



Review of Rock Lobster
Sustainability Measures for
1 April 2015
Consultation Document

Discussion Paper No: 2015/04

Prepared by the National Rock Lobster Management Group

ISBN No: 978-0-477-10535-4 (online)
ISSN No: 2253-3907 (online)

January 2015

Disclaimer

Every effort has been made to ensure the information in this document is accurate.

The National Rock Lobster Management Group and the Ministry for Primary Industries do not accept any responsibility or liability for any error of fact, omission, interpretation or opinion that may be present, however it may have occurred. Any view or opinion expressed does not necessarily represent the views of the National Rock Lobster Management Group or the Ministry for Primary Industries.

Requests for further copies should be directed to:

Publications Logistics Officer
Ministry for Primary Industries
PO Box 2526
WELLINGTON 6140

Email: brand@mpi.govt.nz
Telephone: 0800 00 83 33
Facsimile: 04 894 0300

This publication is also available on the Ministry for Primary Industries website at:

<http://www.mpi.govt.nz/news-and-resources/consultations/>

ISBN No: 978-0-477-10535-4 (online)

ISSN No: 2253-3907 (online)

1	Submission information	1
1.1	Official Information Act 1982	1
2	Executive summary	2
3	Purpose	4
3.1	Need for Action	4
3.2	Management Approach	4
4	Background Information	5
4.1	Management procedure approach	5
4.2	Definition of stock indicators	7
4.3	The MPI Harvest Strategy Standard	8
5	Legal Considerations	8
5.1	TAC setting	8
5.2	TACC setting: Sections 20 and 21	9
5.3	Sustainability Measures: Section 11	10
6	CRA 1 (Northland) rock lobster fishery	10
6.1	CRA 1 stock status	10
6.2	Proposed CRA 1 Options	11
7	CRA 3 (Gisborne) rock lobster fishery	17
7.1	CRA 3 stock status	17
7.2	Proposed CRA 3 Options	17
7.3	Other Considerations	22
8	CRA 5 (Canterbury/Marlborough) rock lobster fishery	23
8.1	CRA 5 stock status	23
8.2	Proposed CRA 5 Options	23
9	CRA 7 (Otago) rock lobster fishery	28
9.1	CRA 7 stock status	28
9.2	Proposed CRA 7 Options	28
10	CRA 9 (Westland/Taranaki) rock lobster fishery	32
10.1	CRA 9 stock status	32
10.2	Proposed CRA 9 Options	32
11	Other matters – uncertainty in non-commercial removals	35
12	Conclusion	35
	Appendix 1: New CRA 1 management procedure specifications	36
	Appendix 2: New CRA 3 management procedure specifications	38
	Appendix 3: CRA 5 management procedure specifications	40
	Appendix 4: CRA 7 management procedure specifications	41
	Appendix 5: CRA 9 management procedure specifications	42

1 Submission information

The National Rock Lobster Management Group (NRLMG) welcomes written submissions on the proposals contained in this document. All written submissions must be received by the Ministry for Primary Industries (MPI), on behalf of the NRLMG, no later than 5 pm on **Tuesday, 17 February 2015**.

Written submissions should be sent directly to:

Inshore Fisheries Management
Ministry for Primary Industries
P O Box 2526
Wellington 6011

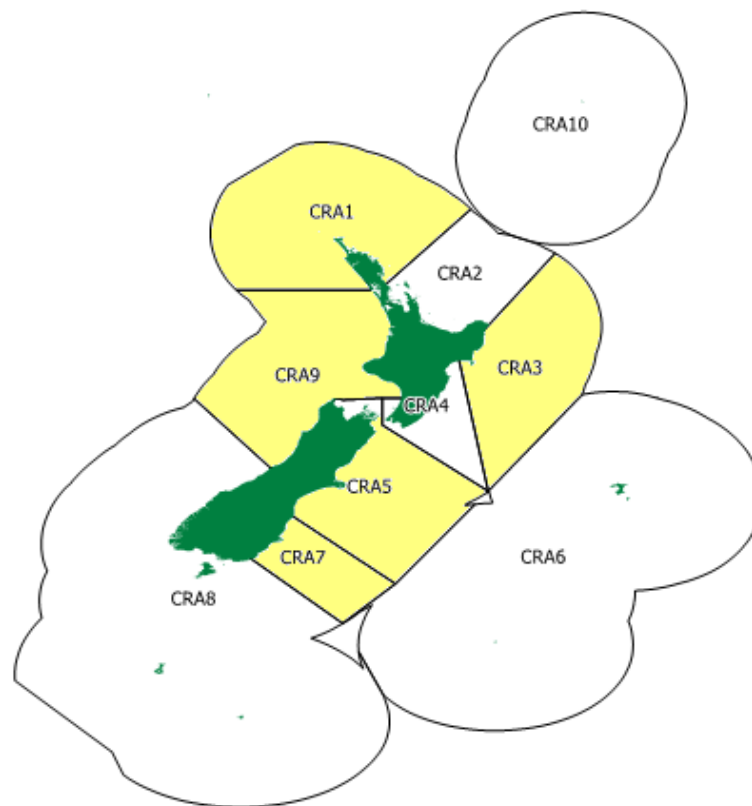
or emailed to FMSubmissions@mpi.govt.nz

1.1 OFFICIAL INFORMATION ACT 1982

All submissions are subject to the Official Information Act 1982 and can be released (along with the personal details of the submitter) under the Act. If you have specific reasons for wanting to have your submission or personal details withheld, please set out your reasons in the submission. MPI will consider those reasons when making any assessment under the Act.

2 Executive summary

Figure 2.1: Map of rock lobster Quota Management Areas showing stocks under review in yellow.



The NRLMG is seeking tangata whenua and stakeholder information and views to inform a review of rock lobster sustainability measures for 1 April 2015.

The total allowable catch (TAC), allowances and total allowable commercial catch (TACC) proposals presented in this document are based on new stock assessment information and/or the results from the operation of management procedures or decision rules.

Table 2.1 provides a summary of the options proposed for rock lobster. These include:

- Use of a new management procedure to guide TAC setting in the CRA 1 (Northland) fishery, the setting of a CRA 1 TAC and non-commercial allowances for the first time, and retention of the current TACC or a small increase;
- Replacing the current CRA 3 (Gisborne) management procedure with a new procedure and making no change to the TAC and TACC;
- TAC and TACC decreases for CRA 5 (Canterbury/Marlborough) and CRA 9 (Westland/Taranaki) fisheries; and
- A TAC and TACC increase for the CRA 7 (Otago) fishery.

This document is solely concerned with TAC, allowance and TACC setting under sections 11, 13, 20 and 21 of the Fisheries Act 1996 (the Act). No regulatory or other changes are proposed as part of this document.

Table 2.1: TAC, allowances and TACC proposals for CRA 1, CRA 3, CRA 5, CRA 7 & CRA 9.

Noting: Options CRA1_01 and CRA1_02 both propose the use of the *Rule 8d* CRA 1 management procedure and the same TACC increase, but have different customary allowance options;
Options CRA1_03 and CRA1_04 both propose the use of the *Rule 9d* CRA 1 management procedure and no change to the current TACC, but have different customary allowance options;
Options CRA3_01 and CRA3_02 propose the use of two different CRA 3 management procedures (*Rule 4* versus *Rule 6*), but with no change to the existing TAC, allowances and TACC.

Stock	Option	TAC	Customary	Recreational	Other mortality	TACC
CRA 1	CRA1_01: Use the <u>new</u> <i>Rule 8d</i> CRA 1 management procedure and set the following TAC, allowances and TACC	269.62 t	10 t	50 t	72 t	137.62 t ↑
	CRA1_02: Use the <u>new</u> <i>Rule 8d</i> CRA 1 management procedure and set the following TAC, allowances and TACC	279.62 t	20 t	50 t	72 t	137.62 t ↑
	CRA1_03: Use the <u>new</u> <i>Rule 9d</i> CRA 1 management procedure and set the following TAC, allowances and TACC	263.062 t	10 t	50 t	72 t	131.062 t
	CRA1_04: Use the <u>new</u> <i>Rule 9d</i> CRA 1 management procedure and set the following TAC, allowances and TACC	273.062 t	20 t	50 t	72 t	131.062 t
	CRA1_05: Retain the current CRA 1 TACC (no TAC or allowances have been previously set for CRA 1)	N/A	N/A	N/A	N/A	131.062 t
CRA 3	CRA3_01: Use the <u>new</u> <i>Rule 4</i> CRA 3 management procedure and retain the TAC, allowances and TACC	389.95 t	20 t	20 t	89 t	260.95 t
	CRA3_02: Use the <u>new</u> <i>Rule 6</i> CRA 3 management procedure and retain the TAC, allowances and TACC	389.95 t	20 t	20 t	89 t	260.95 t
CRA 5	CRA5_01: Use the <u>current</u> CRA 5 management procedure and decrease the TAC and TACC	452.81 t ↓	40 t	40 t	37 t	335.81 t ↓
	CRA5_02: Retain the current CRA 5 TAC, allowances and TACC	467 t	40 t	40 t	37 t	350 t
CRA 7	CRA7_01: Use the <u>current</u> CRA 7 management procedure and increase the TAC and TACC	117.72 t ↑	10 t	5 t	5 t	97.72 t ↑
	CRA7_02: Retain the current CRA 7 TAC, allowances and TACC	86 t	10 t	5 t	5 t	66 t
CRA 9	CRA9_01: Use the <u>current</u> CRA 9 management procedure and decrease the TAC and TACC	101 t ↓	20 t	30 t	5 t	46 t ↓
	CRA9_02: Retain the current CRA 9 TAC, allowances and TACC	115.8 t	20 t	30 t	5 t	60.8 t

3 Purpose

3.1 NEED FOR ACTION

Every year the NRLMG considers the results from the operation of management procedures. This determines whether catch limit changes are required for the upcoming April fishing year to ensure the sustainable use of the rock lobster resource.

A management procedure is a kind of decision rule that is used to guide the setting of catch limits in rock lobster fisheries. Management procedures are informed by annual changes in catch rates ('catch-per-unit-effort' or 'CPUE'), which is considered a reliable indicator of abundance and is supported by scientific modelling.

Management procedures are used in all rock lobster fisheries except for CRA 1, CRA 6 and CRA 10. In 2014, new management procedures were developed for use in the CRA 1 fishery for the first time. The CRA 1 fishery has a history of infrequent stock assessments with the last formal assessment performed in 2002. New CRA 3 management procedures were also evaluated in 2014 to replace the current procedure that has expired (in 2010 the Minister agreed to use the current CRA 3 management procedure until the 2015-16 fishing year).

Based on these new and current management procedures changes to the *status quo* are proposed for the CRA 1, CRA 3, CRA 5, CRA 7 and CRA 9 rock lobster fisheries. Operation of the CRA 2, CRA 4 and CRA 8 management procedures results in no change to the management settings for these fisheries from April 2015¹.

3.2 MANAGEMENT APPROACH

The NRLMG is the primary advisor to the Minister for Primary Industries (the Minister) on catch limit, regulatory and other management actions that apply specifically to rock lobster fisheries. The NRLMG is a national-level, multi-stakeholder group comprising representatives of customary, recreational and commercial fishing sectors and MPI.

