



WEST COAST ROCK LOBSTER

STATUS, TAC, PROSPECTS

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Registration No: 2012/178646/07

The West Coast rock lobster resource is managed by means of an Operational Management Procedure (OMP) for the determination of a global TAC. Key inputs into the OMP each year are:

- The commercial catch-per-unit-of-effort (CPUE) for both hoop net and trap fishing,
- The Fisheries Independent Monitoring Survey (FIMS) index, and
- The somatic growth rates.

The global TAC is divided amongst different sectors of the fishery (nearshore, offshore, interim relief, recreational), each of which is further divided and allocated to the following super-areas:

- Areas 1 and 2 (Port Nolloth and Hondeklipbaai);
- Areas 3 and 4 (Lamberts Bay and Elandsbaai);
- Areas 5 and 6 (Saldanha Bay Area);
- Area 7 (Dassen Island); and
- Area 8+ (Cape Point, east to Gansbaai).

1 BACKGROUND TO THE 2015/2016 TAC

The data facing the scientific work groups for the calculation of the TAC for the 2015/2016 fishing season was mixed and showed the following features:

- Stable lobster growth rates at Dassen Island, An increase in growth rate in Zone A, and growth rate declines elsewhere such as Cape Point and Lamberts Bay to Saldanha Bay
- CPUE declines at Area 8
- Signs of improving catch rates at Dassen Island (Area 7)
- Improved catch rates in Zone A (Areas 1+2) and Area 3+4
- Improved bakkie catch rates in Area 5+6.

Scientific activity in 2015 was dominated by the finalization of the OMP for the resource. Other topics that occupied scientific deliberations included:

- Finalisation of rules for the implementation of an inter-area tolerance for the WCRL Fishery
- Possible new estimates of poaching levels in the fishery / resource
- Indications from WWF that the SASSI rating of the resource could likely become red, citing problems with poaching and ecosystem effect, as well as widespread corruption within compliance as the main contributing factors.

A key factor that came up during the scientific deliberations about the OMP was that it was in fact possible to maintain or even increase the TAC and in theory achieve more than a 35% increase in the resource biomass. Notwithstanding this, the main stakeholders agreed to a relatively modest increase in the TAC within the framework of the 35% rebuilding strategy. Using the revised OMP for the resource, the global TAC recommended for the 2015/2016 season was **1924.08 MT** (a 6.83% increase from the value in the 2014/2015 season).

Aside from the rather profound risks facing the industry and members of the association as a result of pending changes to allocations surrounding the SSF policy, the main risks are:

1. A possible SASSI rating of red.
2. Poaching levels

3. Very high levels of depletion in the resource, driving ongoing conservatism in the management of the resource.
4. Persistent low somatic growth rates.

It is noted that the 80 MT experimental allocation made to Dassen Island would be retained for 2015/2016, although the SWG for WCRL was advised that normal fishing there may be possible starting in 2016/2017.

