

**Mauritius and Southern Mascarene: Pelagic
Ecosystem Survey**

SWIOFP/ FAO 2010 Cruise 1

6– 21 December 2010

Preliminary report

Institute of Marine Research

Norway

CRUISE REPORT "DR. FRIDTJOF NANSEN"

Mauritius and Southern Mascarene: Pelagic Ecosystem Survey

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Preliminary report

By

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TABLE OF CONTENTS

1.	INTRODUCTION.....	4
1.1	Aims and objectives	Error! Bookmark not defined.
1.2	Participation	Error! Bookmark not defined.
1.3	Narrative.....	Error! Bookmark not defined.
1.4	Survey effort.....	Error! Bookmark not defined.
2.	METHODS.....	8
2.1	Meteorological and hydrographical sampling.....	8
2.2	Zooplankton sampling.....	Error! Bookmark not defined.
2.3	Biological fish sampling.....	Error! Bookmark not defined.
2.4	Multibeam echo sounder for bottom mapping	11
2.5	Biomass estimates	Error! Bookmark not defined.
2.6	Collection of soft sediments and macrobenthos	
2.7	Visual observations of cetaceans and sea birds	
3.	RESULTS.....	13
3.1	Hydrographic sections.....	Error! Bookmark not defined.
3.2	Sea surface temperature and salinity	
3.3	Zooplankton	Error! Bookmark not defined.
3.4	Acoustic abundance and distribution	15
3.5	Sea mounts acoustic recordings.....	Error! Bookmark not defined.
3.6	Biological sampling.....	Error! Bookmark not defined.
4.	SUMMARY AND CONCLUSIONS.....	Error! Bookmark not defined.
5.	REFERENCES	21
Annex I	Records of fishing station	23
Annex II	Length distribution of main species.....	25
Annex III	Instruments and fishing gear used	27
Annex IV	Samples collected	Error! Bookmark not defined.
Annex V	List of species for Isotopes analyses.....	52
Annex VI	List of species for DNA analyses	
Annex VII	List of species for biological analyses	
Annex VIII	List of stations for macrobenthos and sediments samples	
Annex IX	Data Management Agreement	

1. INTRODUCTION

In December 2010 the EAF-Nansen Project of FAO in collaboration with the regional South West Indian Ocean Fisheries Project (SWIOFP), undertook a 16 days survey with the R/V “Dr. Fridtjof Nansen” to cover the continental waters around Mauritius and the southern part of the Mascarene to study pelagic fish resources and the pelagic ecosystem.

1.1 Aims and objectives

The aim of the R/V ‘Dr. Fridtjof Nansen’ survey was to establish the physical, chemical and biological characteristics of the pelagic ecosystem associated with shelf region of Mauritius and southern Mascarene. The South West Indian Ocean Fisheries Project (SWIOFP) has identified small pelagic fishes (scads, mackerels, herrings and sardines) as a potential future resource in South Western Indian Ocean waters. The survey is a seasonal follow up on an earlier survey in September-November 2008 initiated by the Agulhas and Somali Current Large Marine Ecosystem Project (ASCLME) and the EAF-Nansen Project, covering then the whole Mascarene, including the Seychelles

The main objectives of the survey were as follows:

- To determine the distribution and abundance of small pelagic fish resources along the coast of Mauritius and the in the continental shelf waters of Southern Mascarene using acoustics methods and a systematic grid survey strategy.
- To use regular midwater trawls on target fish aggregations for species composition, biological information and genetic material of selected small pelagic fishes for fisheries resource assessment purposes.
- To establish the distribution, abundance and composition of other organisms at a number of trophic levels along the shelf. (Phytoplankton, zooplankton, cetaceans and sea birds)
- To establish, as far as possible, the productivity, biodiversity and biomass of the pelagic ecosystem.
- To investigate mesopelagic and, where bottom-trawlable conditions exist, spot check demersal fish species diversity and abundance.
- Where possible, link various sources of energy and nutrition to different food-web compartments.
- Capacity building of SWIOFP and ASCLME trainees and young scientists.
- *To fulfil the data management agreement contained in Annex IX.*

1.3 Participation

A total of 16 scientist and technicians participated in the survey. The full list of the participants, their affiliations is given in Table 1.1 below.

Table 1.1 List of participants

Participants	Institution	Main responsibility
Poornah Singh SREEKEESSOON	MFR, Mauritius	Local cruise leader
Sabrena LAWRENCE	SFA, Seychelles	Fish sampling
Zahirah DHURMEEA	MFR, Mauritius	Cetaceans
Luvna CAUSSY	MFR, Mauritius	Isotopes and genetics
Pushpa SEEPAL	MFR, Mauritius	Fish taxonomy
Veemala CHELUMBRUN	MFR, Mauritius	Nutrients
Vishwakalyan BHOYROO	MOI, Mauritius	Oceanography
Vinesh EMRITH	MFR, Mauritius	Oceanography
Vyoumesh KAWOL	MFR, Mauritius	Fish sampling
Emmanuel Kakunde MBARU	KMFRI, Kenya	Fish taxonomy
Robert Jeremiah KAYANDA	TAFIRI, Tanzania	Acoustics
Johan GROENEVELD	ORI, SWIOFP, South Africa	Fisheries biology
Tore STRØMME	IMR, Norway	Cruise leader
Oddgeir ALVHEIM	IMR, Norway	Taxonomy, quality control
Ole Sverre FOSSHEIM	IMR, Norway	Instrument chief
Terje SVOREN	IMR, Norway	Instrument technician

List of institution abbreviations:

MFR:	Ministry of Fisheries & Rodrigues, Mauritius
SFA:	Seychelles Fishing Authority, Sechelles
MOI:	Mauritius Oceanography Institute, Mauritius
KMFRI:	Kenya Marine and Fisheries Research Institute, Kenya
TAFIRI:	Tanzania Fisheries Research Institute, Tanzania
ORI:	Oceanographic Research Institute, Durban, South Africa
SWIOFP:	South West Indian Ocean Fisheries Project
IMR:	Institute of Marine Research, Norway

1.4 Narrative

The Vessel left Port Louis on 7th December at 18:00 hours, local time. The vessel covered the near shore waters around Mauritius Island from about 20 to 1000m bottom depth in a clockwise direction. After surveying the bank on the northern tip of the island the survey

proceeded northwards covering the Soudan Bank and further north onto the Nazareth Bank. On 12 December the vessel stopped for a few hours mid-day on the lee west side of the Cargados Carajos shoals for video sampling on the bottom fauna. Work proceeded northward with regular acoustic transects 20nm apart. Between 14° and 15° S a hydrographic and environment section was sampled across the plateau. This section is identical to the standard section carried out during the ASCLME/FAO survey in October 2008, but with some fewer stations at the two slopes though.

The weather was generally favourable, but during the first week it was necessary to reduce the cruise speed to 9 nm when working up against the SE trade winds. The northern part of the survey was reached at 13°30'S on 18 December when it was necessary to start the southern return steaming. The Nazareth Bank was well covered except its very northern tip and the deep channel between Nazareth and Saya del Malha Bank.

Continuous acoustic recording and analyses were carried out along preset course tracks throughout the survey. Pelagic and demersal trawling was carried out to identify acoustic target species and to obtain information on fish diversity in the area. A permit to do bottom trawling was received on 14 December when the vessel had proceeded to 16°S, and sampling for demersal fish diversity could be carried out on the northern part of Nazareth Bank. CTD stations was also carried out on the mid part of the plateau from south to north thus enabling an analysis of the oceanographic features along the plateau. CTD samples off the plateau was restricted to the upper 1000m due to time restrictions. Zooplankton samples were taken in three horizontal cast, below, at and above fMax with the Hydrobios Multinet plankton sampler at the hydrographical stations.

At the outset of the survey it was also requested to cover the ridge between Mauritius and Rodriguez and to do a special detailed study of the bathymetry and fish fauna of the Brandon Bank. There was not sufficient time available to carry out this additional task and in consultations with SWIOFP it was decided to skip this. These tasks, outside the main objectives of the survey, would require an extra week of survey time.

Survey effort

For the purpose of acoustic abundance estimation the coast was divided into two areas: the area around Mauritius and north including the Soudan Bank; and the Nazareth Bank. Figures 1.1-1.2 show the cruise tracks with bottom trawls, pelagic trawls, hydrographic stations, and plankton stations.

Table 1.2 summarises the survey effort in each sub-area.

Table 1.2 Number of hydrographic (CTD), plankton (PL), pelagic trawl (PT), and bottom trawl (BT) stations as well as the distance surveyed (NM) during the survey, by sub-areas.

Area	CTD	PL	PT	BT	NM
Mauritius, Soudan Bank	0	1	2	0	XXX
Nazareth Bank	19	12	6	5	XXX
Total	19	13	8	5	XXX

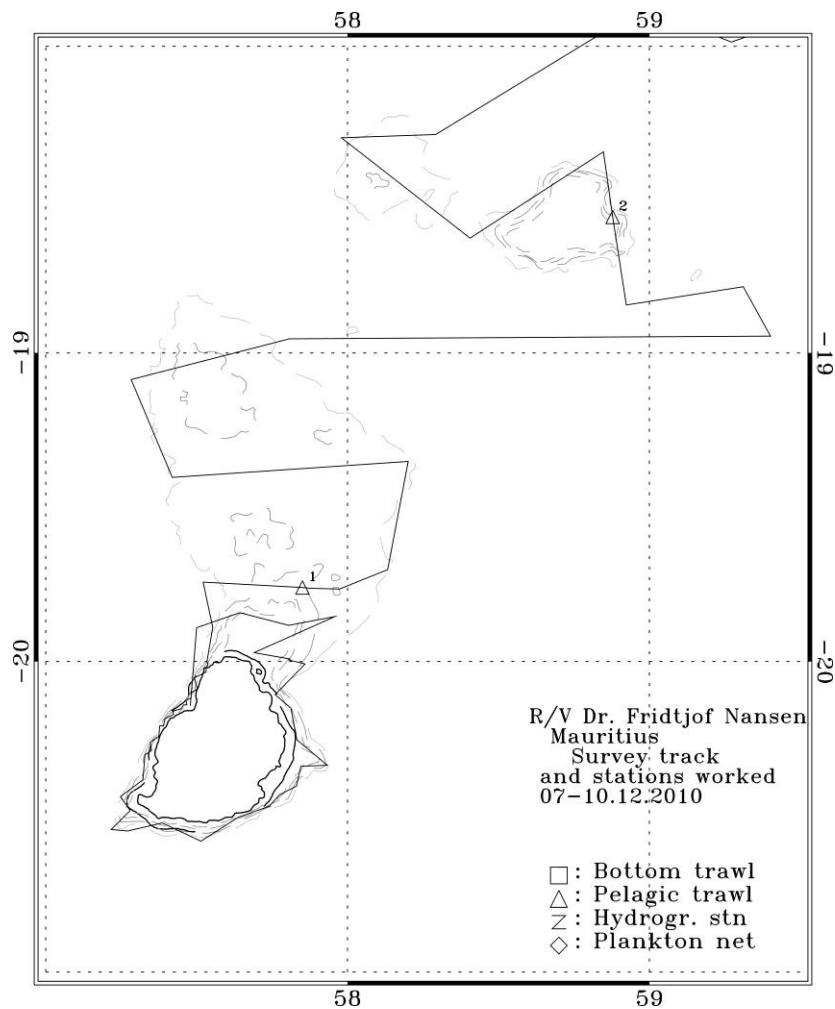


Figure 1.1. Mauritius and Soudan Bank. Course track with bottom trawl, pelagic trawl, plankton and hydrographic stations. The 100, 500 and 1000 m depth contours are indicated.

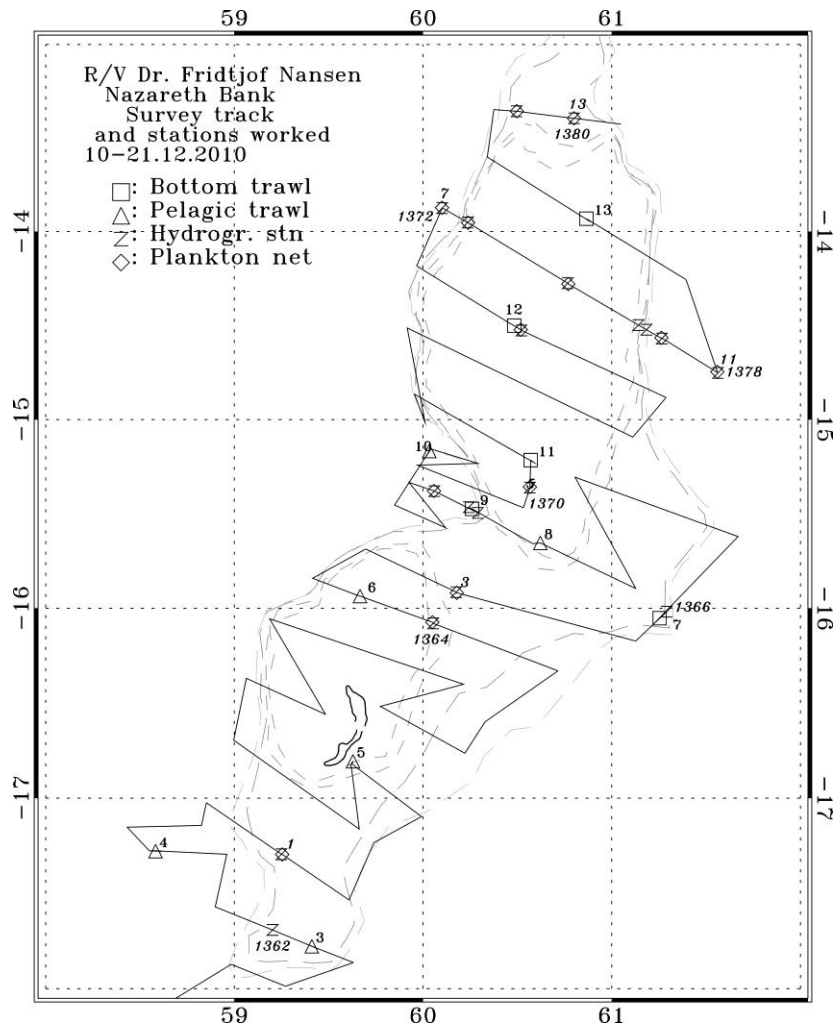


Figure 1.2. Nazareth Bank. Course track with bottom trawl, pelagic trawl, plankton, grab and hydrographic stations. The 100, 500 and 1000 m depth contours are indicated.

2. METHODS

2.1 Meteorological and hydrographical sampling

2.1.1 CTD profiles

A total of 182 CTD stations were conducted along selected hydrographical transects (Figures 1.1-1.2). A Seabird 911 CTD was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done using the Seabird Seasave software installed on a PC. The stations on the shelf and slope were usually taken down to a few metres above

the bottom, whilst offshore, due to time restrictions, the maximum sampling depth was 1000 m. Water samples were taken at 3 standard depths; below fMax (maximum fluorescence detected during the CTD downcast and bottles triggered on the upcast), at fMax, and immediate above fMax for nutrient analysis. Nutrient samples were frozen onboard for analysis on land.

Also attached to the CTD was a Chelsea Mk III Aquatracka fluorometer. It measures chlorophyll-a concentration in microgram per litre with an uncertainty of 3%. Factory slope and offset were 0.921 and -0.02. The readings will be calibrated against samples of chlorophyll preserved for later analysis.

2.1.2 Fluorescence: Chl-a

Water samples were taken using Niskin bottles on the CTD rosette: a sample from below fmax (maximum fluorescence noted during the CTD downcast), one at fmax and one over fmax.

200 ml of water from each depth was filtered through a 2.5 cm diameter Whatman GF/F filter, and the filter paper was then folded and stored on ethanol in tubes in the fridge (samples are marked with M,B and A for the three layers respectively).

2.1.3 Phytoplankton

At each CTD station, water samples from fMax (maximum fluorescence noted during the CTD downcast) , below fMax and above fMax were taken. 200ml was filtered on 2 my filters and then stored test tubes with buffered formaldehyde for later determination of species composition. (samples are marked with M,B and A respectively)

2.1.4 Thermosalinograph

The SBE 21 Seacat thermosalinograph was running routinely during the survey, obtaining samples of sea surface salinity and relative temperature and fluorescence (5 m depth) every 10 seconds. An attached in-line Turner Design SCUFA Fluorometer continuously measured Chlorophyll A levels [RFU] at 5 m below the sea surface while underway during the entire cruise.

2.1.5 Current speed and direction measurements (ADCP)

A vessel-mounted Acoustic Doppler Current Profiler (VMADCP) from RD Instruments was run continuously during the survey in broadband mode shallower than about 400 m and in narrow band mode in deeper waters. The frequency of the VMADCP is 150 kHz and data were averaged and stored in 3 m or 4 m vertical bins. All data were stored on files for post survey processing.

2.1.6 Meteorological observations

Wind direction and speed, air temperature, air pressure, relative humidity, and sea surface temperature (5 m depth) were logged automatically every 1 min. on an WIMDA meteorological station.

2.2 Zooplankton sampling

Zooplankton samples were collected with Hydrobios Multinet at most environmental stations (Figures 1.1-1.2). The multinet was equipped with 5 nets for depth-stratified sampling. The nets were fitted with 180 μm mesh size and the water flow through the nets was measured. The multinet was deployed and retrieved at a rate of ~ 1.5 m per second and was obliquely hauled. The five nets were triggered at the pre-selected depth intervals at above f_{max} , at f_{max} and above f_{max} , similar to the sampling of phytoplankton.

The nets were rinsed and the samples stored in marked bottles and preserved with 4% buffered formaldehyde.

2.3 Biological fish sampling

Trawl hauls were sampled for species composition by weight and number. The deck sampling procedure is described in detail by Strømme (1992). Length measurements were taken for most target species on most stations. An Electronic Fish Meter (SCANTROL) coupled to a customised data acquisition system (Nansis) running on a Windows PC was used for length measurements. The total length of each fish was recorded to the nearest 1 cm, rounding down when this was between sizes. Sex, maturity stage and otoliths for age determination were collected from the first randomly selected 20 individuals of target species. The five maturity stages used were: inactive, active, ripe, ripe-running, spent.

Pelagic hauls at surface at the beginning and end of environmental transects were taken and the catches were frozen for further identification.

The carapace length for crustaceans was measured to the nearest 0.1 cm, again rounding down. Basic information recorded at each fishing station, *i.e.* trawl hauls, is presented in Annex I. Pooled length frequency distributions, raised to catch per hour, of selected species by region are shown in Annex II.

