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STATUS AND MANAGEMENT OF THE SOUTH AFRICAN SQUID AND WEST COAST ROCK LOBSTER– 2018

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West Coast rock lobster: Status, TAC, Prospects

The global Total Allowable Catch (TAC) for the West Coast rock lobster resource is managed by an Operational Management Procedure (OMP) approach, similar to the management approach used for the hake, pelagic fish and South Coast rock lobster resources. However, because of exceptional circumstance, the TAC recommendations for the 2016/2017 and 2017/2018 fishing seasons have not used an OMP for setting the TAC. Additionally, the approach to the formulation of scientific advice for the 2018/2019 season does not use a fixed pre-agreed formula, but recommendations have rather been developed ab initio.

The global TAC is divided amongst different sectors of the fishery (nearshore, offshore, interim relief (to change), and 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, and east to Gansbaai).

The trend in the WCRL global TAC since 1991/1992 is shown in Figure 1.

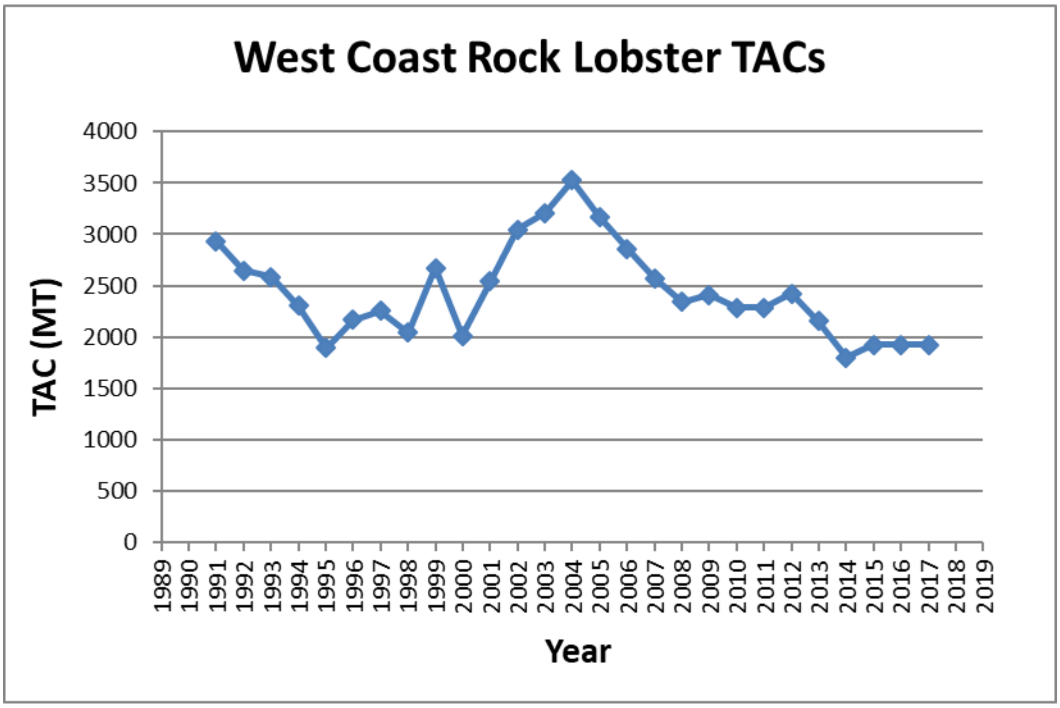

Figure 1. TACs for the West Coast rock lobster resource, 1991/1992 to 2017/2018 fishing seasons. In this plot 1991 refers to the 1991/92 fishing season.

<u>Management considerations for 2017/2018</u>

<u>TAC</u>

Based on all of the information available at the time that the final scientific deliberations took place, it was clear that

- The 35% rebuilding strategy for the resource cannot be achieved in the face of a poaching level of 1475 MT. Even if the legal global TAC was to be set to zero, the maximum rebuilding level that is possible is 27%.
- That should a status quo TAC of 1924.5 MT remain in place, then the resource would suffer a 15% decline in resource biomass over the planning horizon.