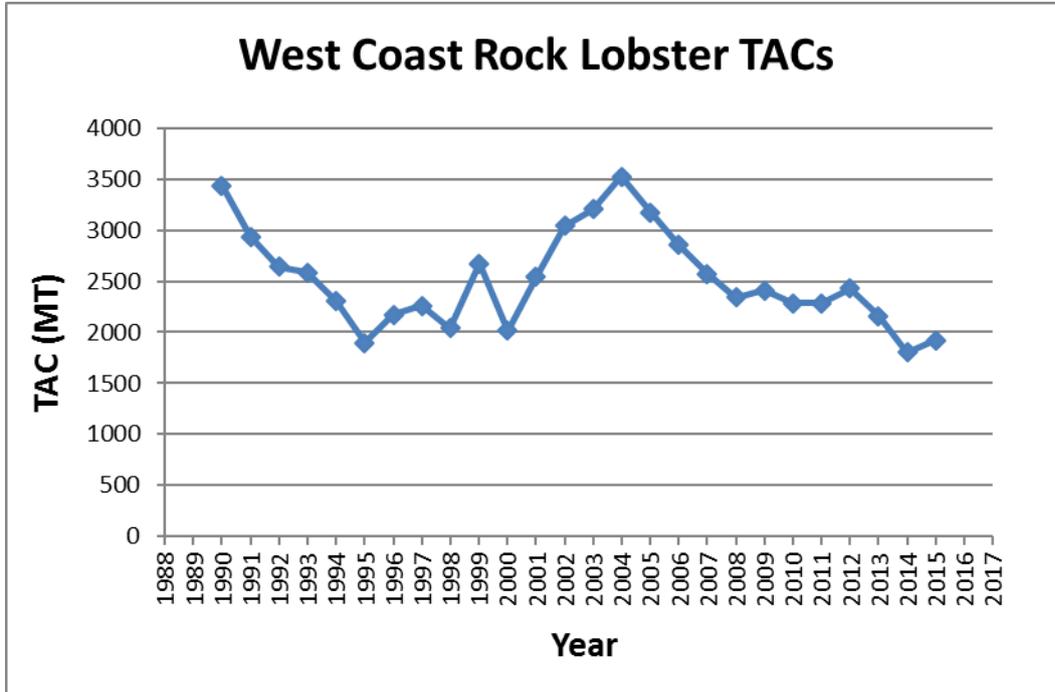


Figure 1: TACs for the West Coast rock lobster resource since 1990, up to and including the 2015/2016 fishing season.

2 MANAGEMENT ADVICE FOR THE RESOURCE FOR 2016/2017

As a result of revised assessments for the resource, the following headline points emerged during 2016:

1. The previous resource assessment had been carried out in 2015. At that time the resource biomass was estimated at about 2.5% of the pristine level. The 2016 assessment, using revised poaching scenarios, and new data, suggest the resource is 20% worse off than was estimated in 2015, at approximately 2.0% of pristine.
2. The 2015 assessment estimated that the resource was 7.8% larger in 2014 than in 2006, on track for the 35% rebuilding target. The 2016 assessment suggests that the resource in 2014 was 15% less than it was in 2006, missing the rebuilding pathway by a substantial margin.
3. High level projections show that if the TAC is set to zero then the resource does not quite achieve 35% rebuilding by 2021. If the TAC is kept at current levels than the resource biomass will remain at about 15% below the 2006 level, never achieving the 35% rebuilding target.

Some of the important results by super area are that:

1. Area 8+ is the main problem area. In this area the 2016 assessment suggests that the resource biomass declined from about 8000 tons to 4000 tons over the last 5 years. This area is very likely to reach exceptional circumstance conditions in a year's time. The reason for the decline is partly the elevated levels of poaching which are now assumed in the model, and revised model parameters, mainly recruitment, due to the new data (two more years of CPUE data showing continued declines in this area).
2. Area 5+6 shows strong growth with potential for a good TAC for hoopnets, but caution is needed in interpreting this result because the strong growth referred to is from a low base.

It is clear therefore that it will be necessary to reduce the TAC, and it is likely that this reduction will be quite large for 2016 / 2017. In July 2016 a proposal was developed to limit the season by area as a way to impose effort controls. The broad nature of the proposal is that about three months should be open to fishing in each Super Area, with some experimental fishing carried out in other months of the year, variable by area. The original proposal was that the experimental tonnages would form part of the TAC, but that these would be small amounts, comparable to the experimental tonnages presently caught monthly at Dassen Island. It appears that now these experimental tonnage proposals have been withdrawn. The intention is that greater compliance effectiveness will be possible if fishing is limited to a relatively short period of time. There are very serious socio-economic consequences of this which have been aired.

It is clear that the 35% rebuilding policy for the resource is an important high level policy objective. The scientific assessment that it may not be possible to attain this policy necessitates a rethink on the need to adhere to this policy. In general it seems that it will not be able to achieve the 35% rebuilding strategy unless something is done to reduce poaching.