The NRLMG's management goal is for all rock lobster fisheries:

"to be managed and maintained at or above the assessed and agreed reference levels, using a comprehensive approach that recognises a range of customary Maori, amateur, commercial and environmental concerns and benefits".

¹ The current CRA 2, CRA 4 and CRA 8 management procedures are not discussed further in this document because there is no proposal to change the management procedure approach, or change the TAC, allowances or TACC for the 2015-16 fishing year.

The NRLMG’s management goal is consistent with the rock lobster objectives in the Draft MPI National Fisheries Plan for Inshore Shellfish Fisheries. These objectives are to maximise the overall social, economic and cultural benefit obtained from each stock, and to maintain biomass of each stock at or above the level that can produce the maximum sustainable yield or at a level that is not inconsistent with this (i.e. *Bmsy* or an accepted proxy, *Bref* – refer to section 4.2 below).

The overall management approach for rock lobster stocks is to monitor and manage them closely to provide for utilisation while ensuring sustainability. The use of responsive management procedures and regular review of rock lobster TACs is consistent with this management approach. Being able to respond to seasonal changes in rock lobster abundance is important because rock lobster populations can fluctuate with changes in their environment.

4 Background Information

This section provides relevant background information on the management procedure approach, stock indicators, and the MPI Harvest Strategy Standard.

4.1 MANAGEMENT PROCEDURE APPROACH

4.1.1 History of management procedure use in New Zealand

Management procedures are currently in place for most of New Zealand’s rock lobster fisheries. Each stock’s procedure has been used by Ministers to guide statutory TAC setting in rock lobster fisheries for varying periods. The oldest example of management procedures is in CRA 7 and CRA 8, where they have been used to guide TAC setting since 1997, first to rebuild the stocks and then to maintain them above reference levels with high probability.

Management procedures are generally reviewed every five years. The review aims to ensure that TAC setting remains compliant with the statutory structure set out in the Act. It involves the development of a new stock assessment model and new management procedure evaluations.

Table 4.1 provides an outline of the use of current management procedures and when they are scheduled for review. New CRA 3 management procedures have been evaluated this year.

Table 4.1: History of current management procedure use and their review schedule

	CRA 2	CRA 3	CRA 4	CRA 5	CRA 7	CRA 8	CRA 9
First year the current management procedure was used	2014	2010	2012	2012	2013	2013	2014
Year of scheduled review	2018	2014	2016	2016	2017	2017	2018

4.1.2 Management procedure benefits

The traditional approach used to set catch limits in many of New Zealand's fisheries is to undertake a stock assessment and then to provide recommendations on the TAC, allowances and the TACC. This approach has some disadvantages: stock assessment capacity is limited, and under this approach for rock lobster only one or two assessments could be carried out each year. Delays in updating a stock assessment can cause management action to be delayed and for catch limits to be set inappropriately for a fishery.

A management procedure has a number of advantages over the traditional stock assessment approach. These include:

- a) The establishment of a management regime that can respond to changes in stock abundance in the fishery on an annual basis;
- b) An explicit definition of management goals (e.g. maximising yield, maximising stability, minimising risk);
- c) Greater certainty of achieving management goals;
- d) The involvement of fishery stakeholders in the choice of a management procedure;
- e) The ability to address uncertainty in all facets of the assessment and management process;
- f) The opportunity to free up resources for other research: management procedures reduce the frequency that stock assessments are required.

4.1.3 Evaluation of management procedures

Management procedures are evaluated with a modified stock assessment model, known as the 'operating model'. Data used in the stock assessment model includes: customary, recreational, commercial and illegal catch, length frequencies of the catch from observer and industry logbook data, tag-recapture data (i.e. growth information) and juvenile settlement levels. However, the most important inputs to the assessment are CPUE indices, which are considered to be proportional to abundance.

Extensive peer-review of stock assessment models and management procedures occurs at the Rock Lobster Fisheries Assessment Working Group (RLFAWG) and at the November Plenary. Each management procedure is also extensively simulation tested, which includes testing for robustness to uncertainties in model assumptions (e.g. variable levels of recruitment and non-commercial catches) and modelling choices.

4.1.4 Main data input

Standardised commercial CPUE from October to September each year is used as input to a management procedure to determine the TAC or TACC for the fishing year that begins in the following April. This CPUE series is called 'offset year CPUE'. Use of offset year CPUE ensures the most up-to-date CPUE information is used in management procedure evaluations and decision-making.

CPUE is used as the main input because it is considered to be a reliable indicator of relative stock size in rock lobster fisheries. CPUE has been successfully used in several management procedures to rebuild stocks from low to high abundance levels.

4.2 DEFINITION OF STOCK INDICATORS

Four stock indicators are relevant to evaluation of the proposals presented in this document²:

- a) The statutory reference level, **Bmsy**, the stock size that can produce the maximum sustainable yield. Section 13 of the Act requires the Minister to set a TAC that moves the stock to, or maintains the stock at, a size at or above a level that can produce the maximum sustainable yield or at a level that is not inconsistent with this objective.
- b) The conceptual proxy, **Bref**³, a reference biomass level. The use of *Bref* is a way of assessing a stock that is not inconsistent with the objective of maintaining a stock at or above, or moving the stock towards, a level that can maintain the maximum sustainable yield. This “not inconsistent” approach is set out in section 13(2A) of the Act where the Minister considers that current biomass or *Bmsy* cannot be estimated reliably using best information. *Bref* is generally a stock size at or above the stock size associated with a period in the fishery that showed good productivity and was demonstrably safe.
- c) The minimum stock size, **Bmin**, which is the lowest stock size observed in the history of the fishery.
- d) Spawning stock biomass, **SSB**, which is the weight of all mature females in the autumn-winter.

As part of the CRA 1 and CRA 3 stock assessments this year, the following indicators were calculated for the first time: the biomass of all fish, **Btot**, and the numbers of all fish, **Ntot**.

There are some differences in the indicators that are reported for each stock in this document because the RLFAGW has continually improved the way indicators are calculated over time. Table 4.2 provides a summary of the key indicators that are available for each stock discussed in this document.

² Stock size is measured in terms of autumn-winter vulnerable biomass for the *Bmsy*, *Bref* and *Bmin* indicators. “Vulnerable biomass” is the biomass that is available to be caught legally: above the minimum legal size and not egg bearing if female.

³ The Operational Guidelines for the Harvest Strategy Standard describe the *Bref* concept as follows: “Conceptual proxies for BMSY, FMSY and MSY are qualitative surrogates that can be used in the absence of adequate information to directly estimate these reference points themselves. The conceptual interpretation embraces the spirit and intent of section 13 of the Act. It can be used in cases where there is insufficient information to estimate BMSY, FMSY or MSY explicitly, or where such estimates may be unreliable because, for example, there is little or nothing known about the stock recruitment relationship. Conceptual BMSY: In cases where the relationship between CPUE and abundance can be assumed to be more or less proportional, or where some other form of relationship has been derived from data, it may be reasonable to select an appropriate historical period when both CPUE and catches were relatively high and to use this CPUE level as a target. *The best example in current use in New Zealand is that for rock lobster.*” [emphasis added].

Table 4.2: Summary of key stock indicators that are available for each stock discussed in this document.

Indicator	CRA 1	CRA 3	CRA 5	CRA 7	CRA 9
<i>Bmsy</i>	✓	✓	✓	-	✓
<i>Bref</i>	✓	-	✓	✓	-
<i>Bmin</i>	✓	✓	✓	✓	✓
<i>SSB</i>	✓	✓	✓	-	-
<i>Btot</i>	✓	✓	-	-	-
<i>Ntot</i>	✓	✓	-	-	-

4.3 THE MPI HARVEST STRATEGY STANDARD

In October 2008, MPI released the Harvest Strategy Standard (HSS) for New Zealand fisheries. The HSS specifies performance standards for Quota Management System species and also provides guidance for TAC setting under the Act.

The HSS specifies that management procedures should be designed to ensure that the probability of:

- Achieving the MSY-compatible target or better is at least 50%;
- Breaching the soft limit does not exceed 10%;
- Breaching the hard limit does not exceed 2%.

For rock lobster:

- 'MSY-compatible target' reference points include those that relate to stock biomass (*Bmsy*) as well as conceptual proxies (*Bref*);
- The soft limit is defined as 20% of the unfished SSB level or 50% *Bref*;
- The hard limit is defined as 10% of the unfished SSB level or 25% *Bref*.

Extensive simulation testing suggests that all of the management procedures discussed in this document are consistent with the HSS.

5 Legal Considerations

The Minister's central statutory considerations for TAC and TACC setting are discussed below and for each individual stock as relevant in the following sections.

5.1 TAC SETTING

A central consideration when choosing whether to use a management procedure to guide TAC setting in a fishery is whether the procedure enables the Minister to set a TAC that complies with section 13 of the Act.

Under section 13(2) of the Act the Minister must set a TAC that maintains at or above, restores to or above, or moves the stock towards or above a level that can produce the maximum sustainable yield. However, before a TAC can be set under section 13(2) the Minister must be provided with an estimate of both current biomass and the biomass that can produce the maximum sustainable yield (commonly called *Bmsy*).

Where current biomass or *Bmsy* estimates are not available or not reliable then the Minister is required to apply section 13 (2A) of the Act instead. Section 13 (2A) requires the Minister to set a TAC using the best available information, and that is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, *Bmsy*.

In considering the way and rate in which a stock is moved towards or above a level that can produce the maximum sustainable yield (i.e. *Bmsy*) under section 13(2)(b) or (c) or (2A), the Minister must have regard to such social, cultural and economic factors that are considered relevant.

The management procedures discussed in this document are designed to move stock biomass to, or maintain the biomass of each stock at, a size at or above *Bmsy* or the agreed proxy (i.e. *Bref*) as required under section 13 of the Act.

When setting a TAC under section 13, the Minister must also have regard to the interdependence of stocks, the biological characteristics of the stock, and any environmental conditions affecting the stock.

5.2 TACC SETTING: SECTIONS 20 AND 21

When setting a TACC for a stock under section 20 of the Act, section 21 requires the Minister to have regard to the TAC for that stock and allow for Maori customary non-commercial fishing interests, recreational interests, and all other sources of fishing-related mortality to that stock.

The Act does not provide an explicit statutory mechanism to apportion available catch between sector groups either in terms of a quantitative measure or prioritisation of allocation. Accordingly, the Minister has the discretion to make allowances for various sectors based on best available information. Allowance options are discussed individually for each rock lobster stock later in this document.

When allowing for Maori customary non-commercial fishing interests the Minister must take into account any relevant mātaihai reserves within the relevant quota management areas and any area closure or fishing method restriction or prohibition within those areas made under section 186A of the Act. There are several mātaihai reserves and temporary closures that fall within the areas of the rock lobster stocks discussed in this document. The NRLMG considers that the proposed customary allowances for each stock will adequately provide for the harvest of rock lobster that is likely to be taken from a management area, after taking into account the mātaihai reserves and temporary closures in place.

When allowing for recreational interests, the Minister must take into account any regulations made under section 311 of the Act that prohibit or restrict fishing in any area. There are currently no section 311 regulations applying in the areas of the rock lobster stocks discussed in this document.

