

## PROJECT DEFINITION REPORT SUMMARY:

# Proposed Sea-Based Aquaculture Development Zone in Saldanha Bay

SRK Project Number: 499020

### 1 INTRODUCTION

The Department of Agriculture, Forestry and Fisheries (DAFF) aims to develop and facilitate aquaculture (the sea-based or land-based rearing of aquatic animals or the cultivation of aquatic plants for food) in South Africa to supply food, create jobs in marginalised coastal communities and contribute to national income.

Saldanha Bay is a highly productive marine environment and has an established aquaculture industry, with potential for growth. Some 430 ha of the Bay are currently leased for aquaculture production. Of these, 152 ha are actively farmed for mussels and oysters (and some fish), mostly in Small Bay (see Figure 1). DAFF has determined that the carrying capacity in 2 980 ha of the Bay can support bivalve production of up to 140 000 tons live weight.

To facilitate investment and development of additional aquaculture in the Bay, DAFF proposes to establish and obtain Environmental Authorisation (EA) for a sea-based Aquaculture Development Zone (ADZ) in Saldanha Bay.

SRK Consulting (South Africa) (Pty) Ltd (SRK) has been appointed as the independent consultant to develop a framework for the Saldanha Bay ADZ and undertake the Basic Assessment (BA) process required in terms of the National Environmental Management Act 107 of 1998, as amended (NEMA) and the EIA Regulations, 2014.

The study consists of two components:

- Project Definition, led by Capricorn Marine Environmental (CapMarine) and concluded in August 2016; and
- Basic Assessment (BA) Phase, led by SRK and currently underway.

A Background Information Document for this project was distributed to stakeholders in June 2016 to provide a general overview of the project.

**This document provides stakeholders with a summary of the Project Definition developed by CapMarine for initial comment. The Project Definition describes the project that will be assessed in the BA.**

### 2 PROJECT DEFINITION PHASE

The Project Definition Phase identified areas for potential aquaculture expansion across Saldanha Bay, as well as different species, culture options and infrastructure requirements.

The analysis used existing information obtained from key stakeholders (including DAFF, Transnet and the local aquaculture industry), published sources and previous studies and considered a range of factors such as depth, swell and water quality as well as other current or proposed uses of the Bay, to identify proposed ADZ areas.

The proposed areas were discussed and vetted with key technical authority and industry stakeholders in a workshop on 20 July 2016 prior to the BA process.

### 3 PROPOSED ADZ AREAS

The proposed ADZ comprises four main precincts in Big Bay and Outer Bay, providing an additional 1 715 ha of aquaculture areas in Saldanha Bay (see Figure 1):

- Outer Bay - North: north of Port entrance channel, near Malgas Island;
- Outer Bay - South: south of Port entrance channel, near Jutten Island;
- Big Bay - North: north of Mykonos entrance channel;
- Big Bay - South: south of Mykonos entrance channel – two alternative layouts are proposed for this area.

Carrying capacity in Small Bay is considered limited and no additional aquaculture is proposed in Small Bay.

**Table 1: Proposed ADZ precincts in Saldanha Bay**

Area	Currently allocated	Currently farmed	New areas	Total future
Outer Bay - North	37	1	299	336
Outer Bay - South	10	-	315	325
Big Bay - North	254	25	584	838
Big Bay - South	4	1	517	521
<i>Small Bay</i>	125	125	-	125
<b>Total</b>	<b>430</b>	<b>152</b>	<b>1 715</b>	<b>2 145</b>

