


FISHERY AND AQUACULTURE COUNTRY PROFILES	Food and Agriculture Organization of the United Nations	FID/CP/ZAF
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NATIONAL FISHERY SECTOR OVERVIEW

SOUTH AFRICA

1. GENERAL GEOGRAPHIC AND ECONOMIC DATA

Area ¹ :	1 220 813 km ²
Water area ² :	(EEZ) 1 071 883 km ²
Shelf area ³ :	275 000 km ²
Length of coastline:	3 623 km
Population (2009):	49 320 500 ⁴ (Census 2001, 44 819 778)
GDP at purchaser's value (2008):	USD 782.7 billion ⁵
GDP per head (year) :	USD 4 247 at market value
Agricultural GDP (2008):	USD 7.4 billion
Fisheries GDP (2008):	USD 322.5 million

2. FISHERIES DATA (2007)

Note: ⁶	Production	Imports	Exports	Total Supply	Per Caput Supply
	tonnes liveweight				kg/year
Fish for direct human consumption	396 660	121 959	144 005	374 614	7.6
Fish for animal feed and other purposes	276 700	41 800	123 400	195 100	

Estimated Employment (2008)	
(i) Primary sector (including aquaculture):	16 853
(ii) Secondary sector:	10 876
Gross value of fisheries output	--
Trade (2008)⁷:	
Value of fisheries imports:	USD 233 842 390
Value of fisheries exports:	USD 537 912 911

¹ Stats SA, 2009 (Geography Division)

<http://www.statssa.gov.za/publications/SASStatistics/SASStatistics2009.pdf>

² South African National Spatial Biodiversity Assessment 2004: Technical Report. Volume 4: Marine Component. South African National Biodiversity Institute

³ Council for Geoscience

⁴ Mid-year population estimates by Statistics South Africa, 2009 (P03022009)

<http://www.statssa.gov.za/PublicationsHTML/P03022009/html/P03022009.html>

⁵ Indicative exchange rate December 2009 US\$=Rand 7.5)

⁶ Based on best available source – Fishing Industry Handbook, 2007 & 2008

⁷ <http://www.trademap.org>

3. FISHERY SECTOR STRUCTURE

3.1 Overall fishery sector

South Africa has a coastline that spans two ecosystems over a distance of 3 623 km, extending from the Orange River in the west on the border with Namibia, to Ponta do Ouro in the east on the Mozambique border. The western coastal shelf has highly productive commercial fisheries similar to other upwelling ecosystems around the world, while the east coast is considerably less productive but has high species diversity, including both endemic and Indo-Pacific species.

The South African fishing industry is regulated by the Department of Environmental Affairs and Tourism (branch Marine and Coastal Management)⁸. The commercial and recreational fishing industry (including primary and secondary industries) is valued at approximately ZAR 4-5 billion annually and provides employment for an estimated 27 700 individuals, both land-based and sea-going. All marine fisheries require a right or permit and fall within one of three main sectors, namely industrial, small-scale/subsistence and recreational. Commercial fishing sectors are managed either through total allowable catches (TACs), total allowable effort (TAEs) or a combination of each. Since democratic change in South Africa in 1994, the fishing industry has undergone significant transformation to benefit previously disadvantaged persons or groups, with the primary mechanism for this change being the granting of new commercial long-term fishing rights (10-15 years on most sectors).

3.2 Marine sub-sector

Marine fisheries in South Africa are diverse, and because of the different ecosystems and irregular coastline, are diversified, both with respect to species caught and gear deployed. In the offshore sector, the industrial fisheries are dominated in terms of volume and value, by the demersal hake trawl fishery and the small pelagic purse seine fishery for anchovy and sardine. These two fisheries are primarily based on the South African west coast from the ports of Cape Town, Saldanha and St. Helena Bay (7, page 16). There are also small fisheries for hake using demersal longlines and hake handline that collectively are allocated 10% of the allowable catch. A further 6% of the hake catch is allocated to a small inshore trawl fishery operating out of Mossel Bay and Port Elizabeth on the south coast. There is a small but significant midwater trawl fishery targeting horse mackerel on the Agulhas Bank – juvenile horse mackerel are also a bycatch in the small pelagic fishery, but catches are limited to 5 000 tonnes per year. Other fishing sectors classified as “offshore” include a tuna bait and pole fishery for longfin and yellowfin tuna (operating from the Cape Town area), a large pelagic longline fishery for tuna, shark and billfish (operates around the whole coast and beyond the EEZ) and a restricted demersal longline fishery for Patagonian toothfish within the EEZ around the Prince Edward Islands (also within the CCAMLR areas 58.6 and 58.7).

There is a diverse crustacean commercial sector. A small trawl fleet targets shrimp off Kwazulu Natal (KZN) and similarly a small fleet of trap boats target deepwater rock lobster on the Agulhas Bank. There is a commercial fishery for West Coast Rock Lobster using traps and ring nets as well as a small subsistence and recreational sector (traps, ring nets, diving) on the Cape west and southwest coasts between Cape Town and Cape Agulhas. Further east in the Port Elizabeth and Port St. Francis area there is a lucrative squid jig fishery using small deck boats up to 20 m in length.

One of the biggest fishery sectors in terms of areas fished and numbers of fishers involved is the linefish sector. This multi-faceted sector is complex with many fishers, subsistence folk and recreational users. There is a dedicated commercial linefish sector (350 boats) distributed around the whole coast targeting primarily snoek and cob as well as numerous other line-caught species. However, the effective declaration of a crisis in this sector in 1999 and the introduction of a *Linefish Management Protocol (LMP)* in 1999

⁸ At the time of preparation of this profile, Marine and Coastal Management (including fisheries research, management, aquaculture and administration) was under review with a likely move to a new “Ministry of Agriculture and Fisheries”

(Griffiths *et al.*, 1999) introduced effort management based on geographical zones⁹. In addition to the commercial linefish sector there is a substantial recreational linefish sector as well that operates around the entire coast that is restricted by permit type and bag limits. Also falling within the small-scale and subsistence sectors are a small beach seine fishery distributed around the coast, small-scale gill net fishers on the west coast, wild oyster pickers and intertidal harvesting by subsistence fishers for mussels and other species, particularly in the Pondoland and Kwazulu-Natal coastal regions.

Notably, the highly controversial fishery for abalone *Haliotis midae* in the Western Cape was closed in 2007 due to near-stock collapse as a result of poaching and uncontrolled fishing. Presently this fishery is under review and indications are that it will be reopened, albeit at a much reduced scale.

3.2.1 Catch profile

South African commercial (see Table 1, page 18) and recreational fisheries are reported to catch over 250 marine species, although fewer than 5 % of these are actively targeted by commercial fisheries, which comprise 90 % of the landed catch. The demersal trawl sector for hake is the most valuable South African fishery (contributing approximately 50 % of the value of fishery production) for which the most important species caught are the cape hakes, *Merluccius paradoxus* and *M. capensis* with the main bycatch species being kinglip (*Genypterus capensis*) and monk (*Lophius upsicephalus*). In 2005, 52 offshore trawling long-term fishing rights were granted for a total of 125 321 tonnes of hake (TAC 118 000 tonnes in 2009). The inshore hake and sole trawl fishery is a relatively smaller sector in which the main target species caught are the cape hakes and sole (*Austroglossus pectoralis*). There are 17 long-term rights holders in the fishery and in 2006 the sector was allocated 9 111 tonnes of the hake and 871 tonnes of sole (the 2007 hake catch was 6 536 tonnes). Also targeting hake are demersal longliners where currently there are 134 long-term rights holders, with small allocations ranging upwards from 40 tonnes each. In 2008, total catches for hakes amounted to 131 715 tonnes.