5.3 SUSTAINABILITY MEASURES: SECTION 11

Section 11 of the Act sets out additional matters that the Minister must take into account or have regard to when setting a sustainability measure such as a TAC⁴. These include:

- Effects of fishing on any stock and the aquatic environment;
- Any existing controls under the Act that apply to the stock or area concerned;
- The natural variability of the stock;
- Relevant regional policy statements, plans or proposed plans;
- Conservation and fisheries services;
- Approved fisheries plans.

If submitters have any section 11 matters they wish to raise, please include them in your submission.

6 CRA 1 (Northland) rock lobster fishery

6.1 CRA 1 STOCK STATUS

A new stock assessment was carried out for the CRA 1 fishery in 2014, the first since 2002. The 2014 assessment results suggest there are no sustainability concerns for the CRA 1 fishery. 2013 biomass is well above *B_{msy}* (100% above), *B_{ref}* (73% above) and *B_{min}* (66% above)⁵. Spawning stock biomass in 2013 was about half of the unfished level. Total biomass is about 40% of the unfished level and total numbers of rock lobster are about 62% of the unfished level. With 2013 catch levels and recent recruitments, biomass is projected to stay near current levels.

⁴ Section 11 of the Act can be viewed here:

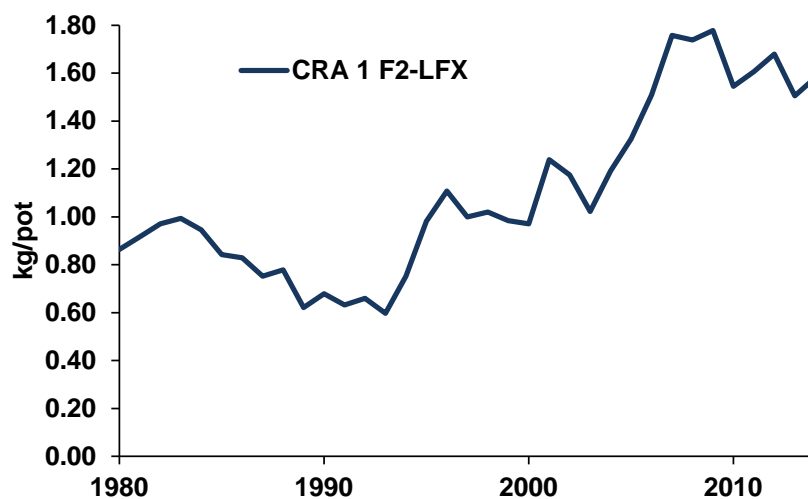
www.legislation.govt.nz/act/public/1996/0088/latest/DLM395397.html?search=ts_act%40bill%40regulation%40demedreg_fisheries+act+1996_resel_25_a&p=1

⁵ *B_{ref}* for CRA 1 is the pre-season autumn-winter vulnerable biomass associated with the period 1979-88.

For all rock lobster stock assessments it is assumed that the stocks are spatially homogenous (i.e. biomass is generally evenly distributed across the management area). However, there is evidence of differences (heterogeneity) in CRA 1 landings and CPUE, with catches in statistical areas 903 and 904 (East Coast Northland) being consistently lower than those in statistical areas 901 (Three Kings Islands), 902 (Far North) and 939 (West Coast). The RLFAWG looked into these differences as part of the 2014 assessment and agreed to continue assessing CRA 1 as a single stock. This decision was based on evidence that the sizes of fish by sex and season are similar among the five statistical areas, which suggests that exploitation across the entire management area is similar.

Despite the differences in CPUE across two sub-areas of CRA 1, CPUE is the abundance indicator used in the proposed new CRA 1 management procedures. The history of offset year (i.e. October to September) CRA 1 commercial CPUE is shown in Figure 6.1. CPUE rose above 1.5 kg/potlift in 2006 and has remained above 1.5kg/potlift since then.

Figure 6.1: The history of CPUE in CRA 1, 1980 – 2014 (offset years).



6.2 PROPOSED CRA 1 OPTIONS

See Table 2.1 at the beginning of this document for a summary of the options proposed for CRA 1.

6.2.1 Use of new management procedures

For the first time, it is proposed that a new management procedure is used to guide TAC setting in CRA 1 for five years from the 2015-16 to 2019-20 fishing years.

Two different management procedure options are proposed for consideration: ‘*Rule 8d*’ (Options CRA1_01 and CRA1_02) and ‘*Rule 9d*’ (Options CRA1_03 and CRA1_04). The development of the new CRA 1 management procedures was guided by feedback received from a multi-sector meeting in Kerikeri in July 2014.

Use of the new CRA 1 management procedures should not pose a risk to stock sustainability. Both rules have similar performance with respect to stock indicators (Table 6.1). Ongoing application of either CRA 1 management procedure is expected to meet the MPI Harvest Strategy Standard and maintain the stock above *Bmsy* with greater than 50% probability and *Bmin* with greater than 90% probability. For further information on the specifications of the new CRA 1 management procedures refer to Appendix 1.

Table 6.1: Summary of indicator results from base case evaluations for CRA 1 *Rule 8d* and *Rule 9d*.

	<i>Rule 8d</i> Options CRA1_01 & CRA1_02	<i>Rule 9d</i> Options CRA1_03 & CRA1_04
Stock Indicators⁶		
The proportion of years in which biomass was <u>less</u> than:		
- <i>Bmsy</i>	1.9 %	1.7 %
- <i>Bref</i>	1.5 %	1.4 %
- <i>Bmin</i>	0 %	0 %
Catch Indicators		
Minimum commercial catch	131.1 t	131.1 t
Average commercial catch	137.3 t	134.1 t
Average recreational catch	58.1 t	58.7 t
Average CPUE	1.458 kg/potlift	1.486 kg/potlift
Stability – the average frequency of change in the TACC	23.5 %	19.0 %

Simulation testing of the new CRA 1 management procedures also suggest they will at least maintain the current utilisation benefit of the CRA 1 fishery for all sectors. Stock biomass is expected to be maintained well above the stock indicators (*Bmsy* and *Bref*).

There are no major differences between the two rule options, except that operation of *Rule 8d* results in a proposed increase to the TACC from 131.062 to 137.62 tonnes. *Rule 9d* results in no proposed change to the TACC (refer to sections 6.2.2 and 6.2.3 below).

If the use of a management procedure for the CRA 1 fishery is considered inappropriate, periodic stock assessments would continue to be used to guide TAC setting. Compared to the management procedure approach, periodic stock assessments are less responsive to observed changes in stock abundance and provide less certainty of achieving desired sustainability and utilisation outcomes.

⁶ An explanation of the stock indicators is provided in section 4.2.

6.2.2 TAC setting

No TAC has been previously set for CRA 1.

Best available information suggests the CRA 1 stock is above *Bmsy*. Accordingly the Minister may set the CRA 1 TAC to maintain the stock at or above *Bmsy* (section 13(2)(a)).

- *Use the new Rule 8d CRA 1 management procedure and set a CRA 1 TAC for the first time (Options CRA1_01 and 02)*

Using the *Rule 8d* CRA 1 management procedure it is proposed that the CRA 1 TAC is set at 269.62 or 279.62 tonnes for the 2015-16 fishing year (depending on allowance options).

The TAC options proposed under Options CRA1_01 and 02 have the potential to increase the current utilisation benefit of the fishery. If the TACC is increased, the commercial sector will receive the increased utilisation benefits. The utilisation benefits for customary Maori and recreational fishing interests are unlikely to change under these options because it is expected that the stock will be maintained well above reference levels.

- *Use the new Rule 9d CRA 1 management procedure and set a CRA 1 TAC for the first time (Options CRA1_03 and 04)*

Using the *Rule 9d* CRA 1 management procedure it is proposed that the CRA 1 TAC is set at 263.062 or 273.062 tonnes for the 2015-16 fishing year (depending on allowance options).

The TAC options proposed under Options CRA1_03 and 04 are unlikely to change the current utilisation benefit of the fishery. It is proposed that the current TACC of 131.062 tonnes will be retained under these options and it is expected that the utilisation benefits for customary Maori and recreational fishing interests will be maintained.

- *Retain the status quo (Option CRA1_05)*

Under Option CRA1_05, the status quo would be maintained. The CRA 1 fishery would continue to have no set TAC, which has been this way since rock lobster entered the Quota Management System in April 1990. Also, no new management procedure will be used to guide TAC setting in the CRA 1 fishery; periodic stock assessments will continue to be used.

6.2.3 Setting of non-commercial allowances

No non-commercial allowances have been previously set for CRA 1. Under Options CRA1_01 to CRA1_04 it is proposed that non-commercial allowances are set for the first time (Table 6.2)

Table 6.2: Summary of non-commercial allowance options for CRA 1

Option	Customary	Recreational	Other mortality
CRA1_01	10 t	50 t	72 t
CRA1_02	20 t	50 t	72 t
CRA1_03	10 t	50 t	72 t
CRA1_04	20 t	50 t	72 t

- *Customary Maori allowance*

Two customary Maori allowance options are proposed:

- 10 tonnes under Options CRA1_01 and 03; or
- 20 tonnes under Options CRA1_02 and 04.

Little is known about customary Maori catch in CRA 1, apart from a small amount of catches reported under the Fisheries (Kaimoana) Regulations 1998 and regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013⁷.

Options CRA1_01 and 03 reflect the constant 10 tonnes of customary catch that was assumed in the recent CRA 1 assessment model, while Options CRA1_02 and 04 reflect the assumption that customary harvest is in the vicinity of 20 tonnes given the number of marae along the CRA 1 coastline. The NRLMG welcomes information from tangata whenua and stakeholders to support the 20 tonne allowance proposal.

- *Recreational allowance*

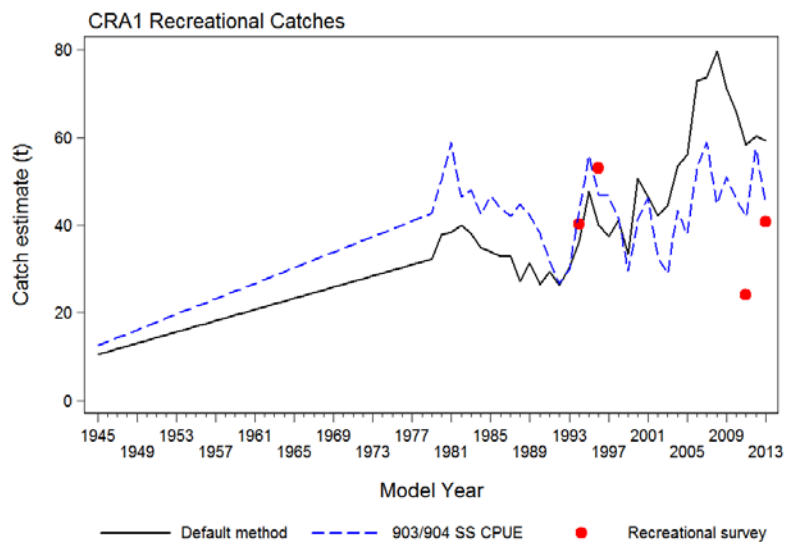
A CRA 1 recreational allowance of 50 tonnes is proposed under Options CRA1_01 to 04.

