

Eastern Cape Coastal Office  
PO Box 381  
Port Alfred, 6170

## **A review**

### **“Proposed 3D seismic survey in the Orange Basin, West Coast, South Africa – a specialist fisheries assessment”.**

An independent review prepared for CapMarine

by

Thomas Hecht (Prof Emeritus)  
Advance Africa Management Services

## **Background**

Environmental Impact Management Services (EIMS) has been appointed by Searcher Geodata (UK) Ltd. as the Independent Environmental Practitioner (EAP) to undertake an Environmental Management Plan (EMPr) process for a proposed three-dimensional (3D) seismic oil and gas survey within the Orange Basin, off the West Coast of South Africa. This is part of the application process for Environmental Authorisation for a Reconnaissance Permit Application for the area in the Orange Basin. The reconnaissance area is approximately 30 000 km<sup>2</sup>, at a depth range of 1500 to 3700m. The survey will take place over a period of 130 days during a survey window period during the 1<sup>st</sup> quarter of 2025 (and possibly extended to 2026, if required).

The survey will be executed by a vessel towing an array of airguns (sound source) and an array of (receiver) streamer cables (8-12 km astern of the vessel at a depth of 8 – 10 m).

As part of the EMPr, CapMarine (Capricorn Marine Environmental (Pty) Ltd.) was contracted by Searcher Geodata (UK) to undertake the specialist assessment study of

the impact of the proposed activities on commercial and non-commercial west coast fisheries. This study, entitled **Proposed 3d seismic survey in the orange basin, offshore South Africa: Specialist Fisheries Assessment (112p)**, is being reviewed here.

### **TOR and evaluation procedures**

The terms of reference for the study were very precise and well-defined. In their study CapMarine addressed each of the TORs in detail. The assessment conventions that were used to evaluate the significance of the impacts (as outlined in Appendix 1 of the CapMarine report) were clearly presented and all were professionally applied.

All aspects of the seismic survey procedures and the levels of sound, pressure and frequencies were very well explained. This provided the acoustic baseline for the assessments.

### **The baseline environment and assumptions**

The description of the environmental baseline of the study area was also very detailed and based on well referenced data sets.

The assumptions are well documented and comprehensive. None of the issues raised in the assumptions would have a material effect on the validity of the conclusions. Some of these are for example, occasional erroneous recording of latitude or longitude by skippers when shooting a line or a net, overestimation of the impact on fishing operations, the transitory nature of the acoustic impacts, and the unknown impact of seismic airgun sound on capture of local species.

The report provides accurate summaries of all fisheries that might in any way be affected / impacted by the seismic survey and then shows whether the individual fisheries overlap with the footprint of the exploration area. All synopses of the various fisheries are excellent. However, there is no need at all for the lengthy historical explanations of and justifications for Small-Scale Fisheries. This fishery should be treated in the same manner as all the others and particularly so because it is the least likely to overlap with the target area or affected by the seismic survey.

The results show that there is no overlap of the Reconnaissance Permit Application Area with the footprints of the demersal trawl, midwater trawl, demersal hake longlining, demersal shark longlining, the small pelagic fisheries, the tuna pole and line fishery, all rock lobster fisheries, as well as the demersal research trawl surveys. There is also no overlap with the traditional line fishery (including snoek), the beach seine and gillnet fisheries, as well as with the small-scale fishery sector. The only overlap with the permit application area is the large pelagic longline fishery. However, the data for the period 2015 to 2022 show that only 4.2% of the total large pelagic effort and 3.5 % of the total catch was recorded in the permit application area.

The spatial and temporal spawning characteristics of commercial species near the target area in the southern Benguela were well presented and accurately reflect our

current knowledge and understanding and show that the seismic survey would have no impact on eggs and larvae of commercial fish stocks.

### **The impact of exclusion from the fishing grounds**

Assessing the impact of exclusion of the large pelagic LL fishery from part of its area of operation was undertaken with great diligence and expertly described and illustrated. The sensitivity of the large pelagic LL fishery to the exclusion in relation to the spatial and temporal availability of the resource was correctly assessed and interpreted as being high, with the extent of the impact considered as moderate. Based on the collective appraisal of extent, duration, and magnitude of the impact and considering immediate probability that the impact would occur the overall significant of the impact was assessed as LOW NEGATIVE. We concur with this conclusion.

Proposed mitigation measures include stakeholder notifications, broadcasts of navigational warnings, presence of an experienced fisheries liaison officer on the escort / support vessel, lighting of the seismic and support vessels and flying of standard flags and lights indicating the constrained manoeuvrability of the survey vessel, notification of vessels at sea within 12 nm radar range. All the proposed measures are reasonable and very practical and if implemented according to standard procedures should not impact significantly on the operations of the large pelagic long liners and also not in any way jeopardies the sensitive nature of the seismic survey.

Based on various impact aspects the cumulative impact of exclusion of large pelagic long line operations from the Permit Application Area was assessed as MEDIUM NEGATIVE. Given the extent of the area and the fact that only 4.2% and 3.5 % of effort and total catch recorded for the Application Permit area over a period of 8 years and the transitory nature of the survey we are of the opinion that the authors assessment was conservative.