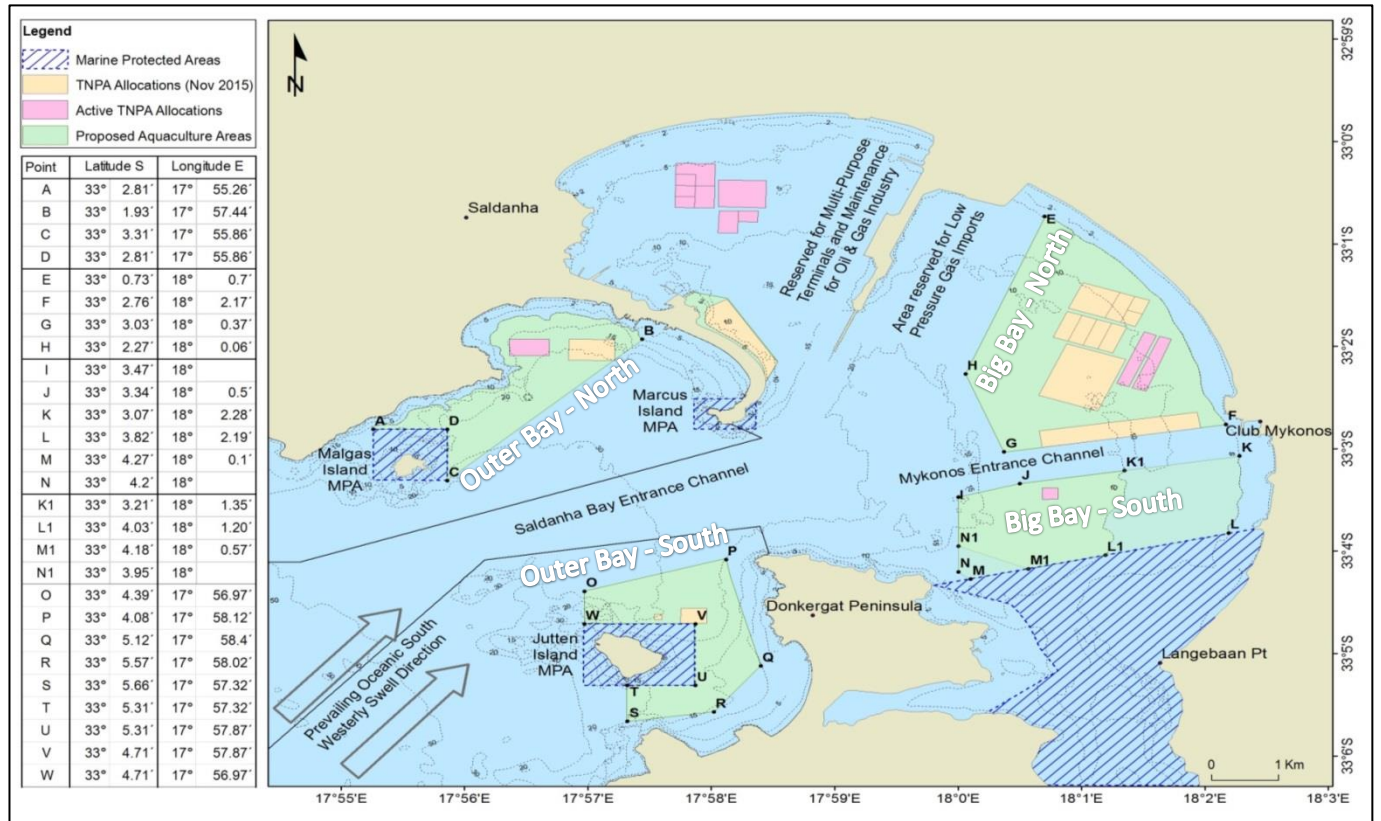


Figure 1: Existing (in yellow and pink) and proposed (in green) aquaculture areas in Saldanha Bay

**3.1 Outer Bay – North**

This precinct extends from the Marcus Island causeway to the Malgas Island Marine Protected Area (MPA) and from the 10 m depth contour to the 30 m depth contour north of the Port entrance channel. Malgas Island provides limited protection from extreme swell conditions, and the area is sheltered from northerly winds (June to August) but exposed to southerly winds (September to May). Waves reach up to 7.5 m.

Water temperature and exposure make this area suitable for mussel culture and possibly other bivalve species with cold water tolerance. Previous finfish cage culture suffered from periodic events of low Dissolved Oxygen (DO) in this area. Indigenous finfish species may be more resistant to these natural conditions and present a viable option in the future.