- A catch of somewhat less than 1200 MT is estimated as the level that will hold the resource biomass steady without any rebuilding taking place.

It seems therefore that if there is going to be any prospect for resource rebuilding (for the 2016/2017 TAC the WCRL SWG opted for a 7% rebuilding target), then a TAC recommendation substantially less than 1924.5 MT, and even less than the resource biomass stabilising catch of 1200 MT, would be required and was likely to be recommended by DAFF scientists.

This meant that the scientific process was likely to recommend, and management possibly to implement, for the first time in the history of the fishing, a legal TAC which was smaller than the estimated level of IUU catch in the fishery. This was a sobering assessment of the state of the fishery, and the capability or lack thereof of the management authorities, who have until now taken a reactive stance to the massive problem with IUU fishing, choosing to reduce the TAC in response to escalating levels of poaching estimates. We have seen the consequences of this process for the commercial sector in the abalone fishery – it is staggering how quickly a similar situation has become the reality for the WCRL resource and fishery.

The final TAC decision for the resource for the 2017/2018 fishing season was to maintain the status quo TAC of 1924 MT. The difference between the scientific recommendation for a large reduction in the TAC, and the decision to set a status quo TAC, has been widely publicised and was the subject of a court case between WWF and DAFF.

The 2018/2019 TAC

The scientific process to provide advice on the TAC for 2018/2019 has followed a very similar route to the process underlying the recommendations made for the 2017/2018 fishing season. As in that case, recent and possible future trends in IUU catch levels are one of the main drivers of the level of the available commercial catch. Other input information are data on CPUE, survey results, and somatic growth rates, as well as information on the size and sex structure of catches. Major areas of uncertainty are possible future recruitment levels and somatic growth rates for the resource. ***Given the legal disputes that have accompanied the management of the resource, the details of these deliberations are very sensitive and cannot be divulged publicly at this stage. Indeed the authors are embargoed from releasing much of the information.*** However given the well-known prevalence of IUU fishing in the sector, the severely depleted state of the resource, and the dictates of sustainable fishing principles, it seems reasonable to conclude that the scientific advise will call for a substantial reduction in the TAC for 2018/2019.

It can be noted that in response to inputs from an international review workshop which was run in November and December of 2017, the methodology to estimate the trend and level of IUU fishing has been substantially reviewed and improved, although many areas of uncertainty remain. The levels of locally consumed IUU catch is one of the main areas of uncertainty.

EFFORT CONTROLS.

In 2017/2018 the scientific committee for West Coast rock lobster had proposed that, in an attempt to limit effort in the fishery, and to allow compliance personnel to focus their energy more effectively, shortened fishing seasons which are different in different management super-areas would be put in place. These new fishing seasons are likely to remain a feature of the management system for the fishery for the 2018/2019 fishing season, although revised in response to stakeholder input.

South Coast rock lobster: Status, TAC, Prospects

Although also 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 operation. The SCRL fishery is conducted 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 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 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. 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 fishery is being managed by means of 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 1989/1990 fishing season, and up to the 2016/2017 fishing season.