The small pelagic fishery is the largest fishery with respect to total volume caught, and targets sardine (*Sardinops ocellatus*), anchovy (*Engraulis capensis*) and round herring (*Etrumeus whiteheadi*). Juvenile horse mackerel (*Trachurus capensis*) and chub mackerel (*Scomber japonicus*) are also caught in smaller amounts. The fishery contributes approximately 25 % of the value of all fisheries although the annual TAC varies from year to year. In 2008, the catch for anchovy and sardine was 265 823 tonnes and 90 969 tonnes respectively, while that of round herring and chub mackerel was 64 701 tonnes and 2 370 tonnes respectively.

Adult horse mackerel (*Trachurus capensis*) are targeted by the midwater trawl fishery in areas where the stock aggregates in highest concentrations on the Agulhas Bank (see Figure). In 2006, long-term rights were issued to 18 companies and the TAC set at 31 500 tonnes with an Upper Precautionary Catch Limit (UPCL) of 48 000 tonnes that includes bycatch of horse mackerel in the demersal trawl sectors. In 2008, total catches for adult and juvenile horse mackerel amounted to 30 502 tonnes.

Highly migratory tuna and tuna-like species are caught on the high seas and seasonally within the South African EEZ. Targeted species include yellowfin tuna (*Thunnus albacares*), bigeye tuna, *T. obesus*, longfin tuna (*T. alalunga*), swordfish and shark. These species are targeted by the large pelagic longline and tuna pole sectors. Large pelagic longlining is a developing sector in South Africa. Historically, foreign effort (mostly from Japan and Taiwan, province of China) dominated, with about 130 permits issued annually. After an experimental fishing period, long-term fishing rights for directed effort on tuna (30 rights) and swordfish (20 rights) were issued in November 2004 to exclusively South African rights holders. Many of these rights are now fished by foreign flag operators in joint ventures with the South African rights holders, with the main

⁹ The number of rights-holders in the linefish sector was dramatically reduced in 2005 with the introduction of new long-term fishing rights. In addition, stricter recreational permit conditions and sharply reduced bag sizes and species restrictions have also since been applied.

objective being to increase South Africa's catch history for tuna and to develop local capacity. There is also a small shark-directed longline fishery that is being integrated into the large pelagic longline sector. The tuna pole and bait fishery fleet consists of approximately 200 vessels landing on average 6 200 tonnes per year.

The rock lobster fishery is divided into two sectors, one targeting the west coast species *Jasus lalandi*, and the other based in deep water on the south coast targeting *Palinurus gilchristi*. The West Coast rock lobster is a shallow-water species caught by trap or hoopnet in waters shallower than 100 m whereas the south coast rock lobster is caught on the Agulhas Bank in water depths up to 200 m by freezer and live-tank vessels setting traps on longlines. Rock lobster contributes only 0.4 % by mass to the total South African fisheries catch, however its contribution by value is 9.2 % since it is a high value product. In 2008 the landed mass of west coast rock lobster was 1 945 tonnes while that of south coast rock lobster was 425 tonnes. The commercial fishery for west coast rock lobster is controlled by company-allocated rights apportionments within a global TAC subdivided by geographical area. A reduction in the minimum size that can be legally harvested, from 89 to 75 mm carapace length, was introduced in April 1992. For 2010 the TAC for west coast rock lobster has been set at 2 393 tonnes that includes a 1 685 tonnes and 451 tonnes for direct commercial exploitation (offshore and inshore respectively) and 257 tonnes provision for recreational allocation. No minimum size limit is enforced in the south coast rock lobster fishery and a conservative TAC of 475 tonnes tail mass has been set in recent years.

The crustacean trawl fishery targets pink prawn (*Haliporoides triarthrus*), langoustine (*Metanephrops andamanicus*) and *Nephropsis stewarti*, red crab (*Chaceon macphersoni*), Natal deepwater rock lobster (*Palinurus delagoae*) and an assortment of other crustacean and fish species. Areas of operation are confined to the province of Kwazulu-Natal. The inshore shrimp fishery operates on muddy grounds at depths of 20 to 45 m primarily on the Tugela Bank. The offshore fishery operates at depths of 100 to 600 m from Port Edward to Cape Vidal.

South Africa's squid-jigging fishery targets chokka squid (*Loligo vulgaris reynaudi*). After its initiation in 1983, the fishery grew rapidly, until a permit system for vessels was introduced in 1987 to limit fishing effort. In 2007, there were 121 rights holders and 138 vessels registered to fish within the sector. As the fishery is input-controlled, catches fluctuate from year to year, being sometimes as high as 12 000 tonnes and in other years as low as 4 000 tonnes. The resource is protected by a closed season of three to five weeks when spawning is at its peak (usually November).

South Africa's commercial abalone fishery (wild abalone harvesting) remained relatively stable for many years, being controlled by a whole-mass quota of some 500 tonnes. However, an escalation in illegal fishing activity has put the resource under recent pressure to the extent that since January 2008, the fishery has been suspended¹⁰. In the linefish fishery, catches of all species in the commercial sector approximated 12 000 tonnes in 2007, somewhat down from the annual 16 000 tonnes average reported prior to the introduction of the Linefish Management Protocol in 1999.

3.2.2 Landing sites

The South African coastline is generally exposed and dangerous for fishing vessels to land. Nearly all beaches, estuaries and sheltered waterways provide some form of access to small craft (called ski-boats). However, most commercial fish landings must take place at designated fishing harbours. For the larger industrial vessels targeting hake, only the major ports of Saldanha Bay, Cape Town, Mossel Bay and Port Elizabeth are used. Durban is the largest port in Africa but handles very few fishing boats including the local prawn-trawl fleets and high seas foreign flag vessels fishing the Indian Ocean. Cape Town is a major provisioning and service port for high seas tuna vessels. On the West Coast, St. Helena and Saldanha Bays are the main landing sites for the small pelagic

¹⁰ In December 2009 it was decided to reopen the fishery under strictly controlled conditions

fleets. These ports also have significant infrastructure for the processing of anchovy into fishmeal as well as canning of sardine.

The smaller fishing harbours include Port Nolloth on the west coast close to the Namibian border, then moving south and eastwards, Hondeklip and Laaiplek (small pelagic and lobster), Hout Bay harbour (rock lobster and line fish), Kalk Bay harbour (rock lobster and linefish), Gansbaai harbour (small pelagic and fishmeal processing), Hermanus harbour (rock lobster and linefish) and East London harbour.