Areas deeper than 15 m may be suitable for finfish cage culture or submerged longlines. Shallower areas may be suitable for surface longlines. Rafts are likely not viable due to oceanographic conditions.

**3.2 Outer Bay – South**

This precinct extends from the Donkergat Peninsula to the Jutten Island MPA and from the 10 m depth contour towards the Port entrance channel. Jutten Island and the mainland provide limited protection from south-westerly swells, and the areas has some shelter from southerly winds (September to May). Waves remain

well below 7.5 m.

Areas deeper than 15 m may be suitable for finfish cage culture or submerged longlines (but strong currents between Jutten Island and the mainland could present challenges). Areas deeper than 10 m in the more protected sections between the mainland and Jutten Island may be suitable for bivalve surface longlines, which benefit from the currents. Rafts are likely not viable due to oceanographic conditions.

**3.3 Big Bay – North**

This precinct extends from the 5m contour towards the Port jetty up to the proposed Port of Saldanha LNG and LPG developments, and south to the Mykonos harbour entrance channel. This area was already demarcated for aquaculture in the 1980s. The area is reasonably sheltered from south-westerly swells and northerly winds (June to August), and wave heights are limited. Tidal currents may mitigate low DO conditions.

Areas deeper than 15 m in the south-western portion of the precinct may be suitable for finfish cage culture. Surface longlines and rafts for bivalve production may be viable in the precinct due to the protection from extreme oceanographic conditions.

**3.4 Big Bay – South**

This precinct extends from the Mykonos harbour entrance channel towards the Langebaan Lagoon MPA,

and from the 5 m depth contour towards the Donkergat Peninsula. An *alternative layout* for this precinct extends from the 10 m depth contour towards the Donkergat Peninsula to accommodate recreational users in shallow waters south of Mykonos and vessel traffic into and out of the Langebaan Lagoon near Donkergat. This area was already demarcated for aquaculture in the 1980s. The Bay provides optimal shelter from south-westerly swells and wind. Tidal currents may mitigate low DO conditions.

Areas deeper than 15 m in the western portion of the precinct may be suitable for finfish cage culture. Surface longlines and rafts for bivalve production may be viable in the precinct due to the protection from extreme oceanographic conditions.

#### 4 RECOMMENDED SPECIES

The following species are considered most viable for farming in the ADZ:

- **Currently cultivated bivalve species:**

- Pacific oyster (*Crassostrea gigas*)
- Mediterranean mussel (*Mytilus galloprovincialis*)
- Black mussel (*Choromytilus meridionalis*)

The species currently farmed in Saldanha Bay are likely to remain the key species farmed in the ADZ, as it has been shown that they can be successfully cultivated and are commercially viable.

- **New indigenous shellfish species:**

- Abalone (*Haliotis midae*)
- South African scallop (*Pecten sulcicostatus*)

Both species are indigenous and do not require risk assessments. Both species have been reared in aquaculture, and additional trials are currently underway. International and domestic demand is likely to make these species commercially viable.

- **New indigenous finfish species:**

- White Stumpnose (*Rhabdosargus globiceps*)
- Kabeljou (*Argyrosomus inodorus*)
- Yellowtail (*Seriola lalandi*)

The species are indigenous and do not require risk assessments. Suitable areas for farming these species are likely located within the ADZ. Commercial viability is likely to increase with lower production costs and more expensive imports / wild catches in future.

- **Alien finfish species:**

- Atlantic salmon (*Salmo salar*)
- Rainbow trout (*Oncorhynchus mykiss*)

Although alien, these species do not require risk assessments and have a high market value. Suitable areas for farming these species are likely located within the ADZ if low DO can be addressed.

- **Seaweed:**

- *Gracilaria gracilis*

Demand for seaweed as abalone feed and fertilizer is high. *G. gracilis* has potential for small scale farmers / community projects and is relatively easy to farm. Commercial viability in Saldanha Bay is uncertain as *G. gracilis* is susceptible to fouling from mussels.