In the 2014 CRA 1 stock assessment, recreational catch estimates from 1994, 1996, 2011 and 2013 recreational harvest surveys were used to construct a recreational catch trajectory through time. The model assumed that recreational catch was proportional to the spring-summer commercial CPUE series for statistical areas 903 and 904 where the majority of recreational fishing is thought to take place. The resulting recreational catch trajectory shows a relatively consistent level of catch since the early 1980s, reflecting the low but stable, CPUE in statistical areas 903 and 904 (Figure 6.2).

The 2013 recreational catch estimate (from the model) was 44.60 tonnes including 5.01 tonnes taken by commercial fishers for non-commercial purposes under s111 of the Act. It is considered that the proposed 50 tonne recreational allowance adequately allows for recreational fishing interests.

⁷ Previously regulation 27A of the Fisheries (Amateur Fishing) Regulations 1986.

Figure 6.2: Recreational catch trajectories (kg) for the 2014 stock assessment of CRA 1. The red dots refer to the recreational survey estimates. The blue dashed line shows the catch trajectory made proportional to statistical area 903 and 904 spring-summer CPUE. The black solid line shows an alternative catch trajectory made proportional to overall CRA 1 spring-summer CPUE, which was used in a sensitivity trial. Both trajectories include section 111 catches which were taken by commercial fishers for non-commercial purposes (i.e. a maximum of 5 tonnes).



- *Other mortality allowance*

An allowance of 72 tonnes is proposed for other sources of fishing-related mortality for CRA 1 under Options CRA1_01 to 04.

There is no reliable information on current levels of other sources of fishing-related mortality. The RLFAWG used available MPI estimates for illegal catches from 1989 and a constant illegal catch of 72 tonnes per year from 2002 to 2013 as an estimate for other mortality. The NRLMG and RLFAWG have little confidence in the estimates of illegal catch because the estimates cannot be verified.

Options CRA1_01 to 04 reflect the 72 tonnes of illegal catch that was assumed in the recent CRA 1 assessment model.

Incidental fishing-related mortality is considered to be low for rock lobster fisheries given the methods used and the practices in place to ensure careful handling of rock lobster.

6.2.4 TACC

The current CRA 1 TACC is 131.062 tonnes.

Under Options CRA1_01 and 02 the CRA 1 TACC would be increased to 137.62 tonnes. Under Options CRA1_03 and 04 the TACC would stay at its current level.

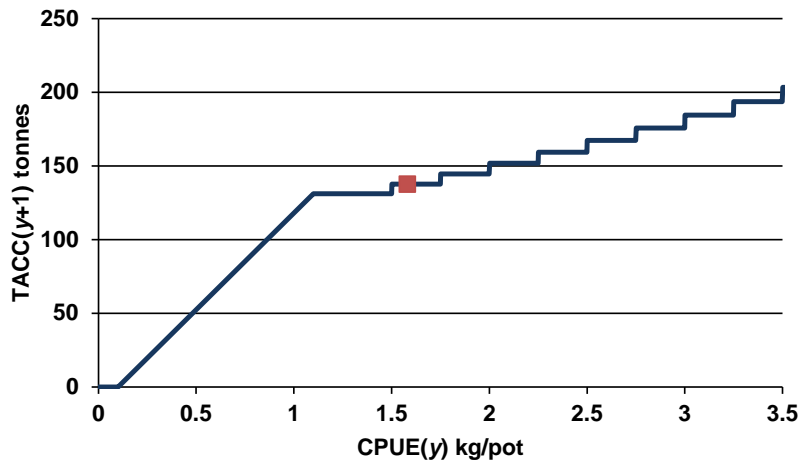
- *Options CRA1_01 and CRA1_02 – Increase the CRA 1 TACC by 6.558 tonnes*

The TACC increase proposed under Options CRA1_01 and 02 is guided by the use of the new *Rule 8d* CRA 1 management procedure.

A graphical representation of *Rule 8d* is provided in Figure 6.3. The graph shows the proposed TACC for the next year as a function of offset-year CPUE in the current year. The 2014 standardised offset year CPUE was 1.580 kg/potlift and when the rule was operated with this CPUE it resulted in a TACC of 137.62 tonnes (shown by the red square on the graph).

The proposed TACC increase has the potential to generate approximately \$460,000 in additional revenue for the commercial sector (based on average 2014 port price information).

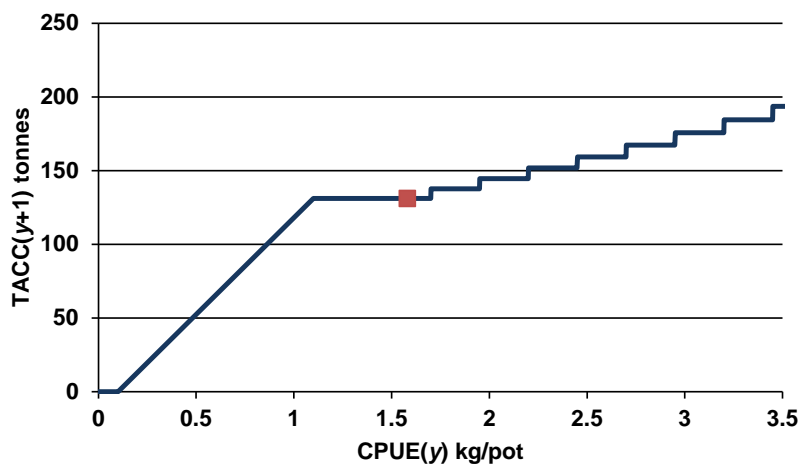
Figure 6.3: The new *Rule 8d* CRA 1 management procedure, showing the TACC for the 2015-16 fishing year resulting from the rule evaluation performed in 2014.



- *Options CRA1_03 and CRA1_04 – Retain the current CRA 1 TACC*

The proposal to retain the current CRA 1 TACC of 131.062 tonnes under Options CRA1_03 and CRA1_04 is guided by the use of the new *Rule 9d* CRA 1 management procedure. A graphical representation of *Rule 9d* is provided in Figure 6.4 (the red square on the graph relates to the proposed TACC of 131.062 tonnes).

Figure 6.4: The new *Rule 9d* CRA 1 management procedure, showing the TACC for the 2015-16 fishing year resulting from the rule evaluation performed in 2014.



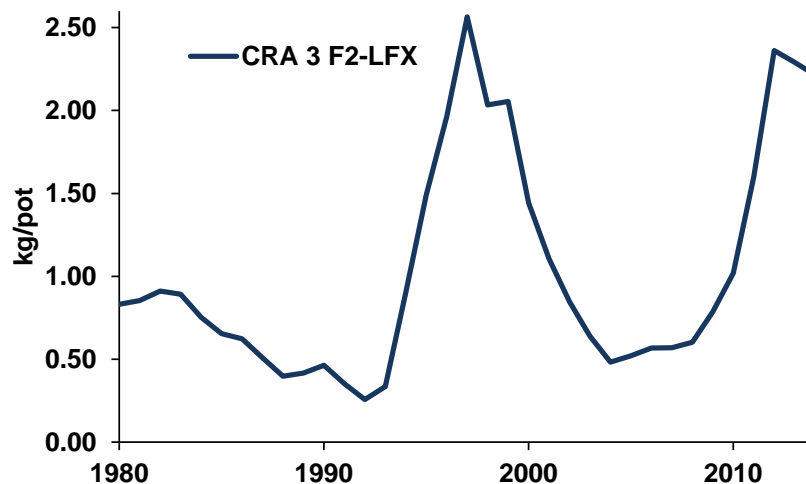
7 CRA 3 (Gisborne) rock lobster fishery

7.1 CRA 3 STOCK STATUS

A new stock assessment was carried out for the CRA 3 fishery in 2014 (the last was in 2008)⁸. The 2014 assessment results suggest there are no sustainability concerns for the CRA 3 fishery. 2013 biomass is well above both *B_{msy}* (3.3 to 4.7 times) and *B_{min}* (3.0 to 3.6 times)⁹. Spawning stock biomass in 2013 was 70-107% of the unfished level. Total biomass is about 50-67% of the unfished level and total numbers of rock lobster are about 76-91% of the unfished level. With 2013 catch levels and recent recruitments, biomass is projected to decline in the next four years by 15-31%, but would remain well above reference points.

Standardised CPUE is considered to be a reliable indicator of relative stock size in CRA 3 and is the abundance indicator used in the new CRA 3 management procedures. The history of offset year (i.e. October through September) CRA 3 commercial CPUE is shown in Figure 7.1. CPUE has increased steadily from 2008 to 2013, with a slight decline observed in 2014.

Figure 7.1: The history of CPUE in CRA 3, 1980 – 2014 (offset years).



7.2 PROPOSED CRA 3 OPTIONS

See Table 2.1 at the beginning of this document for a summary of the options proposed for CRA 3.

7.2.1 Use of new management procedures

It is proposed that a new management procedure is used to guide TAC setting in the CRA 3 fishery for five years from the 2015-16 to 2019-20 fishing years.

⁸ Two alternative CRA 3 stock assessment base cases were considered in 2014. The proposed new CRA 3 management procedures were evaluated under both alternative base cases concurrently.

⁹ *B_{ref}* for CRA 3 is not reported because it is not considered a useful indicator at this time. In previous assessments *B_{ref}* was defined as the period 1974-79, but in the 2014 assessment biomass was declining through this period and it is no longer considered appropriate to choose this period for estimation of *B_{ref}*.

Two different management procedure options are proposed for consideration: 'Rule 4' (Option CRA3_01) and 'Rule 6' (Option CRA3_02). The NRLMG proposes that one of these new procedures replaces the current CRA 3 management procedure that has been in use in the fishery since 2010 and has now effectively expired. The development of the new CRA 3 management procedures was guided by feedback received from a multi-sector meeting in Gisborne in July 2014.

Use of the new CRA 3 management procedures should not pose a risk to stock sustainability. Both rules have similar performance with respect to stock indicators (Table 7.1). Ongoing application of either CRA 3 management procedure is expected to meet the MPI Harvest Strategy Standard and maintain the stock above *Bmsy* with greater than 50% probability and *Bmin* with greater than 90% probability. For further information on the specifications of the new CRA 3 management procedures refer to Appendix 2.

Table 7.1: Summary of indicator results from base case evaluations for CRA 3 Rule 4 and Rule 6.

	Rule 4 Option CRA3_01	Rule 6 Option CRA3_02
Stock Indicators¹⁰		
The proportion of years in which biomass was <u>less</u> than:		
- <i>Bmsy</i>	< 0.9 %	< 1.0 %
- <i>Bmin</i>	< 0.6 %	< 0.6 %
Catch Indicators		
Minimum commercial catch	163 t	153 to 156 t
Average commercial catch	219 to 224 t	219 to 224 t
Average recreational catch	16 to 17 t	16 to 17 t
Average CPUE	1.5 to 1.6 kg/potlift	1.5 to 1.6 kg/potlift
Stability – the average frequency of change in the TACC	61 to 63 %	50 %

Simulation testing of the new CRA 3 management procedures also suggests they will continue to provide for utilisation benefits for all sectors in CRA 3. Stock biomass is expected to be maintained well above the stock indicators (i.e. *Bmsy*).

There are no major differences between the two rule options, except that *Rule 6* reduces the frequency of an annual change in the TACC from above 60% to about 50% over a period of 20 years. *Rule 4* would result in more frequent changes to the TACC when CPUE was between 1 and 2kg/potlift, while *Rule 6* would retain the TACC at 225 tonnes between CPUEs of 1.25 and 2 kg/potlift (see the management procedure graphs in section 7.2.3 below).