3.2.3 Fishing Operations

Vessels active in South Africa's fisheries are generally reaching the end of their working life and many new vessels are being built (most locally). South Africa has introduced effort control and vessel restrictions in most commercial fisheries - rights holders have to justify new vessels within each sector through a *Fishing Effort Allocation Committee*. As a general rule, new effort can only replace existing effort in any sector, with replaced vessels not permitted back into the specific sector from which they came.

In the hake-trawl fishery there are approximately 70 vessels active within the deep-sea sector and a further 31 smaller trawlers active in the inshore sector. The deep-sea fleet is comprised of modern, stern trawlers ranging between 23 and 90 m in length. The typical trawl gear configuration used is that of "otter trawls" consisting of gear towed along the seafloor with trawl doors (or otter boards) maintaining net opening. Gear consists of trawl warps, bridles and trawl doors, a footrope, headrope, net and codend. Trawlers generally tow their gear at 3.5 knots for 1 to 3 hours mainly in daylight hours (when targeting hake). The inshore trawl fishery comprises mostly small trawlers, 14 to 30 m in length and restricted to less than 1000 hp engine capacity. The gear configuration is similar but slightly lighter than that used by the deep-sea fleet. Within the hake longline sector there are 64 active vessels, and fishing grounds overlap those used by the trawl fleet since the two fisheries both target the hake stock. A demersal longline vessel typically deploys a double line which is weighted along the seafloor by concrete blocks placed at regular intervals along the line. The two lines are connected and set parallel to each other with the top line more buoyant and used in retrieving the line. Baited hooks are set along the bottom line (maximum of 20 000 hooks per line for the offshore areas and 5 000 hooks per line for the inshore areas). Lines may be up to 30 km in length and are usually set in the early hours of the morning and left to soak for 5 to 6 hours. Longline vessels are able to work in areas of "hard ground" (unlike trawlers) along the shelf break and vessels range from 18 to 50 m in length.

A small midwater trawl fishery operates within the demersal sector and targets exclusively adult horse mackerel, which are also caught by the inshore and deep-sea trawl fisheries. Six vessels are licensed to fish within the midwater trawl sector although the majority of the effort within the fishery is conducted by a single, dedicated factory vessel. The fishing technique targets fish in the water column by towing a mid-water net at any depth between the seafloor and the surface of the sea without continuously touching the bottom. The gear configuration is similar to that of demersal trawlers except that the net is manoeuvred vertically through the water column.

The small pelagic (purse seine) fleet is comprised of small wooden vessels and larger steel-hulled vessels ranging in length from 11 to 48 m (approximately 100 vessels). The purse seine fishing method targets small mid-water and surface-shoaling species. Once a shoal has been located the vessel will steam around it and encircle it with a large net. The depth of the net is usually between 60 m and 90 m. Netting walls surround aggregated fish both from the sides and from underneath, thus preventing them from escaping by diving downwards. These are surface nets framed by lines: a float line on top and lead line at the bottom. Once the shoal has been encircled the net is pursued and hauled in and the fish are pumped onboard into the hold of the vessel. Most pelagic fishing vessels catch their carrying capacity overnight and land their catches early in the morning. They do not range far from port.

The tuna poling method, in which a baited hook or lure is attached by a short line to a pole, is the primary means of exploitation, targeting longfin tuna (called albacore locally) and to a lesser extent yellowfin tuna. The fishery is seasonal (October to June) and operates on the West Coast. There are currently 200 vessels registered within the fishery. Vessels are relatively small and store catch on ice, thus staying at sea for short periods (approximately five days). The fishing method involves locating a shoal of tuna, and then spraying water alongside the vessel to attract the fish to the surface, at which point they are caught with baited hooks and gaffed aboard. The South African tuna pole annual landings are approximately 6 200 tonnes.

The large pelagic longline sector operates extensively along the shelf edge from the Orange River to East London as well as beyond the South African Exclusive Economic Zone. This type of longline gear targets pelagic species and therefore extends downwards from the sea surface. Longlines of up to 80 nautical miles are set predominantly along the shelf contours and consist of a drifting mainline kept near the surface or at a certain depth by means of regularly spaced floats and vertically hanging branch lines with baited hooks. Marker buoys are attached to the main line by buoy-lines at intervals to keep the mainline near the surface and each end is marked by a Dahn Buoy and Radar reflector, which marks its position for later retrieval by the fishing vessel. A line may be left drifting for a considerable length of time and is retrieved by means of a powered hauler at a speed of approximately 1 knot. There are currently 31 vessels registered to operate within the fishery.

The South Coast rock lobster fishery sector consists of nine vessels (12 rights holders) operating on the south coast. Large freezer vessels are used to set longlines at depths of between 80 and 300 m. Barrel-shaped plastic traps are attached to the line which is left to soak for periods ranging from 24 hours to several days. Vessels may set up to 2 000 traps per day in sets of 100 to 200 traps per line, each of which may be up to two nautical miles in length. Vessels are large, ranging in length from 30 to 60 m, and those that have onboard freezing capacity will remain at sea for up to 40 days at a time before returning to port. Those vessels that retain live catch typically remain at sea for a week before discharging at port.

The West Coast rock lobster fishery is undertaken by a fleet of about 105 small vessels targeting catch in water depths shallower than 100 m using traps and hoopnets.

In the near-shore fisheries there are a large number and diversity of vessels, including large deck boats used in the squid fishery (138 boats) and over 400 commercial boats in the handline fishery. These figures do not include the thousands of recreational fishing boats.

Subsistence and artisanal fisheries are located mostly in rural areas, including the Transkei and Kwazulu-Natal coastlines, where activities such as oyster and mussel picking occur. In some areas, there are also permits for subsistence fishers for the harvesting of rock lobster and abalone.

There is an *Experimental Fisheries Policy*¹¹ aimed at the utilisation of under-exploited resources. Currently, there is an ongoing octopus trap experimental fishery (for five years) with 15 rights issued for different locations extending from Saldanha on the West Coast to East London on the East Coast.

3.2.4 Main commercial resources

The main commercial stocks fished in South Africa are sardine and anchovy, Cape hake, horse mackerel, rock lobster ("west" and "south" coast species), tunas and shark, loligo squid and a large group collectively referred to as "linefish".

¹¹ DEAT, (2007): Establishment of new fisheries in South Africa. Department of Environmental Affairs and Tourism, Marine and Coastal Management.

The largest sector by volume, the anchovy and sardine fishery, is closely associated with the Benguela Current ecosystem and in particular the high productivity of the upwelling on the west coast. To a lesser extent, the Agulhas Current ecosystem also plays a role with spawning and recruitment of both anchovy and sardine occurring in late spring and early summer. As is common in such fisheries with species that are short-lived, the biomass of both stocks fluctuate significantly from year to year – recruitment is sensitive to environmental conditions. In recent years sardine biomass has been high, however since 2008 sardine biomass has declined and TACs have been lower than long-term means. By comparison, anchovy biomass in 2009 was one of the highest on record and a substantial allowable catch was set. There is also a substantial biomass of under-exploited small pelagic species of which red-eye pilchard is harvested as a bycatch (no more than 50 000 tonnes pa.). The meso-pelagic lantern and lightfish are not exploited although unsuccessful attempts have been made in the past to utilise these stocks for their potential oil yield.