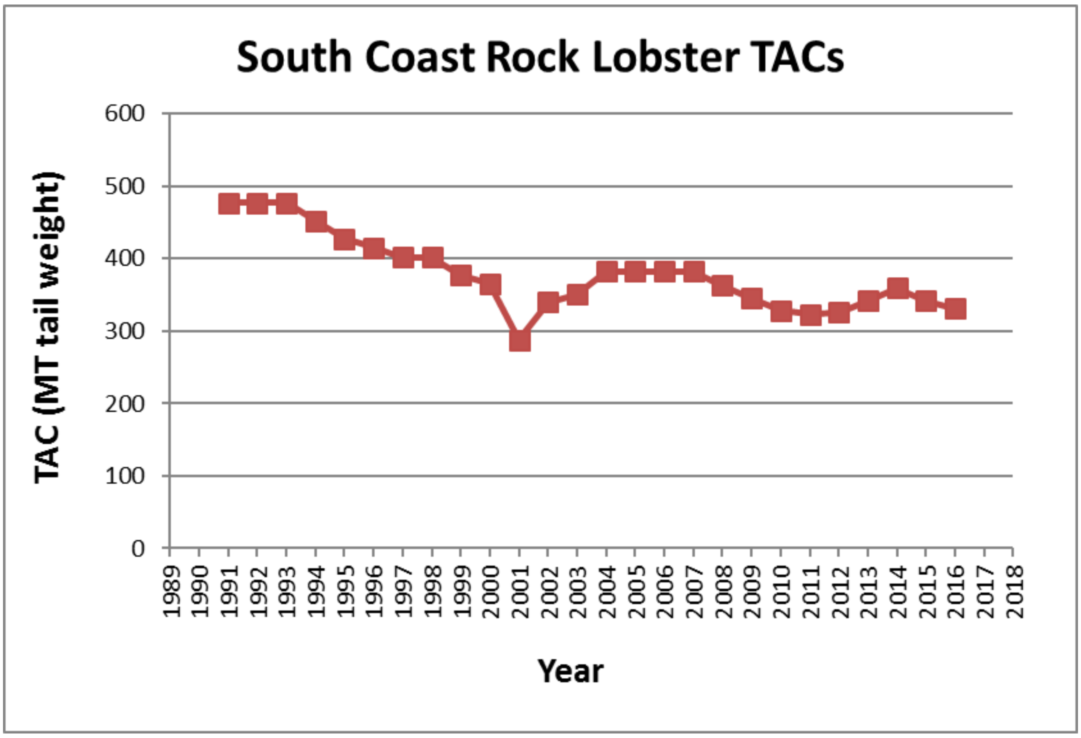

Figure 2. TACs in the South Coast rock lobster fishery 1989/90 – 2016/17.

Summary of recent TAC decisions

2015/2016: 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 was 342 MT tail weight.

2016/2017: The TAC for the 2016 / 2017 fishing season was 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 data showed 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 an 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 was a negative adjustment in the TAC for 2016/2017 to 331 MT.

TAC for the 2017/2018 season

The standardised CPUE indices up to 2015/16, as split into the three statistical area 1E, 1W and 2+3 show that the CPUE has decreased by less in 1E and 1W than was anticipated based on early intelligence of CPUE trends, and the decrease in 2+3 was more than expected. Since 2+3 dominates the OMP formula, the dominant feature is the larger than expected decline in CPUE in that area. This has implications for the 2017/2018 TAC. Calculations suggest that a small increase of a few percentage points (less than 3%) will occur for the TAC for 2017/2018 compared to 2016/2017. The reason that the TAC will increase despite a decline in the CPUE is because the OMP is based on the three-year running mean CPUE. The value for 2012/2013, which has a low CPUE value, falls out of the average, which for the 2017/2018 season is based on results for 2013/2014, 2014/2015 and 2015/2016. This leads to an increase in the running mean CPUE in 2017 compared to 2016.

The 2017/2018 TAC was set at 338 MT tail weight.

Revision of the OMP for the South Coast rock lobster resource

The OMP for the SCRL resource was originally scheduled for revision so that a new formula could be used to set the 2018/2019 TAC. Many factors conspired to make it almost impossible for the available staff to carry out the work necessary to revise the OMP for the resource. Thus the previous OMP was used to set the TAC for the 2018/2019 fishing season.

TAC for the 2018/2019 season

The standardised CPUE indices up to 2016/17, as split into the three statistical areas 1E, 1W and 2+3 shows a decline in all these areas. The main feature of these data is however that the three year running mean CPUE will lose, for Area 2+3, a high point in 2013/2014, and gain a low point in 2016/2017, and it therefore decreases by enough to cause a reduction in the TAC for the 2018/2019 TAC, when inputted into the OMP formula. The main reason for this is also because Area 2+3 dominates the OMP formula. Any reduction in the TAC is limited to a maximum decline of 5%, and preliminary calculations suggest that this reduction will be less than 5%.

