
PORTUNIDAE	0.01	5	0.02	
ISOPODS	0.01	7	0.01	
Argyropelecus aculeatus	0.01	2	0.01	
LEUCOSIIDAE	0.00	2	0.00	
Zenion sp.	0.00	2	0.00	
B I V A L V E S	0.00	4	0.00	
Total	83.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 102
DATE :03/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°27.46
start stop duration Lon E 36°46.61
TIME :00:11:59 00:43:05 31.1 (min) Purpose : 3
LOG : 6764.07 6765.55 1.5 Region : 7420
FDEPTH: 139 142 Gear cond.: 0
BDEPTH: 139 142 Validity : 2
Towing dir: 0° Wire out : 380 m Speed : 2.9 kn
Sorted : 0 Total catch: 83.81 Catch/hour: 161.69

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Scleractinia	70.15	0	43.38	
Polysteganus coeruleopunctatus	13.23	77	8.19	280
Rexea prometheoides	9.11	69	5.63	
MYCTOPHIDAE	8.87	1707	5.49	
PORIFERA (Sponges)	6.60	0	4.08	
Pristigenys niphonia	6.44	15	3.99	
Monocentris japonica	4.90	48	3.03	
CORAL	4.17	0	2.58	
Scyllarides elisabethae	4.09	10	2.53	
Sphyraena forsteri	3.47	27	2.15	
Fistularia petimba	3.05	8	1.89	
Lophiodes insidiator	1.74	2	1.07	
Priacanthus hamrur	1.54	15	0.95	
Histiopterus typus	1.50	8	0.93	
Rhinobatos holcorhynchus	1.45	4	0.89	
Cociella crocodila	1.39	2	0.86	
Dipturus cf lanceorostratus	1.31	12	0.81	
Dactyloptena peterseni	1.23	6	0.76	
Halieutaea sp.	1.20	19	0.74	
Antigonia cf rubescens	1.16	68	0.72	
Synagrops japonicus	1.12	10	0.69	
Parascolopsis eriomma	0.93	8	0.57	
Sepia hieronis	0.91	23	0.56	
Uranoscopus archionema	0.81	6	0.50	
Scorpaena scrofa	0.77	4	0.48	
MYCTOPHIDAE	0.77	60	0.48	0
Satyrichthys adeni	0.66	2	0.41	
Zeus faber	0.66	4	0.41	
Thamnaconus fajardoi	0.66	10	0.41	
Saurida undosquamis	0.64	8	0.39	
SCORPAENIDAE	0.62	2	0.38	
Ommastrephes bartrami	0.56	58	0.35	281
Synodus sp.	0.50	23	0.31	
Serranus africanus	0.46	39	0.29	
Hoplostethus mediterraneus	0.46	64	0.29	
Erythrocles schlegelii	0.39	23	0.24	
Uroconger lepturus	0.39	2	0.24	
Loligo forbesi	0.31	2	0.19	
Umbrina canariensis	0.27	2	0.17	
Sepia prashadi	0.25	2	0.16	
Octopus vulgaris	0.25	2	0.16	
Cirrhilabrus sp.	0.23	6	0.14	
B I V A L V E S	0.19	8	0.12	
Tetrosomus concatenatus	0.19	2	0.12	
Physiculus natalensis	0.17	8	0.11	
Neobythites cf somaliaensis	0.15	4	0.10	
Gonorhynchus gonorhynchus	0.15	4	0.10	
CIDARIDAE	0.14	19	0.08	
COMATULIDAE	0.08	4	0.05	
Brisingidae	0.08	0	0.05	
Holohalaelurus punctatus	0.08	2	0.05	
Serranus sp.	0.07	2	0.04	
Haliporoides triarthrus	0.06	2	0.04	
Citharichthys sp.	0.06	4	0.04	
Plectranthias morgansi	0.06	10	0.04	
Scorpaena sp.	0.05	2	0.03	
Sargocentron sp.	0.04	2	0.02	
Ophichthus sp.	0.04	2	0.02	
Starfish	0.04	4	0.02	
Scyllarus batei	0.03	2	0.02	
Nudibranch sp	0.03	2	0.02	
PORTUNIDAE	0.03	10	0.02	
Laeops pectoralis	0.02	2	0.01	
LAGANIDAE	0.02	25	0.01	
MULLIDAE, juvenile	0.02	4	0.01	
Homola barbata	0.02	2	0.01	
Champsodon capensis	0.02	2	0.01	
LOVENIIDAE	0.01	2	0.01	
PAGUROIDEA	0.01	2	0.01	
Rochinia sp.	0.01	2	0.01	
STOMATOPODA	0.01	2	0.00	
Total	161.05		99.61	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 103
DATE :03/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°18.31
start stop duration Lon E 36°35.31
TIME :02:50:49 03:11:29 20.7 (min) Purpose : 3
LOG : 6782.60 6783.62 1.0 Region : 7420
FDEPTH: 57 56 Gear cond.: 0
BDEPTH: 57 56 Validity : 2
Towing dir: 0° Wire out : 180 m Speed : 3.0 kn
Sorted : 81 Total catch: 565.18 Catch/hour: 1641.37

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus russelli	1186.41	34499	72.28	283
Decapterus macrosoma	108.15	2866	6.59	282
Nemipterus bipunctatus	68.31	732	4.16	286
Loligo forbesi	56.11	1321	3.42	
Polysteganus coeruleopunctatus	54.48	142	3.32	287
Selar crumenophthalmus	52.04	529	3.17	284
Trachinocephalus myops	24.39	854	1.49	
Lagocephalus guentheri	23.58	142	1.44	
Abalistes stellaris	19.92	20	1.21	
Priacanthus hamrur	9.35	61	0.57	
Upeneus bensasi	8.94	346	0.54	285
Equulites elongatus	7.32	1301	0.45	
Portunus sp.	5.29	1870	0.32	
ANTHOZOA (Sea anemones)	2.85	0	0.17	
Thamnaconus fajardoi	2.85	41	0.17	
J E L L Y F I S H	2.64	20	0.16	
Sepia pharaonis	2.03	20	0.12	
Saurida undosquamis	1.63	41	0.10	
Inioteuthis capensis	1.42	163	0.09	
Penaeus latisulcatus	0.61	20	0.04	
Torquigener hypselogenion	0.61	20	0.04	
Pristotis cf. cyanostigma	0.41	20	0.02	
Cociella crocodila	0.41	20	0.02	
Fistularia commersonii	0.41	41	0.02	
Rochinia sp.	0.41	20	0.02	
Paramonacanthus pusillus	0.41	142	0.02	
Uranoscopus archionema	0.20	20	0.01	
Dactyloptena orientalis	0.20	20	0.01	
Total	1641.37		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 104
DATE :03/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°10.97
start stop duration Lon E 36°22.96
TIME :05:09:34 05:24:41 15.1 (min) Purpose : 3
LOG : 6799.87 6800.35 0.5 Region : 7420
FDEPTH: 33 33 Gear cond.: 7
BDEPTH: 33 33 Validity : 5
Towing dir: 0° Wire out : 130 m Speed : 1.9 kn
Sorted : 0 Total catch: 50000.00 Catch/hour: 198544.01

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	198544.01	0	100.00	
Total	198544.01		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 105
DATE :08/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°34.10
start stop duration Lon E 38°24.10
TIME :18:09:30 18:17:40 8.2 (min) Purpose : 3
LOG : 7678.02 7678.44 0.4 Region : 7420
FDEPTH: 257 259 Gear cond.: 0
BDEPTH: 257 259 Validity : 4
Towing dir: 0° Wire out : 655 m Speed : 3.1 kn
Sorted : 41 Total catch: 41.15 Catch/hour: 302.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
HOLUTHUROIDEA	80.93	455	26.78	
Satyrichthys adeni	27.91	37	9.23	
J E L L Y F I S H	27.47	118	9.09	
Coelorinchus trunovi	20.56	1271	6.80	
Chlorophthalmus agassizi	19.98	389	6.61	
Neoscombrops cynodon	11.46	125	3.79	
Saurida undosquamis	10.87	59	3.60	292
Argentina sphyraena	10.43	463	3.45	
Sepia australis	8.81	191	2.92	
Centrophorus moluccensis	8.81	22	2.92	
Ophiuroidae	8.37	1131	2.77	
Atrobucca nibe	7.42	29	2.45	
Aristaeomorpha foliacea	7.34	389	2.43	289
Myctophid sp. A	7.34	294	2.43	
Nettastoma parviceps	5.65	15	1.87	
Holohalaelurus punctatus	4.26	7	1.41	
Heterocarpus woodmasoni	4.11	360	1.36	
Polymixia berndti	3.97	125	1.31	
Aristeus antennatus	3.82	132	1.26	290
RANINIDAE	3.67	764	1.22	
Uroconger lepturus	2.79	22	0.92	
Aristeus cf virilis	2.64	353	0.87	
Ommastrephes bartrami	2.64	44	0.87	
Haliporoides triarthrus	2.20	88	0.73	291
Malthopsis tiarella	1.32	125	0.44	
Parazen pacificus	1.10	73	0.36	
LAGANIDAE	1.03	22	0.34	
Anacanthobatis marmoratus	0.81	15	0.27	
Dipturus cf lanceorostratus	0.73	7	0.24	
Uranoscopus archionema	0.59	15	0.19	
Chaunax sp.	0.59	7	0.19	
Scyllarus batei	0.59	51	0.19	
Callinectes sp.	0.44	37	0.15	
Zenion sp.	0.37	59	0.12	
ISOPODS	0.29	29	0.10	
Decapterus russelli	0.29	15	0.10	
Ophichthus marginatus	0.22	7	0.07	
Synaphobranchus affinis	0.22	7	0.07	
Decapterus macarellus	0.15	7	0.05	
Total	302.20		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 106
DATE :09/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°6.91

start	stop	duration		Lon	E 37°7.26
TIME :23:06:18	23:36:05	29.8 (min)	Purpose	: 3	
LOG : 7897.69	7899.43	1.7	Region	: 7420	
FDEPTH: 628	616		Gear cond.: 0		
BDEPTH: 628	616		Validity : 0		
Towing dir: 0°	Wire out	: 1520 m	Speed	: 3.5 kn	
Sorted : 69	Total catch: 68.74		Catch/hour: 138.49		

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Caelorinchus braueri	44.41	560	32.06	
Caelorinchus trunovi	19.70	48	14.23	
Ventrifossa sp.	18.86	220	13.62	
Coloconger scholesi	13.58	48	9.81	
Neoscopelus macrolepidotus	6.81	181	4.92	
Oplophoris sp.	4.47	222	3.23	
Etmopterus lucifer	3.30	10	2.39	
Centrophorus lusitanicus	3.06	12	2.21	
Lophiodes mutilus	2.78	6	2.01	
Opisthoteuthis sp.	2.58	2	1.86	
Plesiopenaeus edwardsianus	1.96	16	1.41	295
SALPS	1.73	4	1.25	
Hydrolagus africanus	1.61	4	1.16	
Neobythites sp.	1.57	54	1.13	
Haliporoides triarthrus	1.17	42	0.84	297
Ateleopus natalensis	1.05	2	0.76	
Nettastoma parviceps	1.01	14	0.73	
Sicyonia sp.	0.93	240	0.67	
ISOPODS	0.89	46	0.64	
Chlorophthalmus agassizi	0.89	8	0.64	
Aristeus antennatus	0.81	79	0.59	294
Plesionika martia	0.67	105	0.49	296
Loligo sp.	0.60	2	0.44	
Stereomastis sculpta	0.56	32	0.41	
Ommastrephes bartrami	0.44	6	0.32	
Neolithodes capensis	0.40	16	0.29	
Hoplostethus mediterraneus	0.40	24	0.29	
Myctophid sp. A	0.36	246	0.26	
Aristaeomorpha foliacea	0.33	16	0.24	293
Nephropsis stewarti	0.32	8	0.23	
Idiacanthus sp.	0.28	16	0.20	
ANGUILLIDAE	0.24	4	0.17	
Aristeus virilis	0.16	46	0.12	
Halosaurus sp.	0.08	6	0.06	
Nansenia macrolepis	0.08	2	0.06	
Brachyura spp.	0.08	2	0.06	
Jellyfish	0.04	2	0.03	
Psilaster acuminatus	0.04	2	0.03	
Ophiuroidea	0.04	8	0.03	
Malacocephalus laevis	0.04	2	0.03	
Heterocarpus laevigatus	0.04	2	0.03	
Callinectes sp.	0.04	2	0.03	
ANTHOZOA (Sea anemones)	0.04	2	0.03	
Gorgonians	0.01	8	0.01	
Total	138.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 107
DATE :10/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 19°3.61

start	stop	duration		Lon	E 36°56.81
TIME :06:24:42	06:52:09	27.4 (min)	Purpose	: 3	
LOG : 7921.39	7922.84	1.5	Region	: 7420	
FDEPTH: 75	70		Gear cond.: 0		
BDEPTH: 75	70		Validity : 0		
Towing dir: 0°	Wire out	: 210 m	Speed	: 3.2 kn	
Sorted : 105	Total catch: 105.23		Catch/hour: 230.10		

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lutjanus sanguineus	107.06	17	46.53	
Lutjanus argentimaculatus	37.00	7	16.08	
Epinephelus coioides	32.84	2	14.27	
Carcharhinus sealei	14.43	7	6.27	
Lethrinus nebulosus	14.43	2	6.27	
Scomberomorus commerson	12.03	2	5.23	
Ophiuroidea	2.01	9	0.87	
Lactoria cornuta	1.79	7	0.78	
Carangoides armatus	1.14	2	0.49	
Prionocidaris sp	1.14	9	0.49	
Neolithodes capensis	0.64	2	0.28	
Loligo duvauceli	0.52	256	0.23	
B I V A L V E S	0.50	2	0.22	
Etmopterus lucifer ***	0.48	4	0.21	
Stereomastis sculpta	0.48	2	0.21	
Caelorinchus braueri	0.44	11	0.19	
Lactoria diaphana	0.39	2	0.17	
Bathyclupea sp.	0.31	7	0.13	
Neoepinnula orientalis	0.26	2	0.11	
Sicyonia sp.	0.24	9	0.11	
Ophichthus marginatus	0.22	4	0.10	
CIRRHITIDAE	0.22	2	0.10	
Champsodon capensis	0.22	46	0.10	
BENTHESICYMIDAE	0.17	7	0.08	
Callinectes sp.	0.17	52	0.08	
Halieutaea sp. A	0.17	9	0.08	
Upeneus cf. guttatus	0.13	11	0.06	
Fistularia petimba	0.13	11	0.06	
G A S T R O P O D S	0.10	13	0.04	
Psilaster acuminatus	0.09	9	0.04	
Pristipomoides filamentosus	0.09	4	0.04	
Sepia australis	0.09	4	0.04	
Trachinocephalus myops	0.09	9	0.04	
Euaxoctopus sp.	0.04	2	0.02	
Holothuria sp.	0.03	4	0.01	
Total	230.10		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 108
DATE :10/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 18°58.67

start	stop	duration		Lon	E 36°45.30
TIME :09:28:48	09:41:22	12.6 (min)	Purpose	: 1	
LOG : 7941.03	7941.68	0.7	Region	: 7420	
FDEPTH: 38	37		Gear cond.: 6		
BDEPTH: 38	37		Validity : 0		
Towing dir: 0°	Wire out	: 120 m	Speed	: 3.1 kn	
Sorted : 200	Total catch: 50000.00		Catch/hour: 238663.48		

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Aurelia sp	232195.70	0	97.29	
Upeneus vittatus	1933.17	0	0.81	299
Saurida undosquamis	1718.38	76	0.72	300
Loligo forbesi	715.99	86	0.30	
Carangoides malabaricus	572.79	53	0.24	298
Charybdis feriata	405.73	5	0.17	
Trichiurus lepturus	238.66	57	0.10	301
ECHINOMETRIDAE	190.93	10	0.08	
Carangoides sp.	95.47	0	0.04	
Carangoides coeruleopinnatus	95.47	10	0.04	
Jellyfish	76.37	0	0.03	
Trachinocephalus myops	71.60	14	0.03	
Ariomma indicum	71.60	10	0.03	
Alepes djedaba	47.73	10	0.02	
Bothus swio	47.73	5	0.02	
Stephanolepis auratus	47.73	19	0.02	
Portunus gradiator	47.73	5	0.02	
Holothuria sp.	26.25	14	0.01	
Upeneus bensasi	17.90	5	0.01	
Conus spCV2	15.51	5	0.01	
Decapterus russelli	14.32	33	0.01	
Lactoria fornasini	11.93	5	0.01	
Champsodon capensis	4.77	5	0.00	
Total	238663.48		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 109
DATE :10/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 18°48.35

start	stop	duration		Lon	E 36°36.51
TIME :13:57:45	14:26:26	28.7 (min)	Purpose	: 3	
LOG : 7964.91	7966.46	1.6	Region	: 7420	
FDEPTH: 24	21		Gear cond.: 0		
BDEPTH: 24	21		Validity : 0		
Towing dir: 0°	Wire out	: 75 m	Speed	: 3.2 kn	
Sorted : 0	Total catch: 92.00		Catch/hour: 192.33		

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Upeneus sulphureus	58.79	209	30.57	
Thryssa vitrirostris	25.80	44	13.41	306
Upeneus vittatus	24.08	209	12.52	309
Pellona ditchela	19.40	209	10.09	303
Leiognathus dussumieri	13.92	209	7.24	
Pomadasys maculatus	9.57	199	4.98	307
Polydactylus sextarius	5.56	201	2.89	
Scomberoides tala	5.18	17	2.70	
Otolithes ruber	4.98	48	2.59	310
Scomberomorus commerson	3.34	29	1.74	311
Carangoides coeruleopinnatus	2.68	38	1.39	
Matuta cf lunaris	2.22	255	1.15	
Trichiurus lepturus	1.80	31	0.93	315
Secutor insidiator	1.34	217	0.70	
Terapon jarbua	1.30	17	0.67	
Rastrelliger kanagurta	1.25	15	0.65	
Penaeus indicus	1.21	44	0.63	312
Symplectoteuthys oualaniensis	1.13	54	0.59	
Penaeus japonicus	1.09	56	0.57	313
Gazza minuta	0.92	17	0.48	
Ariomma indicum	0.67	25	0.35	
Pomadasys kaakan	0.63	6	0.33	308
Selar crumenophthalmus	0.63	15	0.33	302
Portunus sanguinolentus	0.54	13	0.28	305
PORIFERA (Sponges)	0.42	2	0.22	
Metapenaeus monoceros	0.42	67	0.22	
Metapenaeus dobsoni	0.38	48	0.20	314
Mene maculata	0.38	8	0.20	
Aurelia sp	0.30	4	0.16	
Sphyraena chrysotaenia	0.29	4	0.15	
Lagocephalus guentheri	0.29	6	0.15	
Sardinella albella	0.25	21	0.13	304
Pterygosquilla armata capensis	0.25	17	0.13	
Carangoides armatus	0.21	4	0.11	
Jellyfish	0.19	2	0.10	
Caranx tille	0.17	4	0.09	
Drepane longimana	0.17	4	0.09	
Engyprosopon grandisquama	0.13	17	0.07	
Herklotsichthys quadrimaculat.	0.13	255	0.07	
Apistus carinatus	0.08	23	0.04	
Stolephorus commersonii	0.08	0	0.04	
Cynoglossus cf lida	0.08	6	0.04	
LAGANIDAE	0.04	10	0.02	
Parastromateus niger	0.03	2	0.02	
Starfish	0.02	2	0.01	
Plastic	0.00	2	0.00	
Total	192.33		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 110
DATE :10/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 18°36.06

start	stop	duration		Lon	E 36°45.36
TIME :17:28:21	17:51:34	23.2 (min)	Purpose	: 3	
LOG : 7990.34	7991.59	1.3	Region	: 7420	
FDEPTH: 25	26		Gear cond.: 0		
BDEPTH: 25	26		Validity : 2		
Towing dir: 0°	Wire out	: 85 m	Speed	: 3.3 kn	
Sorted : 205	Total catch: 205.15		Catch/hour: 529.88		