The hake fishery comprises two species (shallow and deep-water Cape hake). Only recently have the catches of the two species begun to be separated in commercial catches and the stocks assessed independently. This is a complicated process, but indications are that the shallow water hake biomass is above Maximum Sustained Yield. The situation is somewhat different for deep-water hake for which the state of the stock is estimated to be below 20% of pristine levels. Through an operational management procedure (OMP), a stock rebuilding strategy is being implemented. The South African hake stocks also overlap with Namibia – currently the issue of transboundary stocks is being addressed by the newly-formed *Benguela Current Commission* (BCC). Associated with the demersal fisheries are many other “bycatch” species. Kingklip are considered threatened and have strict catch limits that include a UPCL of 3 500 tonnes and seasonal closed areas to protect spawning aggregations. Monk has a precautionary 7 000 tonnes catch limit and linefish species such as cob that are caught in the inshore trawl fishery, also have a strict management regime. The Inshore Trawl fishery has two distinct operational sectors – vessels that target hake and those that target sole. The sole stock is stable with an unchanged allowable catch in the last 10 years.

Horse mackerel are a significant resource that is exploited by both mid-water and bottom-trawl. Juveniles are caught seasonally in significant quantities on the west coast. There is uncertainty as to the state of this resource and for this reason an UPCL is applied to the fishery for both adult (48 000 tonnes) and juvenile (5 000 tonnes) components.

High Seas Resources and Regional Fisheries Management Organisations (RFMOs)- Because of their highly migratory nature, tunas (longfin and yellowfin in particular) fall under either the International Commission for the Conservation of Atlantic Tunas (ICCAT) or the Indian Ocean Tuna Commission (IOTC). Stock status of these resources is generally poorly understood, although for longfin tuna the stock is thought to be under-exploited and is allocated by ICCAT under a “sharing” agreement with Namibia, Brazil, Angola and Taiwan, Province of China. Southern Bluefin Tuna are also caught in small quantities in South African waters but the allocation from the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) for South Africa is small (~ 40 tonnes). South Africa is a full member of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and exploits Patagonian toothfish (*Dissostichus eleginoides*) around their southern ocean Prince Edwards islands - the stock is fished very conservatively as it was heavily overexploited in the 1990s and is believed to be at only a fraction of the unexploited biomass.

In the near-shore environment west coast rock lobster is relatively stable but under considerable exploitation pressure from commercial, recreational and Illegal, Unregulated and Unreported (IUU) fishing. The biomass has in recent years declined along with the annual allowable catch. There is also believed to have been a significant shift in stock from the west to the south coast, possibly associated with environmental changes. The abalone stock is severely threatened and the fishery remains closed with the stock at <5% of pristine estimates. The linefish resources, which include up to 250 species as

well as many endemic species, was declared in a "state of crisis" in 1999 and is now managed under a Linefish Management Protocol¹².

3.2.5 Management applied to main fisheries

Of South Africa's 22 commercial fisheries, 9 are managed in terms of total allowable catches ('TAC') only. One (South coast rock lobster) is managed in terms of a combination of a TAC and a total applied effort (sea day restrictions). The remaining fisheries are regulated in terms of a TAE only, which includes restricting vessel numbers or gear, crew numbers or sea days (or a combination of the three). There are no tax incentives or subsidies for South African fisheries.

In the main commercial fisheries, *Operational Management Procedures* (OMPs) are followed. OMPs are agreed procedures between scientists, resource managers and the fishing industry that are based on resource status. For example the annual resource assessment of small pelagic stocks (anchovy and sardine) considers both recruitment and biomass from two seasonally-conducted research surveys as well as the annual fishing mortality of the resource. If biomass is estimated to be below pre-determined critical levels, agreed annual reductions in allowable catches are automatically imposed, such that both resource sustainability and industry viability are not compromised.

Management of each commercial fishery obviously has specific conditions. Hake-trawl for example, apart from a limited catch (apportionment of the TAC), has a 110 mm stretched mesh (codend) limit, has seasonal bycatch controls of kingklip and monk and offshore trawlers are not permitted shallower than 110 m water depth. Recently (2008) the hake trawl fishery (70 boats), through a collaborative agreement with MCM, imposed sea-day limits on all operators as well – this is based on vessel power, catch rates and available catch. Hake-directed longliners (60-70 boats) also have an effort control regime (sea days based on hooks deployed and area fished) as well as bycatch limits for kingklip and other bycatch species. Inshore trawlers (20 boats < 30 m in length) are permitted smaller mesh nets (85 mm) but have limits on specific inshore bycatch species such as cob, a commonly caught commercial linefish species. Sole is also a targeted species by the inshore trawl sector with catch allocations apportioned between hake and sole. Note also that the hake trawl sector is a Marine Stewardship Council (MSC) certified fishery – the industrial body (South African Deep Sea Trawling Industry Association) as a condition of certification, has "ring-fenced" trawling grounds to limit the expansion of trawling from the historical areas trawled.

The midwater trawl-directed horse mackerel fishery is limited to 85 mm mesh and is only permitted to trawl east of 20°E. In the purse seine sector (small pelagic), net mesh is strictly controlled between anchovy and sardine and by-catches of each species, when targeting either anchovy or pilchard, are also strictly controlled.

In the rock lobster sectors fishers are managed by area and a combination of catch limits, gear restrictions (trap offshore, hoop net inshore) and closed seasons. There is also a recreational component that has seasonal and daily catch restrictions (four per-man). The deepwater fishery for South Coast Rock Lobster differs somewhat in that the fishery uses large industrialised vessels that either freeze or catch using traps on longlines for live export. As in the hake trawl fishery, these vessels (six at present) are managed by both output (tail mass) and input (sea day) controls.

Other effort (TAE) controlled fisheries include the squid fishery (2 422 crew and 136 boats), the tuna bait and pole fishery (3 600 crew and 200 boats) and large pelagics 50 rights (tuna, shark and swordfish targets). The commercial linefish sector is restricted to 450 boats and 3 400 crew as well as bag and size limits on most species.

¹² Griffiths *et. al.* 1999. New Management protocol for the South African line fishery. In: B.Q. Mann, Proceedings of the third South African Marine Linefish Symposium, Arniston, 28 April – 1 May 1999. SANCOR report No. 5:145-156

3.2.6 Fishing communities

Traditional fishing communities in the South African context are diverse and mostly poorly defined, in part due to the political history of the country, but also because of the highly diversified nature of fisheries, population demographics and the coastline. The allocation of long-term rights in part removed the "community" component by allocating rights to traditional fishers. This aspect of rights allocations, however, remains an issue and is presently (2009) subject to litigation. Around the coast, there are "traditional" communities that have depended on resources such as for west coast rock lobster, snoek, abalone, mussels, oysters etc. Special dispensations have been granted for example for traditional fishers to catch and sell rock lobster under strict bag limits. The communities that can best be described as "subsistence" fishers are found on the Pondoland (Transkei) coast and the northern coast of Kwazulu Natal. These communities living at the coast harvest inter-tidal organisms such as black and white mussels, oysters and limpets. The rights of "subsistence fishers" have been recognised and application can be made under section 13 of the MLRA Act. Section 19 of the Act makes provision for the formal identification of fishing communities and subsistence fishers.