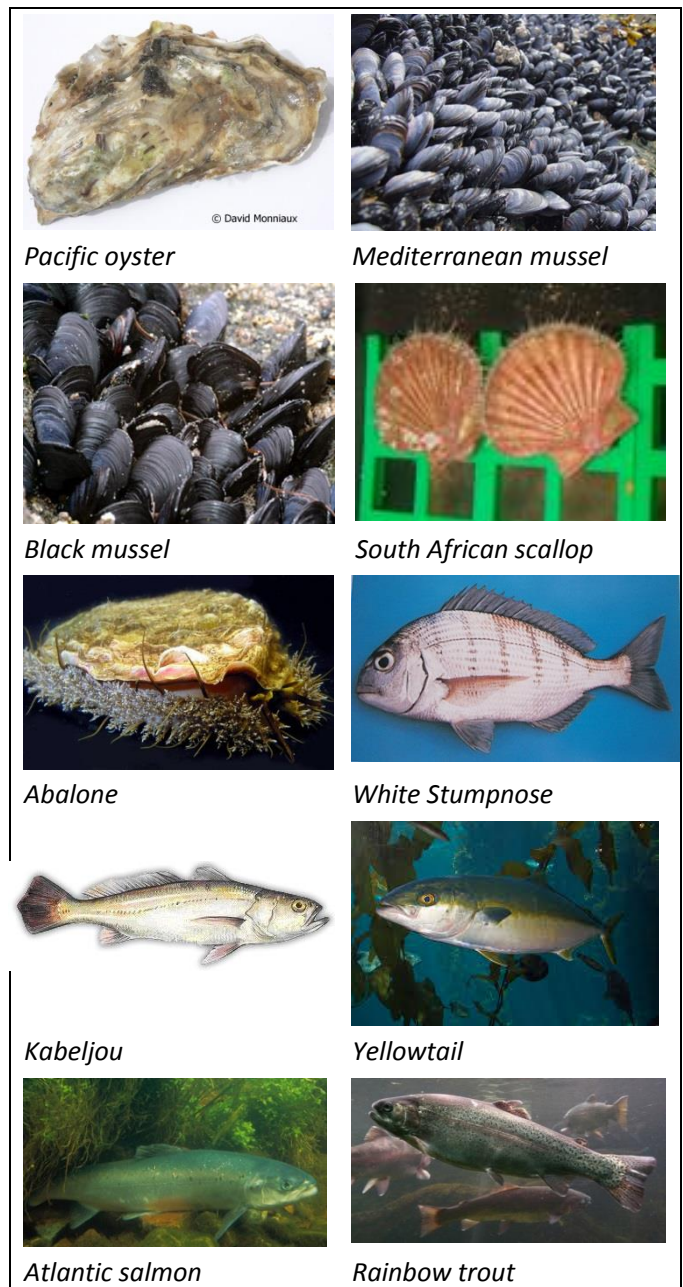


Figure 2: Recommended species for the Saldanha Bay ADZ

Alien species such as the European flat oyster (*Ostrea edulis*) and the Chilean scallop (*Agropected purpuratus*) are not included in the BA for the ADZ, as they require comprehensive risk assessments prior to further consideration for aquaculture.

## 5 RECOMMENDED PRODUCTION METHODS

The following production methods are considered most viable for farming in the ADZ:

- **Longlines** for bivalve culture, comprising surface ropes with floats and moored at each end to fix the lines in position. The production ropes for mussels or oyster racks are then suspended from the surface rope. Longlines are robust and can be used in depths up to 100 m and are suitable throughout the ADZ. The lower density of bivalves attached to longlines promotes better current flow and limits the localised impact of sedimentation from mussel faecal deposition. The recommended spacing is 10 m between longlines and 40 m between lease areas;
- **Rafts** for bivalve culture, comprising a floating top structure from which mussel ropes are suspended. A raft provides a stable surface structure for initial processing of mussels and reduces dependence on larger support vessels for harvesting and processing. However, sediments from faecal deposition and processing waste accumulate below the raft. The recommended density is one raft per hectare, which equates to 20 to 30 tonnes of marketable mussels per ha;
- **Cages** for finfish production, constructed of circular flexible high density polyethylene with multi-mooring systems, deployed at depths of more than ~25 m (larger cages) or ~13 m (smaller cages). Cages in Saldanha Bay have a high fouling rate, requiring regular replacement of cages; and
- **Barrel culture** for abalone, which can be deployed from rafts and longlines. Barrel culture requires regular servicing to feed the abalone.