(THE FOLLOWING TO BE REVISED) Three individuals of each species were sampled for DNA and isotopes. These specimens were measured (total length), sexed (when possible) and photographed.

DNA: Muscle tissue was always taken from the right-hand side of the fish, or ventrally in the case of flatfish. This was done to preserve the left aspect of fish in a good condition for reference pictures (sample tag, ruler and colour chart). Muscle tissue was dissected and placed into 1.5 ml Eppendorf tubes containing 95% ethanol. In most cases, specimens that were used

for DNA sampling were also kept as vouchers by fixing them in 10% formalin. A label with the same identification number used for the DNA tube was attached to the specimens through the mouth and gills for reference purposes.

Isotope sampling: White muscle tissue was collected from selected individuals for isotope analyses ($\delta^{15}\text{N}$ and $\delta^{13}\text{C}$). A 1cm^3 piece of muscle tissue was dissected taken from behind the head, above the lateral line of the fish. The tissue sample was placed in a 1.5 ml Eppendorf tube, and dried open in an oven at 50°C for 48 hours. When possible, 3 individuals of the same species from each trawl were sampled. Once dried, the tubes were closed and stored in a “cryobox”. Full cryoboxes were wrapped in clingfilm for moisture protection and stored in a bin for subsequent analysis on shore.

Voucher specimens were kept for each species for which DNA samples had been collected. All specimens were fixed in formalin until the end of the leg and then rinsed in fresh water and finally transferred to 80% Ethanol.

2.4 Multibeam echo sounder for bottom mapping

The EM 710 multibeam echo sounder is a high to very high-resolution seabed mapping system. Acquisition depth is approximately 3 m below the transducers, and the maximum acquisition depth is limited, in practice, to 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 (manually) according to depth. The receiving beam width is 2 degrees.

2.5 Biomass estimates

2.5.1 Acoustic abundance estimation

A SIMRAD ER 60 Echo sounder was used to survey the water column and the echograms were stored on files. The acoustic biomass estimates were based on the integration technique. The Large Scale Survey System (LSSS) from MAREC (www.marec.no) was used for integration and allocation of the integrated s_A -values (average area back scattering coefficient in m^2/NM^2) The splitting and allocation of the integrator outputs (s_A -values) was based on a combination of a visual scrutiny of the behaviour pattern as deduced from echo diagrams, LSSS analysis and the catch composition. The mean integrator value in each sampling unit (s_A -values) was divided between the following standard categories/groups of fish: PEL 1 (Clupeoid species), PEL 2 (Carangids, Scombrids, Leiognathids and associated pelagic like

barracudas and hairtails), ODFI (Demersal species), Mesfi (Meseopelagic species), Plank (Plankton) and Other.

The following target strength (TS) function was applied to convert s_A -values (mean integrator value for a given area) to number of fish by category:

$$TS = 20 \log L - 72 \text{ dB} \quad (1)$$

or in the form

$$C_F = 1.26 \cdot 10^6 \cdot L^{-2} \quad (2)$$

where L is the total length and C_F is the reciprocal back scattering strength, or the so-called fish conversion factor. Generally, in order to split and convert the allocated s_A -values (m^2/NM^2) to fish densities (number per length group per NM^2) the following formula was used

$$N_i = A \cdot s_A \cdot \frac{P_i}{\sum_{i=1}^n \frac{P_i}{C_{Fi}}} \quad (3)$$

where:

- N_i = number of fish in length group i
- A = area (NM^2) of fish concentration
- s_A = mean integrator value (echo density) in area A (m^2/NM^2)
- p_i = proportion of fish in length group i in samples from the area
- C_{Fi} = fish conversion factor for length group i

$$N = \sum_{i=1}^n N_i \quad (4)$$

Further, the traditional method is to sum the number per length group (N_i) to obtain the total number of fish:

The length distribution of a given species within an area is computed by simple addition of the length frequencies obtained in the pelagic trawl samples within the area. In the case of co-occurrence of target species, the s_A value is split in accordance with length distribution and catch rate in numbers in the trawl catches. Biomass per length group (B_i) is estimated by applying measured weights by length (W_i) when available or theoretical weights (calculated by using condition factors), multiplied with number of fish in the same length group (N_i). The total biomass in each area is obtained by summing the biomass of each length group:

$$B = \sum_{i=1}^n N_i \bar{W}_i \quad (5)$$

The number and biomass per length group in each concentration are then added to obtain totals for each region.

However, the combination of low s_A value recorded, few PEL1 and PEL2 in the bottom trawl catch and few pelagic trawls made the splitting by length groups unreliable. Therefore, a theoretic mean length of 23 cm was used to convert the s_A values by stratum (Equation 3) to number of fish. Equation 5 was used to convert the number of fish in the defined average length class (23 cm) to total estimated biomasses of PEL1 and PEL2.

A description of the fishing gears used, acoustic instruments and their standard settings is given in Annex III.

2.6 Visual observations of cetaceans and seabirds (to be revised)

Observations by eye were done by a single observer (always the same) and binoculars were only used to confirm a sighting and to follow animals. The viewing height above sea level was approximately 6m. Both sides of the vessel were covered alternatively. Using a single observer did not permit a qualitative abundance estimation. The objective of the observer was to focus on cetaceans, but sea birds sightings were also recorded. When possible (dependent on distance, weather conditions), photos of individuals whales were taken to confirm or help on precise identification – this was particularly aimed at humpback whales (*Megaptera novaeangliae*) for photo-identification of individuals from the pectoral fins.

At times, the ship changed course to approach whales to assist in identification. At the beginning and the end of each session, environmental conditions were recorded as follows: GPS position, sea state (Beaufort scale), swell, wind speed (in knots) and direction, cloud cover. For each sighting of cetaceans it was also recorded cue, angle and distance from the ship at first detection, species, number of animals (minimum, maximum and best estimation), presence or not of calves and juveniles, activity, behaviour, reaction to the ship, photo reference and other comments.

3. RESULTS

3.1 Hydrographic sections

The continental shelf around Mauritius is very narrow but with a bank on the northern side. The Soudan Bank

TO BE COMPLETED (awaiting figures to be processed)

3.2 Sea surface temperature and salinity

The surface temperature (5m depth) TO COMPLETED, Maps to be produced in ODW

Figure 3.1 Northern Nazareth Bank Standard Transect. Temperature, salinity, dissolved oxygen and fluorescence observed on Transect 1 (position shown in the figure)

Figure 3.2 . Nazareth Bank from south to north. Temperature, salinity, dissolved oxygen and fluorescence observed on Transect 2 (position shown in the figure)

Figure 3.11. From Mauritius to Nazareth Bank. Horizontal distribution of surface temperatures (5 m depth).

Figure 3.12. From Mauritius to Nazareth Bank. Horizontal distribution of surface salinities (5 m depth).

3.3 Zooplankton

A total of 13 multinet stations were taken (Annex IV). 39 samples were preserved for further analyses ashore.

3.4 Acoustic abundance and distribution

The hydroacoustic survey covered the shelf and slope to about 1000 m bottom depth. Continuous acoustic recording and analysis were carried out throughout the survey. The very narrow shelf around Mauritius was covered with a zig-zag pattern while the banks and plateau further north was covered with transects 20nm apart. There were discovered no aggregations of clupeoid fishes (PEL1) during the survey. The PEL2 group (horse mackerels, scads, scombrids, cutlass fish etc.) was absent from the southern part (Mauritius to Soudan Bank). A few spots of PEL2 was registered around the Cargados Carajos shoals, while a low density aggregation formed around 15°30'S on the western side of the plateau (Figure XX), in a similar location as observed during the 2008 survey. This seems to a point to an area with a slightly higher production than in the in general oligotrophic nature of the upper pelagic ecosystem of the Mascarene. Demersal fish was also recorded by the acoustic system, though no biomass estimates are possible with this method. Demersal fish was recorded at the southern edges of Mauritius and at the bank off the northern part of the island, Figure XX. Scattered demersal fish was also recorded in most of the Nazareth Bank, Figure XX.

The abundance of pelagic fish is assessed to XX thousand tonnes, which is exclusively belonging to the PEL2 group and located at the Nazareth Bank. This indicate a slight but perhaps not significant increase from the estimate of October 2008, which was xx thousand tonnes.

Table 3.1a Acoustic estimates of clupeoids (Pelagic-1) in tons (t).

Region	Biomass (t)
Mauritius & Soudan Bank	0
Nazareth Bank north to 13°30'	0

Table 3.1b Acoustic estimates of carangids, scombrids and associated pelagic (Pelagic -2) in tons (t).

Region	Biomass (t)
Mauritius & Soudan Bank	xx
Nazareth Bank north to 13°30'	Xx
	xx

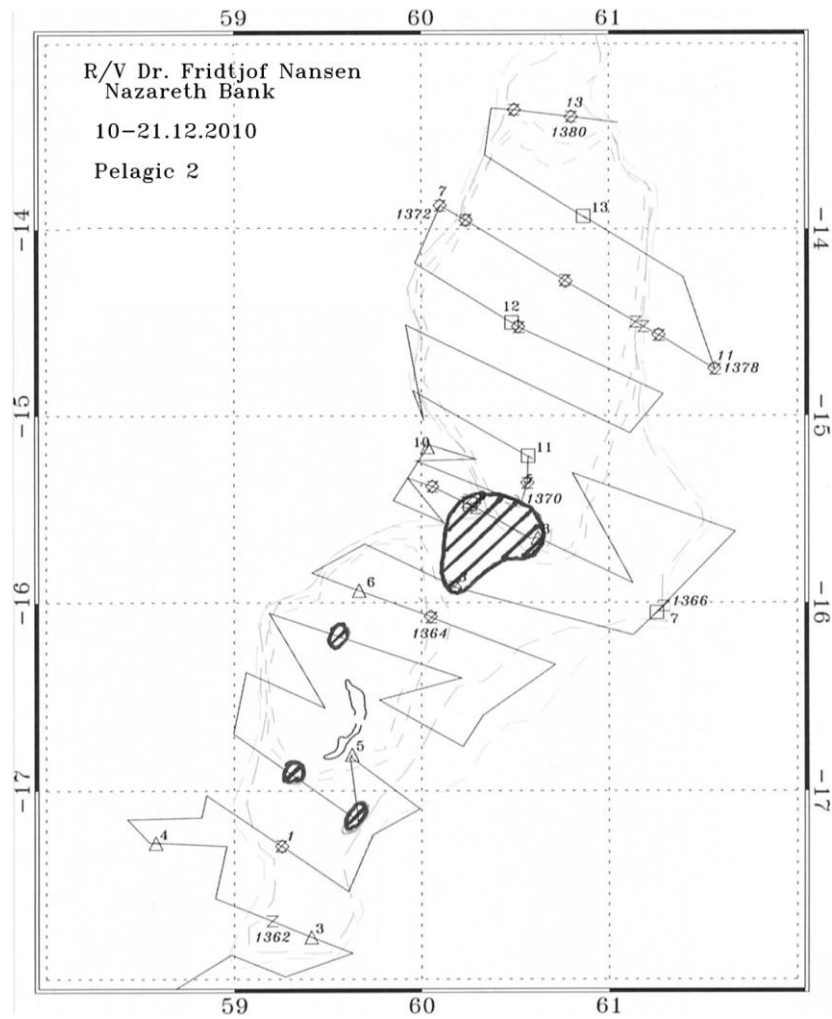


Figure 3.XX Distribution of PEL 2 (carangids and associated pelagic species) on the Nazareth Bank.

Figure 3.15. Distribution of PEL 2 (carangids and associated pelagic species), on the western shelf of Madagascar.

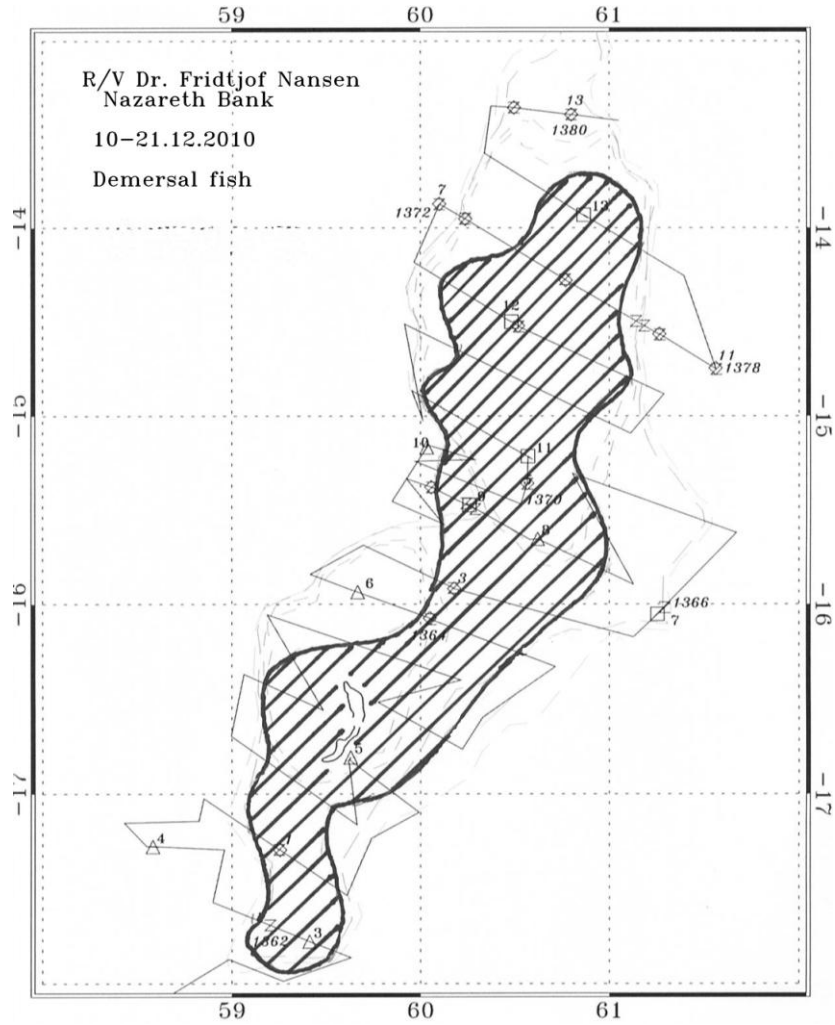


Figure 3.XX Distribution of demersal fish as registered by the acoustic system on the Nazareth Bank.

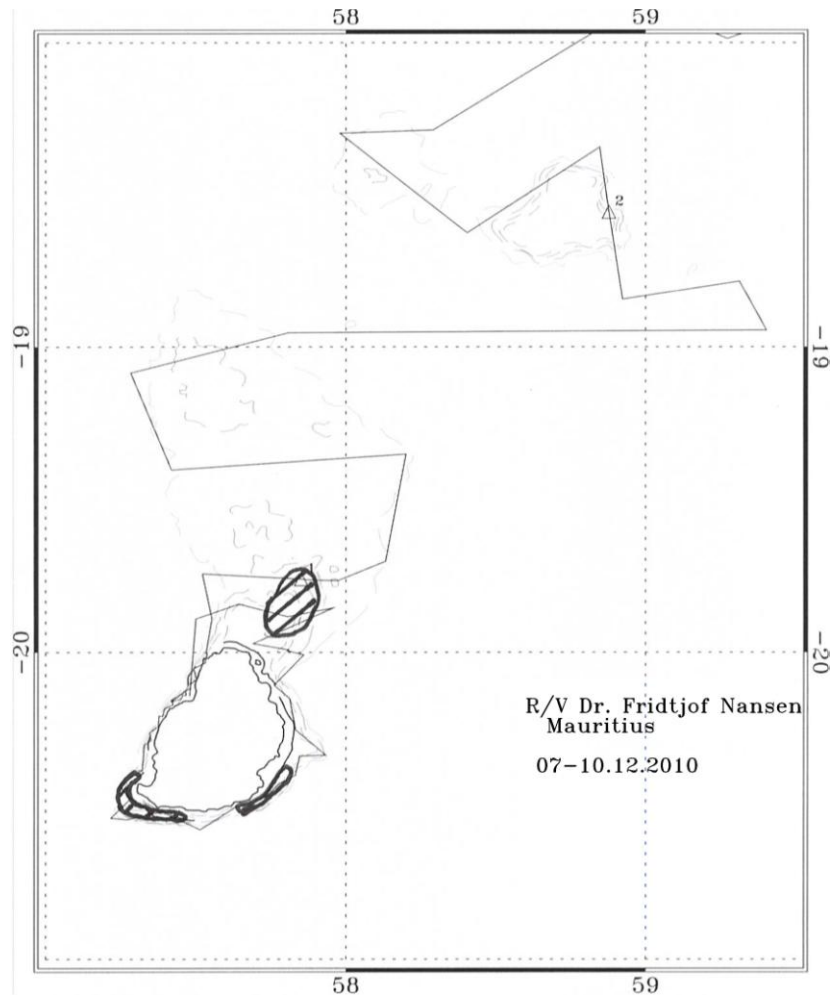


Figure 3.XX Distribution of demersal fish as registered by the acoustic system between Mauritius and Soudan Bank.

3.5 Biological sampling (to be revised)

A list of priority species was identified before the cruise for biological sampling (sex, maturity, otoliths, genetic samples for stock separation), but very few of these were caught. A list of the biological samples, together with the list of specimens collected for various museums and taxonomists, is included in the appendix (Annex VII).

3.6.1 Genetics

A total of XXX tissue samples were taken for DNA analyses to be further processed on land (see Annexes VI and VII).

3.6.2 Isotope samples

A total of XX white muscle samples from pelagic demersal and mesopelagic fish were taken. They were processed and stored for further analyses in South Africa. The list of samples are given in Annex V.

3.6.5 Biodiversity on the shelf

The southern and western coasts of Madagascar (south of 20° S) have large areas of rough seafloor, unsuitable for bottom-trawling. The outer shelf edge is a continuous reef, while the shelf has areas of variable hard and sandy substrate with patches of coral reef. The numbers of bottom trawls were limited due to difficult trawling conditions. Thus, the bottom trawls only give an indication of the most common species within the region.

The catches in the demersal hauls on both the southern and western coasts of Madagascar, though small, were highly diverse. Among the most commonly caught species in the south were *Decapterus kurroides* (with a percentage of incidence in the catches of around 56%), *D. macrosoma*, *Teixeirichthys jordani*, *Chaetodon dolosus*, *Fistularia petimba*, *Stethojulis interrupta*, *Gymnocranius griseus*, several Mullidae species as well as the cephalopod family Ommastrephidae. *D. macrosoma* had the highest catch rate in the region, followed by *Sardinella gibbosa*. Table 3.2 shows the catch rates (kg/h) for the main groups by depths in the southern region.