3.3 Inland sub-sector

There are no inland commercial fisheries of any significance in South Africa. Recreational exploitation of freshwater fish on inland rivers and impoundments is extensive, with small subsistence fisheries in places. However, most freshwater or inland fisheries are related to a limited number of aquaculture developments.

3.4 Recreational sub-sector

South Africa has a large recreational fishing sector. The coastline is extensive and recreational fishing activities around the coast vary and have not been concisely quantified – the economic input of the recreational sector is however known to be substantial and relates to not only direct fishing activity but also all the associated downstream industries such as bait and tackle, boat construction and maintenance, accommodation etc. The main recreational sectors include :

- Rod and line (beaches and estuaries)
- Ski-boat (small harbours and beach launches) – linefish species including tuna
- Recreational diving – spearfishing
- Recreational diving for west coast and natal rock lobster
- Recreational hoop nets for west coast rock lobster (257 tonnes allocated for 2009/10)

3.5 Aquaculture sub-sector

Aquaculture management is presently divided into marine-based "mariculture" (managed by the Department of Environmental Affairs and Tourism, branch Marine and Coastal Management) and freshwater based "aquaculture" (managed by the Department of Agriculture). Mariculture operations include the production of abalone, black mussel, oyster, prawn, finfish and seaweed with abalone the most important of these in terms of volume and employment. This is a fast developing sector and it is estimated that South Africa supplies 21 % of the global market for farmed abalone. Abalone culture is well established, centred in the Hermanus area on the Cape south coast. There is also an experimental offshore farm (cage culture) off Gansbaai for salmon as well as new developments in offshore cage culture in Mossel Bay for cob (*Argyrosomus* sp.). There is an established grow-out facility for fingerlings in Gansbaai as well as developing land-based cultures for finfish in East London. In 2008, mariculture production was comprised of abalone (1 037 tonnes), oysters (227 tonnes), mussels (737 tonnes), prawn (11 tonnes), finfish (3 tonnes) and seaweeds (1 834 tonnes). With the introduction of finfish culture, mariculture production is expected to increase substantially.

Freshwater fish culture is severely limited by the supply of suitable water. However, trout or salmon farming is practised in the Western Cape and other highland areas of South Africa. Other freshwater species cultivated on a small scale include catfish, *Clarias gariepinus*, freshwater crayfish (maron) and tilapia species. After reaching a record level of 2 200 tonnes in 2003, the total freshwater aquaculture production has declined to a level around 1 400 tonnes in recent years.

4. POST-HARVEST USE

4.1 Fish utilisation and markets

The per capita consumption of fish products in South Africa (7.6 kg in 2007) is relatively low, but close to the average of sub-Saharan Africa (8.3 kg in 2005). Whereas South Africa's coastal communities have traditionally had diets high in fish, much of the inland population (which is significantly higher than at the coast) eat relatively little fish. The total annual commercial catch fluctuates depending on the catches of pelagic fish, (particularly of anchovy). For example, the total commercial catch in 2000 was 674 117 tonnes with a wholesale value of about ZAR 3.1 billion (USD 4.8 million). In 2008 the commercial catch approximated 643 686 tonnes, the fall in production mostly due to inter-annual variability of the small pelagic catch. The South African fishery sector is, however, also characterized by its substantial level of international trade, resulting in a significant net contribution to foreign exchange (primarily hake exports to Spain). South African exports of fish products outweigh imports, contributing significantly to the international whitefish trade.

The small pelagic fishery, which is the largest by volume, forms the bulk of the fish production. The sardine catch is used both as bait and is canned - it is a popular protein source whereas the anchovy is reduced to fishmeal and is either exported or used by the agricultural sector locally (exported volumes are dictated by price). The demersal fishery for hake dominates the export market with value-adding in processing plants in Saldanha and Cape Town. South African hake is an important contributor to the global whitefish market, exporting mostly to Spain. This market is diversifying into Europe and America particularly since MSC certification. Fresh longline-caught hake is exported directly to Europe and other value-added products (hake mostly) are also important fish products sold locally in supermarkets and fish shops.

There are many smaller processing plants scattered around the coast and in fishing ports – generally these do not add value to the different commercial catches, but process, freeze and pack for export. Similarly, in most of the industrial fisheries, freezer vessels operate processing and packing for direct export – this includes hake, squid and lobster.

With respect to the midwater trawl catch of horse mackerel, very little is eaten locally – the product is frozen whole on factory freezers and exported into Africa where there is demand for this bulk product as a source of essential protein. The squid jig fishery also use sea-based factory freezers and export directly to Europe with only a fraction of the local catch being consumed locally. Fresh and frozen lobster exports to Asian markets (mostly Japan and China, Hong Kong SAR) are also a valuable export commodity. The high price of rock lobster locally excludes most South Africans from consuming them, although recreational users do harvest a small component of the resource. Large pelagic stocks, mostly longfin and yellowfin tunas as well as shark (mako and blue shark) are exported whole and frozen. There is also a developing local fishery for sashimi-quality big-eye and yellowfin tuna that is utilised both locally and sold into Asia.

5. FISHERY SECTOR PERFORMANCE

5.1.1 Socio-economic contribution of the fishery sector to the national economy

Fishing contributes primarily to the economies of the coastal provinces with the majority (approximately 90 %) of the contribution to the national fishing industry derived from the Western Cape region¹³. Overall, the South African fishing industry experienced negative growth between 1994 and 1999 but has since shown positive growth. The

¹³ Karaan, M. and Rossouw, S., 2004. The Microeconomic Strategy Project: A baseline assessment of the fishing and aquaculture industry in the Western Cape. Study commissioned by the Western Cape Provincial Government. In: Hara, M, de Wit, M., Crookes, D. and T. Jayiya. Working Paper 6: Socio-economic contribution of South African fisheries and their current legal, policy and management frameworks. Institute for Poverty Land and Agrarian Studies.

contribution of fisheries to the South African economy (GDP) was approximately USD 323 million in 2008.

5.2 Supply and Demand

Demand for fish and related products is high, driven primarily by the export markets. Locally, demand is also high and the country generally absorbs as much as can be supplied. However, a controlling factor for fish exports is the ZAR¹⁴:USD or ZAR:Euro exchange rate. Strengthening of the South African Rand in combination with high fuel prices in the 2006-2008 years resulted in many fishing companies declining or being sold to bigger operators who could absorb the risk. The latter part of 2007 into 2008 saw a weakening Rand and lower oil prices and a subsequent improvement in export sales of fish and less sales on the local market. In 2009 the global recession also impacted demand of fish products from South Africa, in particular to Europe and the United States, resulting in many big suppliers being forced to cold store products or sell at sub-economic prices.

