![Victorian Fisheries Authority logo]

Victorian Giant Crab Fishery

Harvest Strategy

2025

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1. Introduction

Harvest strategies provide a structured framework for assessing the status of a fishery and a set of rules to determine the annual catch limits (Sloan et al. 2014). They provide pre-determined management actions to meet the ecological sustainable objectives relevant to that fishery.

The Victorian Giant Crab Harvest Strategy 2025 (the Harvest Strategy) has been developed for the Victorian Giant Crab Fishery (the Fishery) by a dedicated sub-committee of the Victorian Rock Lobster and Giant Crab Resource Assessment Group. The Harvest Strategy sets in place new decision rules for managing the Fishery while continuing to meet the key objectives outlined in the Victorian Giant Crab Fishery Management Plan (DPI 2010). In addition, its development was guided by the principles outlined in the *National Guidelines to Develop Fishery Harvest Strategies* (Sloan et al. 2014).

Unlike the previous arrangements, the Harvest Strategy provides provisions for increases in the total allowable commercial catch (TACC) through a tiered approach. Comparatively, existing arrangements are precautionary and only allow the TACC to decrease. This update improves the capacity for growth within the Fishery whilst providing important criteria for stock protection.

2. Tiered Harvest Strategy

Data collected from this fishery is almost entirely fishery dependent. The nature of this data has remained relatively unchanged since the current management plan was developed. Due to the small number of vessels in the Fishery, the data has been collected by a very small number of fishers; for an extended period this has been almost entirely from a single fisher.

The lack of data has diminished the ability to assess the stock status and resulted in a precautionary harvest strategy that does not provide a pathway for increasing the TACC. There are also difficulties in providing sufficient evidence to ensure export accreditation and for the Status of Australian Fish Stocks Reports.

To enable the Fishery to develop further, a tiered approach is used whereby the provision of more data enables a better assessment and introduces the possibility for TACC increases. Higher tiers also provide earlier warning of recruitment failure and allow quicker and smaller management changes to address this concern. Despite the tiered strategy, there is no need for the Fishery to progress through these levels. It may be more cost-effective to remain at a lower level with lower data collection/assessment costs and more precautionary management.

Table 1: Key characteristics of the harvest strategy tiers.

	Level 1	Level 2	Level 3
Data Type	Vic-eCatch	Level 1 plus verified mandatory L-F sampling* and verification of Vic-eCatch data (observer or camera)	Level 2 data for 3+ years and a model-based assessment
Analysis and assessment	CPUE Trends	CPUE Trends	CPUE Trends, stock assessment model
Key Harvest Control Rule elements	**Cap:** 10.5t	**Cap:** 10.5t when below the target reference point. No cap when above the target reference point.	**Cap:** 10.5t when below the target reference point. No cap when above the target reference point.
	Increase: No available.	**Increase:** Up to 20% every 3 years if the CPUE is above the target reference point.	**Increase and decrease:** TACCs will be set according to the model to ensure the Fishery fluctuates around the target reference point; and remains above the limit reference point with a 90% probability.
	Decrease: Up to 50% if the CPUE is below the threshold reference point. 50-100% if the CPUE is below the limit reference point.	**Decrease:** As per level 1	
Potential cost to licence holder/operator	Low	Low-Moderate	Moderate
Summary	A low level of data collection to inform the stock assessment; includes no scope to increase the TACC beyond 10.5; and results in a minimal cost to fishers.	The requirements include verified catch and length-frequency data which increases confidence in the assessment and permits the TACC to increase above 10.5t.	The assessment model provides an understanding of the stock status and dynamics. This allows input and output controls to be set flexibly to meet industry needs.

* Fishers catching >1t must measure a representative sample of their catch according to a protocol agreed with the VFA.

3. CPUE Indicator and Reference Points

The catch per unit effort (CPUE) time series presented in the annual stock assessment is a proxy for biomass and remains the primary indicator in this fishery. CPUE is adjusted for soak time but not standardised. This approach is taken for simplicity, as previous analyses have shown that standardisation for the limited number of available factors had minimal impact. The largest impact on the CPUE index is likely to be the vessel and skipper, however, this cannot be accounted for due to the small fleet size with limited temporal overlap of operators.

As a result of the small nature of the Fishery, a high rate of inter-annual variability unrelated to the stock has been observed in the CPUE. To provide a stable TACC setting process, the average CPUE from the last three years is used for calculating reference points against which to assess the Fishery. Whilst this provides a more precautionary approach for TACC increases, it also reduces the rate of reaction to CPUE declines, which is addressed through precautionary reference points.