Table 3.2. Catch rates (kg/hour) by main groups caught in valid swept area bottom trawl hauls. Southern region. A: 20-50 m, B: 51-100 m, C: >101.

A: 20-50 m

Station	Gear dept	Carangids	Cephalop	Clupeoids	Groupers	Lethrinida	Scombrid:Snappers	Other	Total
8	39.5	19	1.8			1.4	13.9	243.8	279.9
10	44.5	0.7	3.2		0.2	44.1		114.7	162.9
13	36	2665.8	61.1	22.8			369.5	32.8	3152.1
14	26	23.2	3.4				0.6	0.2	27.5
15	33.5	17.5	0.6	0.6				2.7	21.4
Mean	35.9	545.2	14	4.7		9.1	76.8	78.8	728.8
Std dev	6.9	1185.5	26.3	10.1	0.1	19.6	163.7	103.2	1358.9
%Catch		74.8	1.9	0.6		1.2	10.5	10.8	

B: 51-100 m

Station	Gear dept	Carangids	Cephalop	Clupeoids	Groupers	Lethrinida	Scombrid:Snappers	Other	Total
4	55.5	0.1	1.2		41.7	0		20.8	47.9
7	83		0.4		7.3	2.5		29.7	13.6
16	92.5	18.3	3.6		0			10.1	32
Mean	77	6.2	1.7		16.3	0.8		16.8	23.9
Std dev	19.2	10.5	1.7		22.3	1.5		15.2	20.9
%Catch		9.4	2.6		24.8	1.2		25.5	36.3

C: >100 m

Station	Gear dept	Carangids	Cephalop	Clupeoids	Groupers	Lethrinida	Scombrid:Snappers	Other	Total
3	108.5		0.1		50.4	1.7		17	47.5
6	123		0.1		3.5			12.1	52.9
Mean	115.8		0.1		26.9	0.9		14.6	50.2
Std dev	10.3		0.1		33.2	1.2		3.5	34.2
%Catch			0.1		29	1		15.8	54.2

On a depth basis, the sphyraenids dominated catches from 20 to 100m (because of the single trawl referred to above), followed by carangids (Table 3.4), while between 200 and 500m, the lutjanids (*Etelis* spp and *Pristipomoides* spp) made a substantial contribution (~15 % of catch weight). From 500 – 700m, prawns and shrimps (*Aristaeomorpha foliacea*, *Penaeopsis balssi* and *Heterocarpus* spp) contributed about 10% to the overall catch.

Table 3.3. Catch rates (kg/hour) by main groups caught in valid swept area bottom trawl hauls. A: 50-100 m, B: 101-200 m, C: 201-300 m, D: 301-600 m.

3.6.8 Whale and sea birds observations

The results of whale observations are presented in Figures 3.18-3.20:

Figure 3.XX Whale observations

F

Figure 3.XX Bird observations

The following species of sea birds were observed:

4. SUMMARY AND CONCLUSIONS

5. REFERENCES

Strømme, T. 1992. NAN-SIS: Software for fishery survey data logging and analysis. User's manual. *FAO Computerized Information Series (Fisheries)*. No. 4. Rome, FAO. 1992. 103.

ANNEX I Records of fishing stations

R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 1				start stop duration Lon E 59°37.70			
DATE :08.12.2010	GEAR TYPE: PT NO: 4	POSITION:Lat S 19°45.63		TIME :20:39:27	21:11:02	31.0 (min)	Purpose : 1
		Lon E 57°51.01		LOG : 8072.82	8074.45	1.6	Region : 7600
TIME :13:33:02	14:06:29	33.5 (min)	Purpose : 1	FDEPTH: 80	70		Gear cond.: 0
LOG : 7353.64	7355.09	1.5	Region : 7600	BDEPTH: 157	124		Validity : 0
FDEPTH: 0	0		Gear cond.: 0	Towing dir: 0°	Wire out : 210 m		Speed : 0.0 kn
BDEPTH: 473	462		Validity : 0	Sorted : 1	Total catch: 1.02		Catch/hour: 1.98
Towing dir: 0°	Wire out : 110 m		Speed : 2.6 kn				
Sorted : 0	Total catch: 0.02		Catch/hour: 0.04				
SPECIES				CATCH/HOUR % OF TOT. C SAMP			
weight numbers				weight numbers			
Apogon - juvenile	0.00	2	0.00	Bregmaceros sp.	0.58	414	29.38
Xiphiasia setifer	0.01	2	0.00	Apogon 'spottail dorsal'	0.48	151	24.49
Xiphiasia matsubari	0.01	2	0.00	Dipterygonotus balteatus	0.39	99	19.59
Bothidae - juvenile	0.00	5	0.00	Ariomma cf. melanum	0.17	4	8.81
CARANGIDAE, juvenile	0.00	4	0.00	Champsodon capensis	0.12	35	6.07
Centrolophidae - juvenile	0.01	2	0.00	Priacanthus juvenile, juvenile	0.06	15	3.23
Unidentified crustacean	0.00	5	0.00	Stoloteuthis sp.	0.04	2	1.96
Unidentified crustacean	0.00	4	0.00	Tentoriceps cristatus	0.03	12	1.76
Dactyloptena peterseni	0.00	2	0.00	Saurida undosquamis	0.03	4	1.57
Gempylidae - juvenile	0.00	2	0.00	OMMASTREPHIDAE	0.03	4	1.37
Monacanthidae - juvenile	0.00	2	0.00	Apogon sp.	0.02	19	1.18
Scombridae - juvenile	0.00	4	0.00	Parapriacanthus ransonneti	0.02	8	0.98
Cephalopoda - juvenile	0.00	2	0.00	Leptocephalus	0.01	12	0.49
Unidentified juv fish	0.00	4	0.00	Leptocephalus - transforming	0.01	2	0.39
Unidentified larvae	0.00	7	0.00	Monacanthidae, juvenile	0.00	15	0.20
				Lolliguncula sp.	0.00	2	0.10
				Unidentified crustacean	0.00	4	0.10
				Unidentified crustacean	0.00	25	0.10
				Unidentified crustacean	0.00	4	0.00
				Shrimps unidentified	0.00	2	0.00
				Phyllosoma	0.00	19	0.00
				Total	2.01		101.76
R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 2				R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 6			
DATE :09.12.2010	GEAR TYPE: PT NO: 1	POSITION:Lat S 18°33.43		DATE :13.12.2010	GEAR TYPE: PT NO: 1	POSITION:Lat S 15°56.14	
		Lon E 58°52.70				Lon E 59°39.96	
TIME :18:53:47	19:26:41	32.9 (min)	Purpose : 1	TIME :17:07:57	17:38:34	30.6 (min)	Purpose : 1
LOG : 7630.30	7631.94	1.6	Region : 7600	LOG : 8459.07	8461.02	2.0	Region : 7600
FDEPTH: 0	0		Gear cond.: 0	FDEPTH: 0	25		Gear cond.: 0
BDEPTH: 59	866		Validity : 0	BDEPTH: 52	52		Validity : 0
Towing dir: 0°	Wire out : 110 m		Speed : 3.0 kn	Towing dir: 0°	Wire out : 110 m		Speed : 3.8 kn
Sorted : 1	Total catch: 1.16		Catch/hour: 2.12	Sorted : 0	Total catch: 0.02		Catch/hour: 0.05
SPECIES				SPECIES			
weight numbers				weight numbers			
Myctophum fissunovi	1.35	618	63.57	Leptocephalus	0.00	0	0.00
Acanthusus sp. juvenile	0.66	7	30.93	Unidentified crustacean	0.00	2	0.00
Bentosema fibulatum	0.04	5	1.72	Unidentified larvae	0.00	6	0.00
PARALEPIDIDAE	0.02	5	1.03	Leptocephalus	0.04	31	0.00
Symbolophorus evermanni	0.02	4	0.95				
Bothidae - juvenile	0.01	13	0.52				
Diaphus taaningi	0.01	2	0.26				
Fistularia sp., juvenile	0.00	5	0.17				
Mullidae juvenile	0.00	4	0.17				
OMMASTREPHIDAE	0.00	2	0.17				
Acanthusus sp. juvenile	0.00	2	0.17				
Malacanthus brevisrostris	0.00	4	0.17				
Apogonidae - juvenile	0.00	7	0.09				
Leptocephalus	0.00	4	0.09				
Scorpaenidae - juvenile	0.00	2	0.09				
Unidentified juv fish	0.00	2	0.09				
Unidentified juv fish	0.00	2	0.00				
Unidentified crustacean	0.00	2	0.00				
Total	2.13		100.17				
R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 3				R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 7			
DATE :10.12.2010	GEAR TYPE: PT NO: 1	POSITION:Lat S 17°46.65		DATE :14.12.2010	GEAR TYPE: BT NO: 21	POSITION:Lat S 16°3.13	
		Lon E 59°24.63				Lon E 61°15.23	
TIME :16:42:36	17:12:48	30.2 (min)	Purpose : 1	TIME :10:34:00	11:03:37	29.6 (min)	Purpose : 1
LOG : 7825.04	7826.88	1.9	Region : 7600	LOG : 8598.56	8600.30	1.7	Region : 7600
FDEPTH: 20	40		Gear cond.: 0	FDEPTH: 285	292		Gear cond.: 0
BDEPTH: 279	283		Validity : 0	BDEPTH: 285	292		Validity : 0
Towing dir: 0°	Wire out : 90 m		Speed : 3.7 kn	Towing dir: 0°	Wire out : 750 m		Speed : 3.5 kn
Sorted : 0	Total catch: 0.21		Catch/hour: 0.41	Sorted : 107	Total catch: 107.38		Catch/hour: 217.52
SPECIES				SPECIES			
weight numbers				weight numbers			
Leptocephalus	0.00	2	0.00	Epinephelus sp.	202.57	2	93.13
Bregmaceros sp.	0.01	44	0.00	Emmelichthys nitidus	12.98	150	5.97
Carangoid 'deep' juvenile	0.00	2	0.00	Histioposterus typus	0.49	2	0.22
Decapterus macarellus	0.36	4	0.00	Sea cucumber	0.38	2	0.18
Unidentified crustacean	0.00	10	0.00	Sepia sp.	0.20	4	0.09
Unidentified crustacean larvae	0.00	2	0.00	Champsodon capensis	0.18	34	0.08
Unidentified crustacean larvae	0.00	2	0.00	Etelis carbunculus	0.18	2	0.08
Unidentified crustacean larvae	0.00	18	0.00	Argentina euchus	0.18	71	0.08
Unidentified crustacean	0.00	32	0.00	Anthias sp. 'red' F-M	0.16	6	0.07
Bentosema fibulatum	0.03	8	0.00	B I V A L V E S	0.08	0	0.04
				CORAL	0.06	0	0.03
				Poecilopsetta sp.	0.04	2	0.02
				Shrimps unidentified	0.00	2	0.00
				Total	217.52		100.00
R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 4				R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 8			
DATE :11.12.2010	GEAR TYPE: PT NO: 4	POSITION:Lat S 17°16.72		DATE :15.12.2010	GEAR TYPE: PT NO: 1	POSITION:Lat S 15°39.26	
		Lon E 58°34.95				Lon E 60°37.27	
TIME :01:21:20	01:51:05	29.8 (min)	Purpose : 1	TIME :03:03:09	03:18:09	15.0 (min)	Purpose : 1
LOG : 7903.72	7905.36	1.6	Region : 7600	LOG : 8765.83	8767.34	1.5	Region : 7600
FDEPTH: 10	10		Gear cond.: 0	FDEPTH: 0	0		Gear cond.: 0
BDEPTH: 733	57		Validity : 0	BDEPTH: 174	131		Validity : 0
Towing dir: 0°	Wire out : 140 m		Speed : 3.3 kn	Towing dir: 0°	Wire out : 110 m		Speed : 1.1 kn
Sorted : 0	Total catch: 0.00		Catch/hour: 0.00	Sorted : 0	Total catch: 0.00		Catch/hour: 0.01
SPECIES				SPECIES			
weight numbers				weight numbers			
N O C A T C H	0.00	0	0.00	Scombridae sp - Juvenile	0.00	8	0.00
				Leptocephalus	0.01	4	0.00
R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 5				R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 9			
DATE :11.12.2010	GEAR TYPE: PT NO: 1	POSITION:Lat S 16°48.40		DATE :15.12.2010	GEAR TYPE: BT NO: 21	POSITION:Lat S 15°28.47	
						Lon E 60°15.64	
				TIME :09:11:22	09:43:59	32.6 (min)	Purpose : 1
				LOG : 8794.05	8795.87	1.8	Region : 7600
				FDEPTH: 60	59		Gear cond.: 0
				BDEPTH: 60	59		Validity : 0

Towing dir: 0° Wire out : 190 m Speed : 3.3 kn
 Sorted : 99 Total catch: 99.47 Catch/hour: 183.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lutjanus sebae	59.61	7	32.57	5
CORAL	28.89	0	15.78	
Carangoides fulvoguttatus	21.25	4	11.61	7
Gymnocranius grandoculis	14.63	4	7.99	11
Lethrinus nebulosus	14.26	4	7.79	4
Abalistes stellatus	13.62	7	7.44	12
Aprion virescens	10.12	2	5.53	8
Diagramma centurio	8.56	2	4.67	9
Lethrinus sp. 'elongate'	3.22	2	1.76	6
Seriola rivoliana	2.58	2	1.41	10
Aluterus monoceros	2.30	2	1.26	
Echeneis naucrates	1.93	2	1.06	
Parupeneus fraserorum	0.70	2	0.38	
Dipterygonotus balteatus	0.46	107	0.25	
Dascyllus trimaculatus	0.13	7	0.07	
Scorpaena scrofa	0.11	2	0.06	
Apogon sp.	0.11	92	0.06	
Chaetodon dolosus	0.06	2	0.03	
Synodus sp.	0.04	6	0.02	
Scorpaena normani	0.04	2	0.02	
Dactyloptena orientalis	0.03	2	0.01	
Pristotis cf. cyanostigma	0.02	2	0.01	
Small squids unident.	0.01	6	0.01	
Antennarius coccineus	0.01	4	0.01	
Labroides dimidiatus	0.01	2	0.00	
Champsodon capensis	0.01	2	0.00	
Canthigaster coronata	0.00	2	0.00	
Crabs - hairy	0.00	6	0.00	
Total	182.69		99.82	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lethrinus cf mahsena	45.84	96	28.39	26
Siganus sutor	38.89	73	24.09	19
Scarus cf. ghobban	22.01	3	13.63	27
Pomacanthus semicirculatus	13.57	7	8.41	
Scarus sp.	6.95	7	4.31	20
Starfish	5.13	3	3.18	
Parupeneus barberinus	4.96	3	3.08	23
Aluterus monoceros	4.63	3	2.87	
Plectropomus leopardus	3.97	3	2.46	24
Pseudobalistes fuscus	3.64	3	2.26	
Gymnocranius griseus	3.31	13	2.05	21
Holothuria sp.	3.14	10	1.95	
Plectropomus pessuliferus	2.38	3	1.48	25
Ostracion cubicus	1.49	3	0.92	
Sufflamen chrysopterum	0.66	7	0.41	
Lethrinus sp. 'elongate'	0.66	3	0.41	22
Sea urchin	0.17	3	0.10	
Pomacentrus caeruleus	0.02	3	0.01	
Canthigaster valentini	0.01	3	0.00	
Labroides dimidiatus	0.01	3	0.00	
Total		161.43		100.00

R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 10
 DATE :15.12.2010 GEAR TYPE: PT NO: 1 POSITION:Lat S 15°10.07
 start stop duration Purpose : 1
 TIME :19:05:42 19:37:19 31.6 (min) Region : 7600
 LOG : 8878.08 8879.79 1.7 Gear cond.: 0
 FDEPTH: 10 10 Validity : 0
 BDEPTH: 52 54
 Towing dir: 0° Wire out : 110 m Speed : 3.3 kn
 Sorted : 2 Total catch: 1.54 Catch/hour: 2.91

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Benthoosema fibulatum	2.85	139	97.66	
OMMASTREPHIDAE	0.06	6	1.95	
Unidentified crustacean	0.00	6	0.07	
Apogonidae - juvenile	0.00	8	0.07	
Acanthusus sp. juvenile	0.00	2	0.07	
UNIDENTIFIED FISH	0.00	6	0.07	
Unidentified juv fish	0.00	6	0.07	
Unidentified juv fish	0.00	2	0.00	
Unidentified fish	0.00	0	0.00	
Total	2.91		99.93	

R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 11
 DATE :16.12.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 15°12.96
 start stop duration Purpose : 1
 TIME :06:11:03 06:35:51 24.8 (min) Region : 7600
 LOG : 8971.51 8972.82 1.3 Gear cond.: 0
 FDEPTH: 66 68 Validity : 0
 BDEPTH: 66 68
 Towing dir: 0° Wire out : 205 m Speed : 3.2 kn
 Sorted : 3 Total catch: 3.34 Catch/hour: 8.07