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Upeneus vittatus	63.67	2376	12.02	324
Upeneus sulphureus	58.81	2376	11.10	325
Pomadasys kaakan	47.68	36	9.00	
Penaeus indicus	43.47	1289	8.20	
Penaeus indicus	42.20	1279	7.96	327
Sardinella albella	41.17	1279	7.77	319
JELLYFISH	38.61	344	7.29	
Otolithes ruber	27.61	473	5.21	326
Himantura cf gerrardi	24.12	5	4.55	
Pellona ditchela	16.50	1315	3.11	318
Metapenaeus monoceros	14.83	1279	2.80	329
Polydactylus sextarius	12.01	586	2.27	
Trichiurus lepturus	10.49	331	1.98	332
Loligo forbesi	7.67	395	1.45	
Portunus sanguinolento	6.64	75	1.25	320
Metapenaeus dobsoni	6.15	217	1.16	330

Sepia prashadi	6.15	369	1.16	
Sepia latimanus	6.02	318	1.14	
Thryssa vitrirostris	4.34	1279	0.82	321
Carangoides malabaricus	4.08	49	0.77	316
Terapon jarbua	4.08	62	0.77	
Cynoglossus lida	4.08	256	0.77	
Drepane longimana	4.08	101	0.77	
Secutor insidiator	3.85	777	0.73	
Penaeus japonicus	3.85	178	0.73	328
Matuta cf lunaris	3.85	715	0.73	
Saurida undosquamis	3.33	75	0.63	331
Pomadasys maculatus	3.33	139	0.63	322
Leiognathus equulus	2.82	266	0.53	323
Pterygosquilla armata capensis	2.82	460	0.53	
LAGANIDAE	2.04	434	0.39	
Metapenaeus monoceros	1.65	713	0.31	0
Callionymus sp.	1.29	279	0.24	
Alectis indica	0.90	75	0.17	
Sillago sihama	0.85	75	0.16	
Herklotsichthys quadrimaculat.	0.77	101	0.15	317
Tunicata	0.65	49	0.12	
Pseudorhombus javanicus **	0.52	75	0.10	
Alepes djedaba	0.52	10	0.10	
Carangoides cf. malabaricus	0.52	10	0.10	
Lagocephalus lunaris	0.39	10	0.07	
Scomberomorus commerson	0.26	10	0.05	
Apistus carinatus	0.26	62	0.05	
Platycephalus indicus	0.26	36	0.05	
Ariomma indicum	0.26	10	0.05	
Parastromateus niger	0.23	10	0.04	
Johnius amblycephalus	0.15	10	0.03	
Lutjanus sanguineus	0.05	10	0.01	
Total	529.88		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 111
DATE :11/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 18°37.82
start stop duration Lon E 37°10.89
TIME :00:52:42 01:17:14 24.5 (min) Purpose : 3
LOG : 8054.19 8055.66 1.5 Region : 7420
FDEPTH: 60 61 Gear cond.: 0
BDEPTH: 60 61 Validity : 2
Towing dir: 0° Wire out : 170 m Speed : 3.6 kn
Sorted : 44 Total catch: 173.28 Catch/hour: 423.67

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
CORAL	104.55	0	24.68	
Tetrosomus concatenatus	74.21	230	17.52	
Pristotis cf. cyanostigma	73.20	1604	17.28	
Upeneus sulphureus	28.12	1565	6.64	334
Lethrinus 'narrow'	18.58	364	4.39	
Loligo sp.	16.85	538	3.98	
Synodus 'yellowpectoral'	14.13	1032	3.34	
Decapterus russelli	11.44	293	2.70	333
Lactoria cornuta	11.12	29	2.63	
Nemipterus bipunctatus	9.22	93	2.18	335
Rhinobatos annulatus	8.26	7	1.95	
Loligo duvauceli	6.36	78	1.50	
Trachinocephalus myops	6.36	269	1.50	
Seriola dumerili	6.19	7	1.46	
Ostracion cubicus	4.91	7	1.16	
Priacanthus cf. hamrur	3.96	117	0.93	
Parupeneus nansen	3.81	86	0.90	
Selar crumenophthalmus	3.01	22	0.71	
Apistus carinatus	2.05	125	0.48	
Amblyrhynchotes honkenii	2.05	46	0.48	
Fistularia petimba	2.05	86	0.48	
Lagocephalus guentheri	1.91	61	0.45	
Penaeus latisulcatus	1.74	46	0.41	336
Bothus sp.	1.66	188	0.39	
Synodus binotatus	1.42	103	0.33	
Parupeneus heptacanthus	1.27	15	0.30	
Canthigaster rivulata	0.71	54	0.17	
Callinectes sp.	0.64	22	0.15	
Pseudalutarius nasicornis	0.64	46	0.15	
Epigonus robustus	0.56	61	0.13	
Serranus sp.	0.56	15	0.13	
Aesopia cornuta	0.32	15	0.08	
Plotosus lineatus	0.32	7	0.08	
Cociella crocodila	0.32	7	0.08	
Equulites elongatus	0.32	39	0.08	
Callionymus cf persicus	0.24	15	0.06	
Stephanolepis auratus	0.24	22	0.06	
Diplodus cervinus hottentotus	0.15	7	0.03	
Anthias sp.	0.07	7	0.02	
Callionymus sp. 92	0.07	15	0.02	
Oxycheilinus sp.	0.07	7	0.02	
Total	423.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 112
DATE :11/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 18°30.36
start stop duration Lon E 37°1.32
TIME :03:32:47 04:03:15 30.5 (min) Purpose : 3
LOG : 8071.48 8073.28 1.8 Region : 7420
FDEPTH: 32 32 Gear cond.: 0
BDEPTH: 32 32 Validity : 0
Towing dir: 0° Wire out : 105 m Speed : 3.5 kn
Sorted : 13 Total catch: 705.28 Catch/hour: 1389.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Scomberomorus commerson	573.70	217	41.30	
Notonykia africanae	199.93	108	14.39	
Decapterus russelli	197.75	10986	14.23	338
Rhinobatos holcorhynchus	121.69	11106	8.76	
Decapterus macrosoma	99.97	1109	7.20	337
Equulites elongatus	41.29	108	2.97	
Rhizostoma sp	40.20	0	2.89	
chirodropidae sp	30.41	0	2.19	
Rastrelliger kanagurta	28.25	108	2.03	
Nemipterus bipunctatus	23.91	11795	1.72	
Saurida undosquamis	8.69	217	0.63	
Carangoides ferdau	5.44	108	0.39	
Scyphozoa	5.42	0	0.39	
Synodus 'yellowpectoral'	5.00	9416	0.36	
Octopus vulgaris	4.35	108	0.31	
Paramonacanthus pusillus	2.17	108	0.16	
Carangoides armatus-hedlandens	1.08	108	0.08	
Total	1389.26		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 113
DATE :11/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 18°12.09
start stop duration Lon E 37°6.18
TIME :08:12:05 08:42:26 30.4 (min) Purpose : 3
LOG : 8106.74 8108.27 1.5 Region : 7420
FDEPTH: 30 25 Gear cond.: 0
BDEPTH: 30 25 Validity : 0
Towing dir: 0° Wire out : 85 m Speed : 3.0 kn
Sorted : 0 Total catch: 370.74 Catch/hour: 732.93

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Otolithes ruber	124.09	1829	16.93	346
Pellona ditchela	103.77	8600	14.16	
Trichiurus lepturus	80.38	2080	10.97	352
Aetobatus narinari	59.31	2	8.09	
Herklotsichthys quadrimaculat.	56.07	3420	7.65	339
Polydactylus sextarius	45.61	1109	6.22	
J E L L Y F I S H	44.46	113	6.07	
Leiognathus equulus	41.44	1166	5.65	343
Ariomma indicum	29.65	836	4.05	
Thryssa vitrirostris	29.65	2916	4.05	
Sphyrna lewini	21.15	10	2.89	
Pomadasys maculatus	13.68	601	1.87	341
Sardinella albella	12.93	706	1.76	340
Pomadasys stridens	10.06	75	1.37	
Saurida undosquamis	6.46	65	0.88	351
Upeneus sulphureus	5.89	471	0.80	345
Sphyraena acutipinnis	5.32	85	0.73	350
Upeneus vittatus	4.94	198	0.67	344
Pomadasys kaakan	4.74	38	0.65	342
Arius dussumieri**	4.59	2	0.63	
Penaeus indicus	4.57	170	0.62	348
Lagocephalus lunaris	3.99	85	0.54	
Sepia pharaonis	3.80	170	0.52	
Black sand dollar	2.85	662	0.39	
Alepes djedaba	2.47	144	0.34	
Metapenaeus monoceros	2.27	1062	0.31	349
Scomberomorus commerson	2.19	20	0.30	347
Secutor insidiator	1.72	132	0.23	
Loligo forbesi	1.23	95	0.17	
Terapon jarbua	0.57	10	0.08	
Trachinocephalus myops	0.47	20	0.06	
Apogon cf. quadrifasciatus	0.47	55	0.06	
Drepane africana	0.38	28	0.05	
Alectis indica	0.38	38	0.05	
Pterygosquilla armata capensis	0.28	20	0.04	
Penaeus semisulcatus	0.20	10	0.03	
Stolephorus commersonii	0.20	10	0.03	
Parastromateus niger	0.20	10	0.03	
Carangoides cf. malabaricus	0.20	10	0.03	
Cynoglossus lida	0.20	10	0.03	
Bothus sp.	0.10	10	0.01	
Plastic	0.00	6	0.00	
Total	732.93		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 114
DATE :11/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 18°20.88
start stop duration Lon E 37°27.54
TIME :11:39:00 12:09:00 30.0 (min) Purpose : 3
LOG : 8130.65 8132.01 1.7 Region : 7420
FDEPTH: 75 75 Gear cond.: 0
BDEPTH: 75 75 Validity : 0
Towing dir: 0° Wire out : 210 m Speed : 3.0 kn
Sorted : 56 Total catch: 56.14 Catch/hour: 112.27

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus russelli	88.72	5040	79.02	353
Lagocephalus sceleratus	6.20	2	5.52	
Loligo sp.	5.32	498	4.74	
Tetrosomus concatenatus	3.12	10	2.78	
Saurida undosquamis	1.00	28	0.89	355
Algaes	0.92	0	0.82	
Nemipterus bipunctatus	0.92	24	0.82	354
Synodus 'yellowpectoral'	0.88	82	0.78	
Equulites elongatus	0.68	72	0.61	
Sepia pharaonis	0.68	8	0.61	
Lagocephalus lunaris	0.60	18	0.53	
Sea urchin	0.48	36	0.43	
CORAL	0.44	0	0.39	
Champsodon capensis	0.40	80	0.36	
Argyrops filamentosus	0.40	22	0.36	
Carangoides cf. malabaricus	0.36	2	0.32	
Decapterus macrosoma	0.24	8	0.21	
OCTOPODIDAE	0.20	2	0.18	
Priacanthus cf. hamrur	0.16	4	0.14	
Fistularia petimba	0.12	10	0.11	
Lepidotrigla alcocki	0.12	4	0.11	
Trichiurus lepturus	0.08	4	0.07	
Penaeus semisulcatus	0.04	2	0.04	
NEMATOCARCINIDAE	0.04	0	0.04	
Starfish	0.04	2	0.04	
Penaeus indicus	0.04	2	0.04	
Tunicata	0.04	4	0.04	
Callionymus sp.	0.02	2	0.02	
DIOGENIDAE	0.01	2	0.01	
PENAEIDAE	0.00	2	0.00	
G A S T R O P O D S	0.00	2	0.00	
Plastic	0.00	2	0.00	
Total	112.27		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 115
DATE :11/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 18°27.42
start stop duration Lon E 37°23.30
TIME :14:20:34 14:28:45 8.2 (min) Purpose : 3
LOG : 8144.45 8144.83 0.4 Region : 7420
FDEPTH: 324 320 Gear cond.: 0

BDEPTH: 324 320 Validity : 0
Towing dir: 0° Wire out : 830 m Speed : 2.8 kn
Sorted : 0 Total catch: 31.23 Catch/hour: 229.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus agassizi	46.65	425	20.36	
Hoplostethus melanopterus	33.30	7	14.54	
Sepia vermiculata	18.04	22	7.88	
Saurida undosquamis	15.70	37	6.85	356
Neoscombrops cynodon	14.08	125	6.15	
Nototodarus hawaiiensis	11.74	88	5.12	
Rexea prometheoides	8.66	81	3.78	
Ommastrephes bartrami	8.22	733	3.59	
Palinurus delagoae	7.92	22	3.46	
Parapandalus spinifer	5.72	733	2.50	
Myctophid sp. B	5.57	733	2.43	
Lepidotrigla alcocki	4.84	59	2.11	
Etmopterus pusillus	4.55	44	1.99	
Lophiodes mutilus	4.25	7	1.86	
Antigonia cf rubescens	3.96	198	1.73	
Holohalaelurus sp.	3.81	7	1.67	
Narcine rierai	3.81	44	1.67	
Polymixia berndti	3.52	59	1.54	
Sepia officinalis	3.23	22	1.41	
Chlorophthamus sp. juv	2.79	103	1.22	
Beryx splendens	2.49	7	1.09	
Bythalaelurus lutarius	2.35	37	1.02	
Synagrops japonicus	2.05	29	0.90	
Histioteuthis bonnellii	1.91	15	0.83	
Aristeus antennatus	1.61	169	0.70	
Echinus gilchristi ?	1.03	22	0.45	
Lestrolepis intermedia	1.03	44	0.45	
Austrorossia enigmatica	0.88	15	0.38	
Scorpaenid 'smallspots'	0.73	22	0.32	
Stomias boa boa	0.73	37	0.32	
Acanthocepola indica	0.73	22	0.32	
Metanephrops andamanicus	0.73	7	0.32	
Trichiurus lepturus	0.73	7	0.32	
Neobythites analis	0.44	7	0.19	
Calappidae sp.	0.43	7	0.19	
Champsodon capensis	0.29	7	0.13	
Sphoeroides pachgaster	0.15	7	0.06	
Cynoglossus cf lida	0.15	7	0.06	
Caelorinchus braueri	0.13	7	0.06	
SALPS	0.04	29	0.02	
Zenion sp.	0.03	37	0.01	
Ophididae 'spot nose'	0.03	7	0.01	
Total	229.08		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 116
DATE :11/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 18°10.71
start stop duration Lon E 37°27.27
TIME :21:12:16 21:27:35 15.3 (min) Purpose : 3
LOG : 8176.79 8177.60 0.8 Region : 7420
FDEPTH: 79 79 Gear cond.: 0
BDEPTH: 79 79 Validity : 2
Towing dir: 0° Wire out : 210 m Speed : 3.2 kn
Sorted : 0 Total catch: 25.58 Catch/hour: 100.23

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
CORAL	20.54	0	20.49	
MYCTOPHIDAE	11.05	8634	11.03	
Champsodon capensis	10.66	2050	10.64	
Callinectes sp.	7.05	2755	7.04	
Loligo forbesi	6.58	619	6.57	
Saurida undosquamis	6.27	294	6.26	357
Lophiodes mutilus	5.64	4	5.63	
Rexea sp.	4.04	4	4.03	
Emmelichthys sp.	3.76	690	3.75	
Synodus 'yellowpectoral'	3.14	286	3.13	
Pseudorhombus elevatus	2.74	98	2.74	
Metapenaeus monoceros	2.66	725	2.66	
Cyclichthys sp.	1.92	8	1.92	
Trachinocephalus myops	1.57	43	1.56	
Tetrosomus cf. reipublicae	1.25	4	1.25	
Paramonacanthus pusillus	1.25	384	1.25	
Nemipterus bipunctatus	1.02	153	1.02	
Torquigener hypselogenion	0.98	255	0.98	
Lepidotrigla alcocki	0.71	39	0.70	
Conger wilsoni	0.71	4	0.70	
Apistus carinatus	0.71	43	0.70	
Caristius sp.	0.63	110	0.63	
Sepia pharaonis	0.63	31	0.63	
Unidentified crab	0.47	251	0.47	
Equulites elongatus	0.47	63	0.47	
Dactyloptena orientalis	0.39	4	0.39	
Priacanthus cf. hamrur	0.39	8	0.39	
Trichiurus lepturus	0.35	4	0.35	
Lophiodes sp.	0.31	12	0.31	
Apogon semilineatus	0.31	39	0.31	
Penaeus latisulcatus	0.31	8	0.31	
Octopus sp.	0.29	4	0.29	
Penaeus marginatus	0.24	31	0.23	
Sepia australis	0.24	8	0.23	
Conger cinereus	0.20	20	0.20	
Nettastoma parviceps	0.20	8	0.20	
Bothus sp.	0.16	102	0.16	
Cociella crocodila	0.12	4	0.12	
Apogon cf quekettii	0.08	39	0.08	
Onykia sp.	0.08	8	0.08	
Solenocera sp.	0.04	8	0.04	
Xiphasia sp.	0.04	4	0.04	
Emmelichthys nitidus	0.04	4	0.04	
Plastic	0.00	4	0.00	
Total	100.23		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 117
DATE :11/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 18°6.97
start stop duration Lon E 37°22.43
TIME :23:07:49 23:36:22 28.6 (min) Purpose : 3
LOG : 8187.59 8189.33 1.7 Region : 7420
FDEPTH: 41 43 Gear cond.: 0
BDEPTH: 41 43 Validity : 2
Towing dir: 0° Wire out : 130 m Speed : 3.7 kn
Sorted : 38 Total catch: 38.45 Catch/hour: 80.79