3 SOUTH COAST ROCK LOBSTER: STATUS, TAC, PROSPECTS

Although both based on the exploitation of a spiny rock lobster resource, the economics of the South Coast rock lobster fishery is closer to that of the local hake trawl fishery than it is to the West Coast rock lobster fishery, viewed from the point of view of the capital and cost intensive nature of the fishing. To illustrate, the SCRL fishery is exploited from 9 vessels which range in length from 30 to 40 metres and deploy between 3500 and 6000 plastic traps per vessel. These plastic traps are deployed along a main line roughly 2 km in length and spaced such that each line carries between 150 and 200 traps. A typical set involves the deployment of 20 such lines and the usual configuration is to deploy two sets of 20 lines which are hauled on alternative days with an average soak time of 48 hours. Fishing depth ranges from 100 to 250 metres. Traps are winched collectively by line. Catch rates of in the order of 1 lobster per every three traps per set are typical in this fishery, yielding catch rates in the order of 0.1 kg / trap / pull on a tail weight basis. Crew complements per vessel vary between 25 and 40. The SCRL fishery is therefore a complex and high cost operation where running a vessel above its breakeven point requires careful management of vessel schedules, the selection of fishing locations, and capital financing options.

The South Coast rock lobster (SCRL) fishery is managed by a combination of input and output controls. The output control is a Total Allowable Catch (TAC) and IQs (Individual Quotas), and the input control is a Total Allowable Effort (TAE) which is a limitation on the number of fishing days. The TAC is the primary control measure. The TAE, based on a fishing day allocation, is a secondary measure. Up until the 2015/2016 fishing season, the TAE was designed to be an active constraint on the fishery roughly 1 in 20 years. It is important to note that the fishery is being managed by means of a management procedure (i.e. an OMP) in which the TAC is capped at 450 MT, and with an objective to rebuild the spawning biomass by 30% over the period 2006/07 to 2025/26, an increase in the rebuilding amount of 20% used in the previous OMP.

The following data are used in the management of the resource:

- Catch-per-unit-effort – measured as kg tails per trap set
- Catch-at-length data
- Tagging data

Figure 2 shows the TACs since the 1989. Based on its fishing experience during the 2013/2014 fishing season, in July 2014 an automatic 5% increase in the TAC for the 2014/2015 fishing season was considered as an option in the revised OMP formula. This measure was agreed to at the relevant SWG SCRL meeting in 2014, and resulted in a TAC for 2014/2015 of 359 MT. As was forecast during 2014 and given the increase in 2014/2015, a 5% TAC reduction became very likely for the 2015/2016 season, and this was the final outcome of the scientific deliberations during 2015.

The TAC for 2015/2016 is 342 MT tail weight.