A reference period of 1995/96 to 2013/14 has been chosen from which to develop reference points. This was selected as the period with reliable data that most closely resembles contemporary fishing. This is from the year following the introduction of the size limit change to the beginning of a period of uncertainty in effort data. CPUE during this period is used to set reference points against which the Fishery is assessed annually to inform the TACC setting. These reference points are the limit, threshold and target reference points.

3.1   Limit reference point

The limit reference point represents a level below which there is a serious concern about ongoing sustainability of the Fishery. It is set as the minimum observed CPUE during the reference period (0.435 kg/24 hr pot-lift). This has a biological basis as it is set at a level from which the Fishery has previously rapidly recovered.

3.2   Threshold reference point

The threshold reference point is 1.5 times the limit reference point (0.653 kg/24 hr pot-lift). This provides an early warning, triggering more conservative management action as the limit is approached. It is intended that this approach avoids the Fishery dropping down to the limit reference point.

3.3   Target reference point

The target reference point is a level around which the Fishery should aim to fluctuate. This should substantially exceed the limit and threshold, such as greater than twice the limit reference point, and reflect industry aspirations for the state of the stock. It therefore provides a balance between the economic benefits of higher CPUE and catch volume. A level of 1.00 kg/24 hr pot-lift was chosen through industry consultation.
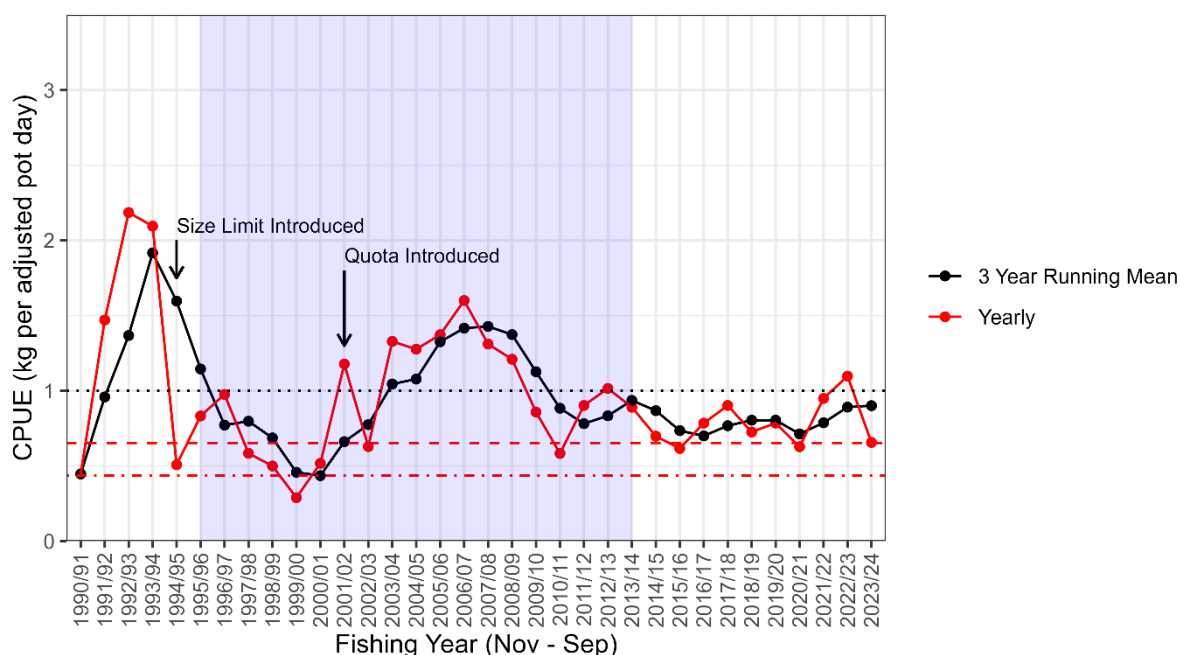
Figure 1: Annual CPUE (red line) and three-year running mean (black line) compared to target (black dotted), threshold (red dashed) and limit (red dash-dot) reference points.

4. TACC Setting Rules

4.1 Determining the tier level

1. Level 1 is the baseline management arrangements for the Fishery and applies unless the requirements are met at another level.

2. Level 2 is applied if recent representative length frequency data is available in sufficient quantity, and can be verified, to provide insight into stock structure.

3. Level 3 can be applied if representative length-frequency data is available for three or more years, and a suitable model-based stock assessment has been conducted.

4.2 Level 1

Due to the small nature of this fishery and the stochasticity in the CPUE time series, it is inappropriate to have a strictly defined harvest control rule. The following harvest control rule provides a guide to TACC setting at Level 1, whilst providing sufficient flexibility to allow management to consider other information about the Fishery which may be available on a sporadic basis:

1. If CPUE exceeds the threshold reference point, the TACC remains unchanged.

2. If CPUE falls below the threshold reference point, the TACC is reduced by up to 50%.

3. If CPUE falls below the limit reference point, a stock rebuilding strategy is developed and the TACC is reduced by 50-100%.