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus russelli	22.98	756	28.45	359
Trachinocephalus myops	10.29	250	12.74	
Thenus orientalis	9.16	46	11.34	
Upeneus bensasi	7.94	317	9.83	
Penaeus latisulcatus	4.20	120	5.20	363
Echeneis naucrates	3.70	4	4.58	
Saurida undosquamis	2.73	44	3.38	364
Ommastrephes bartrami	2.31	88	2.86	
Nemipterus bipunctatus	1.97	15	2.44	361
Waste General	1.58	2	1.95	0
Apistus carinatus	1.47	132	1.82	
Torquigener sp.	1.39	67	1.72	
Lactoria fornasini	1.39	4	1.72	
Terapon jarbua	1.34	11	1.66	
Pomadasys maculatus	1.13	8	1.40	360
Lagocephalus guentheri	1.13	38	1.40	
Bothus sp.	0.97	59	1.20	
Dactyloptena orientalis	0.97	29	1.20	
Paramonacanthus pusillus	0.84	378	1.04	
Loligo forbesi	0.63	4	0.78	
Leiognathus elongatus**	0.50	57	0.62	
Loligo duvauceli	0.46	6	0.57	
Decapterus macrosoma	0.36	17	0.44	358
Penaeus japonicus	0.29	6	0.36	362
Carangoides cf. malabaricus	0.17	2	0.21	
Fistularia petimba	0.15	2	0.18	
Callionymus sp.	0.11	8	0.13	
Aesopia cornuta	0.11	4	0.13	
Cociella crocodila	0.08	2	0.10	
Bothus myriaster	0.08	2	0.10	
Conger cinereus	0.06	2	0.08	
Nettastoma parviceps	0.06	2	0.08	
Parascorpaena mossambica	0.06	2	0.08	
Sphyraena chrysotaenia	0.06	8	0.08	
Waste General	0.05	2	0.06	
Samaris cristatus	0.04	2	0.05	
Total	80.79		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 118
DATE :12/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°53.38
start stop duration Lon E 37°27.54
TIME :05:02:42 05:33:18 30.6 (min) Purpose : 3
LOG : 8227.78 8229.42 1.6 Region : 7420
FDEPTH: 27 27 Gear cond.: 0
BDEPTH: 27 27 Validity : 0
Towing dir: 0° Wire out : 85 m Speed : 3.2 kn
Sorted : 38 Total catch: 37.89 Catch/hour: 74.29

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Equulites elongatus	33.37	11241	44.92	
J E L L Y F I S H	13.25	69	17.84	
Decapterus macrosoma	12.20	2102	16.42	365
Loligo vulgaris	9.41	635	12.67	
Alepes kleinii	1.18	18	1.58	
CORAL	1.10	4	1.48	
Sepia pharaonis	1.02	14	1.37	
Thamnaconus modestoides	0.75	78	1.00	
Decapterus russelli	0.63	14	0.84	366
Saurida undosquamis	0.27	4	0.37	
Ariomma indicum	0.25	16	0.34	
Trachinocephalus myops	0.18	16	0.24	
LAGANIDAE	0.14	24	0.18	
Nemipterus bipunctatus	0.12	39	0.16	367
Alectis indica	0.12	22	0.16	
Callionymus cf persicus	0.08	8	0.11	
Charybdis natator	0.05	2	0.07	
Engyprosopon grandisquama	0.04	2	0.05	
Carangoides armatus	0.03	6	0.05	
Thenus orientalis	0.03	4	0.04	
Saurida gracilis	0.02	6	0.03	
Priacanthus cf. hamrur	0.02	4	0.03	
Canthigaster smithae	0.02	6	0.03	
Upeneus bensasi	0.02	6	0.03	
Plastic	0.00	2	0.00	
Total	74.29		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 119
DATE :12/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°59.27
start stop duration Lon E 37°36.27
TIME :07:38:54 08:09:22 30.5 (min) Purpose : 3
LOG : 8243.78 8245.46 1.7 Region : 7420
FDEPTH: 60 57 Gear cond.: 0
BDEPTH: 60 57 Validity : 0
Towing dir: 0° Wire out : 180 m Speed : 3.3 kn
Sorted : 61 Total catch: 60.78 Catch/hour: 119.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Saurida undosquamis	69.90	108	58.41	371
Decapterus russelli	31.31	971	26.16	368
Nemipterus bipunctatus	4.33	49	3.62	370
Loligo vulgaris	4.10	169	3.42	
Carangoides coeruleopinnatus	1.65	8	1.38	
Starfish	1.28	2	1.07	
Upeneus bensasi	1.02	26	0.86	369
Trichiurus lepturus	0.83	47	0.69	
SALPS	0.79	268	0.66	
Fistularia petimba	0.75	51	0.63	
CORAL	0.69	10	0.58	
Trachinocephalus myops	0.55	4	0.46	
Taeniopsetta ocellata	0.43	10	0.36	
Lagocephalus guentheri	0.39	8	0.33	
Priacanthus hamrur	0.39	6	0.33	
Thenus orientalis	0.32	2	0.26	
Calappa sp.	0.26	2	0.21	
Callionymus cf persicus	0.20	4	0.16	
Jellyfish	0.20	12	0.16	
Unidentified	0.20	0	0.16	
Champsodon capensis	0.08	8	0.07	

Sepia pharaonis	0.02	2	0.02
Total	119.68		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 120
DATE :12/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°48.46
start stop duration Lon E 37°47.23
TIME :13:04:03 13:33:29 29.4 (min) Purpose : 3
LOG : 8281.64 8283.19 1.6 Region : 7420
FDEPTH: 39 39 Gear cond.: 0
BDEPTH: 39 39 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.2 kn
Sorted : 111 Total catch: 687.27 Catch/hour: 1401.63

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Upeneus taeniopterus	854.26	26203	60.95	374
Anchoa sp.	351.62	70324	25.09	
Loligo duvauceli	96.42	5878	6.88	
J E L L Y F I S H	39.32	200	2.81	
Carangoides malabaricus	15.66	261	1.12	372
Decapterus russelli	13.52	804	0.96	373
Saurida undosquamis	4.75	49	0.34	376
Carcharhinus sealei	4.61	4	0.33	
Rastrelliger kanagurta	4.26	173	0.30	375
Thenus orientalis	3.51	12	0.25	
Selar crumenophthalmus	2.75	24	0.20	
Rhinobatos sp.	2.69	2	0.19	
Terapon jarbua	1.75	12	0.13	
Echeneis naucrates	1.71	2	0.12	
Abalistes stellatus	1.47	2	0.10	
Alepes djedaba	1.24	149	0.09	
Nemipterus bipunctatus	0.75	12	0.05	
Jellyfish	0.69	4	0.05	
Ariomma indicum	0.51	49	0.04	
Carangoides armatus	0.12	12	0.01	
Total	1401.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 121
DATE :12/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°38.61
start stop duration Lon E 37°55.43
TIME :17:35:38 18:05:14 29.6 (min) Purpose : 3
LOG : 8316.77 8318.40 1.6 Region : 7420
FDEPTH: 29 29 Gear cond.: 0
BDEPTH: 29 29 Validity : 2
Towing dir: 0° Wire out : 90 m Speed : 3.3 kn
Sorted : 62 Total catch: 403.60 Catch/hour: 818.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Penaeus indicus	216.12	6756	26.41	384
Otolithes ruber	96.64	777	11.81	383
Upeneus taeniopterus	85.24	2847	10.42	382
Thryssa vitrirostris	77.86	91296	9.51	
Pomadasys maculatus	60.41	2666	7.38	379
Secutor insidiator	41.08	2168	5.02	
Pellona ditchela ***	34.36	2721	4.20	377
Leiognathus equulus	31.67	114	3.87	380
JELLYFISH ***	30.31	79	3.70	
Pomadasys stridens	24.56	908	3.00	
Polynemus sextarius**	18.53	85	2.26	
Saurida undosquamis	16.78	132	2.05	387
Penaeus semisulcatus	15.71	120	1.92	386
Penaeus japonicus	15.03	39	1.84	385
Psettodes erumei	9.08	12	1.11	
Upeneus sulphureus	6.44	483	0.79	381
Trichiurus lepturus	5.37	211	0.66	388
Parastromateus niger	4.83	120	0.59	
Scylla serrata	4.45	12	0.54	
Sillago sihama	3.22	118	0.39	
Sphyrna lewini	3.04	2	0.37	
Thenus orientalis	2.95	12	0.36	
Pomadasys kaakan	2.29	39	0.28	
Nudibranchs	2.01	26	0.25	
Ariomma indicum	1.61	39	0.20	
Hilsa kelee	1.54	39	0.19	
Cynoglossus cf lida	1.07	53	0.13	
Sardinella albella	0.94	79	0.12	378
Carangoides armatus	0.81	12	0.10	
Lagocephalus guentheri	0.81	105	0.10	
LAGANIDAE	0.67	105	0.08	
Ascidans	0.57	39	0.07	
Herklotsichthys quadrimaculat.	0.40	53	0.05	
Pseudorhombus elevatus **	0.40	12	0.05	
Trachinocephalus myops	0.36	14	0.04	
Total	817.15		99.85	

Area: Mozambique North

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 122
DATE :12/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°32.54
start stop duration Lon E 38°18.24
TIME :22:25:47 22:46:07 20.3 (min) Purpose : 3
LOG : 8355.34 8356.44 1.1 Region : 7410
FDEPTH: 51 52 Gear cond.: 0
BDEPTH: 51 52 Validity : 2
Towing dir: 0° Wire out : 135 m Speed : 3.2 kn
Sorted : 74 Total catch: 305.05 Catch/hour: 899.85

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
JELLYFISH	471.56	1493	52.40	
Pomadasys kaakan	61.21	24	6.80	
Anchoviella sp.	58.26	19413	6.47	
Upeneus taeniopterus	54.37	1847	6.04	396
Pomadasys maculatus	48.50	634	5.39	394
Secutor insidiator	35.75	4676	3.97	
Upeneus moluccensis	29.62	879	3.29	
Pomadasys stridens	24.25	746	2.69	
Carangoides malabaricus	20.06	366	2.23	389
Leiognathus equulus	16.78	218	1.87	395
Pellona ditchela ***	12.01	549	1.33	392
Sardinella gibbosa	10.77	354	1.20	393
Decapterus russelli	9.41	451	1.05	390
Loligo forbesi	8.82	440	0.98	
Polynemus sextarius**	8.08	218	0.90	
Saurida undosquamis	4.16	24	0.46	399
Nemipterus japonicus	3.07	97	0.34	398
Herklotsichthys quadrimaculat.	2.57	86	0.29	391
Sphyraena qenie	2.45	24	0.27	
Alepes djedaba	1.98	525	0.22	
Gazza minuta	1.71	35	0.19	
Ariomma indicum	1.47	59	0.16	
Metapenaeopsis toloensis	1.24	389	0.14	
Upeneus vittatus	1.24	24	0.14	
Mene maculata	1.24	12	0.14	
Metapenaeus monoceros	0.97	71	0.11	
Apogon 'barred'	0.97	71	0.11	
Carangoides armatus, juvenile	0.97	389	0.11	
Nemipterus bipunctatus	0.97	97	0.11	397
Champsodon capensis	0.86	192	0.10	
Apogon 'black spot'	0.68	12	0.08	
Apogon cf. quadrifasciatus	0.50	71	0.06	
Stolephorus commersonii	0.50	12	0.06	
Synodus 'yellowpectoral'	0.50	47	0.06	
Sardinella albella	0.50	12	0.06	
Bothus sp.	0.27	59	0.03	
Starfish	0.24	24	0.03	
Bathyuroconger vicinus	0.24	12	0.03	
SEPIOLIDAE	0.24	47	0.03	
Pseudorhombus elevatus **	0.21	12	0.02	
CLUPEIDAE, juvenile	0.18	71	0.02	
Cynoglossus 'dashed	0.12	12	0.01	
Apogon queketti	0.12	12	0.01	
Paramonacanthus pusillus	0.12	47	0.01	
Bregmaceros sp.	0.06	24	0.01	
Cynoglossus capensis	0.06	12	0.01	
Chaetodon kleinii, juvenile	0.03	12	0.00	
Total	899.85		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 123
DATE :13/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°25.63
start stop duration Lon E 38°12.74
TIME :00:37:32 00:57:34 20.0 (min) Purpose : 3
LOG : 8368.67 8369.72 1.1 Region : 7410
FDEPTH: 25 25 Gear cond.: 0
BDEPTH: 25 25 Validity : 2
Towing dir: 0° Wire out : 75 m Speed : 3.2 kn
Sorted : 0 Total catch: 88.32 Catch/hour: 264.43

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
JELLYFISH	42.34	0	16.01	
Equulites elongatus	32.34	32335	12.23	
Thryssa vitrirostris	30.48	3461	11.53	404
Pomadasys kaakan	21.32	27	8.06	406
Himantura cf gerrardi	20.96	3	7.93	
Pellona ditchela ***	17.54	1347	6.63	402
Trichiurus lepturus	17.07	560	6.45	413
Penaeus indicus	10.57	503	4.00	409
Upeneus taeniopterus	9.58	228	3.62	407
Pomadasys maculatus	7.49	90	2.83	405
Sepia prashadi	7.19	665	2.72	
Otolithes ruber	6.95	54	2.63	408
Carangoides malabaricus	6.53	90	2.47	400
Sphyrna lewini	5.39	3	2.04	
Secutor insidiator	5.39	389	2.04	
Polydactylus sextarius	5.27	126	1.99	
Herklotsichthys quadrimaculat.	3.29	117	1.25	401
Sillago sihama	2.51	45	0.95	
Metapenaeus monoceros	2.40	263	0.91	411
Sardinella albella	2.34	60	0.88	403
Saurida undosquamis	1.68	12	0.63	412
Parastromateus niger	0.78	3	0.29	
Lagocephalus guentheri	0.66	15	0.25	
Dussumieria acuta	0.60	27	0.23	
Penaeus japonicus	0.60	60	0.23	410
Pseudorhombus elevatus **	0.51	3	0.19	
Scomberomorus commerson	0.48	6	0.18	
Metapenaeus dobsoni	0.45	222	0.17	
Mene maculata	0.36	12	0.14	
Drepane longimana	0.30	9	0.11	
Portunus sanguinolentus	0.24	3	0.09	
Johnius amblycephalus	0.21	3	0.08	
Ariomma indicum	0.21	3	0.08	
Terapon jarbua	0.18	9	0.07	
Bathyuroconger vicinus	0.12	3	0.05	
Leiognathus equulus	0.09	3	0.03	
Johnius dussumieri	0.06	3	0.02	
Total	264.43		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 124
DATE :13/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°17.36
start stop duration Lon E 38°31.86
TIME :04:15:32 04:47:06 31.6 (min) Purpose : 3
LOG : 8396.43 8398.15 1.7 Region : 7410
FDEPTH: 26 22 Gear cond.: 0
BDEPTH: 26 22 Validity : 0
Towing dir: 0° Wire out : 75 m Speed : 3.3 kn
Sorted : 0 Total catch: 1126.05 Catch/hour: 2140.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pellona ditchela ***	1173.67	87567	54.82	415
Thryssa vitrirostris	291.29	27475	13.61	416
Scomberoides tol	116.62	67	5.45	
Pomadasys maculatus	46.03	1473	2.15	417
Upeneus sulphureus	45.13	1430	2.11	420
Ariomma indicum	44.68	646	2.09	
Pomadasys kaakan	44.03	0	2.06	418
Trichiurus lepturus	42.45	2211	1.98	427
Polydactylus sextarius	40.21	1116	1.88	
Arius dussumieri**	33.84	17	1.58	
Sphyraena acutipinnis	32.17	424	1.50	426
Penaeus japonicus	29.05	1496	1.36	424
Leiognathus equulus	27.70	848	1.29	419
Metapenaeus monoceros	27.26	2880	1.27	425

Penaeus indicus	18.76	759	0.88	423
Mene maculata	17.87	67	0.83	
Scomberomorus commerson	16.98	179	0.79	422
Carangoides malabaricus	15.19	110	0.71	414
Secutor insidiator	13.86	937	0.65	
Otolithes ruber	13.69	67	0.64	421
Leiognathus elongatus**	12.97	2165	0.61	
Parastromateus niger	8.23	23	0.38	
Sphyrna lewini	7.60	6	0.36	
Upeneus taeniopterus	5.36	179	0.25	0
Drepane longimana	4.92	67	0.23	
Johnius amblycephalus	4.03	44	0.19	
Pomadasys stridens	2.24	67	0.10	
Dussumieria acuta	1.79	89	0.08	
Loligo vulgaris	1.35	67	0.06	
Sepia prashadi	1.35	133	0.06	
Sardinella albella	0.46	44	0.02	
Total	2140.78		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 125
DATE :13/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°17.34
start stop duration Lon E 38°52.56
TIME :08:30:50 08:58:29 27.6 (min) Purpose : 3
LOG : 8428.93 8430.43 1.5 Region : 7410
FDEPTH: 112 108 Gear cond.: 0
BDEPTH: 112 108 Validity : 0
Towing dir: 0° Wire out : 285 m Speed : 3.3 kn
Sorted : 43 Total catch: 43.04 Catch/hour: 93.43

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Upeneus moluccensis	33.78	784	36.15	
Ariomma indicum	11.77	412	12.59	
Carangoides malabaricus	11.37	91	12.18	428
Metapenaeopsis miersi	6.25	304	6.69	
CIDARIDAE	4.65	829	4.97	
Lagocephalus lunaris	4.38	2	4.69	
Pomadasys maculatus	3.83	28	4.10	431
Pomadasys kaakan	3.17	2	3.39	432
JELLYFISH	2.87	2	3.07	
Saurida undosquamis	2.26	22	2.42	436
EGGS	2.21	0	2.37	
Nemipterus japonicus	1.56	17	1.67	434
Sphyraena qenie	0.96	13	1.02	
Hilsa kelee	0.96	65	1.02	429
Pellona ditchela	0.69	65	0.74	430
Priacanthus hamrur	0.52	7	0.56	
Polynemus sextarius**	0.43	11	0.46	435
Scomberoides tol	0.30	2	0.33	
Champsodon capensis	0.30	56	0.33	
Portunus sanguinolentus	0.22	4	0.23	
Lagocephalus guentheri	0.17	11	0.19	
Sepia pharaonis	0.17	13	0.19	
Upeneus taeniopterus	0.13	17	0.14	433
SALPS	0.11	2	0.12	
Starfish	0.09	2	0.10	
Tunicata	0.09	7	0.09	
Uranoscopus archionema	0.09	7	0.09	
Bothus swio	0.04	2	0.05	
Tylerius spinosissimus	0.04	4	0.05	
Total	93.43		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 126
DATE :13/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°15.40
start stop duration Lon E 38°54.84
TIME :09:28:42 09:58:28 29.8 (min) Purpose : 3
LOG : 8432.15 8433.75 1.6 Region : 7410
FDEPTH: 73 66 Gear cond.: 0
BDEPTH: 73 66 Validity : 0
Towing dir: 0° Wire out : 195 m Speed : 3.2 kn
Sorted : 55 Total catch: 55.08 Catch/hour: 111.05