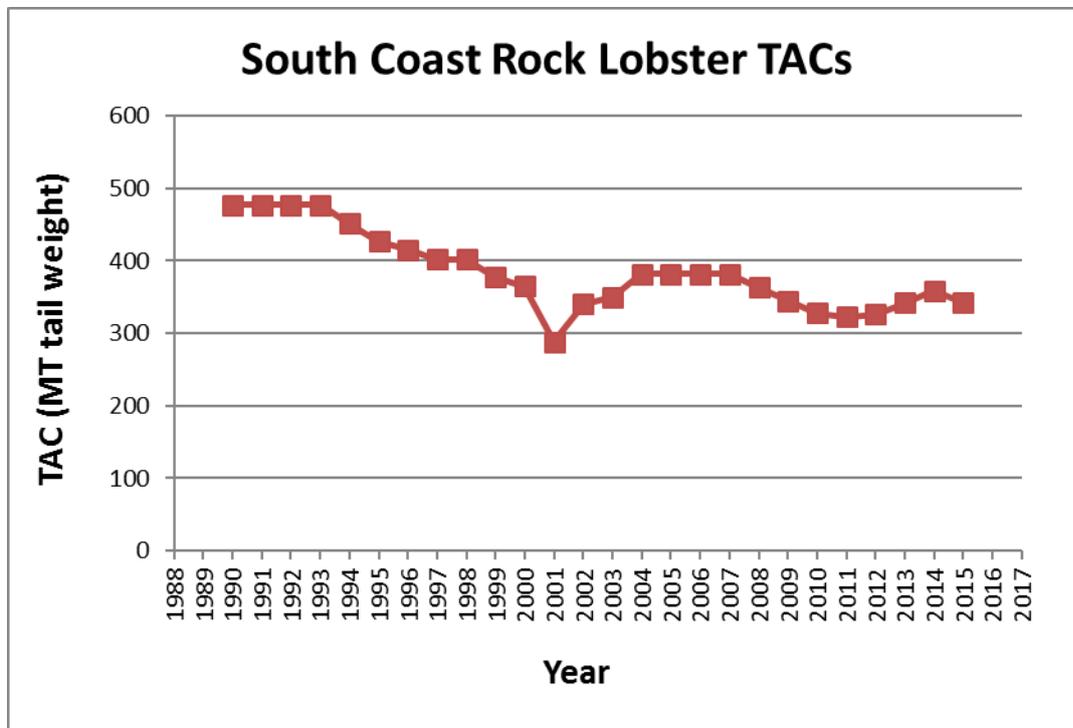


Figure 2: TACs in the South Coast rock lobster fishery 1989/90 – 2015/16.

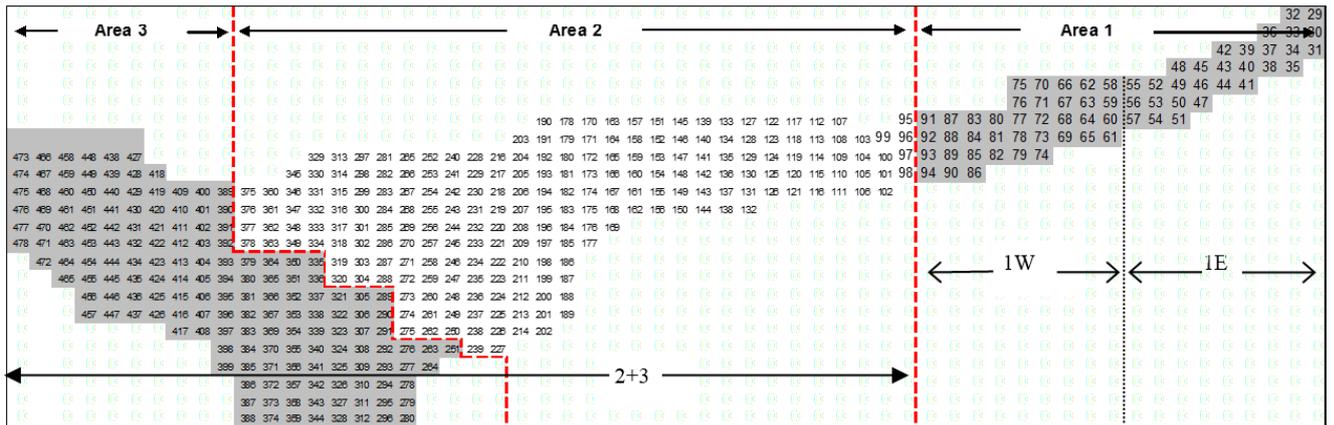


Figure 3: The fishing grounds showing the statistical areas that are used in the formulation of scientific advice for resource management, South Coast rock lobster resource.

An important development during 2015 was a revision of the effort controls (TAE) used in the management of the fishery. Up to 2014 the TAE was set on the basis of a 1:40, pool out basis. This means that the effort control, expressed as fishing days, was at a level of “tightness” that only in one year out of 40 would the industry have difficulty landing their TAC, because effort levels were too low. The pool out aspect means that a 10% buffer of fishing days would be held in reserve to assist worthy applicants with additional extra-ordinary effort. This pool amount is added on to the basic 1:40 years calculated number of fishing days. During 2015 as a result of an initiative by DAFF and an agreement between DAFF and the South Coast Rock Lobster Industry Association, the basis for the TAE was tightened to a level of 1:20 “Pool-In”, where the pool of 10% is subtracted from the basic number of fishing days calculated.

