



agriculture, forestry & fisheries

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Considerations on management of the chokka squid jig fishery with reference to the pending FRAP 2020 allocation of fishing rights and implementation of Small Scale Fisheries

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Summary

The South African squid jig fishery is primarily managed using effort control. The management objective for the fishery is to cap effort at a level that secures the greatest catch, on average, in the longer term without exposing the resource to the threat of reductions to levels which future recruitment success might be impaired or catch rates drop below economically viable levels. Assessments of the dynamics and status of the resource, and subsequent scientific advice on the management of the jig fishery targeting the resource (primarily expressed as a Total Allowable Effort recommendation), are based on an effort metric of person-days. The current TAE is set at 270 000 person-days. Fishing Rights are, however, allocated in terms of the number of fishers that are permitted to operate in the fishery (2 451 fishers). This mismatch has required that within the current structure of the fishery an additional closed season has had to be implemented to ensure that the management objective for the fishery is not compromised. The implications in terms of the pending 2020 allocation of fishing rights and establishment of a Small Scale Fishery are discussed, and alternative management scenarios are explored.

Background

A detailed assessment of the squid resource was conducted in 2013 (Glazer & Butterworth 2013a) in circumstances where the Total Allowable Effort (TAE) had been appreciably exceeded over the period 2009 – 2011 (Figure 1), annual catches and the CPUE index of abundance had markedly declined over the 2010 – 2013 period (Figures 2 and 3), and the FRAP 2013 allocation of Rights was in progress. Results of the assessment showed that the

resource was not as productive as previously thought, and also indicated that several years of below-average recruitment had occurred over the period 2010 – 2013.

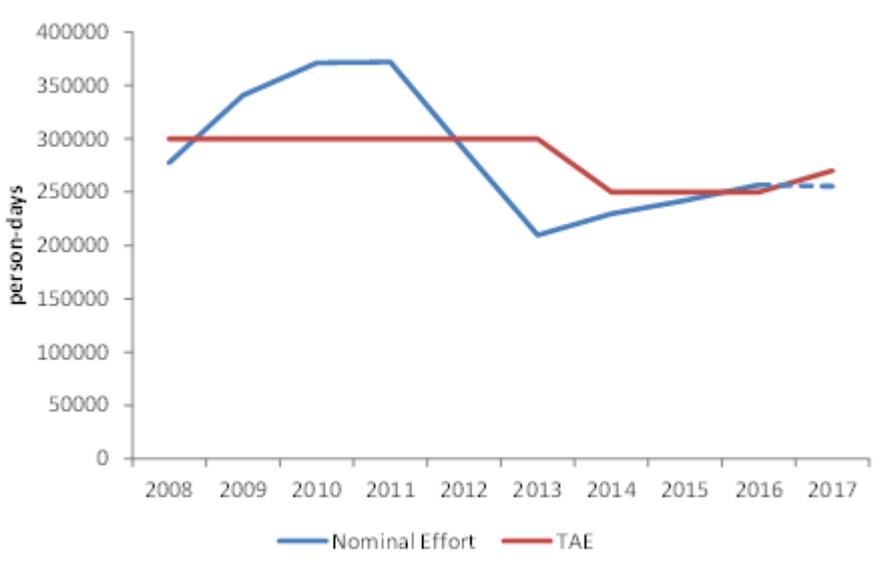


Figure 1: Nominal effort (person-days) exerted by the squid jig fishery and the TAE over the period 2008 – 2017 (note that the 2017 value is preliminary pending data validation that is still in progress)