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Drepane longimana	31.29	32	28.18	
Argyrops filamentosus	26.29	42	23.67	
Pomadasys kaakan	14.72	8	13.25	
Scomberomorus commerson	9.11	2	8.21	439
Loligo forbesi	8.15	494	7.33	
Psettodes erumei	6.17	4	5.56	
Carangoides malabaricus	5.16	24	4.65	437
Starfish	2.74	22	2.47	
Acroteriobatus leucospilus	2.30	2	2.07	
Saurida undosquamis	1.49	10	1.34	440
Tunicata	1.37	34	1.23	
Nemipterus japonicus	1.13	12	1.02	438
Tetrosomus concatenatus	0.40	2	0.36	
Pseudorhombus arsius **	0.28	4	0.25	
Upeneus moluccensis	0.24	4	0.22	
Metapenaeus monoceros	0.12	10	0.11	
Priacanthus hamrur	0.08	2	0.07	
Total	111.05		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 127
DATE :13/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°12.99
start stop duration Lon E 38°52.22
TIME :11:14:25 11:21:24 7.0 (min) Purpose : 3
LOG : 8440.46 8440.87 0.4 Region : 7410
FDEPTH: 29 29 Gear cond.: 7
BDEPTH: 29 29 Validity : 5
Towing dir: 0° Wire out : 90 m Speed : 3.6 kn
Sorted : 0 Total catch: 0.00 Catch/hour: 0.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
N O C A T C H	0.00	0	0.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 128
DATE :13/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 17°12.94
start stop duration Lon E 38°52.88
TIME :11:25:09 11:39:32 14.4 (min) Purpose : 3
LOG : 8441.09 8441.88 0.8 Region : 7410
FDEPTH: 30 29 Gear cond.: 0
BDEPTH: 30 29 Validity : 0
Towing dir: 0° Wire out : 90 m Speed : 3.3 kn
Sorted : 173 Total catch: 434.72 Catch/hour: 1815.11

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Drepane longimana	404.80	919	22.30	
Scomberoides tol	279.62	1261	15.41	
Leiognathus equulus	217.91	5311	12.01	444
JELLYFISH	176.95	543	9.75	
Gazza minuta	133.28	6889	7.34	
Pomadasys maculatus	121.09	969	6.67	
Pomadasys multimaculatus	115.11	50	6.34	
Carangoides malabaricus	84.18	651	4.64	
Sphyraena barracuda	61.80	75	3.40	
Megalaspis cordyla	48.14	96	2.65	
Scomberomorus plurilineatus	44.59	8	2.46	
Gerres filamentosus	35.95	351	1.98	
Caranx ignobilis	22.25	42	1.23	
Pomadasys kaakan	15.78	71	0.87	443
Alepes djedaba	12.40	317	0.68	
Upeneus vittatus	8.35	117	0.46	445
Selar crumenophthalmus	8.14	50	0.45	441
Carangoides chrysophrys	7.93	29	0.44	
Carangoides hedlandensis	7.47	50	0.41	
Saurida undosquamis	2.55	21	0.14	446
Secutor insidiator	2.13	138	0.12	
Loligo forbesi	1.92	167	0.11	
Herklotsichthys quadrimaculat.	1.29	42	0.07	442
Ariomma indicum	0.63	29	0.03	
Nemipterus japonicus	0.42	8	0.02	
Stolephorus commersonii	0.42	29	0.02	
Total	1815.11		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 129
DATE :13/03/18 GEAR TYPE: NO: 0 POSITION:Lat S 17°3.64
start stop duration Lon E 39°8.26
TIME :18:49:21 19:13:57 24.6 (min) Purpose : 3
LOG : 8487.67 8489.11 1.4 Region : 7410
FDEPTH: 24 26 Gear cond.: 0
BDEPTH: 24 26 Validity : 2
Towing dir: 0° Wire out : 80 m Speed : 3.5 kn
Sorted : 277 Total catch: 277.36 Catch/hour: 676.75

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lutjanus argentimaculatus	430.17	0	63.56	
Leiognathus equulus	51.09	952	7.55	452
Pomadasys maculatus	27.45	329	4.06	451
Sphyraena putnamae	22.59	24	3.34	
Engraulis sp.	20.81	6917	3.08	
Gerres filamentosus	17.18	171	2.54	
Carangoides malabaricus	14.49	137	2.14	447
Trichiurus lepturus	12.59	105	1.86	455
Upeneus taeniopterus	9.08	249	1.34	453
Thryssa vitrirostris	8.37	603	1.24	450
Secutor insidiator	7.71	1166	1.14	
Plectorhinchus gibbosus**	6.59	2	0.97	
Pellona ditchela	3.66	212	0.54	448
Pomadasys stridens	3.66	117	0.54	
Metapenaeus monoceros	3.56	447	0.53	
Lutjanus sp.	3.17	1415	0.47	
Sphyraena acutipinnis	2.83	29	0.42	
Atule mate	2.78	63	0.41	
Drepane longimana	2.76	22	0.41	
Alepes djedaba	2.68	61	0.40	
Sardinella albella	2.20	232	0.32	449
Upeneus moluccensis	2.15	122	0.32	
Engraulis capensis	1.85	185	0.27	
Loligo forbesi	1.66	98	0.25	
Mene maculata	1.61	20	0.24	
Polynemus sextarius**	1.37	59	0.20	
Penaeus japonicus	1.27	61	0.19	
Torquigener hypselogenion	1.22	188	0.18	
Sillago sihama	1.12	22	0.17	
Gazza minuta	1.07	283	0.16	
Johnius dussumieri	0.98	20	0.14	
Otolithes ruber	0.94	20	0.14	454
Pseudorhombus elevatus **	0.83	37	0.12	
Scomberoides tol	0.71	2	0.10	
Pseudorhombus arsius **	0.63	10	0.09	
Herklotsichthys quadrimaculat.	0.63	29	0.09	
Sardinella gibbosa	0.63	29	0.09	
Sphyraena flavicauda	0.59	24	0.09	
Bregmaceros sp.	0.56	251	0.08	
JELLYFISH	0.39	2	0.06	
Upeneus vittatus	0.37	61	0.05	
Carangoides oblongus	0.27	2	0.04	
Lutjanus lutjanus	0.27	5	0.04	
Priacanthus hamrur	0.10	10	0.01	
Pseudocyttus maculatus	0.05	2	0.01	
Rastrelliger kanagurta	0.05	2	0.01	
Total	676.75		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 130
DATE :13/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 16°56.33
start stop duration Lon E 39°19.95
TIME :22:34:53 23:04:42 29.8 (min) Purpose : 3
LOG : 8514.87 8516.60 1.7 Region : 7410
FDEPTH: 25 26 Gear cond.: 0
BDEPTH: 25 26 Validity : 2
Towing dir: 0° Wire out : 75 m Speed : 3.5 kn
Sorted : 33 Total catch: 85.82 Catch/hour: 172.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Loligo duvauceli	30.72	680	17.79	
Amblygaster sirm	11.62	958	6.73	457
Metapenaeus monoceros	10.95	3441	6.34	459
Leiognathus elongatus**	9.09	4785	5.27	
Decapterus macrosoma	8.81	479	5.10	
Decapterus russelli	8.60	1064	4.98	456
Pomadasys jubelini	7.83	56	4.53	

Cetengraulis edentulus	7.40	4121	4.29	
Sardinella gibbosa	7.40	340	4.29	
Priacanthus hamrur	6.82	64	3.95	
J E L L Y F I S H	6.82	64	3.95	
Penaeus semisulcatus	6.76	256	3.92	458
Drepane punctata	6.68	64	3.87	
Rhinobatos sp.	4.75	4	2.75	
Rondeletiola minor	4.57	455	2.65	
Lutjanus lutjanus	4.57	113	2.65	
Upeneus bensasi	4.57	853	2.65	
Synodus sp.	4.57	511	2.65	
Thryssa vitrirostris	2.27	227	1.32	
Ommastrephes bartrami	1.91	227	1.11	
Pellona ditchela	1.81	115	1.05	
Trachinocephalus myops	1.77	85	1.03	
Polynemus sextarius**	1.69	169	0.98	
Torquigener hypselogenion	1.69	227	0.98	
Upeneus sulphureus	1.15	56	0.66	
Fistularia petimba	1.15	113	0.66	
Paramonacanthus pusillus	1.15	284	0.66	
Rastrelliger kanagurta	1.15	56	0.66	
Penaeus japonicus	1.15	56	0.66	
Selar crumenophthalmus	1.01	24	0.58	
Apistus carinatus	0.56	56	0.33	
Callionymus sp.	0.56	56	0.33	
Synodus sp.	0.56	227	0.33	0
Mulloidichthys flavolineatus	0.56	54	0.33	
Total	172.68		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 131
DATE :14/03/18 GEAR TYPE: PT NO: 7 POSITION:Lat S 16°34.22
start stop duration Lon E 39°46.41
TIME :06:41:54 07:23:21 41.5 (min) Purpose : 3
LOG : 8566.92 8566.92 0.0 Region : 7410
FDEPTH: 10 10 Gear cond.: 0
BDEPTH: 25 25 Validity : 0
Towing dir: 0° Wire out : 80 m Speed : 0.0 kn
Sorted : 48 Total catch: 47.85 Catch/hour: 69.25

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Encrasicholina punctifer	53.17	29538	76.78	
Loligo vulgaris	12.50	136	18.06	
JELLYFISH	2.63	91	3.80	
CORAL	0.72	0	1.04	
Chaetodon kleinii	0.07	3	0.10	
Gymnocrotaphus curvidens	0.06	6	0.08	
Upeneus sulphureus	0.04	3	0.06	
LUTJANIDAE, juvenile	0.01	1	0.02	
POMACENTRIDAE	0.01	1	0.02	
Scomberomorus commerson	0.01	1	0.02	
Apogon apogonides **	0.00	1	0.01	
Total	69.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 132
DATE :14/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 16°32.52
start stop duration Lon E 39°51.23
TIME :08:57:28 09:16:46 19.3 (min) Purpose : 3
LOG : 8582.50 8583.55 1.1 Region : 7410
FDEPTH: 25 23 Gear cond.: 0
BDEPTH: 25 23 Validity : 0
Towing dir: 0° Wire out : 70 m Speed : 3.3 kn
Sorted : 223 Total catch: 222.84 Catch/hour: 692.41

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
JELLYFISH	680.91	0	98.34	
Loligo forbesi	4.85	96	0.70	
Saurida undosquamis	1.37	6	0.20	
Scomberoides tol	0.81	3	0.12	
Upeneus bensasi	0.75	326	0.11	460
Pterois russelii	0.68	3	0.10	
ANTHOZOA (Sea anemones)	0.47	3	0.07	
E C H I N O D E R M A T A	0.40	31	0.06	
Equulites elongatus	0.37	190	0.05	
Nemipterus japonicus	0.31	9	0.04	
Anchoa sp., juvenile	0.25	143	0.04	
Selar crumenophthalmus	0.25	3	0.04	
Synodus jaculum	0.25	31	0.04	
Apogon sp.	0.19	106	0.03	
Trachinocephalus myops	0.19	37	0.03	
Metapenaeus monoceros	0.12	9	0.02	
Tunicata	0.09	3	0.01	
Decapterus macrosoma	0.06	12	0.01	
Parabothus cf. coarctus	0.06	9	0.01	
Lagocephalus guentheri	0.03	3	0.00	
Total	692.41		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 133
DATE :14/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 16°30.99
start stop duration Lon E 39°54.85
TIME :10:48:12 11:04:54 16.7 (min) Purpose : 3
LOG : 8592.27 8593.41 1.1 Region : 7410
FDEPTH: 75 72 Gear cond.: 0
BDEPTH: 75 72 Validity : 0
Towing dir: 0° Wire out : 210 m Speed : 4.1 kn
Sorted : 18 Total catch: 18.28 Catch/hour: 65.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Rhizoprionodon acutus	20.19	11	30.74	
PORIFERA (Sponges)	13.65	0	20.79	
E C H I N O D E R M A T A	4.53	1257	6.89	
Loligo vulgaris	4.24	176	6.46	
Arothron stellatus	4.24	4	6.46	
Scomberoides tol	3.95	11	6.02	
Lagocephalus guentheri	3.81	22	5.80	
CORAL	2.73	0	4.16	
JELLYFISH	1.58	25	2.41	
Starfish	1.51	133	2.30	
Sepia australis	1.37	7	2.08	
Decapterus kurroides	0.86	4	1.31	
Algaes	0.65	0	0.98	
Argyrops spinifer	0.65	4	0.98	
Selar crumenophthalmus	0.57	4	0.88	
Saurida undosquamis	0.29	4	0.44	
Nemipterus japonicus	0.29	4	0.44	
Fistularia petimba	0.22	14	0.33	
C E P H A L O P O D A	0.14	7	0.22	
PAGUROIDEA	0.07	7	0.11	
PORTUNIDAE	0.07	22	0.11	
G A S T R O P O D S	0.04	4	0.05	
Torquigener flavimaculosus	0.04	4	0.05	
Total	65.68		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 134
DATE :14/03/18 GEAR TYPE: PT NO: 7 POSITION:Lat S 16°27.86
start stop duration Lon E 39°53.56
TIME :13:12:42 13:59:47 47.1 (min) Purpose : 3
LOG : 8605.09 8607.59 2.5 Region : 7410
FDEPTH: 10 10 Gear cond.: 0
BDEPTH: 19 24 Validity : 0
Towing dir: 0° Wire out : 80 m Speed : 3.2 kn
Sorted : 0 Total catch: 4.69 Catch/hour: 5.97

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Anchoa sp., juvenile	3.47	2835	58.02	
JELLYFISH	2.19	56	36.69	
Starfish	0.15	10	2.56	
Algaes	0.10	0	1.71	
CORAL	0.03	0	0.43	
Decapterus russelli	0.03	22	0.43	
Carangoides ferdau	0.01	1	0.15	
Leiognathus equulus	0.00	1	0.02	
Total	5.97		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 135
DATE :14/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 16°27.49
start stop duration Lon E 40°0.35
TIME :15:56:19 16:19:44 23.4 (min) Purpose : 3
LOG : 8618.04 8619.30 1.3 Region : 7410
FDEPTH: 384 350 Gear cond.: 6
BDEPTH: 384 350 Validity : 5
Towing dir: 0° Wire out : 965 m Speed : 3.2 kn
Sorted : 0 Total catch: 17.52 Catch/hour: 44.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Plesiobatis daviesi	17.94	3	39.95	
Satyrichthys adeni	10.51	8	23.40	
Dipturus stenorhynchus	10.41	0	23.17	
Uroconger lepturus	0.92	10	2.05	
Neolithodes asperrimus	0.92	8	2.05	
Chlorophthalmus agassizi	0.87	13	1.94	
Lepidotrigla faueri	0.67	13	1.48	
Coelorinchus denticulatus	0.56	31	1.26	
Etmopterus lucifer	0.56	13	1.26	
Myctophid sp. A	0.51	15	1.14	
Heterocarpus woodmasoni	0.51	44	1.14	
Champsodon capensis	0.21	13	0.46	
Metanephrops andamanicus	0.21	8	0.46	
Aristeus antennatus	0.05	8	0.11	
Aristeus cf virilis	0.05	5	0.11	
Total	44.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 136
DATE :14/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 16°24.30
start stop duration Lon E 40°0.63
TIME :18:56:38 19:26:49 30.2 (min) Purpose : 3
LOG : 8632.34 8633.83 1.5 Region : 7410
FDEPTH: 40 37 Gear cond.: 0
BDEPTH: 40 37 Validity : 2
Towing dir: 0° Wire out : 110 m Speed : 3.0 kn
Sorted : 0 Total catch: 2176.20 Catch/hour: 4326.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
PORIFERA (Sponges)	3976.14	0	91.90	
Lutjanus argentimaculatus	67.28	14	1.56	
Epinephelus malabaricus	58.97	6	1.36	
Lutjanus lutjanus	30.30	145	0.70	
Pomacanthus imperator	16.04	12	0.37	
Lutjanus rivulatus	12.92	2	0.30	
Parupeneus heptacanthus	10.06	10	0.23	
HOLUTHUROIDEA	9.64	99	0.22	
Carangoides malabaricus	9.18	42	0.21	461
Plectorhinchus schotaf	9.18	4	0.21	
Tripterodon orbis	9.11	8	0.21	
Lutjanus notatus	8.67	68	0.20	0
Diagramma pictum	8.03	4	0.19	
Panulirus homarus	7.12	6	0.16	463
Acanthurus dussumieri	6.96	6	0.16	
Lutjanus notatus	6.88	48	0.16	
Lutjanus fulviflamma	6.36	32	0.15	
Selar crumenophthalmus	5.57	34	0.13	462
Sphyraena jello	5.37	10	0.12	464
Priacanthus hamrur	4.93	36	0.11	
Epinephelus coioides	4.57	2	0.11	
Gymnocranius griseus	4.53	14	0.10	
Alepes djedaba	4.29	14	0.10	
Dasyatis sp.	3.22	2	0.07	
Starfish	2.55	4	0.06	
Pomacanthus semicirculatus	2.50	2	0.06	
Scorpaena scrofa	2.31	52	0.05	
Pseudobalistes fuscus	1.99	2	0.05	
Apogon cf. taeniatus	1.95	153	0.05	
Dipturus stenorhynchus	1.83	2	0.04	
Epinephelus rivulatus	1.83	2	0.04	
Parupeneus indicus	1.75	28	0.04	
Lutjanus bengalensis	1.51	30	0.03	
Pterois miles	1.51	6	0.03	
Lethrinus mahsena	1.51	2	0.03	
Thenus orientalis	1.51	8	0.03	
Chaetodon dolosus	1.43	62	0.03	
Ostracion cubicus	1.35	2	0.03	

Heniochus acuminatus	1.03	8	0.02	
Myripristis cf murdjan	0.99	14	0.02	
Caesio caerulaurea	0.91	20	0.02	
Equulites elongatus	0.91	95	0.02	
Carangoides malabaricus	0.91	4	0.02	0
MYCTOPHIDAE	0.87	439	0.02	
Aluterus monoceros	0.78	6	0.02	
Loligo duvauceli	0.72	14	0.02	
Synodus sp.	0.72	16	0.02	
Rexea prometheoides	0.68	56	0.02	
Sargocentron sp.	0.66	4	0.02	
C R A B S	0.48	14	0.01	
Scolopsis vosmeri	0.48	4	0.01	
Molluscs	0.48	2	0.01	
Scolopsis bimaculata	0.44	4	0.01	
Pristotis cf. cyanostigma	0.40	34	0.01	
Sargocentron diadema	0.40	10	0.01	
Bodianus sp.	0.36	2	0.01	
Sepia pharaonis	0.36	4	0.01	
Upeneus bensasi	0.32	16	0.01	
Cirrhilabrus rubripinnis	0.28	2	0.01	
Octopus sp.	0.28	2	0.01	
Nemipterus bipunctatus	0.20	4	0.00	
Apogon queketti	0.20	14	0.00	
Synodus binotatus	0.16	4	0.00	
Upeneus taenioptenus	0.16	8	0.00	
Semirossia sp.	0.14	12	0.00	
Cyprinocirrhites polyactis	0.12	8	0.00	
Rhinopias eschmeyeri	0.12	2	0.00	
Penaeus semisulcatus	0.10	4	0.00	
OCTOPODIDAE	0.10	12	0.00	
Etmopterus lucifer	0.08	2	0.00	
Coris sp.	0.08	2	0.00	
Penaeus latisulcatus	0.08	2	0.00	
Ommastrephes bartrami	0.08	12	0.00	
Emmelichthys nitidus	0.08	6	0.00	
Cociella crocodila	0.08	2	0.00	
Parupeneus pleurostigma	0.06	2	0.00	
Canthigaster rivulata	0.06	2	0.00	
Macrorhamphosus scolopax	0.06	4	0.00	
Acanthurus - juvenile	0.06	2	0.00	
Alectis indica	0.04	2	0.00	
UNIDENTIFIED FISH	0.03	2	0.00	
Plectranthias sp.	0.02	2	0.00	
Equulites elongatus	0.02	18	0.00	0
Parapriacanthus ransonneti	0.02	2	0.00	
Total	4326.44		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 137
DATE :14/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 16°17.99
start stop duration Lon E 40°2.48
TIME :21:57:01 22:23:57 26.9 (min) Purpose : 3
LOG : 8644.23 8645.45 1.2 Region : 7410
FDEPTH: 22 22 Gear cond.: 0
BDEPTH: 22 22 Validity : 2
Towing dir: 0° Wire out : 65 m Speed : 2.7 kn
Sorted : 0 Total catch: 38.27 Catch/hour: 85.27