4. If the Fishery returns to Level 1 from a higher level and has an existing TACC greater the Level 1 cap of 10.5t, the TACC is automatically reduced to 10.5t.

There is no firm rule for a fishery closure. If the CPUE falls significantly below the threshold reference point this will be investigated in detail. This includes consideration and appropriateness of retaining a sentinel fishery under a research permit to maintain data collection and monitoring (the only data source for the Fishery).

The starting TACC under this harvest strategy will commence at 8.5 tonnes within Level 1. This is below the Level 1 cap and no mechanisms exist to increase the TACC under this level. The cap remains relevant, however, as it will apply in the event that the fishery progresses to a higher level, experiences a TACC increase/s at that level and then returns to Level 1.

4.3   Level 2

Under Level 2, additional information about the length-frequency composition is available to assess stock abundance, including undersize stocks. Due to the low productivity attributes of giant crab and the limitations of the data, a precautionary approach is required that enables the impacts of TACC changes to be observed. This harvest control rule adds TACC increases to the Level 1 strategy:

1. If CPUE falls below the threshold reference point, the TACC is reduced by up to 50%.

2. If CPUE falls below the limit reference point, a stock rebuilding strategy is developed and the TACC is reduced by 50-100%.

3. If the CPUE is above the target reference point, the TACC can be increased by 20%. A maximum increase of a total of 20% can be applied in any three-year period.

4. Length-frequency data provides a secondary indicator. A TACC increase is conditional on satisfactory recruitment from this indicator.

4.4   Level 3

The nature of the harvest control rule under Level 3 will depend on the assessment model and the quality of the model-based stock assessment. However, the intent is to allow for more rapid TACC increases (e.g. 20% per year) whilst remaining confident that the Fishery will fluctuate around the target reference point and remain above the threshold reference point with a 90% probability.

5. Glossary

Biomass: The total weight or volume of individuals in a fish stock.

Catch per unit effort: A measure of fishing success with a type or unit of fishing gear. Catch per unit effort in the giant crab fishery is measured as the weight of giant crabs captured per pot lift.

Fishery: The act, process and or industry of catching fish. In Victoria, fisheries are defined by the species to be taken, the equipment used or area as specified in the Fisheries Regulations 2019.

Fishery-dependent data: The information collected by the participants in the fishery about that fishery or fish stock, e.g. commercial catch and effort logbooks.

Fishery-independent data: The information collected about a fishery or fish stock by researchers independent of the fishery. e.g. scientific surveys and on-board observers.

Input controls: Indirect restraints on catch including regulation of the amount or type of fishing gear (e.g. numbers of pots) and fishing period (e.g. closed seasons).

Output controls: A direct limit on catch in a fishery (e.g. a Total Allowable Catch) or on an access licence holder (e.g. individual transferable quota).

Quota: A limit on the weight or number of fish of a particular stock or from specified waters that may be caught in a specified timeframe.

Recruitment: The addition of new individuals of legal size to a stock.

Reference point: An indicator level of fishing (or stock size) to be used as a benchmark for assessment or decision making.

Representative Sample: A proportion of total catch for which length-frequency data is collected, that provides adequate representation of the current fishing effort at that time.

Size limit: A minimum or maximum size limit that determines the legal size at which a given species can be retained.

Stakeholder: An individual or organisation, including peak bodies, with a vested interest or an historical association with a fishery resource.

Stock: A group of individuals of a species occupying a well-defined spatial range independent of other groups of the same species, which can be regarded as an entity for management or assessment purposes.

Target reference point: The target reference point defines the level or value of an indicator that is considered ideal or desirable and at which management should aim.

Trigger or threshold points: Events or measures that, if they occur or if they reach specified levels, are used to determine when a response should be made. The action to be taken is usually prescribed.

Total Allowable Commercial Catch (TACC): The mass of giant crab that may be taken within a quota period by commercial access licence holders according to the final quota order.

Vic eCatch: Electronic catch reporting system used to report daily catch details, allocate quota against catch, complete daily catch records, manage movement of giant crab in wet wells and for fishers to review their own catch history.

6. References

Department of Primary Industries (DPI) (2010). Giant Crab Fishery Management Plan, Second Edition. Fisheries Victoria Management Report Series No. 79.

Sloan, S. R., Smith, A.D.M., Gardner, C., Crosthwaite, K., Triantafillos, L., Jeffries, B. and Kimber, N (2014) National Guidelines to Develop Fishery Harvest Strategies. FRDC Report – Project 2010/061. Primary Industries and Regions, South Australia, Adelaide, March. CC BY 3.0