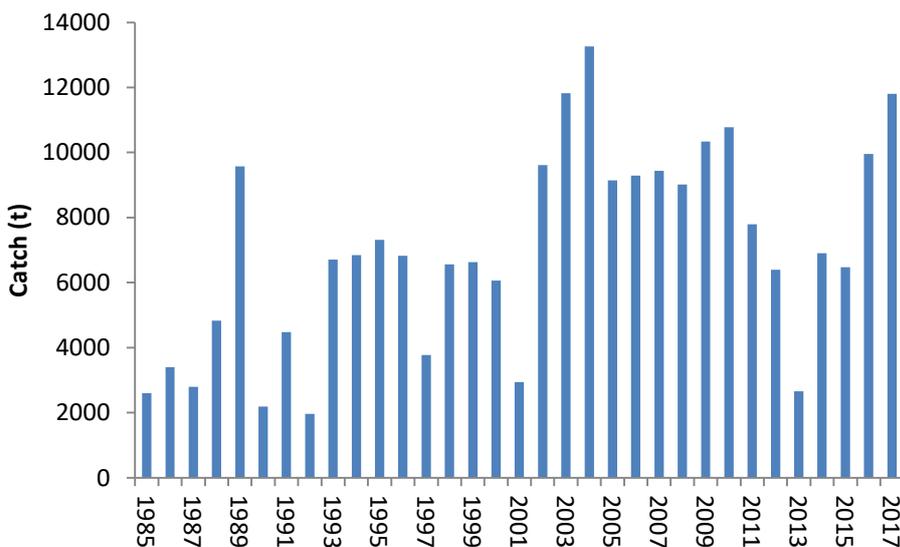


Figure 2: Annual chokka squid catches by the jig fishery over the period 1985 – 2017.

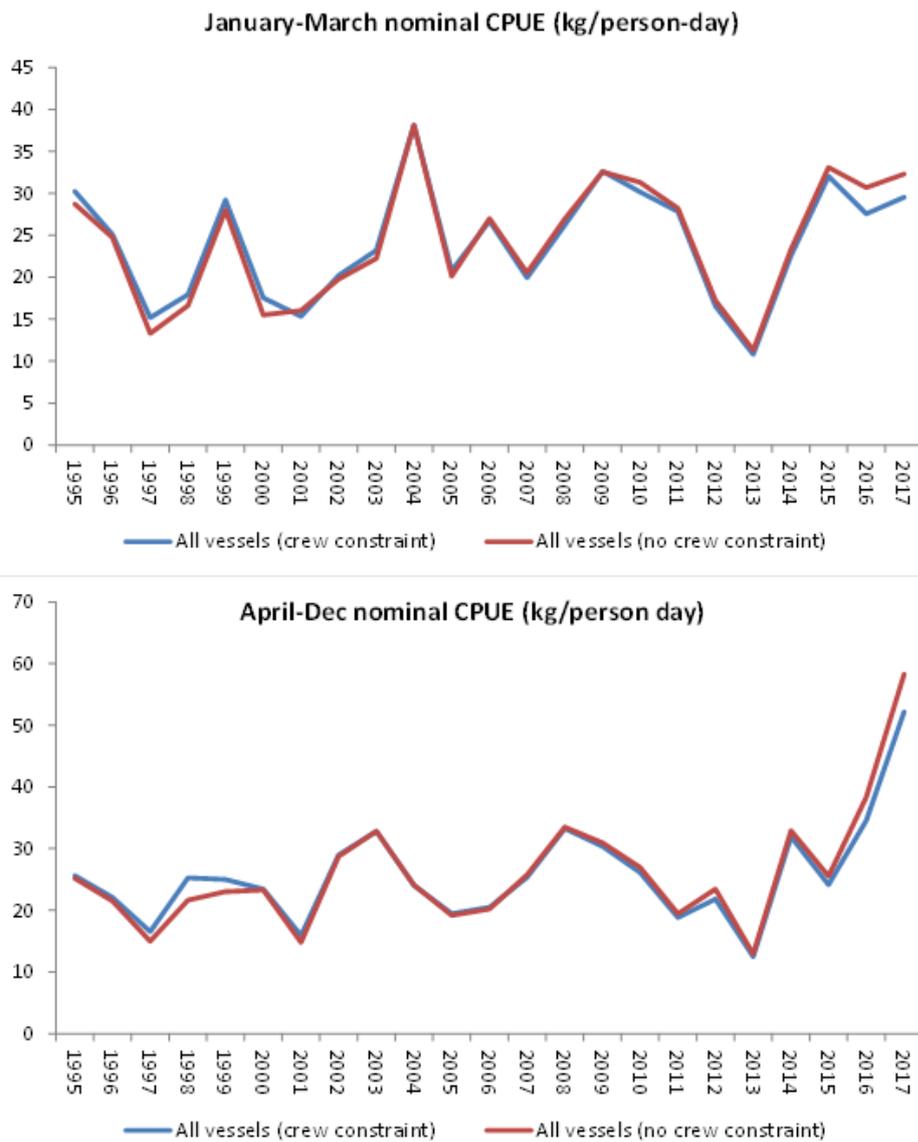


Figure 3: Nominal jig CPUE indices for the January – March and April – December periods, shown for all vessels in the squid jig fishery with and without the crew constraint ($3 \leq \text{crew} \leq 20$).