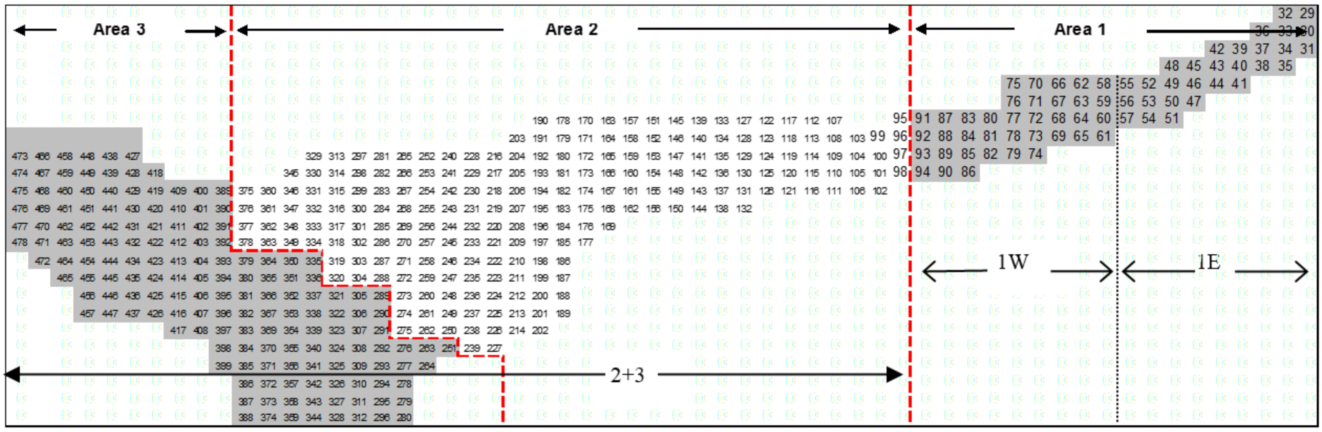

Figure 2. The fishing grounds showing the statistical areas that are used in the formulation of scientific advice for resource management, South Coast rock lobster resource.

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 from demersal trawl surveys
- autumn survey biomass index from demersal trawl surveys

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 the scope for effort increases in the fishery are limited.

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

- Total effort in the fishery rose between the period 1995 to 2010, while the number of crew permits in the fishery remained 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.
- From 2010 to 2013, catch rates declined to a low point. Although it may be that the effort level reached a point at which it impaired the recruitment reproductive capacity of the resource, similar declines in the availability and/or productivity of other resources (notably sole and horse mackerel) at about the same time suggests that the experience in 2013 was more likely an environmentally driven event.

The mathematical models of the resource suggest that the effort level in 2010 was 15%-20% higher than would produce a 5% chance that the 2022 resource biomass would fall less than 20% of the pristine resource biomass. Any appraisal of this result needs to recognise the semi-arbitrary nature of this risk measure. Nevertheless, this was a motivation for proposals 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 under-utilised 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 a target effort level of 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 are concerned about latent effort in the fishery which could increase effort levels. 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. The final management recommendations for 2017 and 2018 retained crew permits at 2422 and instituted extra seasonal closures during April, May and June, additional to the regular five week closure during October and November. 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.