The TAC for the 2016 / 2017 fishing season is reliant on recent trends in CPUE in the three statistical areas that are used for collating data on the performance of the resource, Areas 1E, 1W and 2+3. The most recent complete records are available for the 2014/2015 fishing season. The available data shows that in Areas 1E and 1W the CPUE in 2014/2015 was slightly better than in 2013/2014. However, in Area 2+3 the CPUE in 2014/2015 suffered a moderate roughly 8% reduction. Area 2+3 is the most important CPUE in the overall TAC calculation since it is estimated to contain the overwhelming bulk of the resource biomass. Due as well to the selection of the 359 MT TAC for the 2014/2015 fishing season, there is likely to be a small negative correction in the TAC to levels slightly lower than the 342 MT level of 2015/2016. In that regard it is perhaps worth noting that 324.1 MT is the smallest TAC that is possible for 2016 / 2017 under the prevailing 5% reduction constraint built into the OMP formula. During 2016, proposals were tabled to introduce a so-called exceptional circumstances rule for the TAC in which under certain circumstances the TAC can be reduced by more than 5%. The proposal is that a reduction from a sliding scale of between 5% and 20% will be implemented whenever the mean CPUE over the last three years falls between two limit values, values it should be noted which are considerably lower than current levels. This rule will almost certainly play no role in the determination of the 2016/2017 TAC, and other options are yet to be tested in computer simulation studies before a final option is adopted. The main issue for consideration under this item is the role that the tightened effort control proposal plays, and whether and to what extent the nature of the sliding scale can be ameliorated when this aspect is factored into the simulation studies used to test the exceptional circumstances rule.

There are a number of emerging challenges facing this sector. The following issues are topical:

- Mining prospecting activity in SCRL fishing grounds
- Proposed exploratory phosphate mining on SCRL fishing grounds
- Proposed MPAs impacting on SCRL fishing opportunities, linked to the Phakisa initiative

The last of these, MPAs, were put up for public comment earlier this year, and the proposals which impact on the SCRL rock lobster fishing ground are summarised in Fig. 4. It appears that these are seen by conservation groups as, to some degree, a way of offsetting the conservation risks posed by the various mining proposals that are also part of the Phakisa initiative. There are no scientifically valid grounds which have been tabled to expect that MPAs will have any benefit for the South Coast rock lobster resource, one which is being effectively managed via TAC and TAE and other regulations. A number of these proposed MPAs, which are numerous and fragmented, cover parts of traditional SCRL fishing grounds. Therefore, in effect, the SCRL industry, as do other sectors of the South African fishing industry, faces a potential double impact and loss, due (a) to the looming mining activity, and (b) the MPAs that are proposed to offset the conservation risks posed by mining. The SCRLIA responded to the proposed MPAs by estimating the impact this will have on the fishery. Notwithstanding that some of the proposed MPAs do allow for SCRL fishing activity, the loss is estimated at about 5% of the annual turnover value of the fishery, which converts on a compounded Net Present Value basis with an infinite time horizon to an amount equivalent to an entire year of turnover value in this fishery. This matter is still under review, but the associated costs are very serious for this fishery and the SCRLIA is monitoring developments closely.