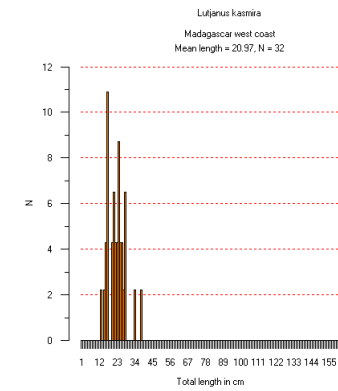
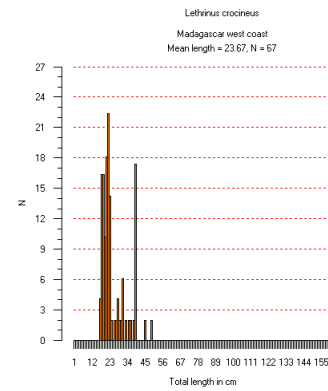
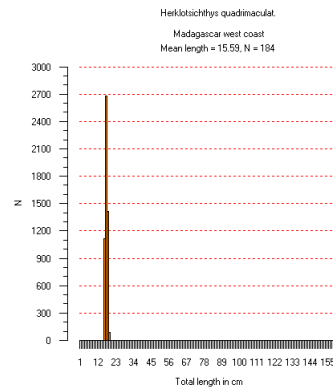
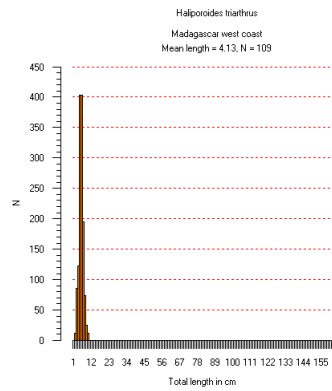
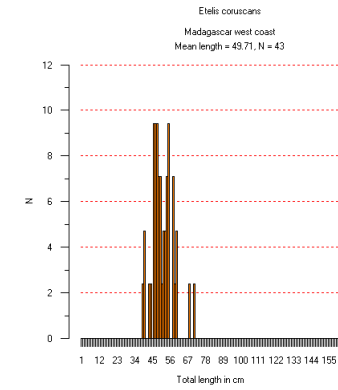
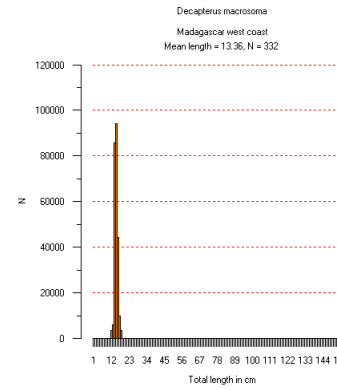
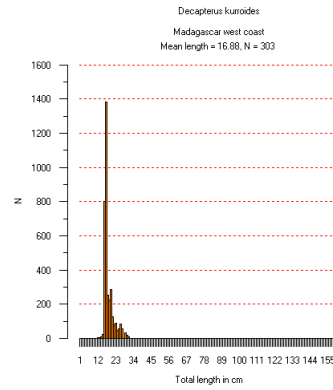
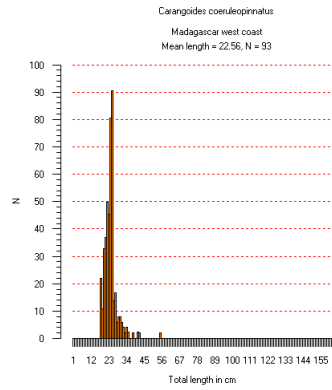
SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Loxodon macrorhinus	5.08	2	62.91	13
Dipterygonotus balteatus	1.69	73	20.97	
Echeneis naucrates	0.48	2	5.99	
Pristotis cf. cyanostigma	0.24	70	3.00	
Lagocephalus sceleratus	0.18	2	2.25	
Sepia sp. 'mottled'	0.17	2	2.07	
Majidae species	0.11	2	1.38	
Synodus sp.	0.07	5	0.84	
Saurida undosquamis	0.05	2	0.57	
Monacanthidae - juvenile	0.00	2	0.03	
Total	8.07		100.00	

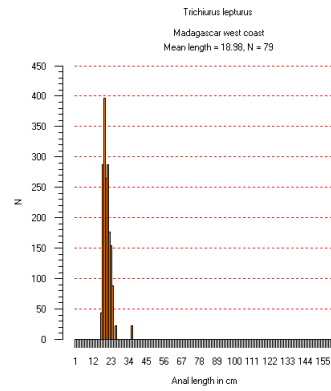
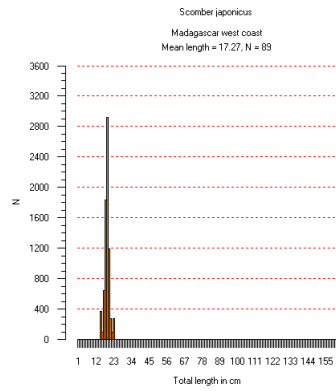
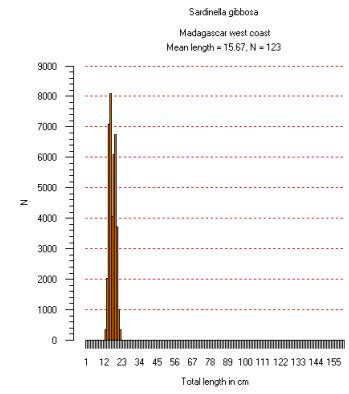
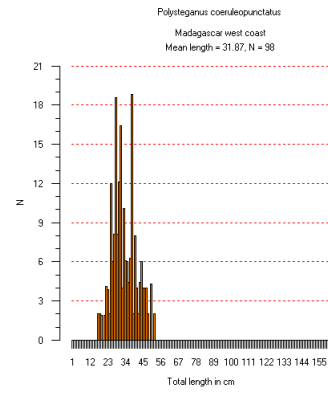
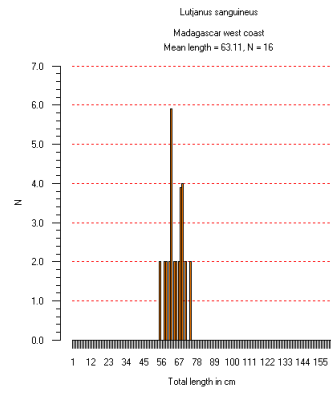
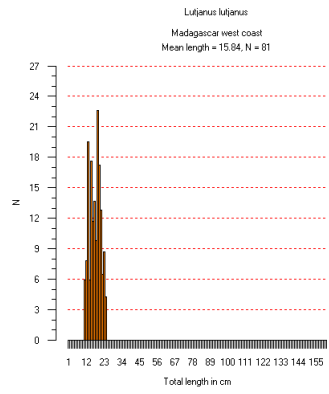
R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 12
 DATE :17.12.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 14°30.05
 start stop duration Purpose : 1
 TIME :06:29:17 06:58:08 28.9 (min) Region : 7600
 LOG : 9203.25 9204.90 1.7 Gear cond.: 0
 FDEPTH: 79 79 Validity : 0
 BDEPTH: 79 79
 Towing dir: 0° Wire out : 220 m Speed : 3.4 kn
 Sorted : 39 Total catch: 39.41 Catch/hour: 81.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
PORIFERA (Sponges)	62.39	0	76.13	
Leionathus elongatus	6.97	1298	8.50	14
Abalistes stellatus	6.24	4	7.61	17
Loxodon macrorhinus	4.47	2	5.46	
Lactoria cornuta	1.14	2	1.40	
Starfish	0.31	4	0.38	
Pristotis cf. cyanostigma	0.21	25	0.25	15
Saurida undosquamis	0.10	6	0.13	16
Nemipterus 'yellow mandible'	0.09	2	0.10	
Apogon 'big'	0.02	2	0.02	18
Lagocephalus sceleratus	0.01	2	0.01	
Carybdis sp.	0.01	2	0.01	
Alpheidae	0.00	4	0.00	
Total	81.96		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2010410 STATION: 13
 DATE :18.12.2010 GEAR TYPE: BT NO: 21 POSITION:Lat S 13°55.84
 start stop duration Purpose : 1
 TIME :11:38:41 11:56:49 18.1 (min) Region : 7600
 LOG : 9431.66 9432.55 0.9 Gear cond.: 8
 FDEPTH: 41 38 Validity : 3
 BDEPTH: 41 38
 Towing dir: 0° Wire out : 120 m Speed : 3.0 kn
 Sorted : 49 Total catch: 48.78 Catch/hour: 161.43

ANNEX II. Length distribution of main species





ANNEX III. Instruments and fishing gear used

Echo sounder

The SIMRAD ER60/38 kHz scientific sounder was used during the survey for fish abundance estimation. The lowering keel was only submerged during the last days of the survey. The LSSS Integrator system was used to scrutinise the acoustic records. System calibration using a standard copper sphere was performed 14.06.2009. The settings of 38 kHz echo sounder were as follows:

Transceiver-1 menu (38 kHz lowering keel)

Transducer depth	5.50 m
Absorbtion coeff.	8.5 dB/km
Pulse length	medium (1.02ms)
Bandwidth	wide (2.43 kHz)
Max power	2000 Watt
2-way beam angle	-20.6 dB
Transducer gain	25.9 dB
Angle sensitivity	21.9
3 dB beamwidth	6.95° alongship 6.99° athwardship
Alongship offset	0.11°
Athwardship offset	0.04°

Display menu

Echogram	1 (38 kHz)
Bottom range	15 m
Bottom range start	10 m

Fishing gear

The vessel has both "Harstad" and "Åkrahamn" pelagic trawls and a "Gisund super bottom trawl".

The bottom trawl has a headline of 31 m, footrope 47 m and 20 mm mesh size in the cod end with an inner net of 10 mm mesh size (see drawings below). The estimated opening is 6 m (observed 5.7) and distance between wings during towing about 18 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. The doors are of 'Thyborøn' combi type, 7.81 m², 1670 kg, their distance while trawling about 45 - 55 m on average, depending on the depth (least distance at low depths). This distance can be kept constant (about 50 m) at all depths by the use of a 9.5 m strap between the wires at 130 m distance from the doors, normally applied at depths greater than 80 m.

The SCANMAR system was used on 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 distance and the trawl with a trawl eye that provides information on the trawl opening, the distance of the footrope to the bottom, bottom contact and fish entering the trawl.

ANNEX V. List of species for Isotope analyses

Trawl station	code	Species	Length (cm)	Weight (g)	Sex	Trawl station	code	Species	Length (cm)	Weight (g)	Sex
4	M001	<i>Pseudanthias cooperi</i>	15	48	J	12	M048	<i>Lethrinus nebulosus</i>	16	77	J
4	M002	<i>Pseudanthias cooperi</i>	15	50	J	12	M049	<i>Gymnocranius griseus</i>	18	126	J
4	M003	<i>Pseudanthias cooperi</i>	15.5	60	J	12	M050	<i>Gymnocranius griseus</i>	12	30	J
4	M004	<i>Pristotis cf. cyanostigma</i>	11.5	20	J	12	M051	<i>Gymnocranius griseus</i>	10.5	22	X
4	M005	<i>Pristotis cf. cyanostigma</i>	11.5	23	J	12	M052	<i>Drepane longimana</i>	52	2850	J
4	M006	<i>Pristotis cf. cyanostigma</i>	12	26	J	12	M053	<i>Drepane longimana</i>	58	3850	J
4	M007	<i>Dasycyllus trimaculatus</i>	10	29	F	12	M054	<i>Drepane longimana</i>	61	4050	J
4	M008	<i>Dasycyllus trimaculatus</i>	11	39	M	12	M055	<i>Decapterus macrosoma</i>	11	35	J
4	M009	<i>Dasycyllus trimaculatus</i>	11	38	J	12	M056	<i>Decapterus macrosoma</i>	13	46	M
4	M010	<i>Trachurus delagoa</i>	13	19	J	12	M057	<i>Decapterus macrosoma</i>	15	52	F
4	M011	<i>Trachurus delagoa</i>	11.5	17	J	12	M058	<i>Herklotsichthys quadrimaculatus</i>			M
4	M012	<i>Trachurus delagoa</i>	13	19	J	15	M059	<i>saurid undoscomis</i>	23	89	F
4	M013	<i>Chaetodon blackburnii</i>	8.5	15	F	15	M060	<i>saurid undoscomis</i>	20	41	F
4	M014	<i>Chaetodon blackburnii</i>	10	25	J	15	M061	<i>saurid undoscomis</i>	18	19	F
4	M015	<i>Chaetodon blackburnii</i>	10	25	J	15	M062	<i>decapterus kuroides</i>	18	49	M
4	M016	<i>Lutjanus sebae</i>	81	9700	M	15	M063	<i>decapterus kuroides</i>	17	45	M
6	M017	<i>Polysteganus coeruleopunctatus</i>	28	32	F	15	M064	<i>decapterus kuroides</i>	15	35	M
6	M018	<i>Polysteganus coeruleopunctatus</i>	27	26	M	15	M065	<i>Herklotsichthys quadrimaculatus</i>	16	31	F
6	M019	<i>Polysteganus coeruleopunctatus</i>	27	25	F	15	M066	<i>Herklotsichthys quadrimaculatus</i>	15	28	F
6	M020	<i>Pristipomoides filamentosus</i>	38	55	F	15	M067	<i>Herklotsichthys quadrimaculatus</i>	16	31	F
6	M021	<i>Pristipomoides filamentosus</i>	35	46	M	15	M068	<i>Upeneus taenopterus</i>	12	30	F
6	M022	<i>Pristipomoides filamentosus</i>	36	48	F	16	M069	<i>Upeneus taenopterus</i>	9	11	F
6	M023	<i>Cantherhines dumerilii</i>	33	44	M	16	M070	<i>Upeneus taenopterus</i>	8	16	F
6	M024	<i>Cantherhines dumerilii</i>	32	42	J	16	M071	<i>Decaptrus kurroides</i>	25	182	F
10	M025	<i>Caesio caerulea</i>	16	79	F	16	M072	<i>Decaptrus kurroides</i>	19	80	F
10	M026	<i>Caesio caerulea</i>	18	95	F	16	M073	<i>Decaptrus kurroides</i>	16	61	M
10	M027	<i>Caesio caerulea</i>	16	63	F	17	M074	<i>seriola rivoliana</i>	35	779	F
10	M028	<i>Parupeneus rubescens</i>	28	349	M	17	M075	<i>seriola rivoliana</i>	32	635	M
10	M029	<i>Parupeneus rubescens</i>	21	152	F	17	M076	<i>seriola rivoliana</i>	32	632	F
10	M030	<i>Parupeneus rubescens</i>	16	81	F	20	M077	<i>Carangoides caeruleolineatus</i>	35	915	F
10	M031	<i>Parupeneus indicus</i>	15	67	F	20	M078	<i>Carangoides caeruleolineatus</i>	29	522	F
10	M032	<i>Parupeneus indicus</i>	13	57	M	20	M079	<i>Carangoides caeruleolineatus</i>	20	181	F
10	M033	<i>Parupeneus indicus</i>	15	68	J	20	M080	<i>Nemipterus japonicus</i>	20	135	M
10	M034	<i>Teixeirichthys jordani</i>	11	31	M	20	M081	<i>Sphyaena forsteri</i>	43	287	F
10	M035	<i>Teixeirichthys jordani</i>	11	30	J	20	M082	<i>Rexea prometheoides</i>	27	146	F
10	M036	<i>Teixeirichthys jordani</i>	10	28	F	20	M083	<i>Rexea prometheoides</i>	23	117	F
10	M037	<i>suganus sutor</i>	25	261	J	20	M084	<i>Rexea prometheoides 3</i>	19	59	F
10	M038	<i>suganus sutor</i>	25	259	F	21	M085	<i>Trichurus lepturus</i>	160	7000	F
10	M039	<i>suganus sutor</i>	22	182	J	21	M086	<i>Trichurus lepturus</i>	23	180	M
12	M040	<i>Parupeneus rubescens</i>	30	437	F	21	M087	<i>Trichurus lepturus</i>	19	70	M
12	M041	<i>Parupeneus rubescens</i>	22	161	F	21	M088	<i>Trichurus lepturus</i>	30	60	F
12	M042	<i>Parupeneus rubescens</i>	14	45	F	21	M089	<i>Polysteganus coeruleopunctatus</i>	50	2040	M
12	M043	<i>Lethrinus crocineus</i>	33	728	M	21	M090	<i>Polysteganus coeruleopunctatus</i>	40	1044	M
12	M044	<i>Lethrinus crocineus</i>	21	168	F	21	M091	<i>Polysteganus coeruleopunctatus</i>	42	1040	F
12	M045	<i>Lethrinus crocineus</i>	15	15	M	24	M092	<i>Decapterus table</i>	26	251	M
12	M046	<i>Lethrinus nebulosus</i>	28	382	M	24	M093	<i>Decapterus table</i>	21	117	F
12	M047	<i>Lethrinus nebulosus</i>	20	147	F	24	M094	<i>Decapterus table</i>	28	286	F

Trawl station	code	Species	Length (cm)	Weight (g)	Sex	Trawl station	code	Species	Length (cm)	Weight (g)	Sex
24	M095	Decapterus table	24	196	F	26	M42	Diaphus effulgens	11	19	F
24	M096	Decapterus table	20	116	F	26	M43	Diaphus effulgens	10	14	M
24	M097	Sphyaena flavicauda	26	87	F	26	M44	Diaphus effulgens	10	19	J
24	M098	Sphyaena flavicauda	26	88	M	26	M45	Diaphus richardsoni	10	17	J
24	M099	Sphyaena flavicauda	28	93	F	26	M46	Myctophum asperum	10	16	J
24	M100	Sphyaena flavicauda	28	95	M	26	M47	Ceratoscopelus warmingii	10	15	J
24	M101	Sphyaena flavicauda	28	87	FF	26	M48	Diaphus thiollieri	10	16	F
24	M102	Pliotrema warreni	98	3021	M	26	M49	Diaphus problematicus	10	13	J
24	M103	Pliotrema warreni	95	3010	M	26	M50	Myctophum spinosum	12	21	J
24	M104	Pliotrema warreni	91	3000	M	26	M51	Diaphus effulgens	10	15	M
24	M105	Pliotrema warreni	90	2841	M	26	M52	Diaphus problematicus	9	10	F
24	M106	Pliotrema warreni	82	2800	F	26	M53	Diaphus garmani	9	11	M
24	M107	Pliotrema warreni	62	2610	M	26	M54	Diaphus jenseni	10	14	F
25	M108	Sphyaena flavicauda	26	91	J	26	M55	Diaphus malayanus	12	23	F
25	M109	Sphyaena flavicauda	27	118	J	26	M56	Diaphus effulgens	10	13	M
25	M110	Sphyaena flavicauda	27	122	J	26	M57	Diaphus effulgens	10	11	F
25	M111	Sphyaena flavicauda	24	90	J	26	M58	Diaphus effulgens	10	11	M
25	M112	Sphyaena flavicauda	27	146	J	26	M59	Diaphus effulgens	10	11	J
25	M113	Sphyaena flavicauda	26	109	J	26	M60	Diaphus effulgens	10	12	F
25	M114	Sphyaena flavicauda	27	92	F	26	M61	Diaphus richardsoni	10	13	F
25	M115	Sphyaena flavicauda	24	95	M	26	M62	Myctophum asperum	9	11	F
25	M116	Decapterus kurroides	25	103	J	26	M63	Ceratoscopelus warmingii	10	14	M
25	M117	Decapterus kurroides	27	252	J	26	M64	Diaphus thiollieri	11	14	F
25	M118	Decapterus kurroides	23	178	J	26	M65	Diaphus problematicus	9	10	F
25	M119	Decapterus kurroides	26	251	J	26	M66	Myctophum spinosum	10	13	F
25	M120	Decapterus kurroides	25	208	F	26	M67	Diaphus effulgens	11	13	M
25	M121	Decapterus kurroides	21	135	J	26	M68	Diaphus problematicus	10	11	J
25	M122	Decapterus kurroides	26	255	J	26	M69	Diaphus garmani	10	11	M
25	M123	Decapterus kurroides	20	91	J	26	M70	Diaphus jenseni	9	13	J
25	M124	Decapterus kurroides	22	133	F	26	M71	Ceratoscopelus warmingii	9	10	F
25	M125	Decapterus kurroides	20	114	M	26	M72	Diaphus effulgens	9	8	J
25	M126	Decapterus kurroides	21	108	F	26	M73	Diaphus effulgens	9	10	F
25	M127	Decapterus kurroides	22	144	F	26	M74	Diaphus effulgens	9	8	J
25	M128	Decapterus kurroides	19	97	M	26	M75	Diaphus effulgens	8	7	F
25	M129	Decapterus kurroides	19	95	F	26	M76	Diaphus effulgens	10	10	F
25	M130	Decapterus kurroides	20	103	M	26	M77	Diaphus richardsoni	23	45	J
25	M131	Decapterus kurroides	23	155	J	26	M78	cubiceps cubiceps	21	46	F
25	M132	Rexea pomethoides	18	37	F	26	M79	cubiceps cubiceps	29	46	F
25	M133	Rexea pomethoides	19	52	F	26	M80	cubiceps cubiceps	25	47	M
25	M134	Rexea pomethoides	21	64	F	26	M81	cubiceps cubiceps	26	25	J
25	M135	Rexea pomethoides	22	72	M	26	M82	cubiceps cubiceps	23	30	J
25	M136	Rexea pomethoides	21	58	F	26	M83	cubiceps cubiceps	24	54	J
25	M137	Rexea pomethoides	19	45	F	26	M84	cubiceps cubiceps	21	49	J
25	M138	Rexea pomethoides	18	41	J	26	M85	cubiceps cubiceps	20	21	F
25	M139	Rexea pomethoides	18	41	F	27	M86	Rexea pomethoides	21	70	J
26	M140	Diaphus effulgens	13	29	J	27	M87	Rexea pomethoides	18	48	J
26	M141	Diaphus effulgens	11	20	J	27	M88	Rexea pomethoides	27	146	M