5.3 Trade

The main exports include fish fillets and lobster products but also crustaceans, tuna, skipjack, bonito, mackerel and octopus. Europe (and most notably Spain) is South Africa's leading market for exported fisheries products. Other countries include the United States, Australia, China Hong Kong SAR and Japan with recent increases in exports to South East Asia. The dominant countries taking South African fish products are :

- Japan – mostly tuna, squid, lobster and abalone
- Spain – whitefish, tuna, squid and all other fish products
- United Kingdom – whitefish and tuna
- United States – whitefish, lobster and tuna
- China – whitefish, lobster, fishmeal
- France – whitefish, lobster
- Australia – whitefish, fishmeal
- Mozambique – whitefish, mackerel

5.4 Food security

Fish does not play a major role in food security in South Africa. In localised coastal communities, there is dependence on fishing (subsistence). The country does, however, have a large rural community base and authorities are looking at alternative sources of protein. One of these, anchovy, is considered to have potential for direct human consumption (it is only used for fishmeal at present). In other parts of Africa, the supply of South African horse mackerel is in demand and contributes to food security in particular to West African countries and Mozambique.

5.5 Employment

As part of the evaluation of all South African fisheries prior to the issuing of medium-term rights in 2003, a comprehensive economic assessment was undertaken of the industry (Rhodes University Economic Sectoral Study, 2003). The results of this study showed that, in 2003, some 16 854 people were directly employed in the fishing industry (fishers) and that secondary and associated industries employed a further 10 876 people. Of the fishing sectors, the linefish sector employed the most (about 3 000), followed by the squid and deep-sea hake sectors. There is also a significant "recreational" component, with associated service industries. Employment in the coastal communities, including subsistence and artisanal fisheries, is also significant in areas around the coastline, but has not been quantified. In a broader context, DEAT runs an *Expanded Public Works Programme* that was reported to have created 13 1887 job opportunities and 459 permanent jobs in 2006/7.

¹⁴ South African Rand (ZAR)

5.6 Rural development

The development of fisheries in rural areas is limited. Inland small impoundments are exploited, but not at any significant scale. On the coast in the traditional rural areas of the Transkei and Ciskei, as well as further north on the eastern seaboard of Kwazulu Natal, subsistence fishing has been promoted.

6. FISHERY SECTOR GOVERNANCE

6.1 Constraints and opportunities

The fishing industry in South Africa is given relatively low priority as it only contributes a very small amount to national GDP. Fisheries do, however, play a much more important role in the coastal economies. Governance of fisheries, however, remains a national competence and is handled by a branch of the Department of Environment Affairs and Tourism. More recently, however, Marine and Coastal Management has been in a state of flux, possibly being moved to the Ministry of Environment or under the Ministry of Agriculture.

6.1.1 Government and non-government sector policies and development strategies

The Marine Living Resources Act (No. 18, 1998) establishes as objectives the achievement of economic growth, the development of human resources, capacity building and the creation of employment. Fisheries policy is founded on two principles: a) that fisheries resources belong to all of South Africa's people and b) that these resources should be utilised on a sustainable basis. Within MCM there are numerous policy initiatives influencing the governance of fisheries (apart from those established for each fishing sector when rights were allocated). For example a new *Mariculture Policy* has been developed with a view to promoting the development of mariculture. There is also an *Experimental Fisheries Policy* aimed at promoting the development of potential new fisheries, such as for octopus. Also, fundamental to the governance of fisheries, the allocation of rights, is now supported by a *Rights Transfer Policy*.

South Africa is a full member of several regional fisheries management organizations whose objectives are the management and conservation of shared fish stocks. These include the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the International Commission for the Conservation of Atlantic Tunas (ICCAT), the South East Atlantic Fisheries Organisation (SEAFO), the Benguela Current Commission (BCC), the Southwest Indian Ocean Fisheries Commission (SWIOFC), the Southern African Development Community (SADC) protocol on Fisheries, and the International Whaling Commission (IWC)¹⁵. Further, South Africa is a non-contracting participating member of the CCSBT and the IOTC.

In recent years, fisheries management and research has seen increasing participation of the fishing industry and non-government organisations. For example, fishing industry representatives and scientists actively participate and contribute to the Scientific Working Groups as well as the Resource Management Working Groups (RMWG) for each of the main fishery sectors.

¹⁵ Hara, M., de Wit, M., Crookes, D. and T. Jayiya. (2009). Working Paper 6: Socio-economic contribution of South African fisheries and their current legal, policy and management frameworks. Institute for Poverty Land and Agrarian Studies.

6.2 Research

MCM is the principal research organisation providing the basis for most of the fisheries management decisions. Research capacity focuses mostly on the assessment of the priority stocks. The research fleet also plays a major role in the activities of MCMs scientists. These include annual demersal trawl surveys for hake on both the west and south coasts and two acoustic surveys of small pelagic species. The results of these surveys (biomass estimates and biological data) input directly to the annual stock assessments and TACs set. In addition to independent surveys, research also focuses on fishing industry-based indices (such as catch per unit of effort) which are also instrumental in the assessment of the commercial stocks. MCM is supported by many outside organisations, contracted to conduct research on fisheries. These include stock assessment (University of Cape Town) and independent marine observer service providers.

There is also participation in international and regional research programmes including the Southwest Indian Ocean Fisheries Project (SWIOFP), the Benguela Current Commission, the Agulhas Somali Large Marine Ecosystem project (ASCLME) and numerous other smaller regional programmes. There are collaborative surveys and research with the EAF-Nansen programme using the RV *Fridtjof Nansen*. South Africa has committed to the Implementation of an Ecosystem Approach to Fisheries (EAF) and has a scientific Ecosystem Working Group contributing to the management of most fisheries. In addition, there are independent initiatives by NGOs developing a *Responsible Fisheries Programme* (WWF) as well as a strong collaborative approach to this work that includes a *Responsible Fisheries Alliance* between major fishing industry players and WWF. Further, supporting the EAF approach, has been the Marine Stewardship Council (MSC) certification of the hake trawl fishery, the first "African" fishery to be certified.

6.3 Education and training

Since democratic elections in 1994, South Africa has gone through a process of transformation. In this regard, fisheries have also been impacted. Apart from the transformation of the fishing industry through the reallocation of fishing rights, the management and research structures have changed to accommodate persons from previously disadvantaged backgrounds. Management of fisheries for example has many relatively new and inexperienced staff who have undergone training in specific disciplines. Numerous programmes are in place to develop skills, some supported by foreign countries, such as the Norwegian "NORAD" programme. Within the fishing industry training and education structures are formalised through the TETA (Transport Education Training Authority) – a compulsory (subsidised) programme aimed at developing skills in the fishing industry (such as survival at sea, fish processing etc). NGOs are also making considerable efforts to train fishers in Responsible Fishing and to promote ecosystem management.

6.4 Foreign aid

Foreign aid for the development of the fisheries sector in South Africa is minimal. Regionally the BCC is supported in part by UNDP and FAO funding. The ASCLME and SWIOFP research programmes are funded in part by UNDP, GEF and the World Bank loans. Norway, through the NORAD programme contributes to many aspects of fisheries research and social development (relating to fisheries). South Africa is a member of the African Union – a specific fisheries portfolio is being developed that will provide funds for fisheries development on a needs basis, but is still at an early stage of development.