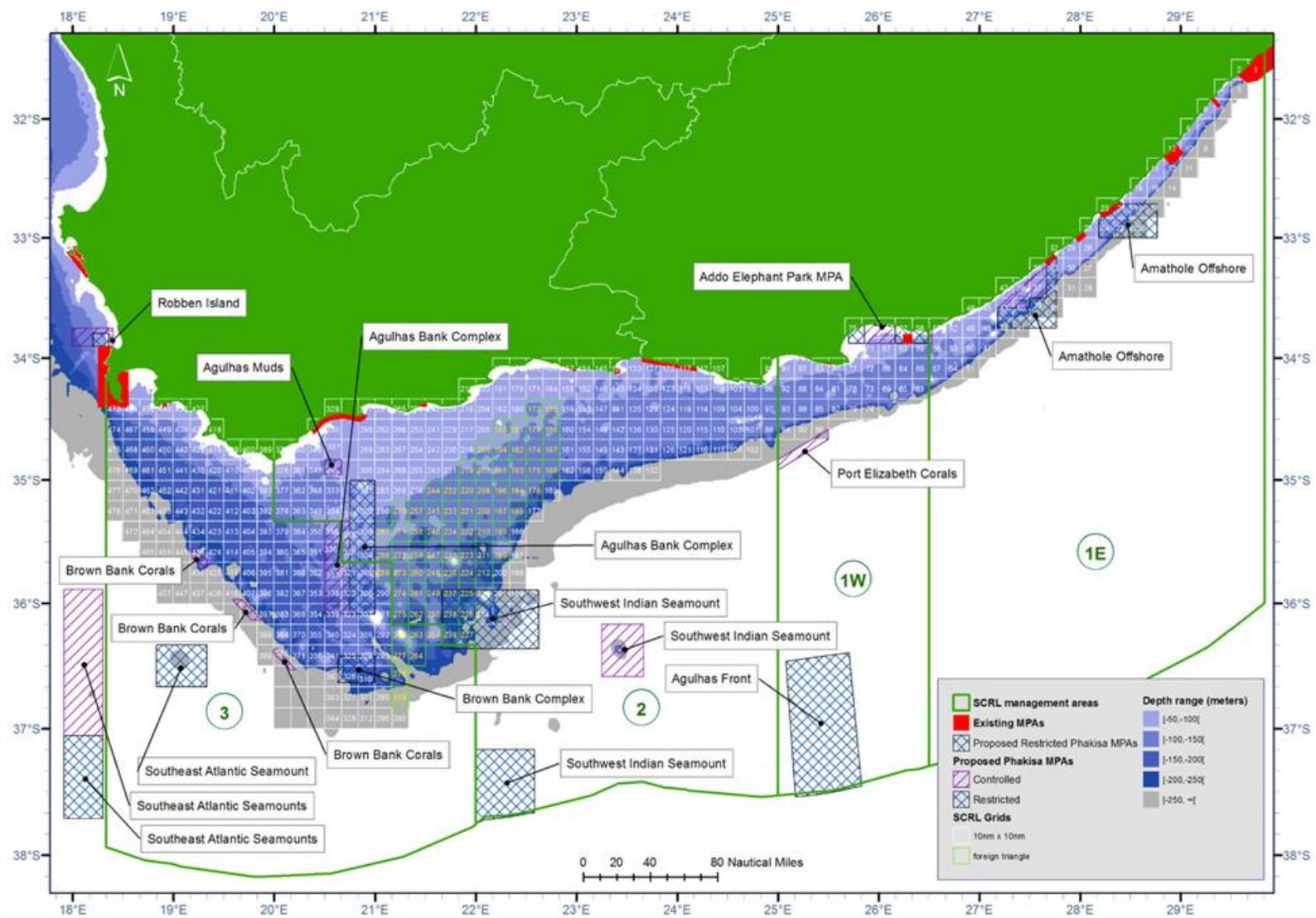


Figure 4. Proposed MPAs which occur within SCRL fishing grounds and which may impact on the economics of the fishery.

4 SQUID JIGGING INDUSTRY

The fishery is an effort controlled fishery, where effort is managed by a combination of vessel and crew allocation permits and closed seasons. A safe effort level is estimated for the resource on the basis of mathematical models which make use of the following data:

- jig catch data
- trawl catch data
- jig CPUE data
- trawl CPUE data
- spring survey biomass index
- autumn survey biomass index

The management of the resource was reviewed at an international workshop held at the University of Cape Town in 2012. Some of the scenarios submitted to this meeting suggested that there was very limited scope for increasing effort in the fishery. Since that time the catch rates in the fishery have declined, particularly in 2012 and 2013, and given the constant effort nature of the fishery, catches in 2012 and 2013 were substantially reduced compared to the period 2002 to 2011. As a result additional closed seasons were recommended for the 2014 fishing season.