While the decline in catches, CPUE and recruitment may have been attributed to the 2009 – 2011 excess effort, the Squid Scientific Working Group (SSWG) could not ignore anecdotal reports of anomalous environmental conditions on the South Coast over the period 2011 – 2013, which may have been responsible for similar observations of declining CPUE and catches in other South Coast resources (most notably Agulhas sole and horse mackerel). In view of these results, the Squid Scientific Working Group considered that a reduction in the Total Allowable Effort (TAE) from 300 000 to 250 000 person-days was appropriate (Glazer & Butterworth 2013b). This indicated that a reduction in the number of fishers permitted to participate in the fishery was required. On conclusion of the FRAP 2013 process, however, it was established that the number of fishers permitted to participate in the fishery had remained at 2 422 (and by 2016, had in fact increased to 2 451 following the finalisation of the FRAP Appeals process). Considering that there is scope for all fishers to fish for 228 days a year (the maximum number of days a commercial vessel has been observed to fish over

the course of a year), this implies a potential for a maximum realised effort of slightly more than 690 000 person-days (although it is recognised that not all vessels in the fleet operate at this level, and currently the average number of days fished across all vessels is 110).

In an endeavour to accommodate the 2 422 fishers and maintain the target effort level, advice was given that the number of fishing days would have to be reduced (Anon 2013a; Anon 2013b). Calculations indicated that a 4 month closed season (additional to the standard October-November closed season that has been in place to minimise disturbance of squid spawning activity) would be required to achieve the necessary effort reduction. In an attempt to ameliorate the socio-economic impacts of this measure, it was advised that this additional closed season should be implemented in a phased approach. It was consequently recommended that a 3 month additional closed season be implemented for the 2015 fishing season, but that the performance of this measure in achieving the required effort reduction should be monitored and its duration adjusted in subsequent fishing seasons if necessary (Anon 2014). The 3 month additional closed season has been implemented since the 2015 fishing season, and realised effort levels have, with the exception of a slight (2.7%) overshoot in 2016, remained within the TAE. Adjustment of the duration of the additional closed season has consequently been considered to be unnecessary to date.

An updated assessment conducted in 2016 provided a refined estimate of resource productivity, which was slightly greater than that estimated by the 2013 assessment. The results indicated that the target effort level of 250 000 person-days could be revised upwards to 270 000 person-days. The TAE for the 2017 fishing season was revised accordingly (Anon 2016), and subsequently maintained for the 2018 fishing season.

Division of the target effort level (270 000 person-days) by the number of fishers (2 451 persons) indicates that fishing should be limited to an average of 110 fishing days per person so as not to exceed the target effort limit. This suggests that a 4 month additional closed season remains the appropriate measure to limit effort at this time.

The SSWG has been advised that chokka squid will be incorporated into the “basket of fish” that will be made available to small scale fishers (presumably during the FRAP 2020 process), and that the intention is to apportion 25% of the squid TAE to the Small Scale Fishery. The implications of this development under various allocation and management scenarios are explored below.

Note that in the commentary below, it is assumed that the fishing mortality exerted by small scale fishers will be the same as that that has been observed for existing commercial fishers, and that any fisher has the scope to fish for a maximum of 228 days over a 12 month period (this is the maximum number of days at sea that has been observed in the existing fishery). It is further assumed that the fishing behaviour and efficiency of the commercial fishers will

remain the same as before the establishment of the Small Scale Fishery. Once data on the performance of the two components of the fishery are available (probably after 2 to 3 years), calculations can be conducted to refine and adjust the management measures as required.