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Upeneus bensasi	16.53	1299	19.39	
Selar crumenophthalmus	13.01	134	15.26	467
Decapterus russelli	11.76	0	13.80	466
Trachinocephalus myops	7.00	305	8.20	
Sardinella gibbosa	4.99	798	5.85	
CORAL	4.81	0	5.64	
Sphyraena barracuda	3.12	2	3.66	
Loligo forbesi	3.12	49	3.66	
Algaes	2.99	0	3.50	
Equulites elongatus	2.99	829	3.50	
Sphyraena cf. forsteri	2.54	40	2.98	
Lactoria cornuta	1.87	7	2.19	
Saurida undosquamis	1.58	11	1.86	470
Priacanthus hamrur	1.18	74	1.38	
Decapterus macrosoma	1.07	74	1.25	465
Bothus sp.	0.98	131	1.15	
Sepia australis	0.94	20	1.10	
Amblygaster sirm	0.67	20	0.78	
Gnathanodon speciosus	0.53	53	0.63	
Penaeus japonicus	0.53	20	0.63	468
Nemipterus bipunctatus	0.53	7	0.63	
CARIDEA	0.45	82	0.52	
Penaeus latisulcatus	0.31	22	0.37	469
Carangoides ferdau	0.22	22	0.26	
MYCTOPHIDAE	0.18	62	0.21	
Syllidae spp	0.18	2	0.21	
Callionymus sp.	0.18	13	0.21	
Apistus carinatus	0.13	16	0.16	
Semirossia sp.	0.13	11	0.16	
Ommastrephes bartrami	0.11	20	0.13	
Torquigener sp.	0.11	13	0.13	
Dipterygonotus balteatus	0.11	25	0.13	
PORTUNIDAE	0.09	2	0.10	
Lagocephalus lunaris	0.07	2	0.08	
Upeneus moluccensis	0.07	4	0.08	
Parupeneus pleurostigma	0.04	2	0.05	
Bathyuroconger vicinus	0.04	2	0.05	
Chauliodus sloani	0.04	4	0.05	
Cociella sp.	0.02	2	0.03	
Unid. juvenile fishes	0.02	2	0.03	
Total	85.27		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 138
DATE :15/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 15°51.85
start stop duration Lon E 40°20.60
TIME :05:55:38 06:12:57 17.3 (min) Purpose : 3
LOG : 8702.60 8703.54 0.9 Region : 7410
FDEPTH: 24 26 Gear cond.: 0
BDEPTH: 24 26 Validity : 0
Towing dir: 0° Wire out : 75 m Speed : 3.3 kn
Sorted : 13 Total catch: 12.52 Catch/hour: 43.39

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Upeneus bensasi	35.06	2654	80.80	472
Salmacis bicolor	1.42	3	3.27	
Trachinocephalus myops	1.42	3	3.27	
Thenus orientalis	1.25	3	2.87	
Astropyga radiata	0.87	3	2.00	
Lactoria cornuta	0.83	3	1.92	
Selar crumenophthalmus	0.73	10	1.68	471
Nemipterus bipunctatus	0.73	17	1.68	473
Decapterus kurroides	0.24	21	0.56	
Fistularia commersonii	0.24	10	0.56	
MULLIDAE	0.21	10	0.48	
Amanses scopas	0.21	3	0.48	
Caranx sem**	0.10	3	0.24	
Loligo vulgaris	0.07	3	0.16	
Equulites elongatus	0.01	3	0.03	
Total	43.39		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 139
DATE :15/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 15°40.15
start stop duration Lon E 40°30.99
TIME :10:18:20 10:49:22 31.0 (min) Purpose : 3
LOG : 8733.45 8735.12 1.7 Region : 7410
FDEPTH: 24 27 Gear cond.: 0
BDEPTH: 24 27 Validity : 0
Towing dir: 0° Wire out : 80 m Speed : 3.2 kn
Sorted : 0 Total catch: 24.63 Catch/hour: 47.61

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Aprion virescens	18.29	10	38.41	
Epinephelus coioides	9.70	2	20.38	
Pseudobalistes flavimarginatus	7.42	2	15.59	
Pseudobalistes fuscus	4.18	2	8.77	
Lophodiodon calori	3.79	2	7.96	
Loligo duvauceli	1.20	17	2.52	
Lactoria cornuta	0.85	2	1.79	
Loligo forbesi	0.73	15	1.54	
Fistularia commersonii	0.54	6	1.14	
Upeneus bensasi	0.35	17	0.73	474
Algaes	0.23	0	0.49	
Lethrinus microdon	0.21	17	0.45	
Sepia australis	0.08	2	0.16	
CORAL	0.04	0	0.08	
Total	47.61		100.00	

R/V Dr. Fridtjof Nansen SU
EY:2018402 STATION: 140
DATE :15/03/18 GEAR TYPE: PT NO: 8 POSITION:Lat S 14°44.46
start stop duration Lon E 40°51.98
TIME :19:51:24 20:22:31 31.1 (min) Purpose : 3
LOG : 8811.29 8813.84 2.5 Region : 7410
FDEPTH: 0 0 Gear cond.: 0
BDEPTH: 354 403 Validity : 0
Towing dir: 0° Wire out : 230 m Speed : 4.9 kn
Sorted : 0 Total catch: 0.00 Catch/hour: 0.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Antigonia 'deep'	0.00	8	0.00	
Decapterus punctatus	8.94	216	0.00	476
Decapterus kurroides	57.17	942	0.00	475
Decapterus russelli	3.47	4337	0.00	
Encrasicholina punctifer	0.27	154	0.00	
Hirundichthys speculiger	0.17	2	0.00	
Sargocentron diadema	0.02	6	0.00	
Cantherhines sp.	0.01	2	0.00	
Pervagor melanocephalus	0.04	2	0.00	
Myctophid sp. A	25.56	8481	0.00	
Lestrolepis intermedia	0.39	40	0.00	
Priacanthus hamrur	0.12	62	0.00	
Crenidens crenidens	0.00	4	0.00	
Sphyraena sp.	0.02	8	0.00	
Loligo sp.	14.46	9036	0.00	
Ommastrephes bartrami	3.89	83	0.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 141
DATE :16/03/18 GEAR TYPE: BT NO: 0 POSITION:Lat S 13°40.90
start stop duration Lon E 40°35.30
TIME :04:52:48 05:21:28 28.7 (min) Purpose : 3
LOG : 8888.37 8889.92 1.6 Region : 7410
FDEPTH: 25 33 Gear cond.: 0
BDEPTH: 25 33 Validity : 0
Towing dir: 0° Wire out : 85 m Speed : 3.2 kn
Sorted : 41 Total catch: 40.91 Catch/hour: 85.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	55.21	295	64.48	
Scomberomorus commerson	11.85	2	13.84	
Loligo vulgaris	10.46	303	12.22	
Chirodropus gorilla	2.80	4	3.28	
Alepes kleinii	2.51	1	2.93	
Lactoria cornuta	1.36	2	1.59	
Carangoides malabaricus	0.88	23	1.03	477
Nemipterus bipunctatus	0.54	8	0.64	478
Total	85.62		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 142
DATE :16/03/18 GEAR TYPE: PT NO: 7 POSITION:Lat S 13°26.34
start stop duration Lon E 40°34.11
TIME :09:11:20 09:45:42 34.4 (min) Purpose : 3
LOG : 8917.52 8919.21 1.7 Region : 7410
FDEPTH: 10 10 Gear cond.: 0
BDEPTH: 26 38 Validity : 0
Towing dir: 0° Wire out : 105 m Speed : 3.0 kn
Sorted : 0 Total catch: 16.27 Catch/hour: 28.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Anchoa sp.	25.25	31563	88.85	
JELLYFISH	2.39	112	8.42	
Loligo forbesi	0.31	17	1.11	

Algaes	0.14	0	0.49
Loligo duvauceli	0.14	3	0.49
Alepes djedaba	0.09	3	0.31
Scomberoides tol	0.05	3	0.18
CORAL	0.03	0	0.12
Leptocephalus, juvenile	0.01	3	0.02
Total	28.42		100.00

R/V Dr. Fridtjof Nansen SURVEY:2018402 STATION: 143
DATE :16/03/18 GEAR TYPE: PT NO: 8 POSITION:Lat S 12°40.17
start stop duration Lon E 40°41.18
TIME :16:47:26 17:17:33 30.1 (min) Purpose : 3
LOG : 8979.32 8981.52 2.2 Region : 7410
FDEPTH: 0 17 Gear cond.: 0
BDEPTH: 450 452 Validity : 0
Towing dir: 0° Wire out : 230 m Speed : 4.4 kn
Sorted : 0 Total catch: 24.10 Catch/hour: 47.99

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	20.57	51427	42.86	
Ommastrephes bartrami	14.80	4931	30.83	
Caranx sexfasciatus	7.69	2	16.02	
Tunicata	3.60	133	7.51	
Leptocephalus, juvenile	1.25	279	2.61	
Decapterus macrosoma	0.08	76	0.17	479
Waste General	0.00	2	0.00	
Plastic	0.00	2	0.00	
Total	47.99		100.00	

ANNEX VI. HYDROGRAPHICAL SECTION PLOTS OF THE NINE ENVIRONMENTAL TRANSECTS

Transect 1

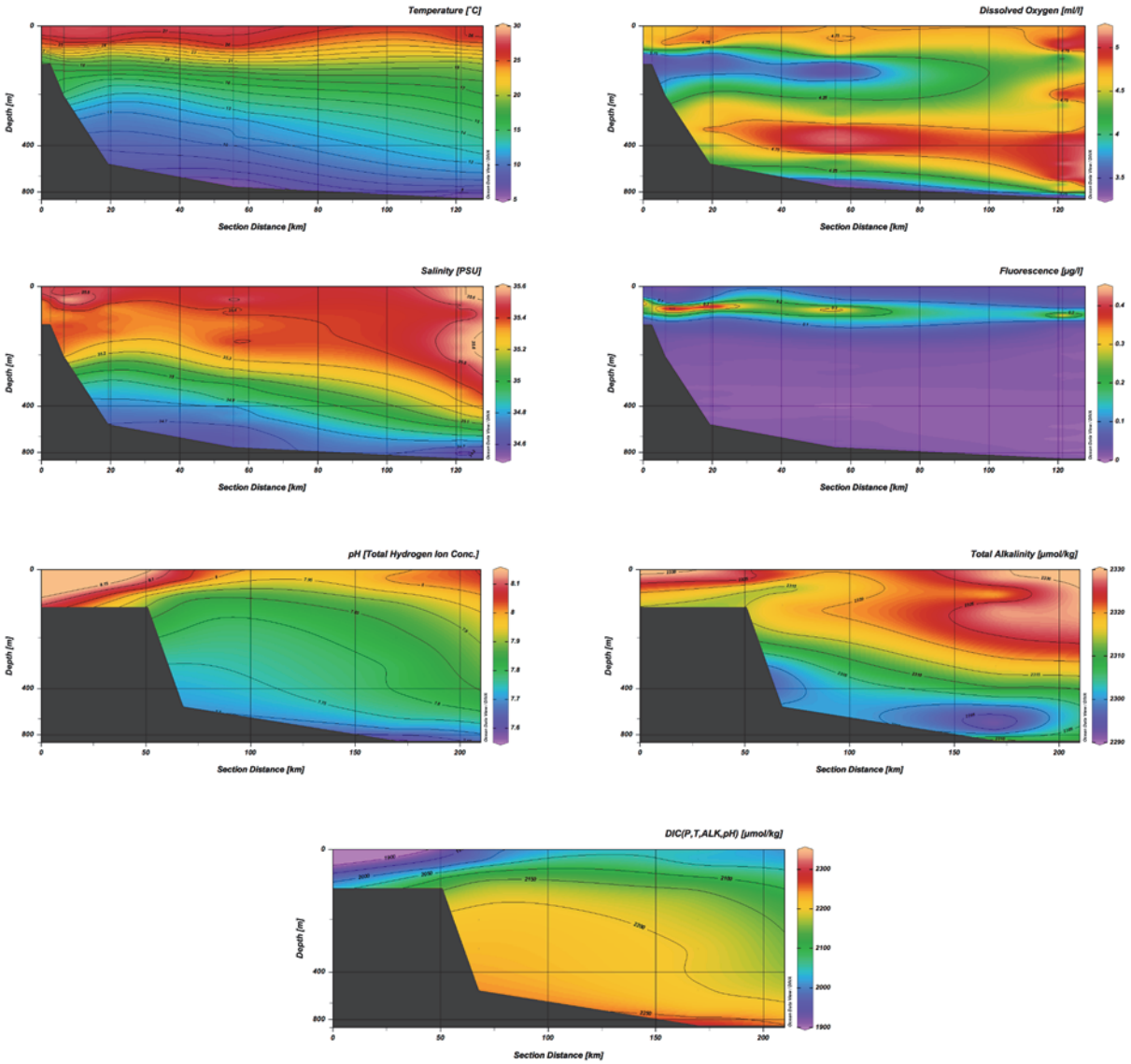


Figure VI.1. Cross-shelf distributions of temperature oxygen, salinity, fluorescence, pH, total alkalinity, dissolved inorganic carbon (derived) for Transect 1.

Transect 2

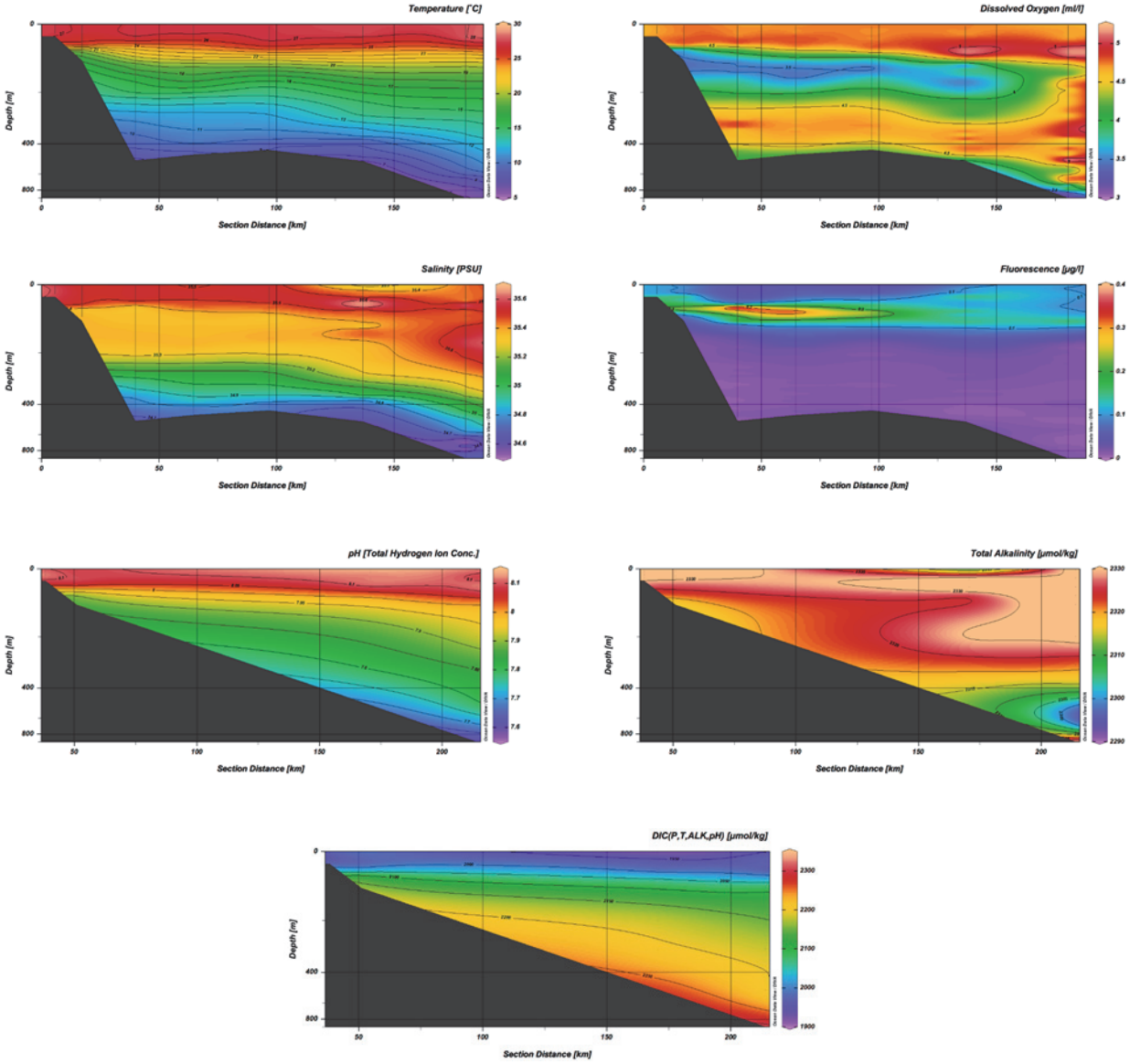


Figure VI.2. Cross-shelf distributions of temperature oxygen, salinity, fluorescence, pH, total alkalinity, dissolved inorganic carbon (derived) for Transect 2.