The following is a summary of important milestones in the fishery:

- Total effort in the fishery rose between the period 1995 to 2010, even though the number of crew permits in the fishery remained essentially unchanged and the number of vessels was reduced. The catch rates peaked in the period 2008 and 2009 as did effort levels despite the existence of an additional closed season of 6 weeks duration in 2008, 2009 and 2010.
- Thereafter, from 2010 to 2013, catch rates declined to a low point, it seems likely that the recorded CPUE understates the extent of the overall decline in resource abundance. It does seem based on this sequence of events that the level that the effort reached reduced the recruitment reproductive capacity of the resource and that this caused the reduction in CPUE levels. The mathematical models do, for example, interpret the sequence of events as being due to a reduction in recruitment.
- Similarly low recruitment levels have been experienced in the fishery before, according to the mathematical models, but coincident with such high effort levels. The combination of the two caused the beginning year biomass in 2012 to be the lowest on record, and 2013 was only slightly larger. This led to very poor economic performance in the fishery.

The mathematical models of the resource suggest that the effort level in 2010 was 15%-20% higher than would produce an acceptable biological risk in the 2022 resource biomass - acceptable biological risk is defined as a 5% chance that the 2022 resource biomass will be less than 20% of the pristine resource biomass. The advisability of this measure of biological risk is of course debateable, any appraisal needs to recognise the semi-arbitrary nature of this risk measure. Nevertheless this has been used to drive the various proposals tabled at the squid SWG for effort reductions in the fishery. Two approaches to reduce effort were considered:

- **Reduce crew permits only:** One was to eliminate vessels which had previously underutilised their opportunities (i.e. days at sea) in the fishery. Under this approach the required 15 - 20% reduction in effort (to 250 000 man days) is achieved when the total number of crew permits are reduced by 57%. This calculation assumes that the vessels which remain in the fishery utilise an average number of fishing days as typical for each vessel in recent years.
- **Introduce an additional 4 month closed season, reduce crew permits slightly:** Another approach considered to achieve the 250 000 man days was to declare an additional 4 month long closed season, coupled with eliminating vessels which previously underutilised the time available for fishing. Under this approach the number of crew permits are reduced by about 7.6% from 2422 to 2238 crew permits by eliminating vessels that have underutilised seadays in the past. This calculation assumes that the remaining vessel do not increase their seaday usage per month beyond what was typical in recent years for the remaining open period of fishing.

Managers have for many years been concerned about the management of effort in the fishery, since data suggests that a large number of the 136 vessels in the fishery utilise far fewer than the available seadays. The effort that these vessels could use is known as latent effort. Without any additional closed seasons the full utilisation of this latent effort could theoretically double the amount of effort used, although the reality of trip turnaround times puts constraints on the maximum the effort can reach at less than double, but nevertheless above a safe effort level. As a result the proponents of the effort reduction options in the previous paragraph also proposed that effort permitted per vessel be capped at each vessel's historic effort level, suggesting that this could be monitored by VMS. The reality of latent effort is however strongly contested by industry representatives, they suggest that the data are either incorrect and/or that the majority of vessels are already turning trips around at close to the maximum level. In contradiction to this view, there were no significant reductions in fishing effort levels when additional closed seasons were declared in the past. Note that the actual catch and effort records for the 2014 and 2015 seasons provide an opportunity to verify or refute these positions. At the time of writing the 2014 effort data were not available and/or their acquisition fell outside the scope of this document.

The final management recommendations for 2014 and 2015 retained crew permits at 2422 and instituted an additional three month closed season instead of four months. No vessel specific effort caps were imposed. On paper, this amounts to far less than the desired reduction in effort. Calculations presented in this document indicate that the net effect of this measure is very little, if any, reduction in effort. The best available science predicts that as a consequence of these watered down measures there will be a larger than 5% frequency of resource biomass falling below 20% of pristine.