The ADZ lies adjacent to the Port of Saldanha and several smaller harbours. As such mooring and surface structures must meet the highest international specifications to prevent structures from breaking loose and endangering navigation in Saldanha Bay.



*Longlines in Big Bay*



*Raft in Small Bay*



*Fish cage in Big Bay*



*Barrel culture*

**Figure 3: Recommended production methods for the ADZ**

## 6 LAND-BASED INFRASTRUCTURE

Sea-based aquaculture requires varying support from land based infrastructure, depending on cultivated species, production methods and processing. Mussels can largely be harvested, de-clumped and graded on the raft or support vessel.

Basic land-based support infrastructure includes:

- Landing quays (catering to personnel, equipment and product) accessible by vehicles;
- Mooring space in protected harbour areas for support vessels; and
- Product holding facilities (which can be off-site if seawater is not required).

Pepper Bay currently provides most land-based infrastructure to the aquaculture industry in Saldanha Bay. The harbour has a 110 m concrete quay, 27 m timber quay, and 18 m timber quay and two concrete boat ramps (shared with other commercial fishing operators).

The existing quays can accommodate a moderate expansion of the aquaculture industry. Large scale expansion and a significant increase in support vessels are likely to limit overnight mooring and berthing space alongside the jetties.

The Operation Phakisa Delivery Unit has assisted the aquaculture industry to date in sourcing additional facilities in Pepper Bay harbour. The Spatial and Economic Development Framework commissioned by the Department of Public Works (DPW) is also investigating the need for additional land-based aquaculture support facilities.

## 7 MANAGEMENT

A number of authorities and other bodies are involved in or affected by aquaculture management. Further expansion of aquaculture will require coordination of these bodies to ensure that new farms adhere to “best practice principles”. Authorities and organisations that are likely to play a role in the management of the ADZ include the following:

- **Transnet National Ports Authority (TNPA)**, which has jurisdiction in the Port of Saldanha Bay. Aquaculture must comply with TNPA requirements to ensure that structures do not endanger shipping in the Bay, including:
  - Specifications on moorings and materials used for surface and sub-surface systems; and
  - Placement of navigational lights and buoys to demarcate areas used for aquaculture;
- **DAFF**, which has overall jurisdiction over the Saldanha Bay fishing harbour and harbour facilities, stipulates permit conditions and implements the South African Live Molluscan Shellfish Monitoring and Control Programme to ensure that water quality and products harvested and marketed conform with international standards;
- **DPW**, which has jurisdiction over the maintenance and management of the harbour and thus plays a role in the provision of land-based support infrastructure;

- **Operation Phakisa units** assisting the aquaculture industry in Saldanha Bay by facilitating access to knowledge and facilities;
- **Saldanha Bay Municipality**, which has jurisdiction over many of the land-based activities surrounding and influencing Saldanha Bay;
- **SANParks**, which has jurisdiction over the MPAs adjacent to the proposed ADZ;
- **Bivalve Shellfish Farmers Association of South Africa**, which currently represents all aquaculture operators in the Bay, conducts negotiations with DAFF and conducts monitoring to ensure the safety of products; and
- **Saldanha Bay Water Quality Forum Trust**, which is independent from the aquaculture industry and monitors and advises on water quality issues affecting the Bay.