Trawl station	code	Species	Length (cm)	Weight (g)	Sex	Trawl station	code	Species	Length (cm)	Weight (g)	Sex
27	M189	Rexea promethoides	21	70	F	29	M214	Lestrolepis japonica	10	15	M
27	M190	Rexea promethoides	22	78	M	29	M215	Lestrolepis japonica	12	11	F
27	M191	Astronesthes trifibulatis	13	17	F	29	M216	argyropelacusa	11	10	M
27	M192	Astronesthes trifibulatis	12	16	F	29	M217	Melanostomias barbato-beani	19	18	F
27	M193	Astronesthes trifibulatis	13	14	F	29	M218	Melanostomias barbato-beani	20	19	F
27	M194	Astronesthes trifibulatis	11	13	F	29	M219	Melanostomias barbato-beani	25	21	F
27	M195	Astronesthes trifibulatis	6	2	J	29	M220	Melanostomias barbato-beani	23	23	F
27	M196	Lestrolepis japonica	14	5	M	29	M221	Melanostomias barbato-beani	17	17	J
29	M197	upe-naeus vittatus	13	40	m	29	M222	Melanostomias barbato-beani	18	17	M
29	M198	upe-naeus vittatus	14	40	f	29	M223	Melanostomias barbato-beani	19	18	J
29	M199	upe-naeus vittatus	14	41	m	29	M224	Melanostomias barbato-beani	21	20	J
29	M200	upe-naeus vittatus	14	42	f	29	M225	Melanostomias barbato-beani	26	25	M
29	M201	upe-naeus vittatus	14	41	J	29	M226	Melanostomias barbato-beani	24	23	F
29	M202	bre-gmaceros maccell-landi	7	3	J	29	M227	Melanostomias barbato-beani	24	22	M
29	M203	Diaphus garmani	13	29	M	30	M228	Nemipterus bipunctatus	21	131	M
29	M204	Diaphus garmani	13	27	F	30	M229	Nemipterus bipunctatus	16	62	F
29	M205	Diaphus thio-llieri	14	17	M	30	M230	Nemipterus bipunctatus	15	60	F
29	M206	Diaphus jenseni	18	36	F	30	M231	Nemipterus bipunctatus	15	65	F
29	M207	Cerastoscope-lus warmingii	19	41	F	30	M232	Nemipterus bipunctatus	11	27	F
29	M208	Astronesthes trifibulatis	14	13	F	30	M233	Nemipterus bipunctatus	10	17	F
29	M209	Astronesthes trifibulatis	20	27	F	31	M234	Nemipterus japonicus	14	46	M
29	M210	Rexea promethoides	17	19	J	31	M235	Nemipterus japonicus	16	49	F
29	M211	Rexea promethoides	19	17	M	31	M236	Nemipterus japonicus	15	63	F
29	M212	Rexea promethoides	21	30	J	31	M237	Nemipterus japonicus	19	96	F
29	M213	Lestrolepis japonica	13	17	J						

ANNEX VI. List of species for DNA analyses and conservation

Trawl station	DNA	Specimen Kept	Photo	Fomalin/Frozen	ACEP #	Species
1	yes	yes	yes	Fomalin	141	Malacostidae
1	yes	yes	yes	Fomalin	142	Chauliodontidae
3	yes	yes	yes	Fomalin	161	Epinephelus morrua
3	yes	yes	yes	Fomalin	162	Epinephelus morrua
3	yes	yes	yes	Fomalin	155	Chaetodon dolosus
3	yes	yes	yes	Fomalin	156	Chaetodon dolosus
3	yes	yes	yes	Fomalin	165	Parupeneus cf seychellensis
3	yes	yes	yes	Fomalin	166	Fistularia petimba
3	yes	yes	yes	Fomalin	167	Fistularia petimba
3	yes	yes	yes	Fomalin	157	Argyrops filamentosus
3	yes	yes	yes	Fomalin	158	Argyrops filamentosus
3	yes	yes	yes	Fomalin	159	Choerodon robustus
3	yes	yes	yes	Fomalin	160	Choerodon robustus
3	yes	yes	yes	Fomalin	151	Parupeneus rubescens
3	yes	yes	yes	Fomalin	152	Parupeneus rubescens
3	yes	yes	yes	Fomalin	179	Gymnocraneus griseus
3	yes	yes	yes	Fomalin	180	Gymnocraneus griseus
3	yes	yes	yes	Fomalin	168	Scorpaena scrofa
3	yes	yes	yes	Fomalin	163	Paracaesio xanthurus
3	yes	yes	yes	Fomalin	164	Paracaesio xanthurus
3	yes	yes	yes	Fomalin	153	Pristipomoides filamentosus
3	yes	yes	yes	Fomalin	154	Pristipomoides filamentosus
3	yes	yes	yes	Fomalin	178	Epinephelus flavocaeruleus
3	yes	yes	yes	Fomalin	169	Polysteganus coeruleopunctatus
5	yes	yes	yes	Fomalin	172	Nemichthys curvirostris
5	yes	yes	yes	Fomalin	170	Priacanthus sp
5	yes	yes	yes	Fomalin	171	Unid
5	yes	yes	yes	Fomalin	173	Bregmaceros sp.
6	yes	no	yes		174	Mustelus mosis
6	yes	yes	yes	Fomalin	194	Lactoria diaphana
6	yes	yes	yes	Fomalin	192	Teixerichthys jordani
6	yes	yes	yes	Fomalin	193	Teixerichthys jordani
6	yes	yes	yes	Fomalin	188	Antigonia rubenensis
6	yes	yes	yes	Fomalin	189	Antigonia rubenensis
6	yes	yes	yes	Fomalin	187	Stethojulis interrupta
6	yes	yes	yes	Fomalin	185	Dascyllus trimaculatus
6	yes	yes	yes	Fomalin	186	Dascyllus trimaculatus
6	yes	no	yes		182	Epinephelus morrua
6	yes	yes	yes	Fomalin	181	Polysteganus coeruleopunctatus
6	yes	no	yes		197	Cantherhines dumerilli
6	yes	no	yes		198	Cantherhines dumerilli
6	yes	yes	yes	Fomalin	175	Pristipomoides filamentosus
6	yes	yes	yes	Fomalin	176	Pristipomoides filamentosus
6	yes	yes	yes	Fomalin	183	Pomacanthus imperator
6	yes	yes	yes	Fomalin	184	Parupeneus rubescens
6	yes	yes	yes	Fomalin	190	Fistularia petimba
6	yes	yes	yes	Fomalin	195	Pseudocanthias cornelli
6	yes	yes	yes	Fomalin	196	Scorpaena scrofa
6	yes	yes	yes	Fomalin	191	Cheimerus nufar
7	yes	yes	yes	Frozen	200	Lutjanus sebae
7	no	no	yes		NA	Rhizoprionodon acutus
7	yes	yes	yes	Fomalin	207	Decapterus sp
7	yes	yes	yes	Fomalin	208	Decapterus sp
7	yes	yes	yes	Fomalin	199	Antigonia cf rubenensis
7	yes	yes	yes	Fomalin	206	Synodus dermatogenys
7	yes	yes	yes	Fomalin	201	Parupeneus
7	yes	yes	yes	Fomalin	202	Parupeneus

Trawl station	DNA	Specimen Kept	Photo	Fomalin/Frozen	ACEP #	Species
8	yes	yes	yes	Fomalin	222	Parupeneus indicus
8	yes	yes	yes	Fomalin	220	Parupeneus macronemus
8	yes	yes	yes	Fomalin	218	Chaetodon blackburnii
8	yes	yes	yes	Fomalin	219	Parupeneus cf seychellensis
8	yes	yes	yes	Fomalin	214	Priacanthus hamrur
8	yes	yes	yes	Fomalin	216	Signanus sutor
8	yes	yes	yes	Fomalin	217	Macropharyngodon kuiteri
8	yes	yes	yes	Fomalin	231	Caranx ignobilis
8	yes	yes	yes	Fomalin	229	Rachcentron canadum
8	yes	yes	yes	Frozen	230	Rachcentron canadum
8	yes	yes	yes	Frozen	227	Scomberosomus commerson
8	yes	yes	yes	Frozen	228	Scomberosomus commerson
10	yes	yes	yes	Fomalin	262	Chaetodon dolosus
10	yes	yes	yes	Fomalin	263	Chaetodon dolosus
10	yes	yes	yes	Fomalin	260	Chaetodon blackburnii
10	yes	yes	yes	Fomalin	261	Chaetodon blackburnii
10	yes	yes	yes	Fomalin	256	Gymnocraneus grandoculis
10	yes	yes	yes	Fomalin	255	Gymnocraneus grandoculis
10	yes	yes	yes	Fomalin	295	Scolopsis bimaculatus
10	yes	yes	yes	Fomalin	296	Scolopsis bimaculatus
10	yes	yes	yes	Fomalin	297	Cheimerus nufar
10	yes	yes	yes	Fomalin	298	Cheimerus nufar
10	yes	yes	yes	Fomalin	246	Parupeneus rubescens
10	yes	yes	yes	Fomalin	247	Parupeneus rubescens
10	yes	yes	yes	Fomalin	250	Parupeneus cf seychellensis
10	yes	yes	yes	Fomalin	239	Parupeneus cf seychellensis
10	yes	yes	yes	Fomalin	253	Halichoeres sp (Labridae)
10	yes	yes	yes	Fomalin	254	Cheilinus sp (Labridae)
10	yes	yes	yes	Fomalin	290	Anthias squamipinnis
10	yes	yes	yes	Fomalin	291	Anthias squamipinnis
10	yes	yes	yes	Fomalin	294	Pomacanthus imperator
10	yes	yes	yes	Fomalin	292	Gymnocranius griseus
10	yes	yes	yes	Fomalin	293	Gymnocranius griseus
10	yes	yes	yes	Fomalin	240	Ctenochaetus stugosus
10	yes	yes	yes	Fomalin	241	Ctenochaetus stugosus
10	yes	yes	yes	Fomalin	258	Fistularia petimba
10	yes	yes	yes	Fomalin	259	Fistularia petimba
10	yes	yes	yes	Fomalin	264	Anthias cornelli
10	yes	yes	yes	Fomalin	265	Anthias cornelli
10	yes	yes	yes	Fomalin	248	Decapterus macarellus
10	yes	yes	yes	Fomalin	249	Decapterus macarellus
10	yes	yes	yes	Fomalin	243	Caesio caerulea
10	yes	yes	yes	Fomalin	245	Caesio caerulea
10	yes	yes	yes	Fomalin	251	Lethrinus crocineus
10	yes	yes	yes	Fomalin	252	Lethrinus crocineus
10	yes	yes	yes	Fomalin	257	Teixerichthys jordani
10	yes	yes	yes	Fomalin	242	Decapterus punctatus
10	yes	yes	yes	Fomalin	244	Decapterus punctatus
10	yes	yes	yes	Fomalin	238	Labroides dimidiatus
10	yes	yes	yes	Fomalin	237	Stethojulis sp (Labridae)
10	yes	yes	yes	Fomalin	236	Stethojulis interrupta
10	yes	yes	yes	Fomalin	235	Signanus sutor
10	yes	yes	yes	Fomalin	234	Sufflamen frenatus
10	yes	yes	yes	Fomalin	266	Lactoria diaphana
10	yes	yes	yes	Fomalin	267	Lactoria diaphana
10	yes	yes	yes	Fomalin	268	Oplegnathus robinsoni
10	yes	yes	yes	Fomalin	232	Lethrinus nebulosus

7	yes	yes	yes	Formalin	203	Champsodon sp	10	yes	yes	yes	Formalin	233	Lethrinus nebulosus
7	yes	yes	yes	Formalin	204	Cyprinocirrhites polyactis	10	yes	yes	yes	Formalin	299	Abalistes stellatus
7	yes	yes	yes	Formalin	205	Cyprinocirrhites polyactis	10	yes	yes	yes	Formalin	300	Abalistes stellatus
8	yes	yes	yes	Formalin	211	Lethrinus crocineus	10	yes	yes	yes	Formalin	269	Drepane longimanus
8	yes	yes	yes	Formalin	212	Lethrinus crocineus	10	yes	yes	yes	Formalin	270	Drepane longimanus
8	yes	yes	yes	Formalin	210	Pagellus bellotti	12	yes	yes	yes	Formalin	277	Naso fageni
8	yes	yes	yes	Formalin	209	Zanclus canescens	13	yes	yes	yes	Formalin	278	Sphyaena acutipinnis
8	yes	yes	yes	Frozen	213	Cheimerus nufar	13	yes	yes	yes	Formalin	279	Decapterus sp
8	yes	yes	yes	Formalin	221	Caesio caerulea	13	yes	yes	yes	Formalin	280	Decapterus sp
8	yes	yes	yes	Formalin	223	Scolopsis bimaculatus	13	yes	yes	yes	Formalin	282	Decapterus sp
8	yes	yes	yes	Formalin	225	Scolopsis vosmeri	13	yes	yes	yes	Formalin	283	Decapterus sp
8	yes	yes	yes	Formalin	226	Scolopsis vosmeri	13	yes	yes	yes	Formalin	284	Decapterus sp
8	yes	yes	yes	Formalin	224	Echeneis naucrates	13	yes	yes	yes	Formalin	285	Upeneus bensasi

Trawl station	DNA	Specimen Kept	Photo	Formalin/Frozen	ACEP #	Species
13	yes	yes	yes	Formalin	281	Scomber japonicus
14	yes	yes	yes	Formalin	273	Decapterus kurroides
14	yes	yes	yes	Formalin	274	Decapterus kurroides
14	yes	yes	yes	Formalin	275	Scomber japonicus
14	yes	yes	yes	Formalin	276	Scomber japonicus
14	yes	yes	yes	Formalin	286	Decapterus macronemus
14	yes	yes	yes	Formalin	287	Decapterus macronemus
15	yes	yes	yes	Formalin	320	Pterois miles
15	yes	yes	yes	Formalin	321	Lagocephalus guentheri
15	yes	yes	yes	Formalin	322	Sardinella gibbosa
16	yes	yes	yes	Formalin	271	Saurida undosquamis
16	yes	yes	yes	Formalin	272	Saurida undosquamis
16	yes	yes	yes	Formalin	288	Saurida undosquamis
16	yes	yes	yes	Formalin	309	Decapterus kurroides
16	yes	yes	yes	Formalin	310	Decapterus kurroides
16	yes	yes	yes	Formalin	305	Zeus faber
16	yes	yes	yes	Formalin	307	Priacanthus hamrur
16	yes	yes	yes	Formalin	306	Sphyræna acutipinnis
16	yes	yes	yes	Formalin	304	Synodus dermatogenys
16	yes	yes	yes	Formalin	303	Synodus sp
16	yes	yes	yes	Formalin	301	Torquigener hypselogenion
16	yes	yes	yes	Formalin	302	Torquigener hypselogenion
16	yes	yes	yes	Formalin	289	Upeneus molluccensis
16	yes	yes	yes	Formalin	308	Upeneus cf vittatus
16	yes	yes	yes	Formalin	311	Upeneus cf vittatus
17	yes	no	yes		144	Mustelus mosis
17	yes	no	yes		145	Mustelus mosis
17	yes	yes	yes	Formalin	316	Echeneis naucrates
17	yes	no	yes		314	Seriola rivoliana
17	yes	no	yes		315	Seriola rivoliana
17	yes	yes	yes	Formalin	317	Abalistes stellatus
17	yes	yes	yes	Formalin	318	Abalistes stellatus
17	yes	yes	yes	Formalin	319	Pseudobalistes fuscus
17	yes	yes	yes	Formalin	312	Tetrasomus concatenatus
17	yes	yes	yes	Formalin	313	Tetrasomus concatenatus
18	yes	yes	yes	Formalin	372	Tetraodontidae sp
18	yes	yes	yes	Formalin	361	Lophius sp
18	yes	yes	yes	Formalin	347	Polymixia berndti
18	yes	yes	yes	Formalin	348	Polymixia berndti
18	yes	yes	yes	Formalin	334	Peristedion cf weberi
18	yes	yes	yes	Formalin	335	Peristedion cf weberi
18	yes	yes	yes	Formalin	333	Coelorinchus sp
18	yes	yes	yes	Formalin	332	Rexea promethoides
18	yes	yes	yes	Formalin	344	Rexea promethoides
18	yes	yes	yes	Formalin	330	Scorpaena sp
18	yes	yes	yes	Formalin	343	Scorpaena sp
18	yes	yes	yes	Formalin	331	Chlorophthalmus sp
18	yes	yes	yes	Formalin	342	Chlorophthalmus sp
18	yes	yes	yes	Formalin	336	Xenolepidichthys dalgleishi
18	yes	yes	yes	Formalin	337	Xenolepidichthys dalgleishi
18	yes	yes	yes	Formalin	338	Xenolepidichthys dalgleishi
18	yes	yes	yes	Formalin	349	Paratriacanthus retrospinus
18	yes	yes	yes	Formalin	350	Paratriacanthus retrospinus
18	yes	yes	yes	Formalin	373	Polyipnus indicus
18	yes	yes	yes	Formalin	354	Symphurus ocellus
18	yes	yes	yes	Formalin	355	Symphurus ocellus
18	yes	yes	yes	Formalin	352	Lepidotrigla '2 dark blotches'
18	yes	yes	yes	Formalin	353	Lepidotrigla '2 dark blotches'
18	yes	yes	yes	Formalin	357	Synogrops japonicus
18	yes	yes	yes	Formalin	358	Synogrops japonicus
18	yes	yes	yes	Formalin	324	Neopinnula orientalis
18	yes	yes	yes	Formalin	325	Neopinnula orientalis