¹⁰ An explanation of the stock indicators is provided in section 4.2.

7.2.2 TAC setting

The current CRA 3 TAC is 389.95 tonnes.

Best available information suggests the CRA 3 stock is above *Bmsy*. Accordingly the Minister may set the CRA 3 TAC to maintain the stock at or above *Bmsy* (section 13(2)(a)).

- *Use the new Rule 4 CRA 3 management procedure and retain the CRA 3 TAC (Option CRA3_01)*

Under Option CRA3_01 the CRA 3 TAC would stay at its current level. This TAC is guided by the use of the new *Rule 4* CRA 3 management procedure.

The 2014 assessment projects that CRA 3 abundance will decline over the next four years. Retaining the current CRA 3 TAC is likely to help prevent a substantial decline of abundance in the fishery, which has flow-on utilisation benefits for all sectors. The operation of the *Rule 4* procedure is expected to maintain the stock well above *Bmsy*.

- *Use the new Rule 6 CRA 3 management procedure and retain the CRA 3 TAC (Option CRA3_02)*

As per Option CRA3_01 above, the current CRA 3 TAC would be retained under Option CRA3_02. This is based on the use of the new *Rule 6* CRA 3 management procedure.

As with *Rule 4*, *Rule 6* is expected to maintain the stock above *Bmsy* and help to prevent a substantial decline in CRA 3 abundance.

7.2.3 Setting of non-commercial allowances

- *Customary Maori allowance*

No change is proposed to the 20 tonne customary Maori allowance for CRA 3 under Options CRA3_01 and 02.

Based on reported customary catches under the Fisheries (Kaimoana) Regulations 1998 and regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013¹¹, it is considered that the current CRA 3 customary allowance is adequate for this interest at this time. In the 2013-14 April fishing year, about 26,000 rock lobsters were reported as caught in CRA 3 under the Kaimoana Regulations. An estimate of 20 tonnes was used in the 2014 stock assessment model to represent customary catches.

- *Recreational allowance*

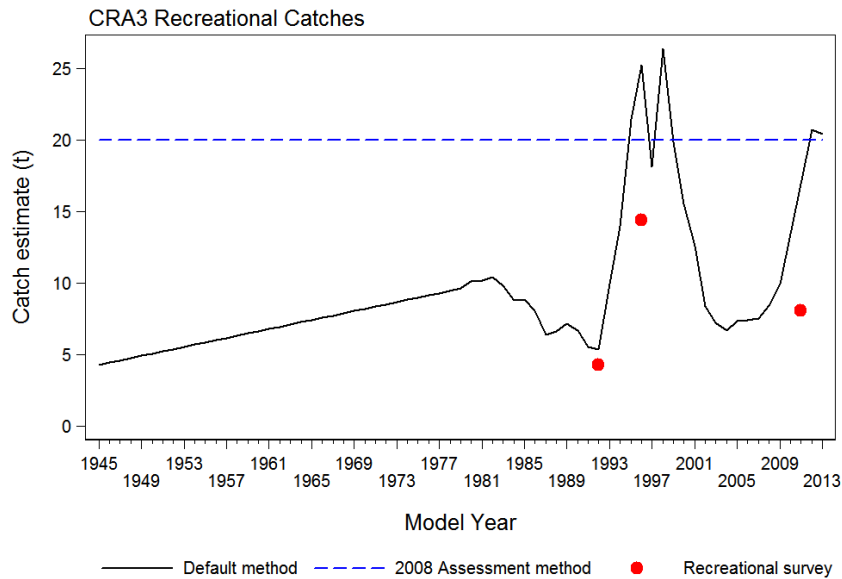
No change is proposed to the 20 tonne recreational allowance for CRA 3 under Options CRA3_01 and 02.

In the 2014 CRA 3 stock assessment, recreational catch estimates from 1992, 1996 and 2011 recreational harvest surveys were used to construct a recreational catch trajectory through time. The model assumed that recreational catch was proportional to CRA 3 spring-summer commercial CPUE. The resulting recreational catch trajectory showed a strong increasing trend from the early 1990s, exceeding 20 tonnes in the late 1990s, and then a strong decreasing trend in the early 2000s before an increase was seen in the late 2000s (Figure 7.3).

¹¹ Previously regulation 27A of the Fisheries (Amateur Fishing) Regulations 1986.

The 2013 recreational catch estimate (from the model) was 20.42 tonnes including 2.94 tonnes of recreational catch taken by commercial fishers under s111 of the Act. It is considered that the 20 tonne recreational allowance adequately allows for likely levels of recreational harvest from the CRA 3 fishery at this time.

Figure 7.3: Recreational catch trajectories (kg) for the 2014 stock assessment of CRA 3. The red dots refer to the recreational survey estimates. For comparison, the black solid line shows the catch trajectory made proportional to spring-summer CRA 3 CPUE. The blue dashed line is the recreational catch trajectory that was used in the 2008 stock assessment (a constant 20 tonnes). Section 111 catches which were taken by commercial fishers for non-commercial purposes were added to the 2014 trajectory (i.e. a maximum of 2.94 tonnes).



- *Other mortality allowance*

No change is proposed to the 89 tonne CRA 3 allowance for other sources of fishing-related mortality under Options CRA3_01 and 02.

There is no reliable information on current levels of other sources of fishing-related mortality. The RLFAWG used available MPI estimates for illegal catches from 1989 and a constant illegal catch of 89 tonnes per year from 2002 to 2013 as an estimate of other mortality.

The NRLMG and RLFAWG have little confidence in the estimates of illegal catch because the estimates cannot be verified. MPI considers that there are moderate to high levels of illegal fishing activity in the CRA 3 fishery, but illegal activities are thought to have decreased in recent years due to targeted and varied enforcement efforts. The NRLMG does not propose to vary the CRA 3 other mortality allowance until a better estimate of illegal take becomes available.

Incidental fishing-related mortality is considered to be low for rock lobster fisheries given the methods used and the practices in place to ensure careful handling of rock lobster.

7.2.4 TACC

The current CRA 3 TACC is 260.95 tonnes.

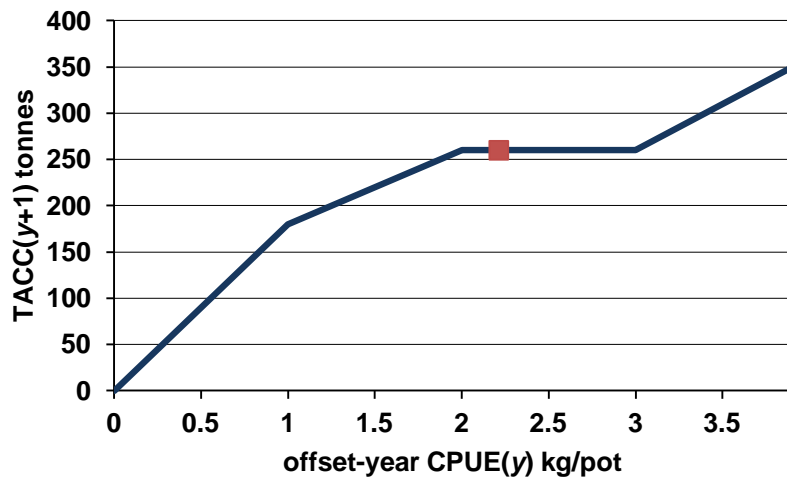
Under Options CRA3_01 and 02 the CRA 3 TACC would stay at its current level.

- *Option CRA3_01 – Retain the current CRA 3 TACC (as guided by the new Rule 4 CRA 3 management procedure)*

Under Option CRA3_01 the proposed retention of the current CRA 3 TACC is guided by the use of the new *Rule 4* CRA 3 management procedure.

A graphical representation of the *Rule 4* procedure is provided in Figure 7.4. The graph shows the proposed TACC for the next year as a function of offset-year CPUE in the current year. The 2014 standardised offset year CPUE was 2.214 kg/potlift and when the rule was operated with this CPUE it resulted in a TACC of 260.95 tonnes (shown by the red square on the graph).

Figure 7.4: The new *Rule 4* CRA 3 management procedure, showing the TACC for the 2015-16 fishing year resulting from the rule evaluation performed in 2014.

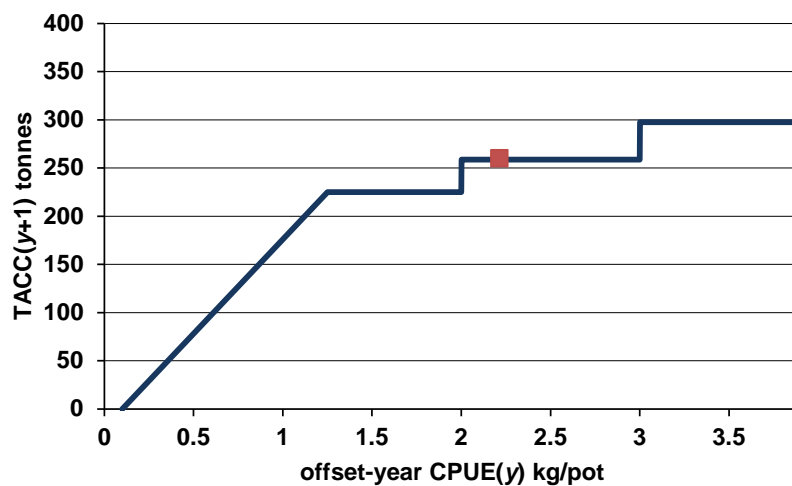


- *Option CRA3_02 – Retain the current CRA 3 TACC (as guided by the new Rule 6 CRA 3 management procedure)*

Under Option CRA3_02 the proposed retention of the current CRA 3 TACC is guided by the use of the new *Rule 6* CRA 3 management procedure.

A graphical representation of the *Rule 6* procedure is provided in Figure 7.5. When the rule was operated with the 2014 offset year CPUE it resulted in no change to the current TACC (shown by the square in the graph).

Figure 7.5: The new *Rule 6* CRA 3 management procedure, showing the TACC for the 2015-16 fishing year resulting from the rule evaluation performed in 2014.



7.3 OTHER CONSIDERATIONS

Separate to the sustainability measures proposals for CRA 3 are the perceived equity issues that some non-commercial fishers continue to hold with respect to the differential rock lobster size limits between sectors. Commercial fishers in CRA 3 are able to land male rock lobsters at or above 52 mm tail width only during June, July and August, while recreational fishers must take male rock lobsters at or above 54 mm tail width year-round.

Recreational fisher concerns about the availability of legal sized rock lobsters relates to a portion of the CRA 3 fishery in waters close to Gisborne City or statistical area 910. Some recreational representatives consider that the smaller commercial autumn-winter size limit for male rock lobsters remains at the heart of the ongoing spatial conflict dispute locally between recreational and commercial fishers. These representatives assert that the commercial size limit must be increased immediately to match the recreational size limit. If this doesn't occur options for spatial separation will be pursued.