Aspects to be specified and monitored by ADZ management include *inter alia*:

- Specifications for structures and mooring systems to prevent danger to shipping in the Bay;
- Farm layouts that minimise impacts on neighbouring farms, including:
  - Spacing and positioning of lines to allow safe navigation between farms;
  - Stocking densities to maintain local carrying capacity and avoid disease; and
  - Management of discharge water from cleaning of fouling organisms to prevent excessive sedimentation and deterioration of water quality from decomposing material on seabed;
- Specifications that maximise the capacity of quays and jetties used by the aquaculture industry, including:
  - Regulation of the time vessels can load and offload at quays / jetties;
  - Limit on processing on or alongside jetties;
  - Control over storage of crates, ropes and nets on jetties; and
  - Control over access and parking of vehicles that support the industry.

**8 PROPOSED ADZ CONCEPT PLAN**

Table 2 provides a summary of the proposed ADZ characteristics, derived from the identification of suitable ADZ areas, species and production methods. These are represented spatially in Figure 4 below.

**Table 2: Proposed Saldanha Bay ADZ areas, species and production methods**

Area	Recommended species	Recommended Production Method
Outer Bay - North	Mediterranean mussel ( <i>Mytilus galloprovincialis</i> )	Sub-surface longlines
	Black mussel ( <i>Choromytilus meridionalis</i> )	
	White Stumpnose ( <i>Rhabdosargus globiceps</i> )	Floating cages
	Silver Kabeljou ( <i>Argyrosomus inodorus</i> )	
Yellowtail ( <i>Seriola lalandi</i> )		
Outer Bay - South	Mediterranean mussel ( <i>Mytilus galloprovincialis</i> )	Sub-surface longlines
	Black mussel ( <i>Choromytilus meridionalis</i> )	Floating cages
	White Stumpnose ( <i>Rhabdosargus globiceps</i> )	
	Silver Kabeljou ( <i>Argyrosomus inodorus</i> )	
	Yellowtail ( <i>Seriola lalandi</i> )	
	Atlantic salmon ( <i>Salmo salar</i> )	
Rainbow trout ( <i>Oncorhynchus mykiss</i> )		
Big Bay - North	Pacific oysters ( <i>Crassostrea gigas</i> )	Longlines / rafts
	South African scallop ( <i>Pecten sulcicostatus</i> )	
	Mediterranean mussel ( <i>Mytilus galloprovincialis</i> )	
	Black mussel ( <i>Choromytilus meridionalis</i> )	
	Abalone ( <i>Haliotis midae</i> )	
	Gracilaria ( <i>Gracilaria gracillis</i> )	
	White Stumpnose ( <i>Rhabdosargus globiceps</i> )	Floating cages (depths >13m)
	Silver Kabeljou ( <i>Argyrosomus inodorus</i> )	
Big Bay - South	Yellowtail ( <i>Seriola lalandi</i> )	Longlines / rafts
	Rainbow trout ( <i>Oncorhynchus mykiss</i> )	
	Pacific oysters ( <i>Crassostrea gigas</i> )	
	South African scallop ( <i>Pecten sulcicostatus</i> )	
	Mediterranean mussel ( <i>Mytilus galloprovincialis</i> )	
	Black mussel ( <i>Choromytilus meridionalis</i> )	
	Abalone ( <i>Haliotis midae</i> )	Floating cages (depths >13m)
	Gracilaria ( <i>Gracilaria gracillis</i> )	
Big Bay - South	White Stumpnose ( <i>Rhabdosargus globiceps</i> )	Floating cages (depths >13m)
	Silver Kabeljou ( <i>Argyrosomus inodorus</i> )	
	Yellowtail ( <i>Seriola lalandi</i> )	
	Rainbow trout ( <i>Oncorhynchus mykiss</i> )	