Trawl station	DNA	Specimen Kept	Photo	Formalin/Frozen	ACEP #	Species
18	yes	yes	yes	Formalin	326	Coloconger sp
18	yes	yes	yes	Formalin	339	Halleutaea sp
18	yes	yes	yes	Formalin	340	Halleutaea sp
18	yes	yes	yes	Formalin	329	Halocephalus laevis
18	yes	yes	yes	Formalin	351	Chaunax sp
18	yes	yes	yes	Formalin	365	Gonorynchus gonorhynchus
18	yes	yes	yes	Formalin	356	Unidentified
18	yes	yes	yes	Formalin	363	Bathyclupea sp
18	yes	yes	yes	Formalin	364	Bathyclupea sp
18	yes	yes	yes	Formalin	369	Hymenocephalus sp
18	yes	no	yes	Formalin	370	Hymenocephalus sp
18	yes	yes	yes	Formalin	374	Neoscopelus macrolepidotus
18	yes	yes	yes	Formalin	375	Neoscopelus macrolepidotus
18	yes	yes	yes	Formalin	366	Zenion sp
18	yes	yes	yes	Formalin	371	Macrorhamphosodes uradoi
18	yes	yes	yes	Formalin	345	Etmopterus sentosus
18	yes	yes	yes	Formalin	346	Etmopterus sentosus
18	yes	yes	yes	Formalin	323	Taractichthys steindachneri
18	yes	yes	yes	Formalin	341	Taractichthys steindachneri
18	yes	yes	yes	Formalin	377	Centrophorus molluccensis
18	yes	yes	yes	Formalin	378	Centrophorus molluccensis
18	yes	yes	yes	Formalin	382	Centrophorus molluccensis
18	yes	yes	yes	Formalin	383	Centrophorus molluccensis
18	yes	yes	yes	Formalin	381	Centrophorus molluccensis
18	yes	yes	yes	Formalin	384	Pteraclis cf velifera
20	yes	yes	yes	Formalin	387	Carangoides Caeruleopinnatus
20	yes	yes	yes	Formalin	388	Carangoides Caeruleopinnatus
20	yes	yes	yes	Formalin	389	Sphyræna forsteri
20	yes	yes	yes	Formalin	390	Nemipterus japonicus
20	yes	yes	yes	Formalin	391	Nemipterus japonicus
20	yes	yes	yes	Formalin	393	Argyrops filamentosus
20	yes	yes	yes	Formalin	392	Tetrasomus concatenatus
20	yes	yes	yes	Formalin	395	Gazza minuta
20	yes	yes	yes	Formalin	394	Upeneus sp.
20	yes	yes	yes	Formalin	385	Squatina africana
20	yes	yes	yes	Formalin	386	Squatina africana
21	yes	yes	yes	Formalin	423	Neobythites sp
21	yes	yes	yes	Formalin	421	Hoplostethus atlanticus
21	yes	yes	yes	Formalin	422	Hoplostethus atlanticus
21	yes	yes	yes	Formalin	431	Synchirops monacanthus
21	yes	yes	yes	Formalin	424	Neobythites cf somalensis
21	yes	yes	yes	Formalin	425	Neobythites cf somalensis
21	yes	yes	yes	Formalin	426	Polysteganus coeruleopunctatus
21	yes	yes	yes	Formalin	427	Citharoides macrolepis
21	yes	yes	yes	Formalin	428	Citharoides macrolepis
21	yes	yes	yes	Formalin	417	Champsodon capensis
21	yes	yes	yes	Formalin	418	Champsodon capensis
21	yes	yes	yes	Formalin	419	Zenion sp
21	yes	yes	yes	Formalin	420	Zenion sp
21	yes	yes	yes	Formalin	409	Rexea promethoides
21	yes	yes	yes	Formalin	410	Rexea promethoides
21	yes	yes	yes	Formalin	435	Apogon sp
21	yes	yes	yes	Formalin	436	Apogon sp
21	yes	yes	yes	Formalin	411	Triglidae sp
21	yes	yes	yes	Formalin	429	Carangoides Caeruleopunctatus
21	yes	yes	yes	Formalin	430	Carangoides Caeruleopunctatus
21	yes	yes	yes	Formalin	399	Satrychthyes adeni
21	yes	yes	yes	Formalin	400	Satrychthyes adeni
21	yes	yes	yes	Formalin	401	Chaunax sp
21	yes	yes	yes	Formalin	402	Chaunax sp
21	yes	yes	yes	Formalin	407	Chlorophthalmus punctatus
21	yes	yes	yes	Formalin	408	Chlorophthalmus punctatus

18	yes	yes	yes	Formalin	327	Benthodesmus elongatus	21	yes	yes	yes	Formalin	432	Coloconger sp
18	yes	yes	yes	Formalin	328	Benthodesmus elongatus	21	yes	yes	yes	Formalin	433	Coloconger sp
18	yes	yes	yes	Formalin	359	Brama orcini	21	yes	yes	yes	Formalin	405	Polymixia berndti
18	yes	yes	yes	Formalin	360	Brama orcini	21	yes	yes	yes	Formalin	406	Polymixia berndti
18	yes	yes	yes	Formalin	376	Gymnoscopelus sp	21	yes	yes	yes	Formalin	396	Owstonia weberi
18	yes	yes	yes	Formalin	367	? Polymetne ?	21	yes	yes	yes	Formalin	397	Owstonia weberi
18	yes	yes	yes	Formalin	368	? Polymetne ?	21	yes	yes	yes	Formalin	398	Owstonia weberi
18	yes	yes	yes	Formalin	362	Cubiceps cubiceps	21	yes	yes	yes	Formalin	413	Lepidotrigla sp

Trawl station	DNA	Specimen Kept	Photo	Fomalin/Frozen	ACEP #	Species
21	yes	yes	yes	Fomalin	414	Lepidotrigla sp
21	yes	yes	yes	Fomalin	403	Trichiurus lepturus
21	yes	yes	yes	Fomalin	404	Trichiurus lepturus
21	yes	yes	yes	Fomalin	415	Poecilopsetta zanzibareni
21	yes	yes	yes	Fomalin	416	Poecilopsetta zanzibareni
21	yes	yes	yes	Fomalin	412	Synagrops japonicus
21	yes	yes	yes	Fomalin	434	Holohalaelurus sp
22	yes	yes	yes	Fomalin	496	Lutjanus bohar
22	yes	yes	yes	Fomalin	476	Apnion virescens
22	yes	yes	yes	Fomalin	475	Carangoides Caeruleopinnatus
22	yes	yes	yes	Fomalin	495	Carangoides Caeruleopinnatus
22	yes	yes	yes	Fomalin	466	Lutjanus gibbus
22	yes	yes	yes	Fomalin	467	Lutjanus gibbus
22	yes	yes	yes	Fomalin	460	Paracaesio xanthurus
22	yes	yes	yes	Fomalin	461	Paracaesio xanthurus
22	yes	yes	yes	Fomalin	437	Anthias pulcherrimus
22	yes	yes	yes	Fomalin	449	Sargocentron microstoma
22	yes	yes	yes	Fomalin	450	Sargocentron microstoma
22	yes	yes	yes	Fomalin	448	Sargocentron ittodai
22	yes	yes	yes	Fomalin	449	Sargocentron ittodai
22	yes	yes	yes	Fomalin	479	Lutjanus bouton
22	yes	yes	yes	Fomalin	480	Lutjanus bouton
22	yes	yes	yes	Fomalin	481	Lutjanus lutjanus
22	yes	yes	yes	Fomalin	482	Lutjanus lutjanus
22	yes	yes	yes	Fomalin	487	Heniochus acuminatus
22	yes	yes	yes	Fomalin	488	Heniochus acuminatus
22	yes	yes	yes	Fomalin	489	Heniochus acuminatus
22	yes	yes	yes	Fomalin	440	Upeneus vittatus
22	yes	yes	yes	Fomalin	441	Upeneus vittatus
22	yes	yes	yes	Fomalin	446	Pristipomoides filamentosus
22	yes	yes	yes	Fomalin	447	Pristipomoides filamentosus
22	yes	yes	yes	Fomalin	483	Lutjanus kasmira
22	yes	yes	yes	Fomalin	484	Lutjanus kasmira
22	yes	yes	yes	Fomalin	442	Lethrinus elongatus
22	yes	yes	yes	Fomalin	464	Lethrinus rubrioperculatus
22	yes	yes	yes	Fomalin	465	Lethrinus rubrioperculatus
22	yes	yes	yes	Fomalin	443	Lethrinus rubrioperculatus
22	yes	yes	yes	Fomalin	444	Caesio caeriolflavia
22	yes	yes	yes	Fomalin	445	Caesio caeriolflavia
22	yes	yes	yes	Fomalin	485	Acanthurus mala
22	yes	yes	yes	Fomalin	486	Acanthurus mala
22	yes	yes	yes	Fomalin	492	Dasyatis kuhlii
22	yes	yes	yes	Fomalin	493	Dasyatis kuhlii
22	yes	yes	yes	Fomalin	490	Rexea promethoides
22	yes	yes	yes	Fomalin	491	Rexea promethoides
22	yes	yes	yes	Fomalin	457	Gymnocranius grandoculis
22	yes	yes	yes	Fomalin	458	Gymnocranius grandoculis
22	yes	yes	yes	Fomalin	459	Tetrasomus concatenatus
22	yes	yes	yes	Fomalin	477	Parupeneus 'roundhead yellowstripe'
22	yes	yes	yes	Fomalin	478	Parupeneus 'roundhead yellowstripe'
22	yes	yes	yes	Fomalin	438	Naso hexacanthus
22	yes	yes	yes	Fomalin	439	Naso hexacanthus
22	yes	yes	yes	Fomalin	472	Chlorophthalmus agassizi
22	yes	yes	yes	Fomalin	471	Citharichthys sp
22	yes	yes	yes	Fomalin	470	Pseudorhombus elevatus
22	yes	yes	yes	Fomalin	?	Pseudorhombus elevatus
22	yes	yes	yes	Fomalin	462	Pterocaesio pisang
22	yes	yes	yes	Fomalin	463	Pterocaesio pisang
22	yes	yes	yes	Fomalin	468	Satyrichthys adeni
22	yes	yes	yes	Fomalin	469	Satyrichthys adeni
22	yes	yes	yes	Fomalin	451	Priacanthus hamrur

Trawl station	DNA	Specimen Kept	Photo	Fomalin/Frozen	ACEP #	Species
24	yes	yes	yes	Fomalin	499	Chlorophthalmus agassizi
24	yes	yes	yes	Fomalin	500	Chlorophthalmus agassizi
24	yes	yes	yes	Fomalin	551	Leiognathus equulus
24	yes	yes	yes	Fomalin	552	Leiognathus equulus
24	yes	yes	yes	Fomalin	555	Sphyræna flavicauda
24	yes	yes	yes	Fomalin	556	Sphyræna flavicauda
24	yes	yes	yes	Fomalin	553	Apogon apogonoides
24	yes	yes	yes	Fomalin	554	Apogon apogonoides
24	yes	yes	yes	Fomalin	557	Trichiurus lepturus
24	yes	yes	yes	Fomalin	558	Trichiurus lepturus
24	yes	yes	yes	Fomalin	560	Champsodon capensis
24	yes	yes	yes	Fomalin	561	Uranoscopus archionema
24	yes	yes	yes	Fomalin	562	Neobythites sp
24	yes	yes	yes	Fomalin	563	Pilotrema warreni
24	yes	yes	yes	Fomalin	564	Pilotrema warreni
24	yes	yes	yes	Fomalin	578	Pilotrema warreni
24	yes	yes	yes	Fomalin	580	Squatina africana
24	yes	yes	yes	Fomalin	581	Squatina africana
24	yes	yes	yes	Fomalin	579	Aphareus furcatus
24	yes	yes	yes	Fomalin	572	Fistularia petimba
24	yes	yes	yes	Fomalin	573	Fistularia petimba
24	yes	yes	yes	Fomalin	559	Naso hexacanthus
24	yes	yes	yes	Fomalin	567	Upeneus vittatus
24	yes	yes	yes	Fomalin	568	Upeneus vittatus
24	yes	yes	yes	Fomalin	565	Histioporus typus
24	yes	yes	yes	Fomalin	566	Histioporus typus
24	yes	yes	yes	Fomalin	569	Saurida undosquamis
24	yes	yes	yes	Fomalin	570	Chaunax sp
24	yes	yes	yes	Fomalin	571	Chaunax sp
24	yes	yes	yes	Fomalin	576	Decapterus tabl
24	yes	yes	yes	Fomalin	577	Decapterus tabl
24	yes	yes	yes	Fomalin	574	Johnius dussimieri
24	yes	yes	yes	Fomalin	575	Johnius dussimieri
24	yes	yes	yes	Fomalin	582	Mustelus monazo
25	yes	yes	yes	Fomalin	594	Chaunax sp
25	yes	yes	yes	Fomalin	599	Chaunax sp
25	yes	yes	yes	Fomalin	596	Rexea promethoides
25	yes	yes	yes	Fomalin	601	Rexea promethoides
25	yes	yes	yes	Fomalin	595	Decapterus kurroides
25	yes	yes	yes	Fomalin	597	Decapterus kurroides
25	yes	yes	yes	Fomalin	598	Upeneus vittatus
25	yes	yes	yes	Fomalin	600	Upeneus vittatus
25	yes	yes	yes	Fomalin	593	
25	yes	yes	yes	Fomalin	590	
25	yes	yes	yes	Fomalin	606	Satyrichthys adeni
25	yes	yes	yes	Fomalin	583	Priacanthus hamrur
25	yes	yes	yes	Fomalin	584	Priacanthus hamrur
25	yes	yes	yes	Fomalin	585	Sphyaena acutipinnis
25	yes	yes	yes	Fomalin	586	Sphyræna acutipinnis
25	yes	yes	yes	Fomalin	587	Argentina euchus
25	yes	yes	yes	Fomalin	591	Apogon apogonoides
25	yes	yes	yes	Fomalin	592	Apogon apogonoides
25	yes	yes	yes	Fomalin	588	Citharoides macrolepis
25	yes	yes	yes	Fomalin	589	Citharoides macrolepis
25	yes	yes	yes	Fomalin	602	Squalus megalops
25	yes	yes	yes	Fomalin	607	Squalus megalops
25	yes	yes	yes	Fomalin	603	Polysteganus coeruleopunctatus
25	yes	yes	yes	Fomalin	604	Polysteganus coeruleopunctatus
25	yes	yes	yes	Fomalin	605	Polysteganus coeruleopunctatus
26	yes	yes	yes	Fomalin	620	Coelorinchus braueri
26	yes	yes	yes	Fomalin	621	Coelorinchus braueri

22	yes	yes	yes	Formalin	453	Lutjanus fulviflamma	26	yes	yes	yes	Formalin	618	Chlorophthalmus agassizi
22	yes	yes	yes	Formalin	454	Lutjanus fulviflamma	26	yes	yes	yes	Formalin	619	Chlorophthalmus agassizi
22	yes	yes	yes	Formalin	473	Sargocentron melanopsis	26	yes	yes	yes	Formalin	614	Neopinnula orientalis
22	yes	yes	yes	Formalin	474	Sargocentron melanopsis	26	yes	yes	yes	Formalin	615	Neopinnula orientalis
22	yes	yes	yes	Formalin	452	Myripristis murdjan	26	yes	yes	yes	Formalin	611	Saurida gracilis
22	yes	yes	yes	Formalin	494	Naso tuberosus	26	yes	yes	yes	Formalin	612	Saurida gracilis
22	yes	yes	yes	Formalin	455	Apogon apogonoides	26	yes	yes	yes	Formalin	610	Gonorynchus gonorhynchus
22	yes	yes	yes	Formalin	456	Apogon apogonoides	26	yes	yes	yes	Formalin	613	Gonorynchus gonorhynchus
24	yes	yes	yes	Formalin	497	Rexea promethoides	26	yes	yes	yes	Formalin	616	Johnius amblycephalus
24	yes	yes	yes	Formalin	498	Rexea promethoides	26	yes	yes	yes	Formalin	617	Johnius amblycephalus