6.5 Transnational issues and development

The South African maritime Economic Zone borders with Namibia on the west coast and Mozambique on the east coast. The EEZ also extends well south into Antarctic waters around the Prince Edward Islands. South Africa is a founder member of CCAMLR and works closely with that organisation with regard to the management of the Patagonian toothfish longline fishery in CCAMLR areas 58.6 and 58.7. A proposed offshore MPA around the Prince Edwards Islands is also under consideration. A marine protected area also abuts Mozambique and there is ongoing research into the development of Offshore MPAs that may have transboundary implications with Namibia. A critical transboundary

issue presently under consideration by the Benguela Current Commission is the status of the two hake species stocks between Namibia and South Africa. Presently the deep-water and shallow-water hake stocks are assessed and managed independently by the two countries. IUU is a global issue and one which South Africa is committed to address.

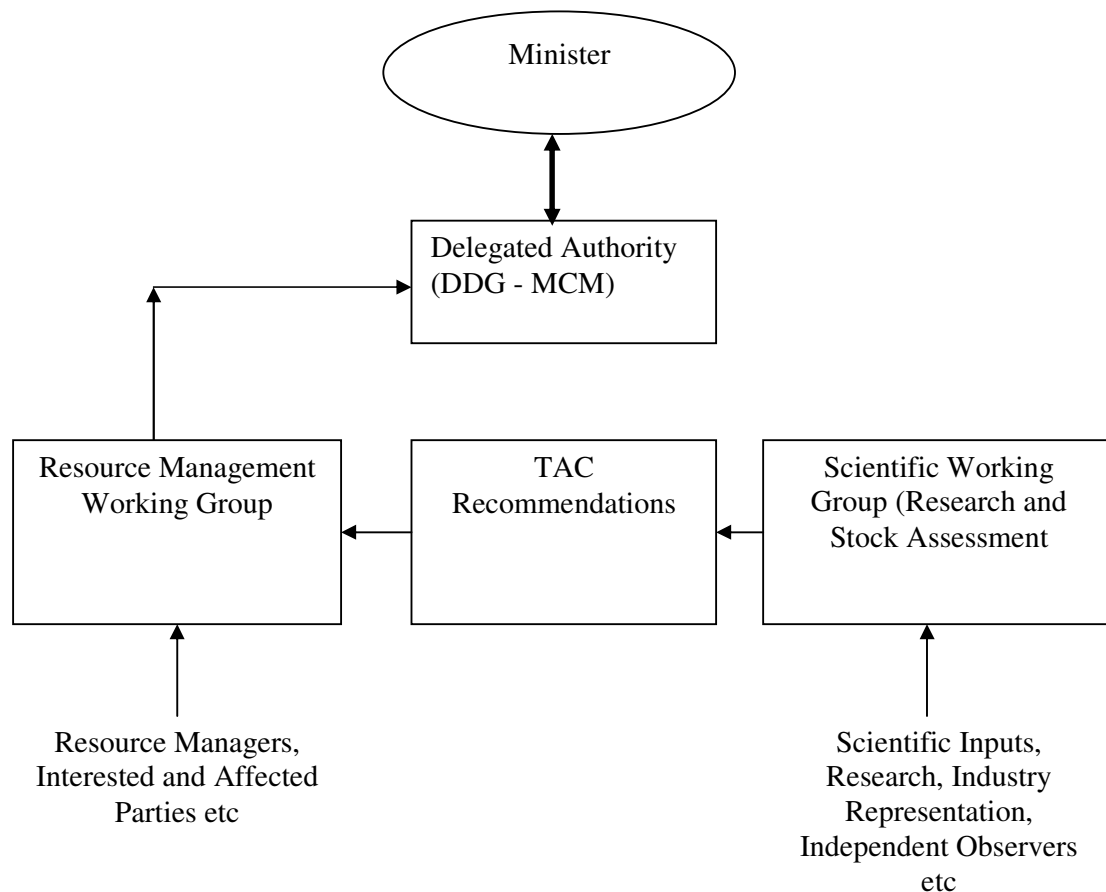
7. INSTITUTIONAL FRAMEWORK

Ultimate responsibility for fisheries and all management decisions lies with the Minister in the relevant Ministry (presently DEAT). The Minister may also delegate responsibility for some decisions, such as the annual issuing of TACs or the granting of "exemptions" for specialised projects, to the Deputy Director General (DDG) who heads up MCM. Within the Department of Environmental Affairs and Tourism, the branch *Marine and Coastal Management* was established in 2000 (formerly the Department of Sea Fisheries that included the Sea Fisheries Research Institute). An important overarching policy has been the commitment to the implementation of an *Ecosystem Approach to Fisheries* (EAF) by MCM – there are now concerted efforts to manage fisheries under an EAF regime including inputs to all management decisions by a specific scientific Ecosystem Working Group.

Within the MCM organisation there are different directorates - these include :

- Administration
- Research, Antarctica and Islands
- Integrated Coastal Management
- Monitoring Compliance and Surveillance
- Legal Resources
- Resource management

Compliance is maintained through a comprehensive monitoring, control and surveillance strategy, patrol vessels, officers and vessel monitoring systems. The Antarctic Islands (Prince Edwards Islands) are managed collectively with the fisheries research group and legal issues are also dealt with as an independent directorate. Integrated coastal management does not deal directly with fisheries, but is still a vital component when dealing with coastal zone and community-based fisheries. By way of example, the process of issuing the annual TAC for hake would be as follows :



8. LEGAL FRAMEWORK

Overarching Legislation

Fisheries in South Africa are managed as a national competence (rather than on a provincial basis). Marine and Coastal Management (MCM) within the Department of Environment Affairs and Tourism (DEAT) is the regulatory authority (based in Cape Town in the Western Cape Province) responsible for managing all marine and coastal activities, and the issuing of rights to commercial and subsistence fisheries¹⁶. Through a transformation process following democratic elections in 1994, new fisheries policies were developed for all commercial fishing sectors resulting in firstly four-year "medium-term" rights issued between 1998-2004 and thereafter long-term rights for up to 15 years¹⁷. There is no formal Individual Transferable Quota regime although fishing rights are transferable by specific application and is handled under a recently (2009) developed *Rights Transfer Policy*.

The principal regulatory framework governing fisheries management comprises section 24 of South Africa's Constitution and the Marine Living Resources Act of 1998¹⁸ (and associated regulations and specific permit conditions). Each commercial fishery sector therefore has a clear policy that provides guidelines for the issuing of fishing rights as well as a strategy designed to secure transformation of the fishing industry through a

¹⁶ Note that in December 2009 changes to departmental structures were pending with a split in the activities of MCM between the Ministry of Livestock and Agriculture and Tourism.

¹⁷ Different sectors had different rights periods applied

¹⁸ The Constitution of the Republic of South Africa, Act 106 of 1998

balance of maintaining an environment in which large companies would continue to invest and small companies would be able to develop. Separate management plans for each of the main fishery sectors are however still being developed. There are numerous other Acts that add to the marine legislative framework that work in conjunction with the MLRA. These include the National Environmental Management: Protected Areas Act (No. 57 of 2003), the National Environmental Management: Biodiversity Act (No. 10 of 2004), the Maritime Zones Act (No. 15 of 1994), Sea Birds and Seals Protection Act (No. 46 of 1973), Sea Shore Act (No. 21 of 1935) and the Nature and Environmental Conservation Ordinance, (Ordinance 19 of 1974).