Transect 3

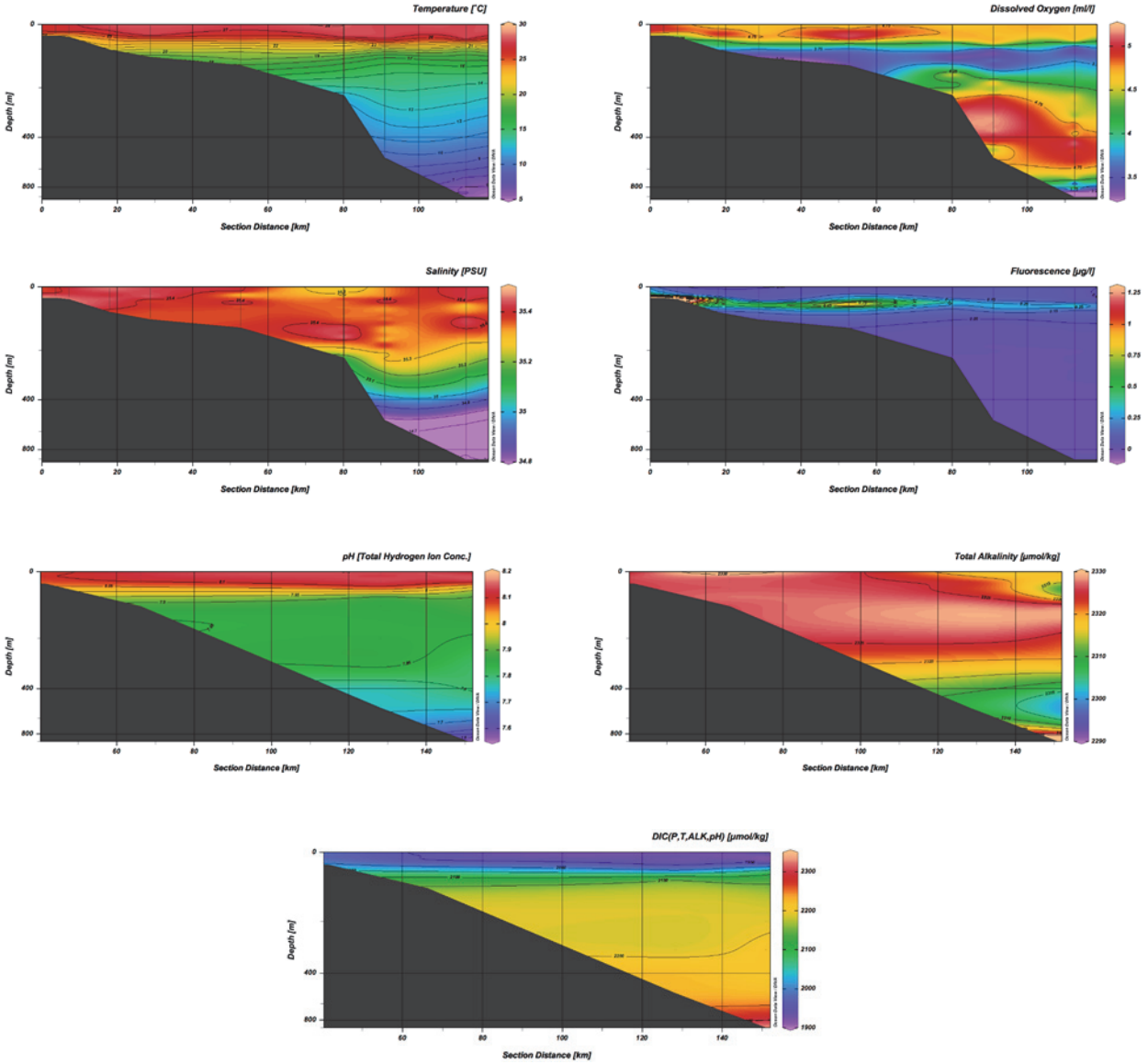


Figure VI.3. Cross-shelf distributions of temperature oxygen, salinity, fluorescence, pH, total alkalinity, dissolved inorganic carbon (derived) for Transect 3.

Transect 4

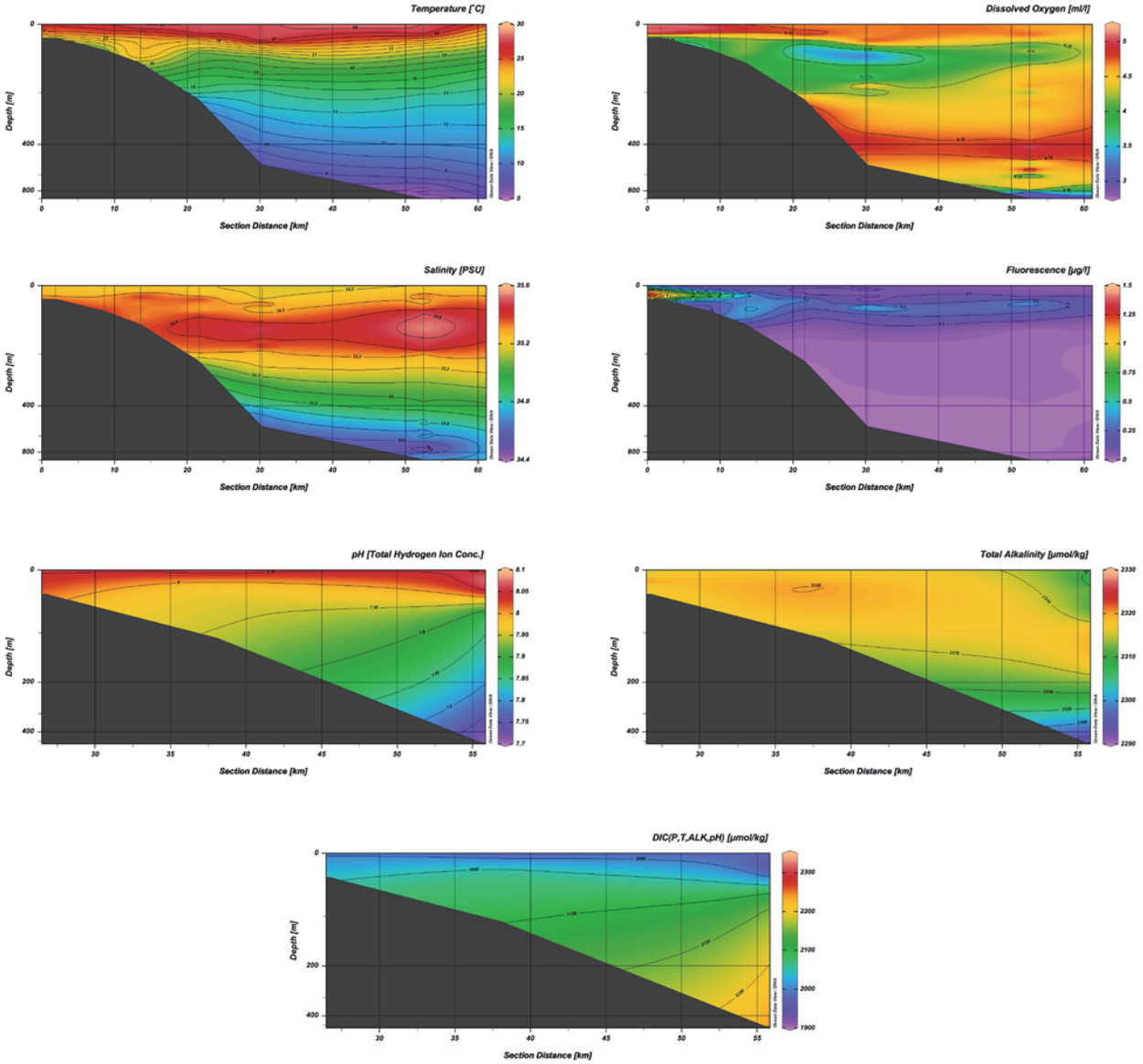


Figure VI.4. Cross-shelf distributions of temperature oxygen, salinity, fluorescence, pH, total alkalinity, dissolved inorganic carbon (derived) for Transect 4.

Transect 5

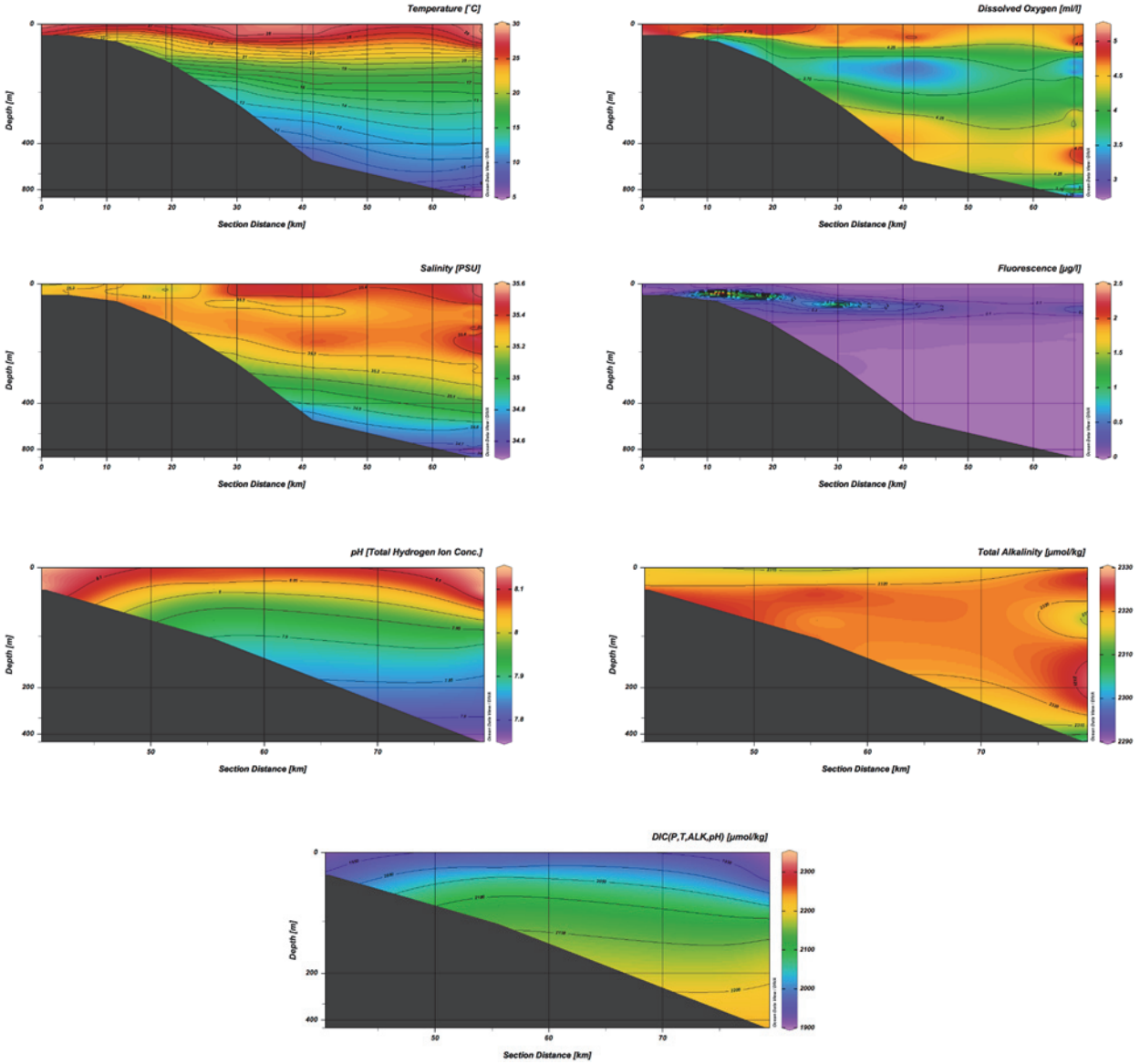


Figure VI.5. Cross-shelf distributions of temperature oxygen, salinity, fluorescence, pH, total alkalinity, dissolved inorganic carbon (derived) for Transect.

Transect 6

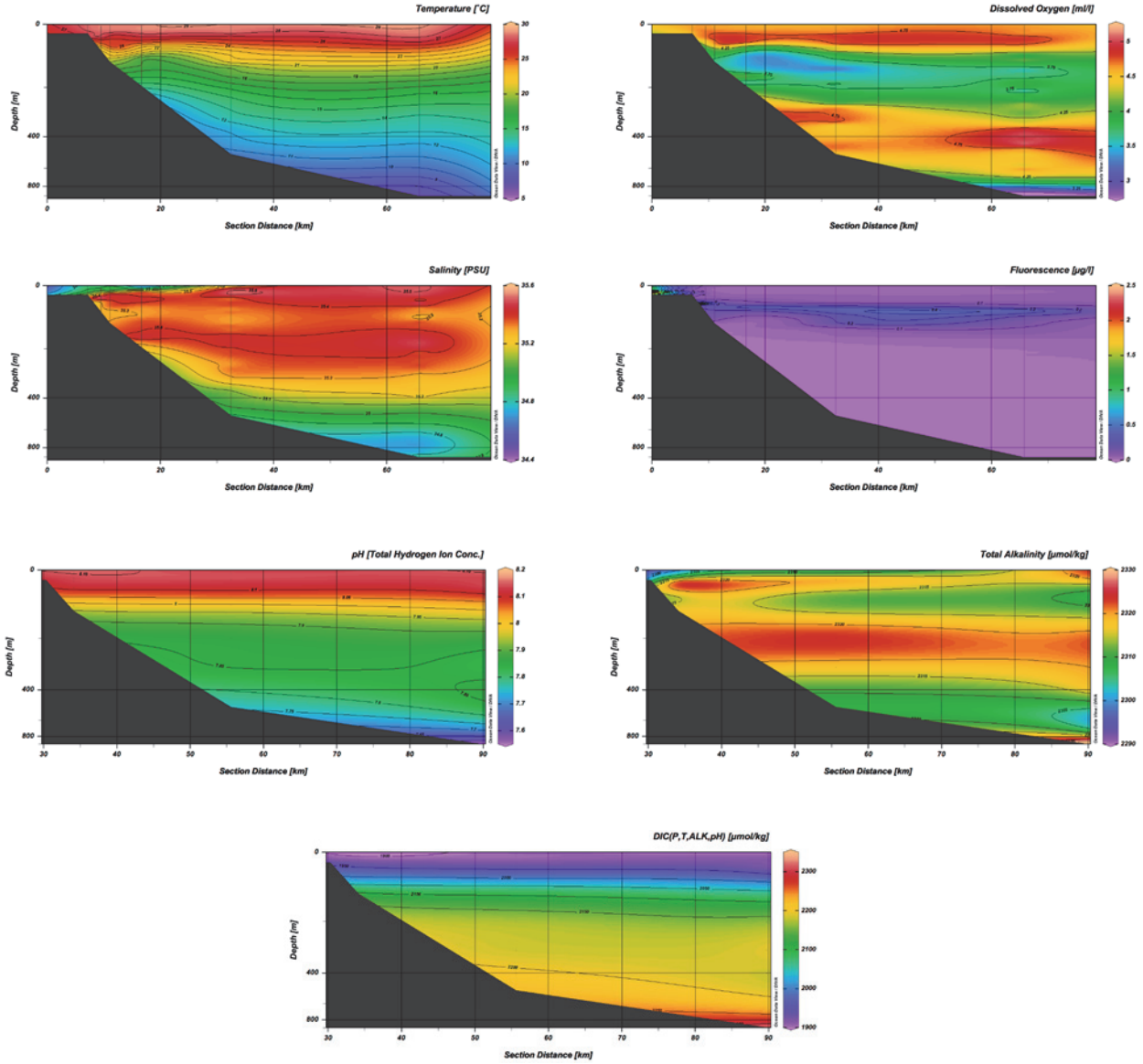


Figure VI.6. Cross-shelf distributions of temperature oxygen, salinity, fluorescence, pH, total alkalinity, dissolved inorganic carbon (derived) for Transect 6.

Transect 7

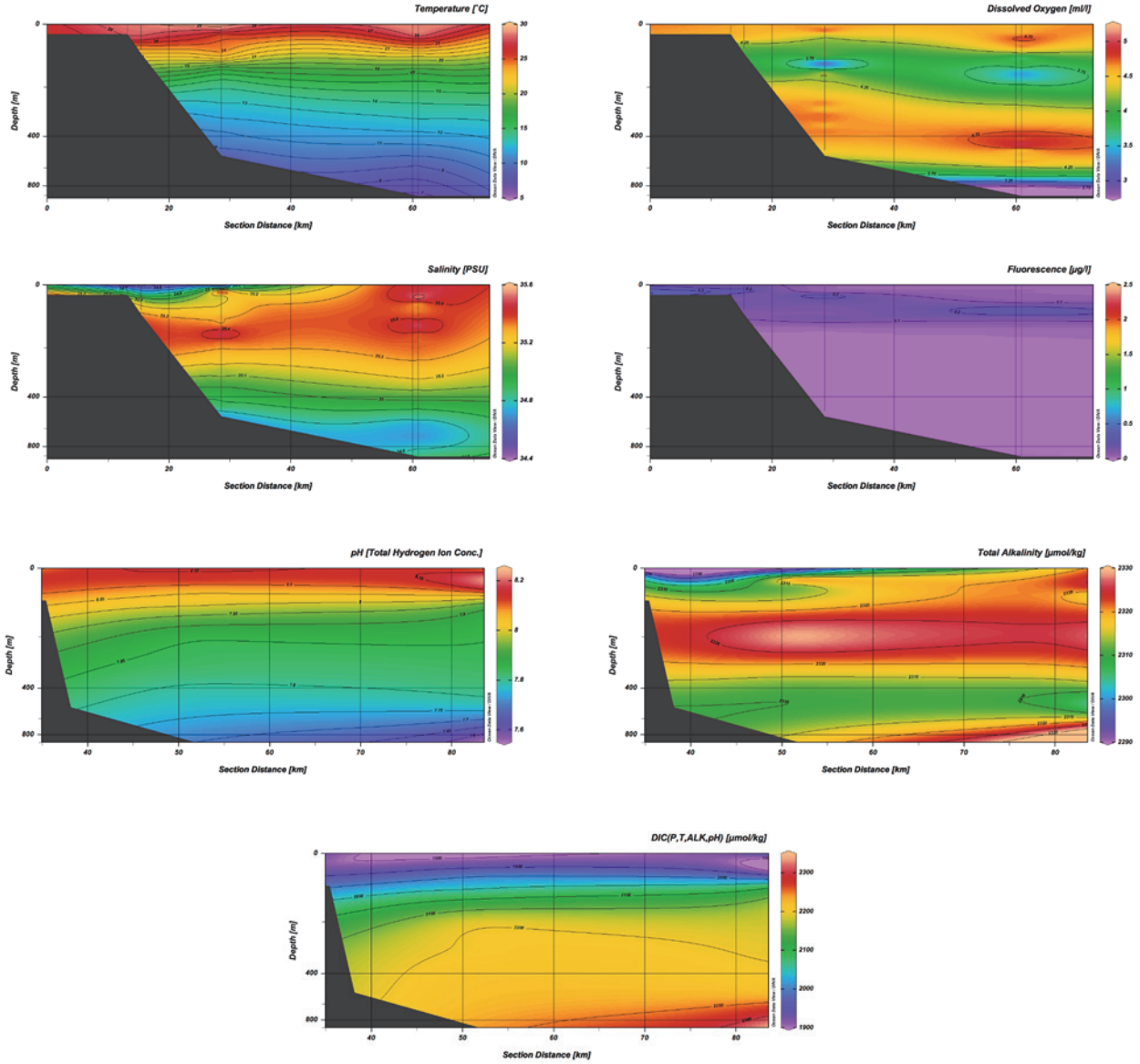


Figure VI.7. Cross-shelf distributions of temperature oxygen, salinity, fluorescence, pH, total alkalinity, dissolved inorganic carbon (derived) for Transect 7.