Trawl station	DNA	Specimen Kept	Photo	Formalin/Frozen	ACEP #	Species
26	yes	yes	yes	Formalin	608	Squalus megalops
26	yes	yes	yes	Formalin	609	Squalus megalops
26	yes	yes	yes	Formalin	631	Etmopterus sentosus
26	yes	yes	yes	Formalin	634	Etmopterus sentosus
26	yes	yes	yes	Formalin	624	Epinephelus septemfasciatus
26	yes	yes	yes	Formalin	625	Gnathopis capensis
26	yes	yes	yes	Formalin	626	Gnathopis capensis
26	yes	yes	yes	Formalin	630	Congridae sp
26	yes	yes	yes	Formalin	627	Nettastoma parviceps
26	yes	yes	yes	Formalin	628	Nettastoma parviceps
26	yes	yes	yes	Formalin	638	Lestrolepis intermedia
26	yes	yes	yes	Formalin	636	Serranus sp
26	yes	yes	yes	Formalin	637	Serranus sp
26	yes	yes	yes	Formalin	635	Haplostethus atlanticus
26	yes	yes	yes	Formalin	622	Tylerius spinosissimus
26	yes	yes	yes	Formalin	623	Tylerius spinosissimus
26	yes	yes	yes	Formalin	640	Polyipnus indicus
26	yes	yes	yes	Formalin	641	Polyipnus indicus
26	yes	yes	yes	Formalin	632	Lepidotrigla sp 'yellow dorsal spots'
26	yes	yes	yes	Formalin	633	Lepidotrigla sp 'yellow dorsal spots'
26	yes	yes	yes	Formalin	629	Uroconger lepturus
26	yes	yes	yes	Formalin	639	Uroconger lepturus
27	no	yes	yes	Formalin		Malthopsis sp
27	yes	yes	yes	Formalin	643	Zenion leptolepis
27	yes	yes	yes	Formalin	644	Zenion leptolepis
27	yes	yes	yes	Formalin	661	Ectreposebastes sp
27	yes	yes	yes	Formalin	647	Histioporus typus
27	yes	yes	yes	Formalin	648	Histioporus typus
27	yes	yes	yes	Formalin	657	Neobythites somalensis
27	yes	yes	yes	Formalin	650	Grammatonotus cf macrophamus
27	yes	yes	yes	Formalin	651	Peristedion weberi
27	yes	yes	yes	Formalin	652	Peristedion weberi
27	yes	yes	yes	Formalin	645	Lagocephalus guentheri
27	yes	yes	yes	Formalin	655	Minous sp
27	yes	yes	yes	Formalin	656	Minous sp
27	yes	yes	yes	Formalin	660	Citharoides macrolepis
27	yes	yes	yes	Formalin	646	Branchiostegus doliatus
27	yes	yes	yes	Formalin	653	Lepidotrigla multispinosus
27	yes	yes	yes	Formalin	654	Lepidotrigla multispinosus
27	yes	yes	yes	Formalin	658	Physiculus natalensis
27	yes	yes	yes	Formalin	659	Physiculus natalensis
27	yes	yes	yes	Formalin	662	Ateleopus natalensis
27	yes	yes	yes	Formalin	663	Ateleopus natalensis
27	yes	yes	yes	Formalin	642	Bregmaceros macdellandii
28	no	yes	yes	Formalin		Dactyloptena peterseni
28	no	yes	yes	Formalin		Gempylus cf serpens
28	no	yes	yes	Formalin		Pervagor janthinosoma
28	no	yes	yes	Formalin		Pseudalutarius nasicornis
29	yes	yes	yes	Formalin	672	Laemonema cf globiceps
29	yes	yes	yes	Formalin	673	Laemonema cf globiceps
29	yes	yes	yes	Formalin	671	Johnius dussumieri
29	yes	yes	yes	Formalin	670	Johnius dussumieri
29	yes	yes	yes	Formalin	666	Parapriacanthus ransonneti
29	yes	yes	yes	Formalin	668	Parapriacanthus ransonneti
29	yes	yes	yes	Formalin	667	Serranus cabrilla
29	yes	yes	yes	Formalin	669	Serranus cabrilla
29	yes	yes	yes	Formalin	664	Rechias cf wallacei
29	yes	yes	yes	Formalin	665	Rechias cf wallacei
29	yes	yes	yes	Formalin	674	Uranoscopus archionema
29	yes	yes	yes	Formalin	675	Uranoscopus archionema

Trawl station	DNA	Specimen Kept	Photo	Formalin/Frozen	ACEP #	Species
32	yes	yes	yes	Formalin	690	Carangoides malabaricus
32	yes	yes	yes	Formalin	691	Carangoides malabaricus
32	yes	yes	yes	Formalin	692	Synodus hoshinonus
32	yes	yes	yes	Formalin	693	Synodus hoshinonus
32	yes	yes	yes	Formalin	696	Saurida tumbil
32	yes	yes	yes	Formalin	697	Saurida tumbil
32	yes	yes	yes	Formalin	695	Pseudalutarius nasicornis
32	yes	yes	yes	Formalin	694	Lagocephalus scleratus
32	yes	yes	yes	Frozen	687	Scoberomorus commerson
32	yes	yes	yes	Frozen	688	Scoberomorus commerson
32	yes	yes	yes	Frozen	689	Scoberomorus commerson
33	yes	yes	yes	Formalin	698	Sphyræna chrysotaenia
33	yes	yes	yes	Formalin	699	Tentoriceps cristatus
36	yes	yes	yes	Frozen	701	Gnathanodon speciosus
36	yes	yes	yes	Frozen	702	Gnathanodon speciosus
36	yes	yes	yes	Formalin	703	Scomberoides commersonianus
36	yes	yes	yes	Formalin	700	Scomberomorus commerson
36	yes	yes	yes	Formalin	704	Psetodes erumei
37	yes	yes	yes	Formalin	707	Nemipterus bipunctatus
37	yes	yes	yes	Formalin	708	Nemipterus bipunctatus
37	yes	yes	yes	Formalin	709	Carangoides Caeruleopunctatus
37	yes	yes	yes	Formalin	710	Drepane longimanus
37	yes	yes	yes	Formalin	705	Abalistes stellatus
37	yes	yes	yes	Formalin	706	Abalistes stellatus
37	yes	yes	yes	Formalin	711	Leiognathus fasciatus
37	yes	yes	yes	Formalin	712	Leiognathus fasciatus
37	yes	yes	yes	Formalin	713	Leiognathus leuciscus
37	yes	yes	yes	Formalin	714	Stolephorus indicus
37	yes	yes	yes	Formalin	715	Stolephorus indicus
37	yes	yes	yes	Formalin	720	Alepes kleinii
37	yes	yes	yes	Formalin	721	Alepes kleinii
37	yes	yes	yes	Formalin	718	Carangoides armatus
37	yes	yes	yes	Formalin	719	Carangoides armatus
37	yes	yes	yes	Formalin	716	Decapterus russelli
37	yes	yes	yes	Formalin	717	Decapterus russelli
38	yes	yes	yes	Formalin	728	Ostracion cubiceps
38	yes	yes	yes	Formalin	744	Diagramma centurio
38	yes	yes	yes	Formalin	745	Diagramma centurio
38	yes	yes	yes	Formalin	741	Scomberomorus commerson
38	yes	yes	yes	Formalin	743	Scoberomorus commerson
38	yes	yes	yes	Formalin	742	Alectis ciliaris
38	yes	yes	yes	Formalin	726	Scarus ghobban
38	yes	yes	yes	Formalin	729	Upeneus vittatus
38	yes	yes	yes	Formalin	730	Upeneus vittatus
38	yes	yes	yes	Formalin	739	Argyrops spinifer
38	yes	yes	yes	Formalin	740	Argyrops spinifer
38	yes	yes	yes	Formalin	732	Gymnocranius griseus
38	yes	yes	yes	Formalin	727	Longimans drepane
38	yes	yes	yes	Formalin	733	Canthigaster janthinoptera
38	yes	yes	yes	Formalin	734	Canthigaster janthinoptera
38	yes	yes	yes	Formalin	722	Carangoides caeruleopunctatus
38	yes	yes	yes	Formalin	723	Carangoides caeruleopunctatus
38	yes	yes	yes	Formalin	747	Epinephelus coiedes
38	yes	yes	yes	Formalin	748	Epinephelus coiedes
38	yes	yes	yes	Formalin	735	Geres filamentosus
38	yes	yes	yes	Formalin	736	Geres filamentosus
38	yes	yes	yes	Formalin	724	Tripteron orbis
38	yes	yes	yes	Formalin	725	Tripteron orbis
38	yes	yes	yes	Formalin	737	Carangoides
38	yes	yes	yes	Formalin	738	Carangoides

29	yes	yes	yes	Formalin	676	<i>Diretmoides parini</i>	38	yes	yes	yes	Formalin	731	<i>Lethrinus lentjan</i>
29	yes	yes	yes	Formalin	677	Macrouridae sp	38	yes	yes	yes	Formalin	746	
31	yes	yes	yes	Formalin	678	<i>Carangoides Caeruleopunctatus</i>	39	yes	yes	yes	Formalin	743	<i>Ostracion cubiceps</i>
31	yes	yes	yes	Formalin	679	<i>Carangoides Caeruleopunctatus</i>	39	yes	yes	yes	Formalin	751	<i>Platax</i>
31	yes	yes	yes	Formalin	680	<i>Carangoides Caeruleopunctatus</i>	39	yes	yes	yes	Formalin	750	<i>Sphyraena forsteri</i>
31	yes	yes	yes	Formalin	681	<i>Lactoria cornuta</i>	39	yes	yes	yes	Formalin	749	<i>Apogon aureus</i>
31	yes	yes	yes	Formalin	682	<i>Lactoria cornuta</i>	40	no	yes	yes	Formalin		<i>Trachyramphus sp</i>
31	yes	yes	yes	Formalin	683	<i>Nemipterus japonicus</i>	40	yes	yes	yes	Formalin	752	<i>Terapon theraps</i>
31	yes	yes	yes	Formalin	684	<i>Nemipterus japonicus</i>	40	yes	yes	yes	Formalin	753	<i>Terapon theraps</i>
31	yes	yes	yes	Formalin	685	<i>Loxodon macrorhinus</i>	40	yes	yes	yes	Frozen	754	<i>Lutjanus sanguineus</i>
31	yes	yes	yes	Formalin	686	<i>Loxodon macrorhinus</i>	40	yes	yes	yes	Formalin	755	<i>Himantura gerrardi</i>

Trawl station	DNA	Specimen Kept	Photo	Fomalin/Frozen	ACEP #	Species
42	yes	yes	yes	Fomalin	756	
42	yes	yes	yes	Fomalin	757	Mobula sp
42	yes	yes	yes	Fomalin	758	Dasyatis
43	no	yes	yes	Fomalin		Decapterus macrosoma
43	no	yes	yes	Fomalin		Centrolophus cf niger
43	no	yes	yes	Fomalin		Polyipnus polli
43	no	yes	yes	Fomalin		Polyipnus polli
43	no	yes	yes	Fomalin		Polyipnus polli
43	no	yes	yes	Fomalin		Unidentified
43	no	yes	yes	Fomalin		Glass eel
43	no	yes	yes	Fomalin		Glass eel
44	yes	yes	yes	Fomalin	765	Neobythites cf somalensis
44	yes	yes	yes	Fomalin	759	Pristipomoides multidentis
44	yes	yes	yes	Fomalin	760	Pristipomoides multidentis
44	yes	yes	yes	Fomalin	766	Apogon 'black spot'
44	yes	yes	yes	Fomalin	767	Apogon 'black spot'
44	yes	yes	yes	Frozen	763	Squalus megalops
44	yes	yes	yes	Frozen	764	Squalus megalops
44	yes	yes	yes	Fomalin	768	Pseudalutarius nasicornis
44	yes	yes	yes	Fomalin	769	Pseudalutarius nasicornis
44	yes	yes	yes	Fomalin	761	Sphyaena acutipinnis
44	yes	yes	yes	Fomalin	762	Sphyaena acutipinnis
46	no	yes	yes	Fomalin	-	Eurypegasus draconis
46	no	yes	yes	Fomalin	-	Paramonacanthus sp
49	yes	yes	yes	Fomalin	780	Etelis coruscans
49	yes	yes	yes	Fomalin	781	Etelis coruscans
49	yes	yes	yes	Fomalin	782	Epinephelus magniscuttis
49	yes	yes	yes	Fomalin	776	Scorpaenus sp
49	yes	yes	yes	Fomalin	777	Scorpaenus sp
49		yes	yes	Fomalin	-	Pelagocephalus marki
49	yes	yes	yes	Fomalin	770	Plectranthias sp
49	yes	yes	yes	Fomalin	771	Plectranthias sp
49	yes	yes	yes	Fomalin	773	Grammatonotus sp 'plintail'
49	yes	yes	yes	Fomalin	774	Grammatonotus sp 'plintail'
49	yes	yes	yes	Fomalin	775	Etelis carbunculus
49	yes	yes	yes	Fomalin	778	Pristipomoides argyrogrammicus
49	yes	yes	yes	Fomalin	779	Pristipomoides argyrogrammicus
49	yes	yes	yes	Fomalin	772	Fistularia petimba
49	yes	yes	yes	Fomalin	783	Pristipomoides filamentosus
49	yes	yes	yes	Fomalin	784	Pristipomoides filamentosus
49	no	yes	yes	Fomalin	-	Lutjanus sp
49	no	yes	yes	Fomalin	-	Paratrachichthys sp
49	no	yes	yes	Fomalin		Rexea promethoides
50	no	yes	yes	Frozen	-	Sphyaena putnamae
50	yes	yes	yes	Fomalin	785	Dipterygonotus balteatus
50	yes	yes	yes	Fomalin	786	Dipterygonotus balteatus
50	no	yes	yes	Fomalin	-	Dipterygonotus balteatus
50	no	yes	yes	Fomalin	-	Dipterygonotus balteatus
50	yes	yes	yes	Fomalin	787	Unidentified a
50	yes	yes	yes	Fomalin	788	Unidentified a
50	no	yes	yes	Fomalin	-	Bregmaceros sp.
50	no	yes	yes	Fomalin	-	Astronesthidae
50	no	yes	yes	Fomalin	-	unidentified b
50	no	yes	yes	Fomalin	-	Unidentified c
56	yes	yes	yes	Fomalin	789	Oxyurichthys papuensis
56	yes	yes	yes	Fomalin	790	Apogonidae sp
57	yes	yes	yes	Fomalin	791	Epinephelus chlorostigma
57	yes	yes	yes	Fomalin	794	Dactylopterus orientalis
57	yes	yes	yes	Fomalin	792	Fistularia petimba
57	yes	yes	yes	Fomalin	793	Fistularia commersonii
57	yes	yes	yes	Fomalin	795	Psettodes erumei

Trawl station	DNA	Specimen Kept	Photo	Fomalin/Frozen	ACEP #	Species
60	no	yes	yes	Fomalin	-	Polyipnus indicus
60	yes	yes	yes	Fomalin	799	Neobythites cf somalensis
60	yes	yes	yes	Fomalin	800	Xenolepidichthys dalgleishi
60	yes	yes	yes	Fomalin	801	Torpedo nobiliana
61	yes	yes	yes	Frozen	802	Loxodon macrorhinus
61	yes	yes	yes	Frozen	803	Carangoides cf equla
61	yes	yes	yes	Frozen	804	Carangoides fulviguttatus
61	yes	yes	yes	Frozen	805	Carangoides fulviguttatus
62	yes	yes	yes	Frozen	806	Loxodon macrorhinus
62	yes	yes	yes	Frozen	807	Caranx ignobilis
62	yes	yes	yes	Frozen	808	Caranx ignobilis
62	yes	yes	yes	Frozen	809	Sphyaena barracuda
62	yes	yes	yes	Frozen	810	Sphyaena barracuda
62	yes	yes	yes	Frozen	811	Arothron stellatus
62	yes	yes	yes	Fomalin	812	Upeneus bensasi
62	yes	yes	yes	Fomalin	813	Upeneus bensasi
62	yes	yes	yes	Fomalin	816	Sorsogona prionata
62	yes	yes	yes	Fomalin	814	Lagocephalus cf scleratus
62	yes	yes	yes	Fomalin	815	Lagocephalus cf scleratus
64	yes	yes	yes	Fomalin	817	Laeops nigromaculatus
64	yes	yes	yes	Fomalin	818	Etmopterus sentosus
64	yes	yes	yes	Fomalin	819	Etmopterus sentosus
64	yes	yes	yes	Fomalin	820	Etmopterus sentosus
64	no	yes	yes	Fomalin	-	Peristiidae sp
64	yes	yes	yes	Frozen	823	Centrophorus molluccensis
64	yes	yes	yes	Fomalin	822	Unidentified
65	yes	yes	yes	Frozen	824	Dalatis licha
67	yes	yes	yes	Fomalin	827	Selar crumenophthalmus
67	yes	yes	yes	Fomalin	828	Selar crumenophthalmus
67	yes	yes	yes	Fomalin	829	Sphyaena pinguis
67	yes	yes	yes	Fomalin	830	Unid little stripey
67	yes	yes	yes	Fomalin	831	Apistus carinatus
67	yes	yes	yes	Fomalin	832	Apistus carinatus
67	yes	yes	yes	Fomalin	833	Rhecias wallace
68	yes	yes	yes	Fomalin	825	Chirocentrus dorab
68	yes	yes	yes	Fomalin	826	Chirocentrus dorab
73	yes	yes	yes	Fomalin	834	Synchirops marmoratus
73	no	yes	yes	Fomalin	-	Halaelurus sp
74	yes	yes	yes	Fomalin	840	Chaunax sp 2
74	yes	yes	yes	Fomalin	838	Setarches guentheri
74	yes	yes	yes	Fomalin	839	Setarches guentheri
74	yes	yes	yes	Fomalin	837	Unidentified Red pect blotch
74	yes	yes	yes	Fomalin	836	Trigididae sp
74	yes	yes	yes	Fomalin	842	Centrophorus molluccensis
74	yes	yes	yes	Fomalin	841	Deania quadrispinosum
74	yes	yes	yes	Fomalin	843	Symbolophoris evermanni
74	yes	yes	yes	Fomalin	844	Physiculus natalensis
74	yes	yes	yes	Fomalin	845	Macrouridae sp
74	yes	yes	yes	Fomalin	846	Macrorhamphosus sp
74	yes	yes	yes	Fomalin	847	Myctophidae red fins
75	yes	yes	yes	Fomalin	848	Unidentified Big red
75	yes	yes	yes	Fomalin	850	Holocentridae sp
75	yes	yes	yes	Fomalin	851	Bathygadus sp
75	no	yes	yes	Fomalin	-	Unid spiny fish
75	no	yes	yes	Fomalin	-	Unid red fish
75	yes	yes	yes	Fomalin	852	Unid. Big eyes
75	no	yes	yes	Fomalin	-	Unid. Rat tail
75	yes	yes	yes	Fomalin	849	Unid. Spine nose
75	yes	yes	yes	Fomalin	853	Dalatis licha
75	yes	yes	yes	Fomalin	854	Unid red fin big mouth
75	yes	yes	yes	Fomalin	855	Tydemania navigatoris

60	no	yes	yes	Formalin	-	Astronesthes martensii	75	yes	yes	yes	Formalin	856	Hydrolagus africanus
60	no	yes	yes	Formalin	-	Astronesthes martensii	75	yes	yes	yes	Formalin	857	Coloconger scholesi
60	no	yes	yes	Formalin	-	Diaphus sp	75	yes	yes	yes	Formalin	858	Coloconger scholesi
60	yes	yes	yes	Formalin	797	Hypsophum zeinhardtii	76	yes	yes	yes	Formalin	859	Etmopterus lucifer
60	yes	yes	yes	Formalin	798	Hypsophum hanseni	76	yes	yes	yes	Formalin	860	Etmopterus lucifer
60	yes	yes	yes	Formalin	796	Synagrops japonicus	76	yes	yes	yes	Formalin	864	Cubiceps sp
60	no	yes	yes	Formalin	-	Cynaglossus lida	76	yes	yes	yes	Formalin	874	Bathygadus sp
60	no	yes	yes	Formalin	-	Leptolepis sp	76	yes	yes	yes	Formalin	868	Satyrichthyes sp
60	no	yes	yes	Formalin	-	Polyipnus indicus	76	yes	yes	yes	Formalin	876	Nansenia macrolepis