In matters relating to fishing on the high seas, South Africa also applies to fishing permits specific conditions that might, for example, relate to conservation measures in CCAMLR and other RFMOs.

Figure 1 – Distribution of main commercial fisheries in South African waters showing main fishing ports

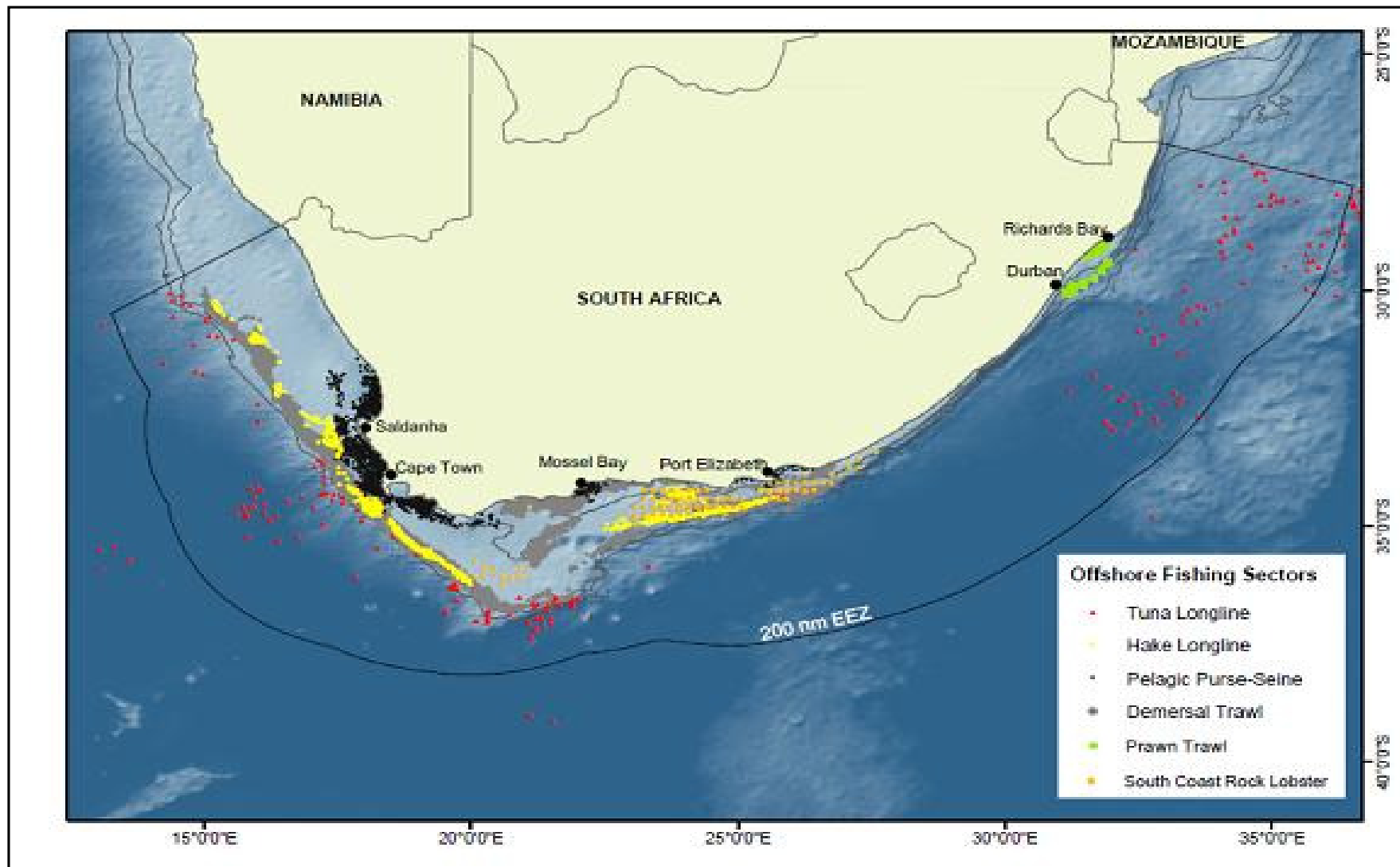


Table 1 - Major commercial species caught in South African waters with catch

Target Species	Annual Catch	Gear / Fishery	Main Bycatch	Main Ports in Priority
Cape Hake	Hake : TAC 2009 = 119 000 tonnes Catch 2008 = 126 000 tonnes Sole TAC 2009 = 871 tonnes	Bottom trawl, longline, hand line	kingklip, monk, snoek, dory, horse mackerel, sole	1. Cape Town 2. Saldanha 3. Mossel Bay 4. Port Elizabeth 5. Gansbaai
Sardine	Sardine TAC 2009 = 90 000 tonnes Catch 2008 = 126 000 tonnes	Purse seine	Anchovy, red eye pilchard and juvenile horse mackerel	1. St Helena Bay 2. Saldanha 3. Hout Bay 4. Gansbaai 5. Mossel Bay
Anchovy	Anchovy TAC 2009 = 569 000 tonnes Catch 2008 ~ 400 000 tonnes	Purse seine	Sardine, red-eye pilchard and juvenile horse mackerel	6. St. Helena Bay 7. Saldanha 8. Hout Bay 9. Gansbaai
Horse Mackerel	Precautionary Catch Limit 2009 = 48 000 tonnes	Midwater Trawl	Ribbon fish	1. Cape Town 2. Port Elizabeth
West Coast Rock lobster	TAC 2007 = 2 895 tonnes	Traps and hoops	Nil	1. Hout Bay 2. Kalk Bay 3. St. Helena
South Coast Rock Lobster	TAC 2009 = 733 tonnes (whole mass)	Bottom set traps	Minor - Octopus in traps	1. Cape Town 2. Port Elizabeth
Squid	4 -8000 tonnes annually 2008 Catch = 4 500 tonnes	Jig with deck boats TAE managed	Nil	1. Port Elizabeth 2. Port St. Francis
Shrimp	44 tonnes (2007)	TAE- Managed	Slipper lobster, linefish	1. Durban 2. Richards Bay
Tuna Bait and Pole	Albacore Catch (2007) = 3582 tonnes Yellowfin Catch (2007) = 19.1 t	Pole and line	Yellowfin Tuna Bigeye tuna Shark Yellowtail	1. Cape Town 2. Saldanha
Large Pelagic	Yellowfin Tuna (2007) = 958 tonnes Bigeye Tuna (2007) = 571tonnes Swordfish (2007) = 388tonnes Shark (2007) = 753 tonnes	Pelagic Longline	Albacore Tuna Mako Shark Blue Shark	1. Cape Town 2. Durban 3. Richards Bay 4. Port Elizabeth
Linefish (2007 Catch est.)	Snoek = 2 741 tonnes Cob = 312 tonnes Geelbek = 426 tonnes Yellow Tail = 461 tonnes	Hand line 18	Shark Other linefish	All ports, harbours and beaches around the coast

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