MPI is currently exploring different options in relation to the CRA 3 size limit and whether any changes should be proposed to the size limit for recreational or commercial fishers. Any changes to the size regime would require regulatory amendment which is subject to a separate process and different timeframe than the April 2015 sustainability process. MPI is proposing to discuss different options with tangata whenua and stakeholders during 2015. This document is solely concerned with TAC, allowance and TACC setting under sections 11, 13, 20 and 21 of the Act and no regulatory or other changes are proposed as part of this document.

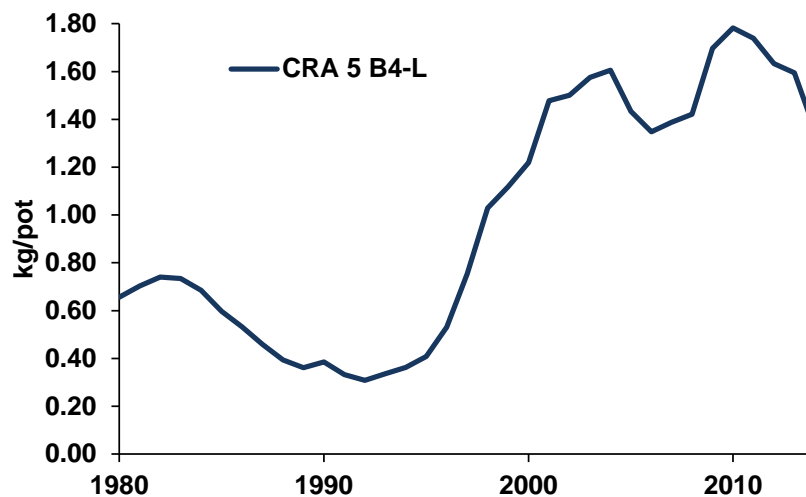
8 CRA 5 (Canterbury/Marlborough) rock lobster fishery

8.1 CRA 5 STOCK STATUS

Based on the most recent commercial CPUE information, CRA 5 stock biomass in 2014 was considered virtually certain (>99%) to be above *Bmsy*, *Bref* and *Bmin*¹². Spawning stock biomass in 2009 was above 20% of its unfished level with greater than 99% probability (based on the 2010 CRA 5 stock assessment).

Standardised CPUE is considered to be a reliable indicator of relative stock size in CRA 5 and is the abundance indicator used in the CRA 5 management procedure. The history of offset year (i.e. October through September) CRA 5 commercial CPUE is shown in Figure 8.1. CPUE has decreased since 2009, but remains at high levels.

Figure 8.1: The history of CPUE in CRA 5, 1980 – 2014 (offset years).



8.2 PROPOSED CRA 5 OPTIONS

See Table 2.1 at the beginning of this document for a summary of the options proposed for CRA 5. The current CRA 5 management procedure is used to guide TAC setting options.

8.2.1 TAC setting

The current CRA 5 TAC is 467 tonnes.

Best available information suggests the CRA 5 stock is above *Bmsy*. Accordingly the Minister may set the CRA 5 TAC to maintain the stock at or above *Bmsy* (section 13(2)(a)).

- Use the CRA 5 management procedure and decrease the CRA 5 TAC (Option CRA5_01)

Under Option CRA5_01 the CRA 5 TAC would be decreased to 452.81 tonnes. The proposed TAC decrease is specified by the CRA 5 management procedure that the Minister agreed to use in 2012 to guide TAC setting in the fishery until the 2017-18 fishing year. Important elements of the CRA 5 management procedure are set out below and in Appendix 3.

¹² *Bref* for CRA 5 is the pre-season autumn-winter vulnerable biomass associated with the period 1979-88.

Ongoing application of the CRA 5 management procedure is expected to meet the MPI Harvest Strategy Standard and maintain the stock above *Bref* with greater than 50% probability and above *Bmin* with greater than 90% probability. Simulation testing indicates it would maintain the stock above *Bref* with 99% probability.

Option CRA5_01 will decrease the current utilisation benefit of the fishery. How this reduction is shared amongst the fishery sectors will depend on allocation decisions. CRA 5 non-commercial allowances and the TACC have remained unchanged since 1999.

Overall it is expected that ongoing application of the CRA 5 management procedure will at least maintain fishing opportunities for all sectors by maintaining stock abundance above the agreed reference level.

- *Retain the current CRA 5 TAC (Option CRA5_02)*

Under Option CRA5_02 the CRA 5 TAC would stay at its current level for the 2015-16 fishing year. This option has initial support from the industry.

Making no change to the CRA 5 TAC for one year is unlikely to pose a sustainability risk to the stock because information suggests, despite the observed decline in abundance, that the stock is currently above the agreed reference level. However, if the stock continues to decline a bigger decrease in the TAC may be required for April 2016 if the proposed decrease is not followed for April 2015.

It is important to note that several other management procedures (i.e. CRA 2, CRA 3, CRA 8 and CRA 9) have a 5% minimum change threshold. A minimum change threshold was not applied to the CRA 5 management procedure when developed, in part because there was a low probability that CPUE would fall below 1.4 kg/potlift and a TACC reduction would be recommended (simulation testing of the management procedure indicated CPUE would remain above 1.4kg/potlift with 86% probability). If a 5% minimum change threshold was applied to CRA 5 this would result in no proposed change to the TAC for April 2015 (a 4.05% TAC decrease is proposed under Option CRA5_01).

Under this option it is proposed that no change is made to the TAC and allocation decisions are considered in conjunction with a new stock assessment model and management procedure evaluations. A CRA 5 stock assessment is to be carried out in 2015 instead of in 2016 as originally scheduled. It is proposed that initial consultation is undertaken with regional fishery interests in 2015 on potential allocation approaches.

8.2.2 Setting of non-commercial allowances

- *Customary Maori allowance*

No change is proposed to the 40 tonne customary Maori allowance for CRA 5.

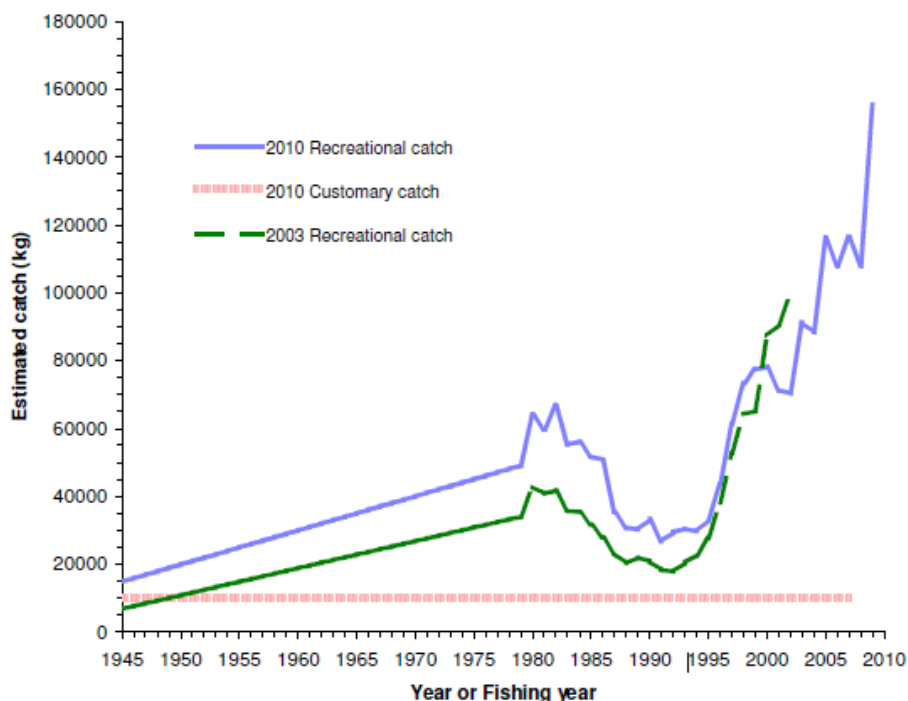
Little is known about customary Maori catch in CRA 5, apart from the small amount of catches reported under the Fisheries (South Island Customary Fishing) Regulations 1999 and regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013¹³. However, it is assumed that current CRA 5 customary Maori catch is within the allowance allocated for this interest at this time. An estimate of 10 tonnes was used in the 2010 CRA 5 stock assessment model to represent customary catch (pink line in Figure 8.2).

- *Recreational allowance*

No change is proposed to the 40 tonne recreational allowance for CRA 5.

In the 2010 CRA 5 stock assessment, recreational catch estimates from 1994, 1996, 2000 and 2001 recreational harvest surveys were used to construct a recreational catch trajectory through time. The model assumed that recreational catch was proportional to the spring-summer commercial CPUE for statistical area 917 (Kaikoura). The resulting recreational catch trajectory showed a strong increasing trend since the mid-1990s, exceeding 100 t since 2005 and exceeding 150 t in 2009. The model assumptions of recreational catch suggest catches are exceeding the 40 tonne allowance for CRA 5 recreational interests.

Figure 8.2: Recreational (blue line) catch trajectory (kg) for the 2010 stock assessment of CRA 5 made proportional to spring-summer CPUE in statistical area 917. For comparison, the green dashed line is the recreational catch trajectory used for the 2003 CRA 5 stock assessments. The pink line is the customary catch trajectory used in the 2010 assessment. Section 111 catches which were taken by commercial fishers for non-commercial purposes were added to the 2010 recreational catch trajectory (i.e. a maximum of 6.2 tonnes).



¹³ Previously regulation 27A of the Fisheries (Amateur Fishing) Regulations 1986.

Results from a recent boat ramp survey at Kaikoura and Motunau indicate that private vessels and charter vessels harvested about 55 tonnes of rock lobster from October 2012 to September 2013. This estimate does not include shore-based fishing and includes only a portion of the CRA 5 fishery (Marlborough Sounds and Banks Peninsula are outside the survey area). This survey information also suggests the 40 tonne recreational allowance is being exceeded.

It is proposed that changes to the recreational allowance and/or recreational rules are considered in 2015 when results from a new stock assessment will be available.

- *Other mortality allowance*

No change is proposed to the 37 tonne CRA 5 allowance for other sources of fishing-related mortality.

There is no reliable information on current levels of other sources of fishing-related mortality. The RLFAWG used available MPI estimates from 1990 to 2003 in the 2010 stock assessment model to estimate illegal catches. For the 2009-10 fishing year the other mortality estimate from the model was 52 tonnes, which suggests the current CRA 5 other mortality allowance of 37 tonnes may be being exceeded. However, there is little confidence in the estimates of illegal catch because the estimates cannot be verified. The NRLMG does not propose to vary the CRA 5 other mortality allowance until a better estimate of illegal take becomes available.

Incidental fishing-related mortality is considered to be low for rock lobster fisheries given the methods used and the practices in place to ensure careful handling of rock lobster.