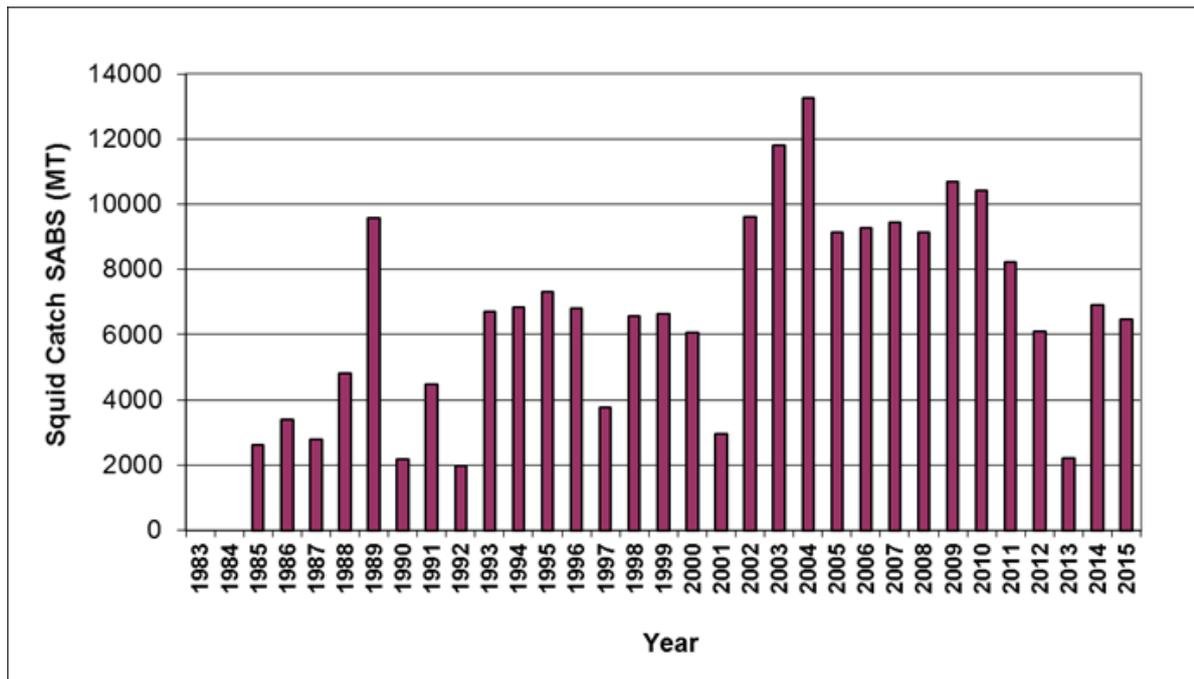


Figure 5. Catches in the squid jigging fishery 1985 to 2015.

Table 1. Table of effort controls and closed seasons for the squid jigging fishery.

Year	Effort Controls	Closed Season
2005	2423 unrestricted crew, 22 restricted crew	5 weeks Oct / Nov
2006	2423 crew or 138 vessels	5 weeks Oct / Nov
2007	2422 crew or 138 vessels	5 weeks Oct / Nov
2008	2422 crew or 136 vessels	5 weeks Oct / Nov + 6 weeks
2009	2422 crew or 136 vessels	5 weeks Oct / Nov + 6 weeks
2010	2422 crew or 136 vessels	5 weeks Oct / Nov + 6 weeks
2011	2422 crew or 136 vessels	5 weeks Oct / Nov
2012	2422 crew or 136 vessels	5 weeks Oct / Nov
2013	2422 crew or 136 vessels	5 weeks Oct / Nov
2014	2422 crew or 136 vessels	April, May, June + 5 weeks Oct / Nov
2015	2422 crew or 136 vessels	April, May, June + 5 weeks Oct / Nov