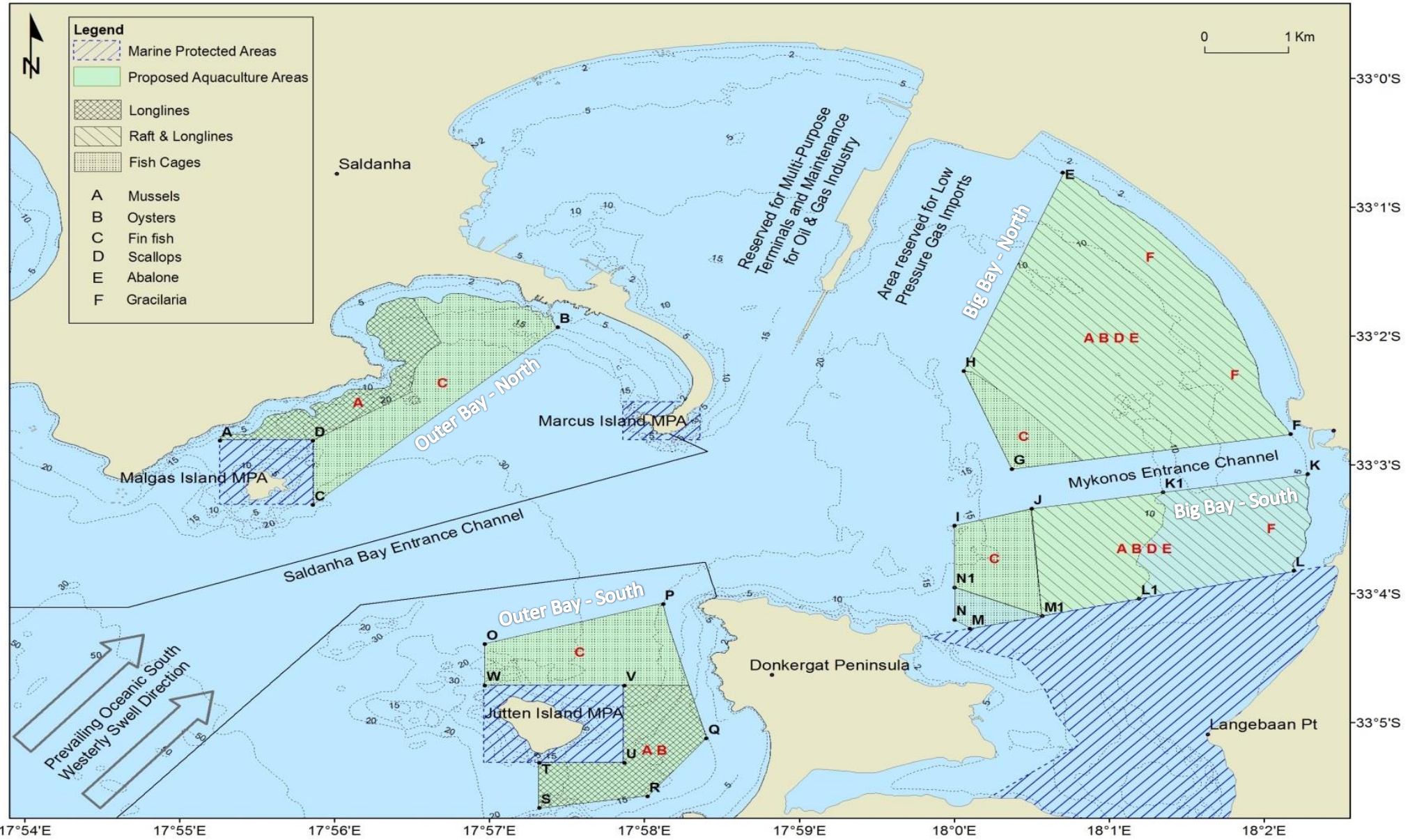


Figure 4: Proposed Saldanha Bay ADZ areas, species and production methods

## HOW YOU CAN YOU PARTICIPATE IN THE BA PROCESS

We value your input into this project. Stakeholders are invited submit comments on the Project Definition, which must reach SRK by 19 August 2016 to be considered in the BA Report.

The BA Report, once compiled, will be made available to all registered stakeholders for comment.

Stakeholders not yet registered on the project database may also do so at any time during the process. Please note that only registered stakeholders will be notified when the documents are made available for comment as part of the BA Process.

### REGISTER OR PROVIDE YOUR OPINION

Register or send written comment to:

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Please refer to the SRK Project Number in your submissions. If registering as a stakeholder, please provide your name, contact details (preferred method of notification, e.g. email), and an indication of any direct business, financial, personal or other interest in the application.