Transect 8

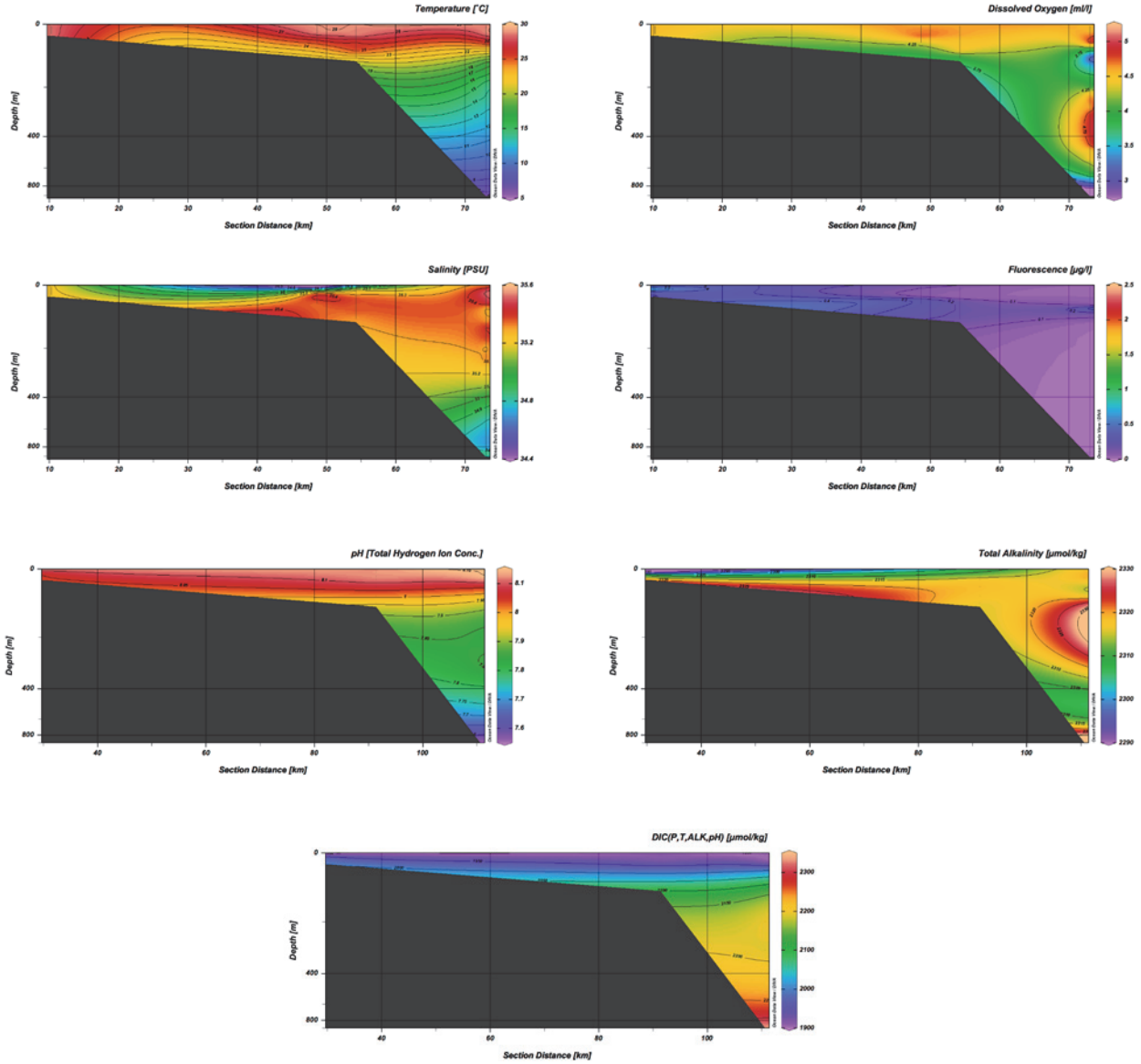


Figure VI.8. Cross-shelf distributions of temperature oxygen, salinity, fluorescence, pH, total alkalinity, dissolved inorganic carbon (derived) for Transect 8.

Transect 9

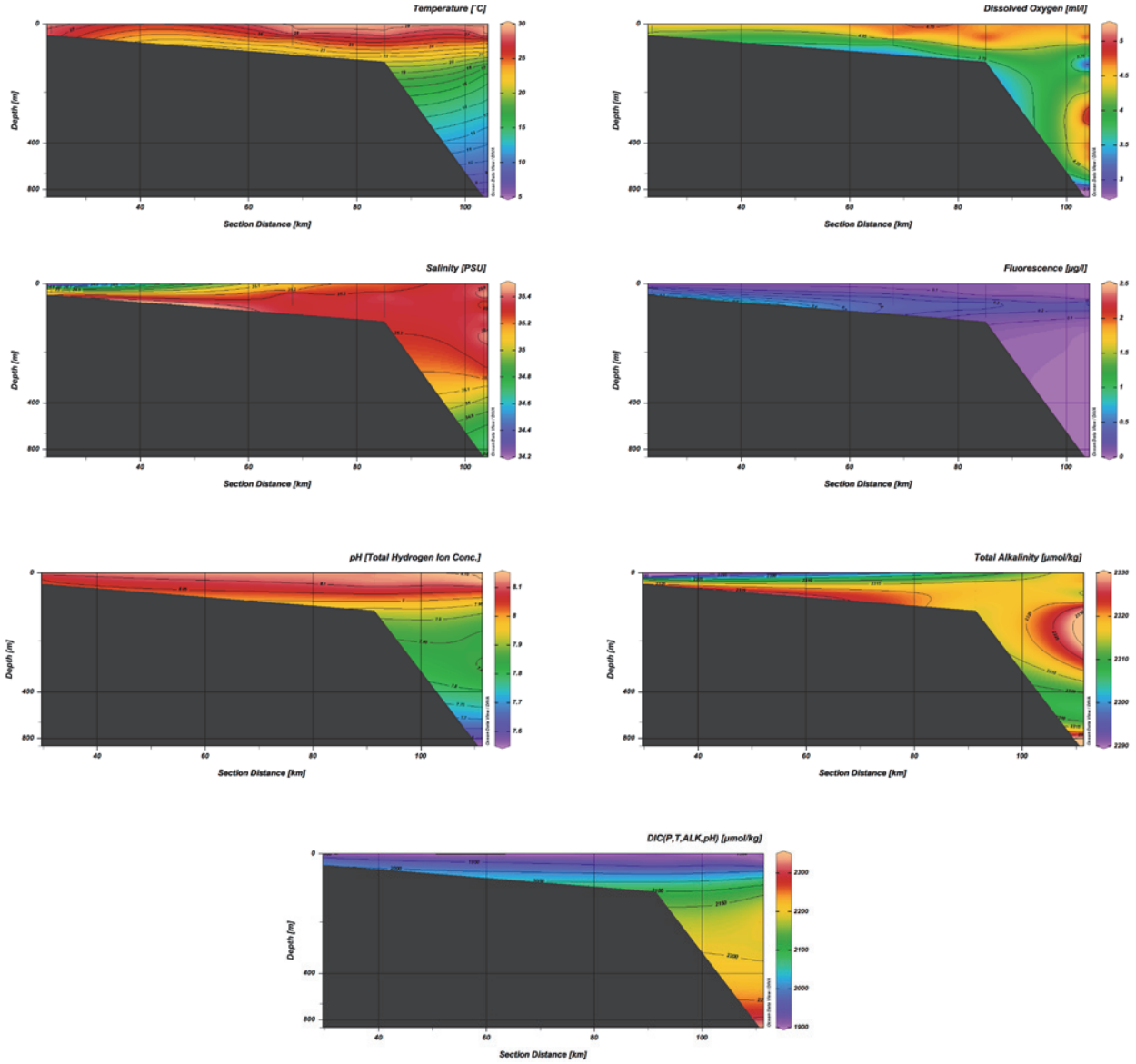


Figure VI.9. Cross-shelf distributions of temperature oxygen, salinity, fluorescence, pH, total alkalinity, dissolved inorganic carbon (derived) for Transect 9.

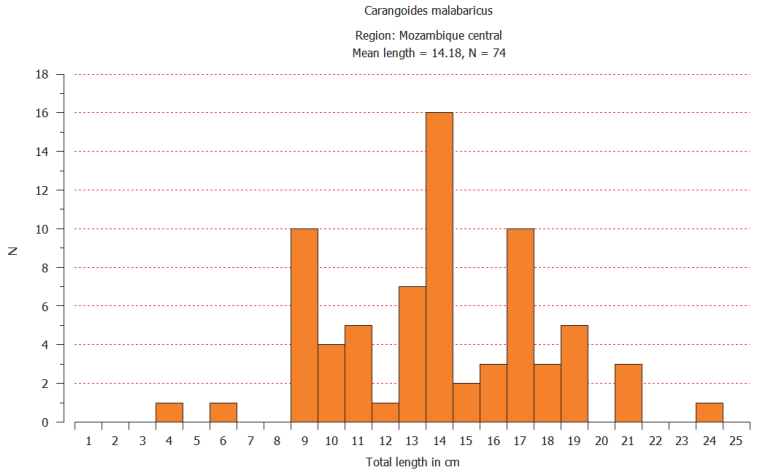
ANNEX VII. MESOZOOPLANKTON BIOMASS

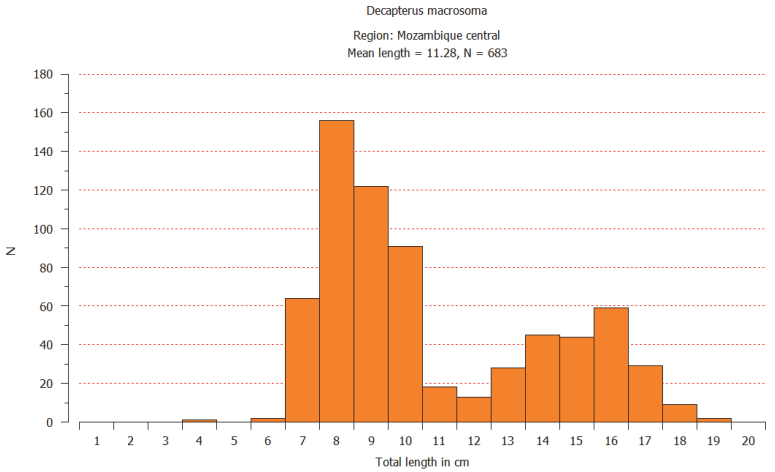
Station	Year	Month	Day	Time	Latitude	Longitude	UpperDepth	LowerDepth	Dry weight (g/m^2)
73	2018	2	13	0818	-26.7577	32.9622	0	100	1.5384
73	2018	2	13	0830	-26.7577	32.9622	0	30	1.6608
75	2018	2	13	1446	-26.7603	33.1202	0	200	5.3368
75	2018	2	13	1504	-26.7603	33.1202	0	30	0.9384
77	2018	2	14	0500	-26.7575	34.151	0	200	1.4784
77	2018	2	14	0517	-26.7575	34.151	0	30	1.9912
93	2018	2	16	1919	-25.6082	33.0513	0	30	1.56
95	2018	2	16	2143	-25.633	33.155	0	100	1.7208
95	2018	2	16	2156	-25.633	33.155	0	30	0.5672
99	2018	2	17	1349	-25.9262	34.3102	0	200	1.792
99	2018	2	17	1409	-25.9262	34.3102	0	30	0.9904
100	2018	2	17	1841	-26.0377	34.7243	0	200	1.6672
100	2018	2	17	1902	-26.0377	34.7243	0	30	0.3944
118	2018	2	20	0905	-24.9448	34.464	0	30	2.0072
121	2018	2	20	1505	-25.0958	34.6537	0	100	1.024
121	2018	2	20	1515	-25.0958	34.6537	0	30	0.6648
124	2018	2	20	2306	-25.4368	35.141	0	200	3.0856
124	2018	2	20	2326	-25.4368	35.141	0	30	1.3648
125	2018	2	21	0200	-25.5523	35.32	0	200	4.0256
125	2018	2	21	0223	-25.5523	35.32	0	30	1.5672
138	2018	2	22	1635	-24.3607	35.3502	0	30	1.6608
140	2018	2	22	1928	-24.4037	35.4558	0	100	1.8528
140	2018	2	22	1941	-24.4037	35.4558	0	30	2.116
142	2018	2	22	2341	-24.46	35.6137	0	200	3.5328
142	2018	2	22	2359	-24.46	35.6137	0	30	1.4192
153	2018	2	24	0621	-23.4653	35.8638	0	30	0.4256
153	2018	2	24	0638	-23.4653	35.8638	0	200	1.5672
155	2018	2	24	1056	-23.465	35.6393	0	100	3.4944
155	2018	2	24	1111	-23.465	35.6393	0	30	1.848
157	2018	2	24	1439	-23.4613	35.4938	0	30	0.7912
166	2018	2	25	1834	-22.4643	36.1463	0	30	0.4656
166	2018	2	25	1839	-22.4643	36.1463	0	200	1.6456
167	2018	2	25	2151	-22.4613	35.818	0	30	0.676
167	2018	2	25	2200	-22.4613	35.818	0	200	2.7624
170	2018	2	26	0416	-22.4625	35.6077	0	30	0.484
170	2018	2	26	0423	-22.4625	35.6077	0	100	1.2776
171	2018	2	26	0635	-22.4577	35.5707	0	25	0.9504
177	2018	2	27	0126	-21.487	35.9667	0	30	0.9048
177	2018	2	27	0131	-21.487	35.9667	0	200	2.2416
178	2018	2	27	0427	-21.4925	35.6585	0	30	0.4912
179	2018	2	27	0629	-21.4883	35.532	0	30	0.7856
179	2018	2	27	0634	-21.4883	35.532	0	95	0.816
180	2018	2	27	0727	-21.496	35.5052	0	30	0.756
185	2018	2	28	0442	-20.6078	36.0793	0	30	0.384
185	2018	2	28	0448	-20.6078	36.0793	0	200	1.0568
186	2018	2	28	0701	-20.5578	35.9078	0	30	0.8728
186	2018	2	28	706	-20.5578	35.9078	0	100	2.0552
188	2018	2	28	1122	-20.4573	35.4918	0	30	1.5752
196	2018	3	1	1658	-19.8833	36.6728	0	30	0.3048
196	2018	3	1	1703	-19.8833	36.6728	0	200	1.4112
197	2018	3	1	1933	-19.8073	36.5105	0	30	0.8544
197	2018	3	1	1937	-19.8073	36.5105	0	100	2.3472
199	2018	3	2	206	-19.5653	35.982	0	30	3.052
214	2018	3	10	0054	-19.1263	37.0853	0	30	0.4384
217	2018	3	10	0429	-19.0728	37.0132	0	80	2.5224
217	2018	3	10	0430	-19.0728	37.0132	0	30	0.8648
219	2018	3	10	1131	-18.8538	36.7082	0	30	2.3528
227	2018	3	11	1747	-18.2098	37.5483	0	200	1.868
227	2018	3	11	1813	-18.2098	37.5483	0	30	0.9384
228	2018	3	11	1946	-18.1702	37.4955	0	100	3.676
228	2018	3	11	1952	-18.1702	37.4955	0	30	0.7856
231	2018	3	12	0057	-18.0403	37.3205	0	30	5.2616

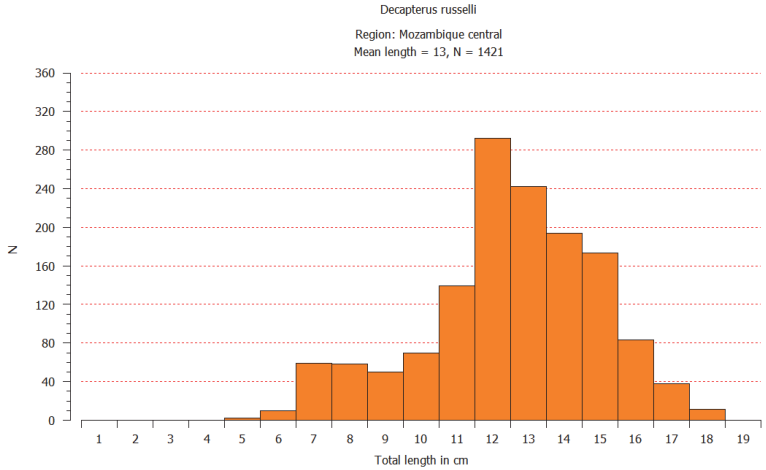
Note: Station 214 has an underestimated biomass value due to mishandling of the sample.