8.2.3 TACC

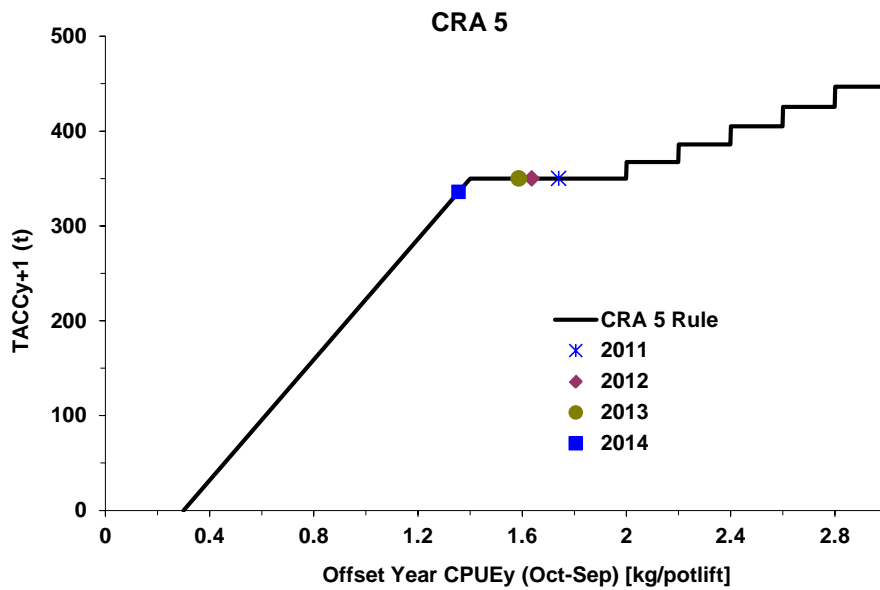
The current CRA 5 TACC is 350 tonnes.

- *Option CRA5_01 – Decrease the CRA 5 TACC by 14.19 tonnes (as guided by the CRA 5 management procedure)*

Under Option CRA5_01 the CRA 5 TACC would be decreased to 335.81 tonnes from April 2015, as guided by the use of the CRA 5 management procedure. The proposed 14.19 tonne TACC decrease has the potential to result in a loss of revenue for the industry of approximately \$1 million (based on 2014 average port price information).

A graphical representation of the CRA 5 management procedure is provided in Figure 8.3. The graph shows the proposed TACC for the next year as a function of offset-year CPUE in the current year. The 2014 standardised offset year CPUE was 1.355 kg/potlift and when the rule was operated with this CPUE it resulted in a TACC of 335.81 tonnes (shown by the blue square on the graph).

Figure 8.3: The CRA 5 management procedure, showing the TACCs resulting from the rule evaluations performed in 2011 through 2014 for the 2011-12 through 2015-16 fishing years (shown as coloured shapes).



- *Option CRA5_02 – Retain the current CRA 5 TACC*

Under Option CRA5_02 the CRA 5 TACC would stay at its current level. This option would maintain the current utilisation benefit of the commercial fishery.

This option has initial support from the CRA 5 industry for reasons noted above. It is considered that there is little risk to the sustainability of the stock if no change is made to the TACC for one year.

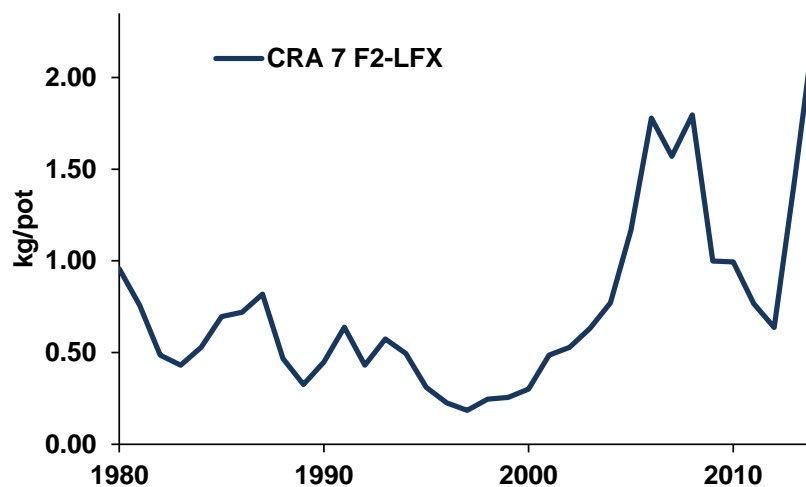
9 CRA 7 (Otago) rock lobster fishery

9.1 CRA 7 STOCK STATUS

Based on the most recent commercial CPUE information, CRA 7 stock biomass in 2014 is considered to be about as likely as not (40-60%) to be above *Bref* and is well above *Bmin*¹⁴.

Standardised CPUE is considered to be a reliable indicator of relative stock size in CRA 7 and is the abundance indicator used in the CRA 7 management procedure. The history of offset year (i.e. October through September) CRA 7 commercial CPUE is shown in Figure 9.1. CPUE has increased substantially since 2012.

Figure 9.1: The history of CPUE in CRA 7, 1980 – 2014 (offset years).



9.2 PROPOSED CRA 7 OPTIONS

See Table 2.1 at the beginning of this document for a summary of the options proposed for CRA 7. The current CRA 7 management procedure is used to guide TAC setting options.

9.2.1 TAC setting

The current CRA 7 TAC is 86 tonnes.

There is a reliable estimate of current biomass, but no reliable estimate of *Bmsy*. Because of this any variation to the CRA 7 TAC must be done under section 13(2A).

- Use the CRA 7 management procedure and increase the CRA 7 TAC (Option CRA7_01)

Under Option CRA7_01 the CRA 7 TAC would be increased to 117.72 tonnes. The proposed TAC increase is specified by the CRA 7 management procedure that the Minister agreed to use in 2013 to guide TAC setting in the fishery until the 2018-19 fishing year. Important elements of the CRA 7 management procedure are set out below and in Appendix 4.

¹⁴ *Bref* for CRA 7 is the pre-season autumn-winter vulnerable biomass associated with the period 1979-81. 1979-81 was a period when the stock showed good productivity and was demonstrably safe. There are no reliable *Bmsy* and *SSB* estimates available for CRA 7 because of the high level of out-migrations estimated for the stock.

Ongoing application of the CRA 7 management procedure is expected to meet the MPI Harvest Strategy Standard and maintain the stock above *Bref* with greater than 50% probability and above *Bmin* with greater than 90% probability. Simulation testing indicates it would maintain the stock above *Bref* with greater than 89% probability.

Option CRA7_01 should increase the current utilisation benefit of the fishery. How the benefits are accrued depends on allocation decisions. Historically, only the TACC has been increased or decreased to give effect to the variations in the TAC. Overall utilisation benefits are likely to increase for all sectors under the management procedure approach through increases to CRA 7 abundance.

- *Retain the current CRA 7 TAC (Option CRA7_02)*

Under Option CRA7_02 the CRA 7 TAC would stay at its current level for the 2015-16 fishing year.

This option could result in increased abundance in the CRA 7 fishery in the short term, increased non-commercial catches and catch rates compared to Option CRA7_01, and higher CPUE for commercial fishers, which may result in reduced harvesting costs (but at the cost of not being able to take advantage of the proposed TACC increase under Option CRA7_01).

9.2.2 Setting of non-commercial allowances

- *Customary Maori allowance*

No change is proposed to the 10 tonne customary Maori allowance for CRA 7.

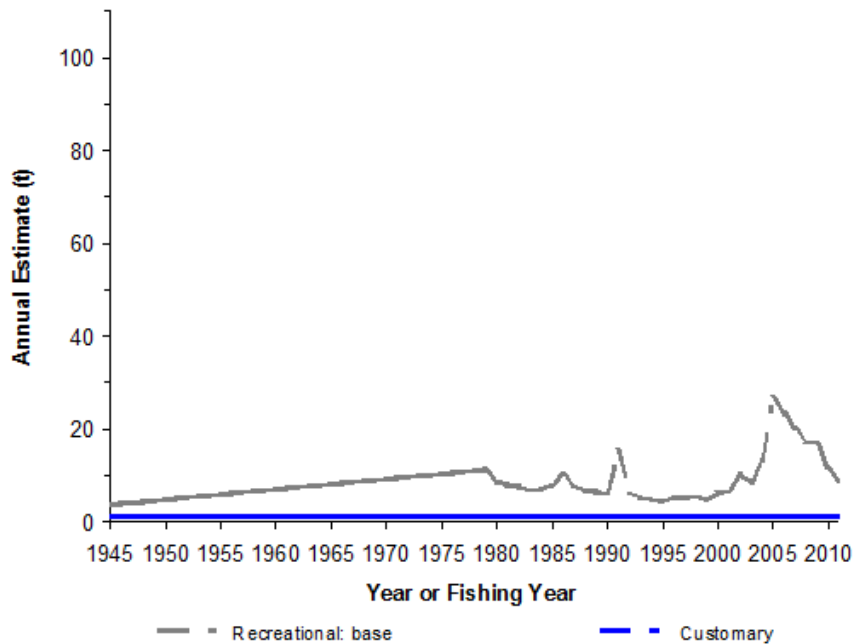
Information suggests existing CRA 7 customary Maori catch is within the allowance allocated for this interest at this time. Reports of customary harvest under the Fisheries (South Island Customary Fishing) Regulations 1999 suggest there are low levels of rock lobster harvest from CRA 7. An estimate of 1 tonne was used in the 2012 CRA 7 stock assessment model to represent customary catch (blue line in Figure 9.2).

- *Recreational allowance*

No change is proposed to the 5 tonne recreational allowance for CRA 7.

In the 2012 CRA 7 stock assessment, recreational catch estimates from 1992, 1996, 2000 and 2001 recreational harvest surveys were used to construct a recreational catch trajectory through time. The model assumed that recreational catch was proportional to spring-summer commercial CPUE for CRA 7. The resulting recreational catch trajectory reflects the low abundances in the 1990s, followed by a strong increase to the mid to late 2000s followed by a subsequent drop (Figure 9.2).

Figure 9.2: Recreational (grey line) catch trajectory (kg) for the 2012 stock assessment of CRA 7 made proportional to spring-summer CPUE in CRA 7. The blue line is the customary catch trajectory used in the 2012 assessment. Section 111 catches which were taken by commercial fishers for non-commercial purposes were added to the 2012 recreational catch trajectory (i.e. a maximum of 1.7 tonnes).



Based on the model, the average recreational catch from 1979 to 2011 was 10 tonnes. This suggests that the current recreational allowance may have been exceeded at times over this period, but given the uncertainty associated with the model estimates of recreational catch it is proposed that no change is made to the recreational allowance at this time.

- *Other mortality allowance*

No change is proposed to the 5 tonne CRA 7 allowance for other sources of fishing-related mortality.

There is no reliable information on current levels of other sources of fishing-related mortality. The RLFAWG used available MPI illegal take estimates from 1990 to 2002 and 1 tonne per year from 2002 to 2011 in the 2010 stock assessment model to estimate illegal catches. It is considered that the 5 tonnes of other sources of fishing-related mortality allowance covers the possible illegal take in the fishery; however, there is little confidence in the estimates of illegal catch because the estimates cannot be verified.

Incidental fishing-related mortality is considered to be low for rock lobster fisheries given the methods used and the practices in place to ensure careful handling of rock lobster.