It should be further noted that the standard closed season (typically of 5 weeks duration during October – November each year) should be applied to all components of the squid fishery (i.e. both commercial and small scale). This closed season has been established for biological reasons, that is, to limit disturbance of squid spawning aggregations during the peak spawning season. References to the additional closed season in the commentary below are to a closed season implemented during the winter months each year (typically from March/April –July) with the specific objective of restricting fishing effort to ensure the TAE is not exceeded.

Possible Allocation Scenarios and Management Implications

In evaluating possible allocation and management scenarios, a range of plausible future TAE values is used to illustrate scenarios and their implications. It must be recognised that the TAE will change over time, depending on the status and productivity of the resource. These changes will manifest in changes to the management measures required to ensure that realised fishing effort does not exceed the TAE.

1) *Fishing Rights are allocated to entities (individuals, commercial companies, small scale co-operatives) in terms of person-days, with each Right being granted as a proportion (%) of the Total Allowable Effort (TAE):*

The actual number of person-days available to a Right Holder for any given fishing season would then be the product of this proportion and the TAE set for that fishing season. Operationally, the Right Holder would exercise their Right by balancing the number of fishers deployed during a fishing season with the number of days spent fishing. As an example of the trade-offs involved, Table 1 shows the maximum number of fishers that could be deployed by a Right Holder (individual, commercial or small scale entities) for 228 days over a 12 month period within the constraints of various proportional allocations under a range of plausible future TAE scenarios.

It is recognised, however, that such a management scenario would be difficult to properly monitor to ensure compliance (in the absence of an observer on each trip of each vessel to record the numbers of fishers operating and the number of days that each person fished, the Department would not be in a position to detect any mis-reporting).

Table 1: The numbers of fishers that could be deployed by a Right Holder for 228 days per annum within a range of allocation and TAE scenarios.

Allocation	TAE (person-days)				
	200 000	250 000	270 000	300 000	330 000
1%	9	11	12	13	14
5%	44	55	59	66	72
10%	88	110	118	132	145
15%	132	164	178	197	217
20%	175	219	237	263	289
25%	219	274	296	329	362
100%	877	1 096	1 184	1 316	1 447

2) Fishing Rights are allocated to entities (individuals, commercial companies, small scale co-operatives) in terms of number of persons:

(a) *The existing 2 451 commercial Rights are retained and additional small scale Rights are granted as 25% of the TAE.*

Table 2 shows the 75:25 split of a range of plausible future TAEs between commercial and small scale components of the fishery.

Table 2: 75:25 splits of a range of future TAEs between commercial and small scale components of the squid fishery. Values are person-days.

	TAE (person-days)				
	200 000	250 000	270 000	300 000	330 000
Commercial (75%)	150 000	187 500	202 500	225 000	247 500
Small Scale (25%)	50 000	62 500	67 500	75 000	82 500

Table 3 shows the implications of these splits in terms of the number of fishing days to which the commercial fishers will need to be restricted to ensure that the TAE is not exceeded, the duration (days) of an additional closed season that will be required to achieve this restriction, as well as the number of small scale fishers that could be accommodated (with no fishing days restrictions) within each plausible future TAE scenario.

Table 3: Implications of a 75:25 split of various plausible future TAEs on commercial and small scale components of the squid fishery. The italicised values in parentheses reflect the current situation (i.e. where the entire TAE is apportioned to the existing commercial Right Holders).

		TAE (person-days)				
		200 000	250 000	270 000	300 000	330 000
Commercial (2 451 persons)	Fishing days per person	61 (82)	76 (102)	83 (110)	92 (122)	101 (135)
	Closed season days	167 (146)	152 (126)	145 (118)	136 (106)	127 (93)
Small scale	Persons	219	274	296	329	362

Within this scenario, further options to alleviate the impacts could involve imposing the additional closed season on the small scale fishers as well as the commercial fishery, which would allow more small scale fishers to be accommodated.

(b) *The existing number of commercial fishers (2 451) is reduced.*

If on review, certain of the existing 2 451 commercial fishers are excluded from the fishery (e.g. as a result of inadequate performance), the average number of fishing days expected to be required to reach the commercial sector proportion of the TAE would first have to be recalculated as such exclusions would change the efficiency distribution of the commercial fleet; that in turn could lead to a reduction in the extent of the additional closed season.

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