### **The impact of sound on catch rates**

This section of the report is preceded by a very detailed clarification of the impact of sound on fish (as well as eggs and larvae) and invertebrate mortality, physiological changes, masking effects and behavioural responses. This provides the necessary context with which to consider the conclusions reached on the impact of sound on catches and cpue. Of particular significance for this study were the results of previous studies showing that seismic survey activity impacts catch rates, particularly of demersal species with advanced swim bladders. Species such as sharks and some tuna and tuna like species without or with primitive swim bladders are less likely to be impacted. However, some tuna species such as Yellowfin and Big Eye tuna have advanced swim bladders and would physiologically, therefore, be more vulnerable than other species in the long line species basket. It should also be noted that the mere distance between the eastern boundary of the application area and other commercial stocks, e.g. demersal, midwater or small pelagic and all other fisheries makes it highly unlikely that sound from the survey airguns would have an impact on the behaviour and or catch rates of these species.

The conclusion that physiological injury from the seismic sound activity would be LOW NEGATIVE is well founded. Similarly, we agree that the noise of airgun firings would attenuate to below threshold levels for behavioural disturbances on any of the fish or fisheries other than the large pelagic LL fishery, for which it was assessed as MEDIUM to LOW NEGATIVE.

The mitigation measures that have been proposed to counteract any impact on sound on catch rates are practical and easily implementable.

### **Impact of Unplanned Events**

The impact of unplanned events are mandatory issues that have to be assessed in a basic assessment of this nature. Unplanned events that have been assessed include, accidental oils spills and loss of equipment at sea. They have been examined in detail.

Mitigation control measures to prevent and or control minor oil spills or loss of equipment at sea include best international industry practices, appropriate SOPs, spill containment and clean-up methods and equipment. The potential impact on commercial fishing operations along the SA Coast and the Permit Application Area were therefore correctly assessed as LOW NEGATIVE.

### **Cumulative impact**

Cumulative impacts were assessed based on three concurrent seismic surveys taking place. The assessment resulted in an impact of MEDIUM NEGATIVE significance, with no residual impact. The likelihood that three such surveys would take place simultaneously, is also highly unlikely.

### **Impact of seismic activity on cetaceans**

The possible impact of seismic activity on cetaceans is taken care of by the EMP of the survey plan as specified by Department of Mineral Resources and Energy. Because of observed migration patterns, the survey may only take place from December through to May. Of interest is that this period overlaps with 4 out of 6 months with low or moderate large pelagic LL fishing effort in the Permit Application Area. This further supports the conclusion that the significance of the impact of the survey on the fishery would be LOW NEGATIVE.

### **Overall conclusions and recommendations**

As explained in the CapMarine report, the permit application area is situated in the Orange basin, offshore of the shelf break and offshore of all of the fishing grounds of the important South African fisheries, except the large pelagic long line sector. However, even this fishery operates largely along the shelf break and fishing activities in the area are generally low. Moreover, and because the area does not overlap with spawning or nursery areas of major fish stocks the risk of sound disturbance to spawning behaviour and recruitment were, in our view, correctly considered as unlikely.

The report then summarises the impacts of elevated sound levels on catch rates. Based on the expected increased sound levels of airgun firings, peak sound pressure

levels and the frequency range it was concluded that these levels of sound are within the “hearing” range of most fish species. Using a Sound Transmission Loss model, it was possible to identify predicted zones of impact on the effects of noise on the mortality, physiology and behavioural disturbances of fish. Using these predictions and together with project controls and mitigation measures the residual impact of the effects of noise was assessed as being of LOW NEGATIVE significance for the large pelagic LL fishery and with no residual impacts on any other fisheries in South Africa.

Based on the evidence provided, the decision by the CapMarine specialist group that the seismic survey activities may be authorised, subject to the implementation of all mitigation measures as described in the report, is fully supported. Similarly, the legal obligations to prevent oil spills and loss of equipment and the relevant mitigation measures as described, should also minimise these risks.

### Overall conclusion

The specialist assessment by CapMarine is highly commendable. It was undertaken clinically and with due diligence. We concur with all impact significance levels proposed, as summarised in Table 5.1 of the report and copied below.

Fishery Sector	Distance of fishing ground to Reconnaissance Permit Area	Percentage Catch/Effort Overlap with Reconnaissance Permit Area	Residual Impact Significance			
			Exclusion Zone	Underwater Noise	Accidental Spill	Loss of Equipment
Demersal Trawl	35 km	0	No Impact	No Impact	No Impact	No Impact
Midwater Trawl	280 km	0	No Impact	No Impact	No Impact	No Impact
Demersal Longline	35 km	0	No Impact	No Impact	No Impact	No Impact
Small Pelagic Purse-Seine	170 km	0	No Impact	No Impact	No Impact	No Impact
Large Pelagic Longline	0 km	3.5/4.2	Low Negative	Low Negative	Low Negative	Low Negative
Tuna Pole-Line	55 km	0	No Impact	No Impact	No Impact	No Impact
Traditional Linefish	200 km	0	No Impact	No Impact	No Impact	No Impact
West Coast Rock Lobster	250 km	0	No Impact	No Impact	No Impact	No Impact
Small-Scale Fisheries	200 km	0	No Impact	No Impact	No Impact	No Impact
Netfish	220 km	0	No Impact	No Impact	No Impact	No Impact
Fisheries Research	30 km	0	No Impact	No Impact	No Impact	No Impact

Thomas Hecht (Prof. Emeritus)  
Advance Africa Management Services  
tomh@advanceafrica.co.za

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