Trawl station	DNA	Specimen Kept	Photo	Formalin/Frozen	ACEP #	Species
76	yes	yes	yes	Formalin	871	Malacocephalus sp rattail
76	yes	yes	yes	Formalin	867	Cubiceps whiteleggi
76	yes	yes	yes	Formalin	866	Macrouridae sp
76	yes	yes	yes	Formalin	872	Neoscopis macrolepidotus
76	yes	yes	yes	Formalin	865	Lestrolepis intermedia
76	yes	yes	yes	Formalin	870	Trichyuridae sp
76	yes	yes	yes	Formalin	875	Oreosoma cf atlanticum
76	yes	yes	yes	Formalin	873	Argyropelecus sp
76	yes	yes	yes	Formalin	869	Argyropelecus/Polyipnus sp
76	yes	yes	yes	Formalin	877	Argyropelecus/Polyipnus sp
76	yes	yes	yes	Formalin	878	Gonostoma sp
76	yes	yes	yes	Formalin	880	Bathyclupea sp
76	yes	yes	yes	Formalin	879	Beryx splendens
76	yes	yes	yes	Formalin	881	Diaphus watasei
77	yes	yes	yes	Formalin	861	Scarus sp blue chin
77	yes	yes	yes	Formalin	862	Scarus sp yellow chin
77	yes	yes	yes	Formalin	863	Naso cf tuberosus
Aborted	yes	yes	yes	Frozen	882	Emmelichthys sp
Aborted	yes	yes	yes	Frozen	883	Emmelichthys sp
Aborted	yes	yes	yes	Frozen	884	Emmelichthys sp

Trawl station	DNA	Specimen Kept	Photo	Formalin/Frozen	ACEP #	Species
Aborted	yes	yes	yes	Formalin	885	Antigonia sp
Aborted	no	yes	yes	Frozen	-	Emmelichthys sp
79	yes	yes	yes	Frozen	886	Sphyaena forsteri
79	yes	yes	yes	Frozen	887	Sphyaena forsteri
79	yes	yes	yes	Frozen	888	Sphyaena helleri
79	yes	yes	yes	Frozen	889	Sphyaena helleri
82	yes	yes	yes	Formalin	890	Luciobrotula cf bartschi
82	yes	yes	yes	Formalin	891	Acropoma sp Red
82	yes	yes	yes	Formalin	892	Acropoma sp Red
83	yes	yes	yes	Formalin	893	Owstonia sp
83	yes	yes	yes	Formalin	894	Monomitopus cf....
83	yes	yes	yes	Formalin	895	Neobythites analis
83	yes	yes	yes	Formalin	896	Parapembras sp
83	yes	yes	yes	Formalin	897	Epigonus sp
83	yes	yes	yes	Formalin	898	Callionymus sp 1
83	yes	yes	yes	Formalin	899	Callionymus sp 1
83	yes	yes	yes	Formalin	900	Callionymus sp 2
83	yes	yes	yes	Formalin	901	Unide. Eel
83	no	yes	yes	Formalin	-	Callionymus sp 3

ANNEX VII. List of species for biological analyses and conservation (B: biological, G: genetic, M:museum)

Date	Trawl Station	Species	Purpose	No.	Preserved	Photo
06.09.2009	21	Polysteganus coeruleopunctatus	B	9	N/A	
07.09.2009	24	Polysteganus coeruleopunctatus	B	9	N/A	
09.09.2009	25	Polysteganus coeruleopunctatus	B	7	N/A	
09.09.2009	25	Decapterus russelli	B	14	N/A	
20.09.2009	56	Polysteganus coeruleopunctatus	B + G	7	Ethanol	
22.09.2009	56	Sepia sp	M	1	Formalin	
22.09.2009	57	Loligo sp	M	6	Formalin	
23.09.2009	57	Mixed crabs	M	12	Formalin	Yes
23.09.2009	57	Monomia sp	M	1	Formalin	Yes
23.09.2009	57	Murex sp + cowrey	M	1,1	Formalin	Yes
24.09.2009	60	Unidentified natantia	M	6	Formalin	
24.09.2009	60	Unidentified squid (large)	M	2	Formalin	Yes
24.09.2009	60	Unidentified pansy shell	M	1	Formalin	
24.09.2009	60	Unidentified egg/jelly	M	1	Formalin	
24.09.2009	60	Unidentified squid (small)	M	2	Formalin	
24.09.2009	60	Rossia macrosoma	M	1	Formalin	
24.09.2009	60	Munida sp	M	1	Formalin	
24.09.2009	60	Sepiola rondileti	M	1	Formalin	
24.09.2009	60	Bryozoan	M	1	Formalin	
24.09.2009	60	Gorgonian	M	1	Formalin	
24.09.2009	60	Long arm ophiuroida	M	2	Formalin	Yes
24.09.2009	60	Sepia elegans	M	2	Formalin	Yes
24.09.2009	60	Murex	M	1	Formalin	
24.09.2009	64	unidentified crabs	M	3	Formalin	
24.09.2009	64	Palinurus juvenile	M	1	Ethanol	
24.09.2009	64	Penaeopsis balssi	M	8	Formalin	Yes
24.09.2009	64	Oplophorus gracilirostris	M	2	Formalin	Yes
24.09.2009	64	Plesionika longirostris	M	1	Formalin	Yes
24.09.2009	64	Heterocarpus sp	M	1	Formalin	
24.09.2009	64	Solenocera sp	M	2	Formalin	
25.09.2009	66	Loligo sp	M	5	Formalin	
25.09.2009	69	Metapenaeus monoceros	G	10	Ethanol	
25.09.2009	69	Pansy shell	M	1	Formalin	
26.09.2009	71	Loligo sp	M	6	Frozen	
26.09.2009	72	Selar crumenophthalmus	G	3	Ethanol	
26.09.2009	72	Rastrelliger kanagurta	G	3	Ethanol	
26.09.2009	72	Decapterus russelli	G	8	Ethanol	
26.09.2009	73	Isopod	M	1	Formalin	
26.09.2009	73	Gastropods/bivalves	M	~ 6	Formalin	
27.09.2009	74	Hippolytidae	M	5	Formalin	
27.09.2009	74	Heterocarpus sp	M	2	Formalin	
27.09.2009	74	Heterocarpus tricarinata	M	2	Formalin	
27.09.2009	74	Heterocarpus woodmasoni	M	2	Formalin	
27.09.2009	74	Munida sp	M	2	Formalin	
27.09.2009	74	Solenocera sp	M	3	Formalin	
27.09.2009	74	Unidentified crab	M	1	Formalin	
27.09.2009	75	Aristaeomorpha foliacea	G	8	Ethanol	
27.09.2009	76	Mixed cephalopods	M	~ 12	Frozen	
27.09.2009	76	Portunus sp	M	1	Formalin	
01.10.2009	83	Polychaete	M	1	Formalin	
01.10.2009	83	Unidentified carids	M	5	Formalin	
01.10.2009	83	Unidentified prawn	M	3	Formalin	
01.10.2009	83	Unidentified crabs	M	3	Formalin	
01.10.2009	83	Unidentified squid	M	1	Formalin	

ANNEX VIII. Soft sediment macrobenthos and associated sediment samples

Macrobenthos samples

Nansis Grab Station	Nansis CTD Station	Sample Label No.	0.1mm Sample Collected	0.5mm Sample Collected	Comment
X	X	1/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		1/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		1/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
1	No sample	1/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
2	953 (approx. area)	1/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
3	952 (approx. area)	1/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
4	No sample	1/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
5	No sample	1/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/200/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
6	966	2/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		2/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
7	967 (approx. area)	2/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
8	968 (also 965 in approx. area)	2/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY.

Nansis Grab Station	Nansis CTD Station	Sample Label No.	0.1mm Sample Collected	0.5mm Sample Collected	Comment
					Incorrect sampling protocol.
9	964	2/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
10	969 (approx. area)	2/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
11	971 (approx. area)	2/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/200/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
12	1009	3/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
13	1010	3/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
14	1011	3/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
15	1012	3/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
16	1013	3/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
17	1014	3/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
20	1034	4/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
19	1033	4/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
18	1031	4/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
21	1037	4/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.

Nansis Grab Station	Nansis CTD Station	Sample Label No.	0.1mm Sample Collected	0.5mm Sample Collected	Comment
		4/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
22	1038	4/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		4/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		4/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
23	1039	4/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		4/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		4/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
29	1049	5/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
28	1046 (approx. area)	5/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
27	1045 (approx. area)	5/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
26	1044	5/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		5/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
25	1043 (approx. area)	5/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
24	1042 (approx. area)	5/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
36	(Not working)	6/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
35	(Not working)	6/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		6/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		6/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
34	(Not working)	6/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
33	1057	6/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
32	1055 (also 1056 in approx. area)	6/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
31	1054	6/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
30	1053	6/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.

Nansis Grab Station	Nansis CTD Station	Sample Label No.	0.1mm Sample Collected	0.5mm Sample Collected	Comment
		6/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.

- Shaded cells – samples discarded or only for species inventory dues to incorrect sampling protocol.
- Labelling of station number: # (transect no.)/### (depth strata)/# (replicate no.)

Sediment samples

Nansis Grab Station	Nansis CTD Station	Sample Label No.	TOC Sample Collected	GRAIN Sample Collected	Comment
X	X	1/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		1/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		1/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
1	No sample	1/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
2	953 (approx. area)	1/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
3	952 (approx. area)	1/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
4	No sample	1/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
5	No sample	1/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
		1/200/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample discarded. Incorrect sampling protocol & no preservation.
6	966	2/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		2/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
7	967 (approx. area)	2/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.

Nansis Grab Station	Nansis CTD Station	Sample Label No.	TOC Sample Collected	GRAIN Sample Collected	Comment
8	968 (also 965 in approx. area)	2/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
9	964	2/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
10	969 (approx. area)	2/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
11	971 (approx. area)	2/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
		2/200/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for species inventory ONLY. Incorrect sampling protocol.
12	1009	3/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
13	1010	3/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
14	1011	3/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
15	1012	3/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
16	1013	3/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
17	1014	3/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		3/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
20	1034	4/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
19	1033	4/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
18	1031	4/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.

Nansis Grab Station	Nansis CTD Station	Sample Label No.	TOC Sample Collected	GRAIN Sample Collected	Comment
		4/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
21	1037	4/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		4/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
22	1038	4/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		4/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		4/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
23	1039	4/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		4/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		4/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
29	1049	5/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
28	1046 (approx. area)	5/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
27	1045 (approx. area)	5/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
26	1044	5/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		5/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
25	1043 (approx. area)	5/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
24	1042 (approx. area)	5/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		5/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
36	(Not working)	6/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
35	(Not working)	6/20/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		6/20/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
		6/20/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
34	(Not working)	6/40/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/40/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/40/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
33	1057	6/60/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/60/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/60/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
32	1055 (also 1056 in approx. area)	6/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/100/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/100/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample not collected.
31	1054	6/150/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/150/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.

Nansis Grab Station	Nansis CTD Station	Sample Label No.	TOC Sample Collected	GRAIN Sample Collected	Comment
		6/150/3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
30	1053	6/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/200/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.
		6/200/2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample retained for quantitative analysis.

- Shaded cells – samples discarded or only for species inventory dues to incorrect sampling protocol.
- ORI station number: # (transect no.)/### (depth strata)/# (replicate no.)
- TOC: sediment Total Organic Content GRAIN: sample for grain size distribution of sediments

ANNEX IX. Data Management Agreement for the FAO/ASCLME Cruises

The intention of this Data Management Agreement is to clarify and protect the interests of all scientists and countries. This Agreement is appended to the ToRs for all scientists that are working on the Nansen as part of the 2008 ASCLME Cruise Schedule.

Introduction

Participating countries in the ASCLME Project, and their designated representatives, have the mandate to develop a comprehensive document on principles and guidelines for ASCLME data and information management so that it facilitates the effective collection, use and dissemination of information in support of TDA/SAP development in the short term and the ecosystem approach in the long term. National Data and Information coordinators in particular, have a responsibility for developing mechanisms for reliable long-term storage and use of information collected under the ASCLME Project.

This Agreement is intended to govern the collection, storage and access to data on the ASCLME 2008 Cruises as an interim measure prior to agreement of a more detailed MoU on data access and management which is currently under development as part of the overall ASCLME Programme (particularly as a joint MoU between the ASCLME and SWIOFP projects and their respective countries). In this context, data collected will be shared freely between the ASCLME and the SWIOFP Project with due note being taken of SWIOFP's own MoU with each of its countries regarding Transboundary Marine Scientific Research in Support of the South West Indian Ocean Fisheries Project (SWIOFP). Nothing in this current agreement should jeopardise the ability of SWIOFP scientists on joint research cruises from abiding by their terms of agreement as specified in this SWIOFP MoU.

Bearing in mind that access to new data, associated metadata, information collection **activities and resulting products funded by the FAO/ASCLME Project** shall be free and unrestricted;

The primary owner of data sets shall be the UNDP GEF ASCLME Project, the FAO and the member-countries of the ASCLME Project, and the primary contact points and archive locations for ASCLME-generated data shall be at nationally appointed data centres as well as through the ASCLME Project Coordination Unit and the FAO.

The first right to publish findings from new data, associated metadata, information collection activities and resulting products funded by the ASCLME Project resides with the principal investigator and her/his associated team (in the case of a scientific investigation), the participating country and the ASCLME Project and FAO.

These guidelines for intellectual property assume that adequate opportunity has been given to regional scientists to collaborate on research projects (data collection, processing and paper-writing), particularly from countries in whose territorial waters the research cruises have taken place.

Interim data management guidelines with specific reference to 2008 ASCLME/EAF-Nansen cruises

Detailed documentation will be made of all measurements and samples collected during each cruise. Documentation will include the cruise track, timing, geo-referenced and time-referenced records of every sampling site and station. All specimens and samples collected will be described and documented electronically during each cruise.

Wherever possible, duplicate or triplicate voucher specimens of macrofauna will be preserved.

The IMR Cruise Leader and the ASCLME Chief Scientist will be jointly responsible for ensuring the accurate documentation of activities, preservation of samples and backup of electronic data.

The primary custodians of data sets shall be the Institute of Marine Research, Bergen (on behalf of the FAO EAF-Nansen project,) the UNDP/GEF ASCLME Project and the member-countries of the ASCLME Project. The primary contact points and archive locations for the survey data shall be at nationally appointed data centres as well as through the ASCLME Project Coordination Unit. The intellectual property of new data, associated metadata, information collection activities and resulting products resides with the principal investigator (in the case of a scientific investigation), the Institution to which the scientist belongs, the participating countries, the ASCLME Project and FAO.

Timing of cruise data reports and products

Specimens

Morphological specimens which are preserved as voucher specimens will be fixed in formalin during the cruises. These will be transferred to ethanol after fixing, also during the cruises. At least one voucher will be lodged at each of:

- 1) the South African Institute of Aquatic Biodiversity in South Africa (SAIAB). This is an African collection where specimens will be preserved for the use and study by scientists throughout the region.
- 2) The National collection or National focal point institution for the ASCLME Project of the country from which the collection was made. This will ensure that countries also keep voucher collections. Where feasible, appropriate support will be provided by the ASCLME Project to the countries that do not currently have good capacity for specimen curation.

Specimens will be lodged at institutions within three months of the conclusion of the 2008 cruises (18 March 2009)

Electronic data from the cruises

A provisional cruise report and completed data report (containing documentation of all measurements and samples collected during each cruise, include the cruise track, timing, geo-referenced and time-referenced records of every sampling site and station) will be provided to the ASCLME PCU within 21 days of end of that particular cruise. It is accepted that biological samples may not be identified and sorted before the end of the cruises, but those data that are captured must be included in the report.

Together with this, an electronic version (in Excel) of all activity/site/station records, and video & photographic inventories will be given to the PCU.

The provisional cruise reports and completed data reports will be made available to the ASCLME participating countries within six weeks of the conclusion of the 2008 cruise schedule (21st February 2009).

A final draft cruise report will be made within three months of the completion of the survey. The Cruise Leader and the Chief Scientist are responsible for finalising the report which will be distributed to ASCLME and FAO for final editing and approval. After approval this will be named the Final Cruise Report and will be printed and be available in electronic copies in pdf format.

Processed data from the cruises

A complete set of all processed data collected on the 2008 ASCLME cruises will be made available to the PCU *within three months of the conclusion of the cruise (18 March 2009)*. Examples of these data will include CTD, ADCP, multibeam data sets, as well as inventories of identified specimens. It is recognized that some data sets may not be processed by this time. In that case, any raw electronic data must be provided to the PCU together with a report on the steps (and timing) that will be taken to process the data.

The provision of flagged (data to be published) data sets to the PCU will be safely retained offline until either

- a) Chief scientists agree to the dissemination of data sets OR
- b) Publications are submitted OR
- c) Eighteen months has passed since the conclusion of the cruise, whichever is the soonest.

As soon as processed data sets are distributable, they will be lodged at nationally appointed data centres for the ASCLME.

Raw OR processed data collected by scientists under the ASCLME Project shall be immediately available to the Regional Information Working Group (made up of national D&I Coordinators) for the sole purpose of (*internally*, not for distribution) informing the TDA/SAP, should it be necessary.

Proposed time line for delivery of data products

During each cruise	All sampling activities are carefully documented, geo-and time-referenced.
	Voucher specimens are fixed.
Final day of the 2008 cruise schedule. 18 December	Provisional cruise reports, and final data report (containing a record of sampling activities) is delivered to the PCU. Electronic inventories are provided to the PCU.
After completion of the 2008 cruise schedule (ongoing)	Public domain data sets are reviewed, checked and made available to the PCU and National data centres.
Six weeks after that. 21 st February	Provisional reports, and the final data reports are sent to ASCLME countries.
Three months from the conclusion of the 2008 cruise schedule. 18 March 2009	Voucher specimens are lodged at National Collections.
	All processed data (or raw data sets + report if not yet processed) provided to the PCU.
	Draft Final Cruise Report submitted to FAO and ASCLME
Eighteen months from the conclusion of the 2008 cruise schedule. 11 th June 2010.	The last of the processed data sets are made available to National data centres.