ANNEX VIII. LENGTH FREQUENCIES OF MOST COMMONLY CAUGHT PELAGIC SPECIES

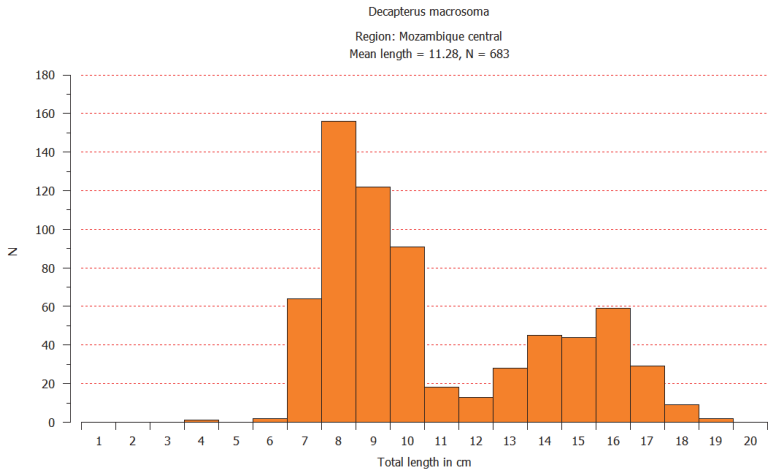
Southern region

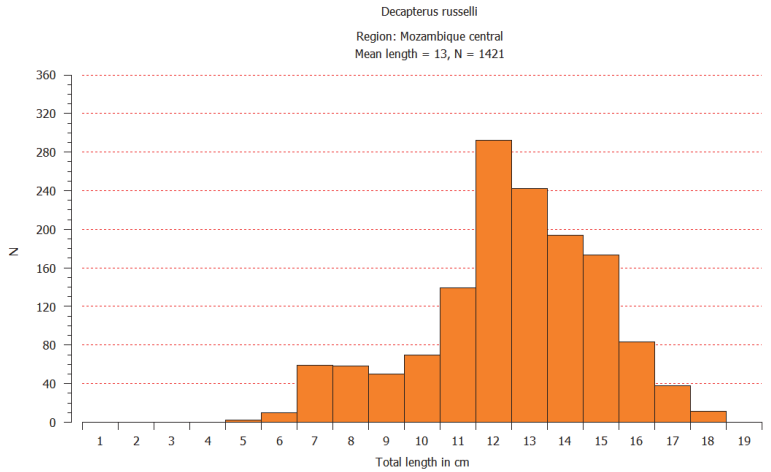


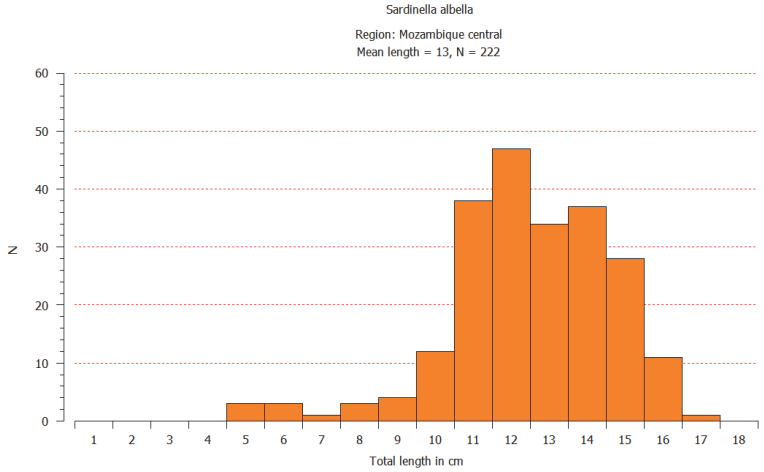


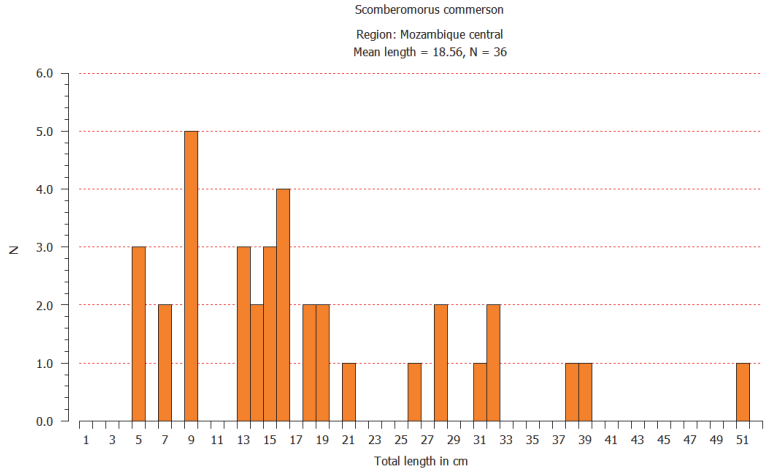


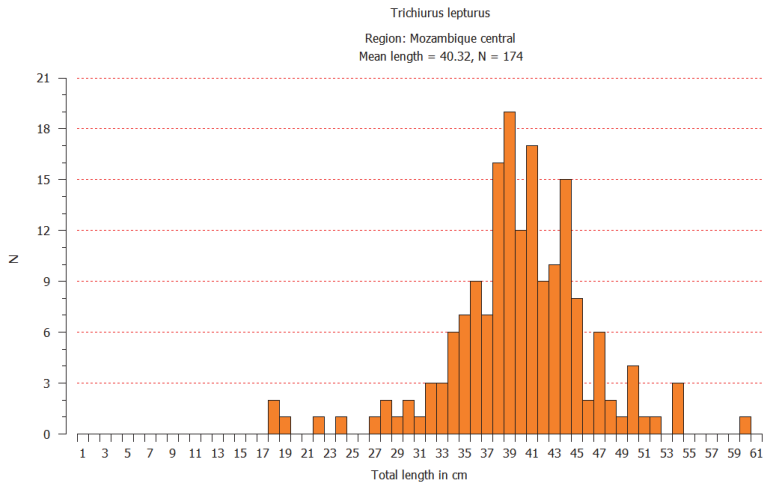
Central region



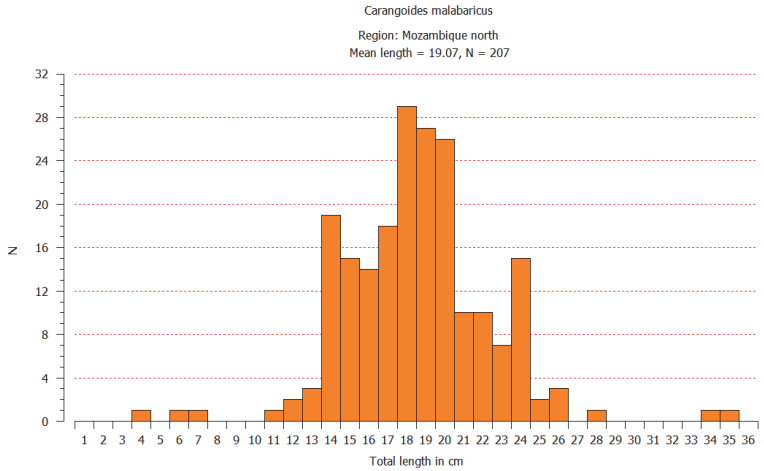


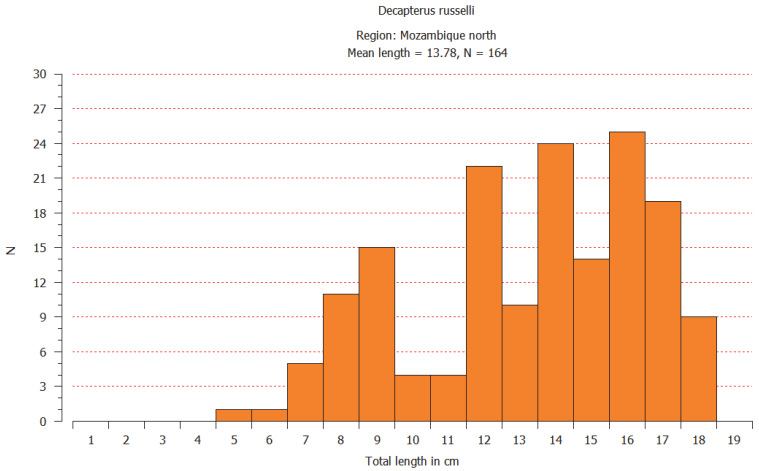


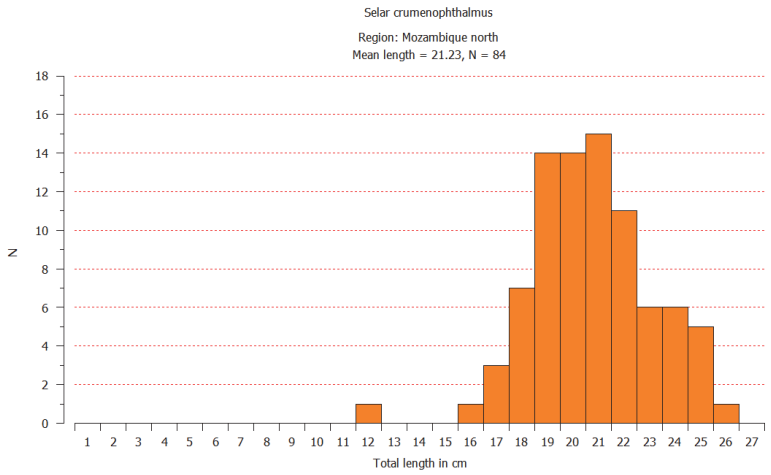


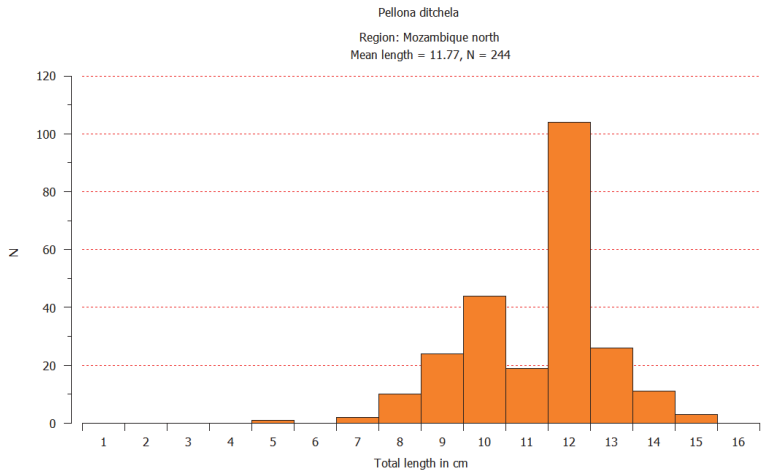


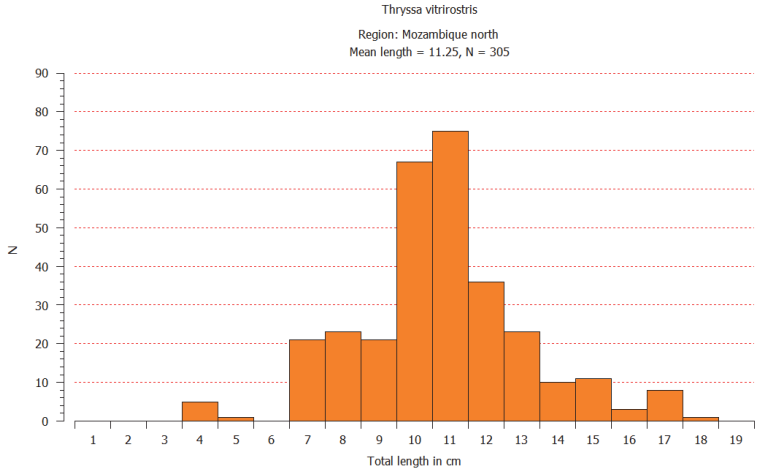
Northern region

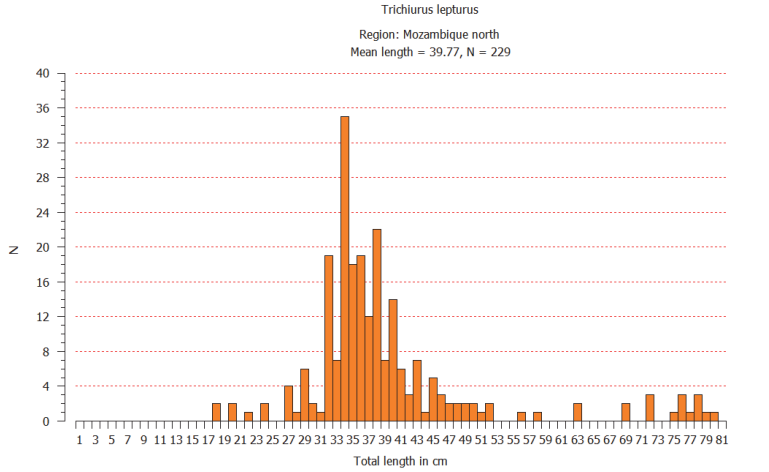





Selar crumenophthalmus
Region: Mozambique north
Mean length = 21.23, N = 84
N
Total length in cm


Pellona ditchela
Region: Mozambique north
Mean length = 11.77, N = 244
N
Total length in cm


Thryssa vitrirostris
Region: Mozambique north
Mean length = 11.25, N = 305
N
Total length in cm


Trichiurus lepturus
Region: Mozambique north
Mean length = 39.77, N = 229
N
Total length in cm

ANNEX IX. BIOLOGICAL SAMPLES FOR FUTURE ANALYSIS

Table IX.1. Main pelagic and demersal fish species and their prioritary analysis.

Groups	Families	Typical Species	Length/ weight	Sex/ maturity	Stomach	Genetics	Contami-nants
Pelagic fish	Clupeidae	*Hilsa kelee*	x	x	x	x	x
		Pellona ditchela	x	x	x	x	x
		Sardinella albella	x	x	x	x	x
		Herklotsichthys quadrimaculat.	x	x	x	x	x
		Etrumeus whiteheadi	x	x	x	x	
		Sardinops ocellatus	x	x	x	x	
	Engraulidae	*Encrasicholina punctifer*	x	x	x		x
		Thryssa vitrirostris	x	x	x		x
		Thryssa setirostris	x	x	x		
	Carangidae	*Decapterus russelli*	x	x	x	x	x
		Decapterus macrosoma	x	x	x	x	x
		Selar crumenophthalmus	x	x	x	x	x
	Scombridae	*Rastrelliger kanagurta*	x	x	x		
		Scomber japonicus			x		x
	Trichiuridae	*Trichiurus lepturus*	x	x	x		x
	Sphyraenidae	*Sphyraena barracuda*	x	x	x		x
Demersal fish	Mullidae	*Upeneus taenopterus*	x	x	x		
		Upeneus bensasi	x	x	x		x
		Upeneus sulfureus	x	x	x		x
	Synodontidae	*Saurida undosquamis*	x	x	x		x
	Merlucciidae	*Merluccius paradoxus*	x	x	x	x	x
	Scianidae	*Johnius dussumieri*	x	x	x		x
		Otolithes ruber	x	x	x	x	x
	Haemulidae	*Pomadasys maculatus*	x	x	x	x	x
		Pomadasys kaakan	x	x	x	x	x
	Sparidae	*Polysteganus coeruleopunctatus*	x	x	x		x

Table IX.2. Main crustaceans and invertebrates and their prioritary analysis.

Groups	Families	Typical Species	Length/ weight	Sex/ maturity	Genetics	Contaminants
Shrimps	Penaeidae	*Penaeus indicus*	x	x	x	x
		Metapenaeus monoceros	x	x	x	x
	Solenoceridae	*Haliporoides triarthrus*	x	x	x	x
Lobsters	Palurinidae	*Palurinus delagoae*	x	x	x	x
Crayfish	Nephropidae	*Metanophropsis mozambicus*	x	x	x	
		Nephropsis stewarti	x	x	x	
Crabs	Portunidae	*Portunus sanguinolentus*	x	x	x	
		Portunus pelagicus	x	x	x	
	Geryonidae	*Chaceon macpherson*	x	x	x	
Squids	Ommastrephidae	*Ommastrephes bartrami*	x			x

ANNEX X. OVERVIEW OF SAMPLES COLLECTED

Gear/equipment	Samples	Preservation	Port of off loading	Transport	Institution address	Contact person	number	Status	Report
Niskin bottles	Nutrients	Chloroform	Dar-es-Salam	Cold (3 to 5 C)	IMR	David Cervantes		Samples Processed	Included
Niskin bottles	Chlorophyll a	Frozen (-18 to -20 C, best -80)	Analysis onboard (if instrument is calibrated)		IMR (if calibration not possible)	David Cervantes		Samples Processed	Included
Niskin bottles	alkalinity		Analysis onboard (if instrument is calibrated)		IMR			Samples Processed	Included
Niskin bottles	pH		Analysis onboard (if instrument is calibrated)		IMR	David Cervantes		Samples Processed	Included
Algae net	phytoplankton	formaldehyde	Dar-es-Salam		IMS-TZ	Margareth Kyewalyanga		unprocessed	Not included
WP2 (180 µm): (1) vertical haul from max 200 m) – ½ sample, (2) vertical haul from 30 m – ½ sample	zooplankton (biomass)	dried	Dar-es-Salam?	Air freight	IMR	Stamatina Isari	WP2_30 = 27 samples WP2_200 = 22 samples	Samples Processed	Included

Gear/equipment	Samples	Preservation	Port of off loading	Transport	Institution address	Contact person	number	Status	Report
(1) vertical haul from max 200 m)- ½ sample (2) vertical haul from 30 m – ½ sample	Zooplankton identification	formaldehyde	Dar-es-Salam	Air freight	IIP	Ceiça Chioze		Unprocessed	Not included
MultiNet (Midi, 1 x 180 µm): oblique tow from max 200 m	depth-related zooplankton community composition	formaldehyde	Dar-es-Salam	Air freight	IMS/IIP?	Margareth?	(1/2) 25 samples preserved in formalin	½ processed onboad and 1/2 preserved in formalin	Included
Manta trawl (375 µm): surface tow for 15 mins	Eggs and larvaes	formaldehyde	Dar-es-Salam?	Road	UWC ?	Mark Gibbons??	27 samples	½ processed onboad and 1/2 preserved in formalin	Included
Manta trawl (375 µm): surface tow for 15 mins	Microplastics	Photographed and freezed	Dar-es-Salam?	Road	IMR	Bjørn Einar Grøsvik	8 preserved in formaldehyde 8 persevered by freezing	Pre-processed (counted Unprocessed for the categories and further analysis)	Included
Cufes	Microplastic samples	NA	NA	NA	NA	NA	*No samples*	*Processed onboard*	*Included*
Cufes	Fish eggs and larvae, Zooplankton	NA	NA	NA	NA	NA	*179 samples processed onboard*	*Processed onboard*	*Included*
Trawl	South Africa east coast, whole clupeiods/ engraulids	Frozen	Dar-es-Salam	Road	ORI	Sean (for Carl van der Lingen)	???	??	

Gear/equipment	Samples	Preservation	Port of off loading	Transport	Institution address	Contact person	number	Status	Report
Trawl	South Africa east coast, whole fish for taxonomy	Frozen	Dar-es-Salam	Flight?	IMR		???	??	Check with Sarah Ann and Frøydis Rist Bogetveit
Trawl	Otolithes *Polysteganus coeruleopuctatus* (MOZ specific)		Pemba		IIP	Rui Mutombene	36	Unprocessed (low samples)	Not included
Trawl	Crustacean flesh samples (MOZ specific)	Ethanol	Pemba	Road	MHN-UEM	Alvaro Vetina	231 OF 61 species	???	Not included
Trawl	Flesh samples/fin clips of priority species from other regions for genetic analysis	ethanol	Dar-es-Salam	Air freight	IMR, Bergen	Geir Dahle	161 preserved in Ethanol	Unprocessed	Not included
Trawl	Stomach priority species	Frozen	Dar-es-Salam	??	UWC?	Mark Gibbons?	1809	??	Not included
Trawl	Flesh tissue for Contaminants (MOZ specific)	Frozen	Pemba		INIP	Argelio Cuambe	17	??	Not included
Trawl	Standard Nansen food safety sampling	-80^{o}C	Dar-es-Salam	shipment	IMR		134 Dried samples of 696 specimens	Unprocessed	Table of samples

Gear/equipment	Samples	Preservation	Port of off loading	Transport	Institution address	Contact person	number	Status	Report
Trawl	Contaminants in fishes – Leg 1.2	-80^{o}C	Dar-es-Salam	shipment	IMR		134 Dried samples of 696 specimens	Unprocessed	Table of samples
Grab	Macrobenthos	4% formaldehyde	Dar-es-Salam	flight	IIP	Stela	20	Unprocessed	Not included
Trawl - cylinder	Sediments grain size	4% formaldehyde	Dar-es-Salam		IIP	Stela	89	Unprocessed	Not included

*These were not requests, opportunistic sampling