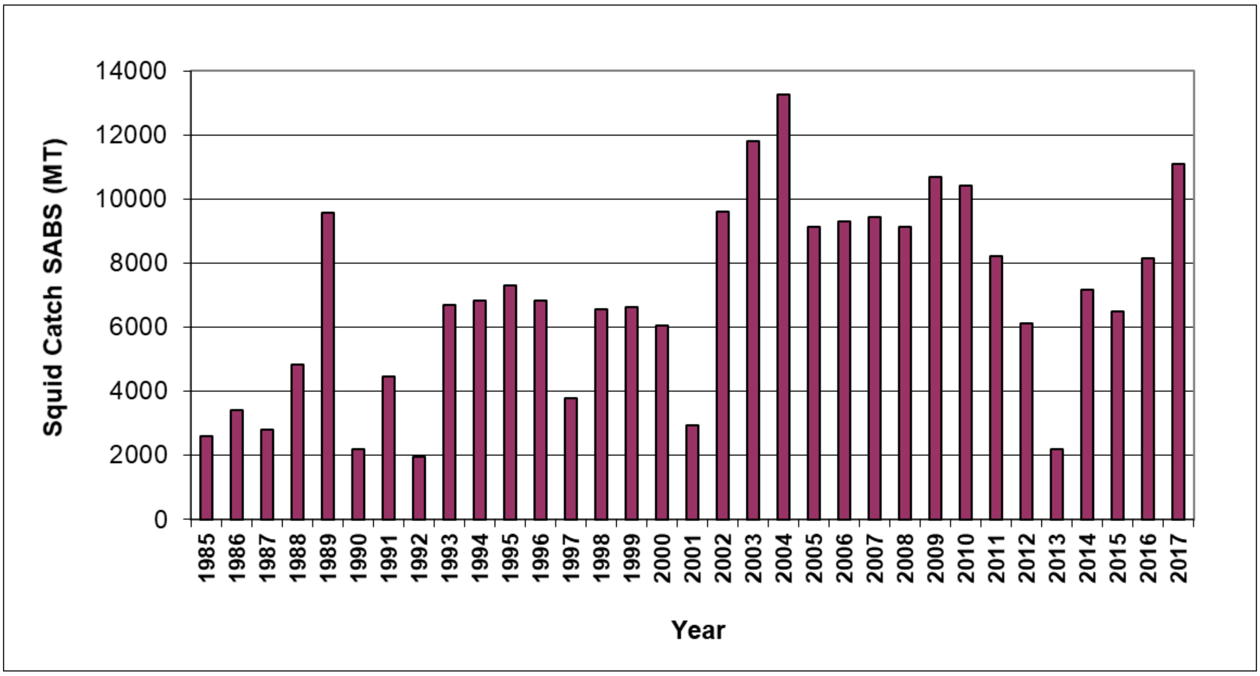

Figure 4. Catches in the squid jigging fishery 1985 to 2017.

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
2016		April, May, June + 5 weeks Oct / Nov
2017		April, May, June + 5 weeks Oct / Nov
2018		April, May, June + 5 weeks Oct / Nov

Updated assessment results, 2016

In 2016, updated stock assessment results were produced for squid (FISHERIES/2016/OCT/SWG-SQ/25). The main conclusion from this work was that effort in the fishery be maintained at 250 000 man-days. This work also reported jig CPUE indices for a core set of vessels that are used in the scientific process. These are shown below, and they indicate a period of reduced CPUE levels since 2010 compared to the decade prior to 2010. Abundance levels for 2014 and 2015 derived from demersal research cruises are reduced compared to the average for the period 2000 – 2010.

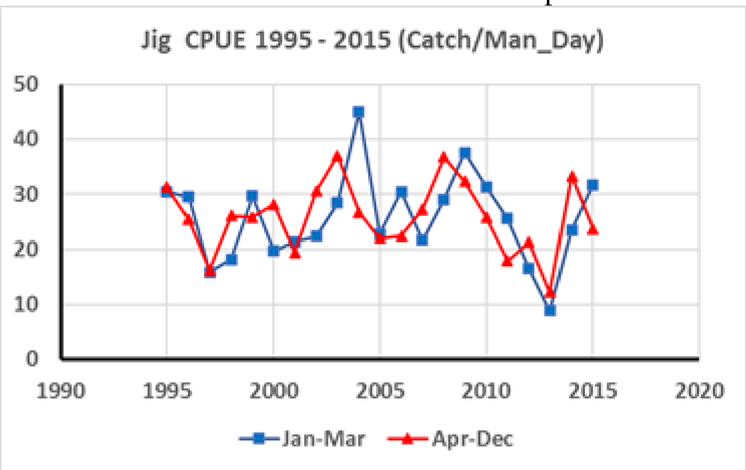

Figure 5. CPUE for squid derived from jig vessel catches.