APPENDIX 2 – FISHERIES AND BIODIVERSITY

2.4 Sailing Orders Biodiversity Survey *FV Zeearend*

CRUISE:	Namibian Phosphate Biodiversity Verification Survey
VESSEL:	FV *Zeearend*, Benguella Fishing Company Pty (LTD)
START UP MEETING:	NMP Offices. 127 Theo-Ben Gurigab Street. Walvis Bay +264 (64) 27 8150 Tuesday 17/6/2014 14:00
SAILING:	*From*: Benguella Fishing Company, Walvis Bay Wednesday: 18/06/2014 (Time TBA) *To*: Benguella Fishing Company, Walvis Bay Saturday: 28/06/2014 (Time TBA)

PERSONNEL	**PERSONNEL**	**ROLE**	**NATIONALITY**
	Melanie Smith	*Chief Scientist /fish sampler*	SA
	Victor Ngcongo	*Chief technician / fish sampler*	SA
	Robert Williamson	*Data manager/ fish sampler*	SA
	Tim McClurg	*Epibenthic specialist / benthic sampler*	SA
	Kate Munnik	*CTD technician / fish sampler*	SA
	Ester Nangolo	*Scientist / fish sampler*	NAM
	Malakia Shimhanda	*Technician / fish sampler*	NAM

AREA OF OPERATION:	ML 170 – SP-1. Between Conception Bay and Meob Bay in Namibia, approximately 60 km offshore in water depths from 200 – 300 m. There will be 24 stations and general direction of trawls will be from north to south.
GEAR:	1. Viking double belly monkfish trawl net (with tickler chains) 2. Codend liner 20mm 3. Digital scales 4. CTD and stainless steel casing 5. Digital cameras

CONDITIONS OF USE OF THIS REPORT

Email: info@namphos.com
127 Theo-Ben Gurirab Street
Walvis Bay
Namibia

contents

OBJECTIVES

- Estimate the abundance (density) of the main commercial species such as hake, monk and horse mackerel etc.,
- Collect biological information (length, sex, maturity stage, stomach content) from the commercially important/exploited species,
- Identify, collect and photograph epibenthic species and at the same time record the nature of the substrate and bottom profile,
- Collect environmental data (using visual observations and a CTD) to establish linkages between the environment and species distribution, recruitment and abundance, and
- Record/identify the occurrence of surface species such as marine mammals and seabirds in the area
- Collect baseline data for future monitoring

1 DATA TO BE COLLECTED

- The entire catch will be identified and sorted into species and the weight and numbers recorded.
- Hake, monk, horse mackerel and other target species will be differentiated by sex and lengths measured.
- Representative sub-samples of hake and monk will be measured for biological information such as individual length, weight, sex, maturity stage, and stomach fullness
- Two days will be available in the event of weather down time or gear damage (torn net).
- CTD data (vertical hydrographic profiles) will be collected at all stations. Data will include temperature, salinity (conductivity) and oxygen at a one metre depth resolution.
- Seabirds and marine mammal will be identified and counted (during the day) within a 500 m radius of the vessel.

2 GENERAL CRUISE PLAN

2.1 BOTTOM TRAWLING

Trawl duration will be 30 minutes, this being the time the net actually spends on the bottom, at a speed of 3 knots. Fishing will take place during day and night hours. The gear should not be deployed until the trawl deck has been cleared, or before the scientific processing of the previous catch is sufficiently advanced.

A commercial type Viking double-belly_monkfish bottom trawl with a head length 88 m, footrope 47 m and vertical net opening 30 – 40 m will be used. The distance between the wings during towing will be around approx 40 m. The trawl will be rigged with tickler chains along the footrope. The “Thyborun” trawl doors will be 4.2 m square in size and weigh around 800 kg. The codend mesh size will be 120 mm but in order to avoid small fish and epibenthic fauna being lost through the meshes, a 20 mm inner-liner will be installed inside the codend. No SCANMAR sensors are onboard, only trawl out will be measured

2.2 FISH SAMPLING

The entire catch (or a subsample in the case of large catches) will be sorted into species. Monk, hake, horse mackerel and chondrichthyans (sharks) will be further sorted by sex. The total catch weights (kg) of each species (and sex where applicable) will be recorded. Length frequency (total length) data will be collected for all commercial species (measured by sex if split). For non-commercial species (such as rat tails), only the weight and number of fish will be used.

If the catch is > 1 tonne, it will be split into two (approximately 50%) and one half will be sampled as above. If the catch is > 5 tonnes then 25% of the catch will be sampled as above. This will be done by estimating the catch in the stocker pond and splitting the catch into the desired proportions e.g. 50 or 25%.

In both cases, biological sampling (individual weight and length measurements, sex, maturity stage, stomach contents) of about 15 – 20 fish will be done for hake and monk per station

2.3 HYDROLOGY

A CTD will be deployed to acquire environmental research data.

2.4 STATION NUMBER ALLOCATION

Stations were randomly selected by dividing the survey area into grid blocks (2.5 nm x 3 nm). In each grid block two stations were randomly selected using Excel. Where possible, the first random position was selected. If not, the next position on the list was selected, and this continued until two stations were selected per grid block. Stations that were not suitable for trawling include those in water shallower than 200 m, those inside the environmental reference site areas and within 500 m of the oceanographic mooring anchor.

2.5 PROGRESS MEETINGS

Initial and final meetings will be held to inform everybody about the objectives of and progress made during and after the trip.

2.6 GENERAL

All scientific staff are advised to study the standing instructions regarding safety measures. A detailed guide covering all aspects of shipboard procedures is available in each cabin. All scientists are advised that casual attire should be worn for meals (i.e. NO work clothes/boots/shoes please).

DATA MANAGEMENT AND CRUISE REPORT

All data will be recorded on data sheets and entered electronically in an Access (and Excel) database. Hard copies of the data sheets will be retained by NMP. Three integrated reports; the Cruise Report, the Verification Report and Epibenthic Report will be submitted to NMP approximately three months after the completion of the survey.