9.2.3 TACC

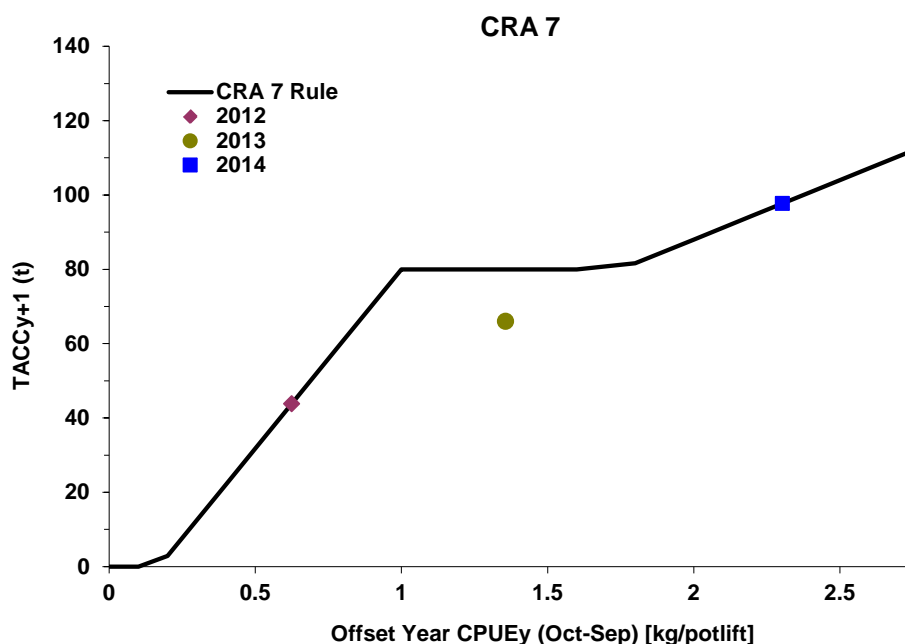
The current CRA 7 TACC is 66 tonnes.

- *Option CRA7_01 – Increase the CRA 7 TACC by 31.72 tonnes (as guided by the CRA 7 management procedure)*

Under Option CRA7_01 the CRA 7 TACC would be increased to 97.72 tonnes from April 2015, as guided by the use of the CRA 7 management procedure. The proposed 31.72 tonne TACC increase has the potential to generate approximately \$2.2 million in additional earnings for the commercial sector (based on 2014 average port price information).

A graphical representation of the CRA 7 management procedure is provided in Figure 9.3. The graph shows the proposed TACC for the next year as a function of offset-year CPUE in the current year. The 2014 standardised offset year CPUE was 2.304 kg/potlift and when the rule was operated with this CPUE it resulted in a TACC of 97.72 tonnes (shown by the blue square on the graph).

Figure 9.3: The CRA 7 management procedure, showing the TACs resulting from the rule evaluations performed in 2012 through 2014 for the 2013-14 through 2015-16 fishing years (shown as coloured shapes).



- *Option CRA7_02 – Retain the current CRA 7 TACC*

Under Option CRA7_02 the CRA 7 TACC would stay at its current level. This option would constrain utilisation in the commercial fishery and result in a loss of additional revenue compared to Option CRA7_01.

10 CRA 9 (Westland/Taranaki) rock lobster fishery

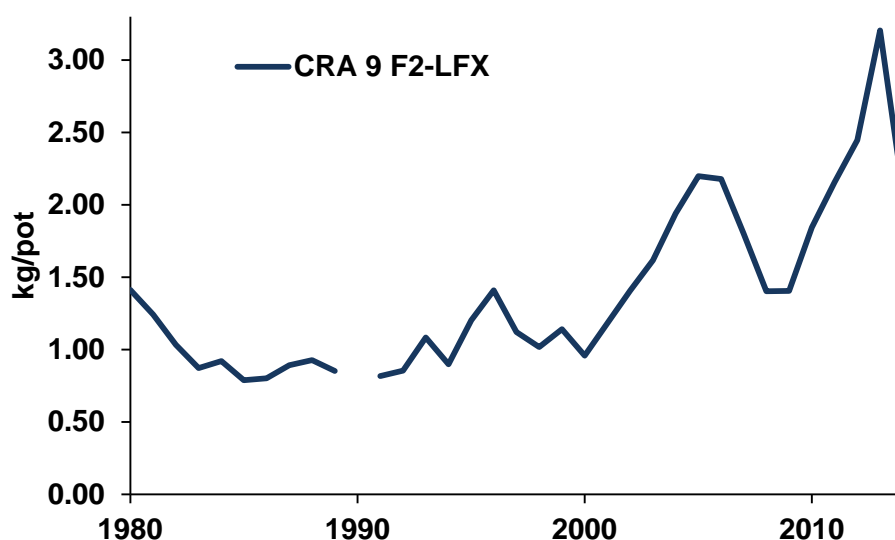
10.1 CRA 9 STOCK STATUS

Based on the most recent commercial CPUE information, CRA 9 stock biomass in 2014 was considered very likely (>90%) to be above *B_{msy}* and well above *B_{min}*¹⁵. Fishing intensity in 2012 was estimated to be at low levels (12%).

Standardised CPUE is considered to be a reliable indicator of relative stock size in most rock lobster fisheries. There are some concerns that the CRA 9 CPUE indices are sensitive to different catching patterns rather than changes in stock size because of the small number of vessels targeting rock lobster in the area.

Despite this sensitivity, CRA 9 CPUE has been used as an indicator of abundance in the CRA 9 management procedure. The history of offset year (i.e. October through September) CRA 9 commercial CPUE is shown in Figure 10.1. CRA 9 CPUE increased strongly from 2009 with a decrease observed in 2014.

Figure 10.1: The history of CPUE in CRA 9, 1980 – 2014 (offset years).



10.2 PROPOSED CRA 9 OPTIONS

See Table 2.1 at the beginning of this document for a summary of the options proposed for CRA 9. The current CRA 9 management procedure is used to guide TAC setting options.

10.2.1 TAC setting

The current CRA 9 TAC is 115.8 tonnes.

Best available information suggests the CRA 9 stock is above *B_{msy}*. Accordingly the Minister may set the CRA 9 TAC to maintain the stock at or above *B_{msy}* (section 13(2)(a)).

- Use the CRA 9 management procedure and decrease the CRA 9 TAC (Option CRA9_01)

¹⁵ *Bref* for CRA 5 is the pre-season autumn-winter vulnerable biomass associated with the period 1979-88.

Under Option CRA9_01 the CRA 9 TAC would be decreased to 101 tonnes. The proposed TAC decrease is specified by the CRA 9 management procedure that the Minister agreed to use in 2014 to guide TAC setting in the fishery until the 2018-19 fishing year. Important elements of the CRA 9 management procedure are set out below and in Appendix 5.

Ongoing application of the CRA 9 management procedure is expected to meet the MPI Harvest Strategy Standard and maintain the stock above *Bmsy* with greater than 50% probability. Simulation testing indicates the stock would be maintained above *Bmsy* with greater than 93% probability.

Option CRA9_01 will decrease the current utilisation benefit of the fishery. How this reduction is shared amongst the fishery sectors will depend on allocation decisions.

- *Retain the current CRA 9 TAC (Option CRA9_02)*

Under Option CRA9_02 the CRA 9 TAC would stay at its current level for the 2015-16 fishing year.

Retaining the current TAC for one year is unlikely to pose a risk to stock sustainability in the short term. However, if a decision is made not to follow the results of the CRA 9 management procedure in 2015, the procedure cannot be used to guide TAC setting in future years. The current TACC could pose a risk to stock sustainability in future years unless a revised management procedure is evaluated or a new assessment is performed.

10.2.2 Setting of non-commercial allowances

- *Customary Maori allowance*

No change is proposed to the 20 tonne customary Maori allowance for CRA 9.

Little is known about customary Maori catch in CRA 9, apart from the small amount of catch reported under the Fisheries (Kaimoana Customary Fishing) Regulations 1998, the Fisheries (South Island Customary Fishing) Regulations 1999 and regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013¹⁶. However, it is assumed that current CRA 9 customary Maori catch is within the allowance allocated at this time. An estimate of 1 tonne was used in the 2013 CRA 9 surplus production model to represent customary catch.

- *Recreational allowance*

No change is proposed to the 30 tonne recreational allowance for CRA 9.

In the 2013 CRA 9 surplus production model it was assumed that CRA 9 recreational catch was 20.22 tonnes in 2011. This catch estimate was based on the 2011 National Panel Survey estimate and the assumption that recreational catch is proportional to spring summer commercial CPUE in CRA 9. It is assumed that the current CRA 9 recreational allowance adequately allows for recreational interests.

- *Other mortality allowance*

No change is proposed to the 5 tonne CRA 9 allowance for other sources of fishing-related mortality.

¹⁶ Previously regulation 27A of the Fisheries (Amateur Fishing) Regulations 1986.

There is no reliable information on current levels of other sources of fishing-related mortality. The RLFAWG used available MPI estimates for illegal catches from 1989 and a constant illegal catch of 1 tonne per year from 2001 to determine an appropriate estimate of other mortality in the 2013 assessment. It is assumed that the current allowance adequately allows for likely levels of other mortality.

Incidental fishing-related mortality is considered to be low for rock lobster fisheries given the methods used and the practices in place to ensure careful handling of rock lobster.

10.2.3 TACC

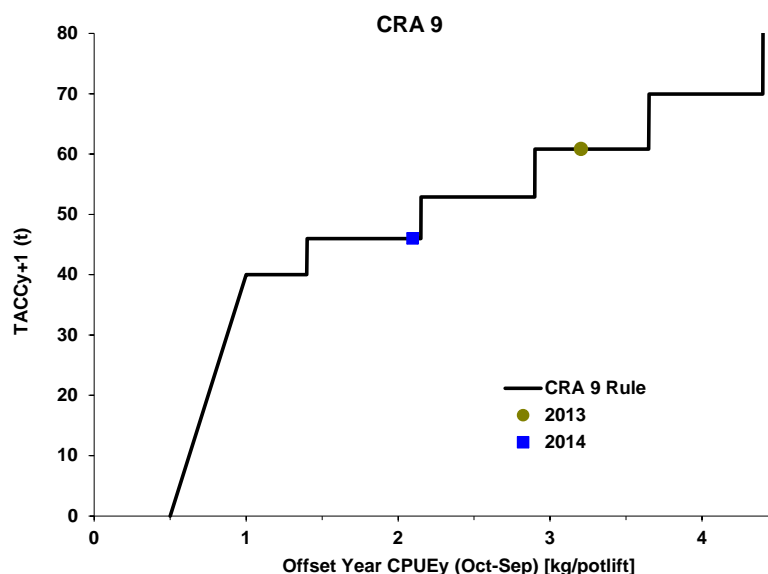
The current CRA 9 TACC is 60.8 tonnes.

- *Option CRA9_01 – Decrease the CRA 9 TACC by 14.8 tonnes (as guided by the CRA 9 management procedure)*

Under Option CRA9_01 the CRA 9 TACC would be decreased to 46 tonnes from April 2015, as guided by the use of the CRA 9 management procedure. The proposed 14.8 tonne TACC decrease has the potential to result in a loss of revenue for the industry of approximately \$1.04 million (based on 2014 average port price information).

A graphical representation of the CRA 9 management procedure is provided in Figure 10.2. The graph shows the proposed TACC for the next year as a function of offset-year CPUE in the current year. The 2014 standardised offset year CPUE was 2.095 kg/potlift and when the rule was operated with this CPUE it resulted in a TACC of 46 tonnes (shown by the blue square on the graph).

Figure 10.2: The CRA 9 management procedure, showing the TACs resulting from the rule evaluations performed in 2013 through 2014 for the 2014-15 through 2015-16 fishing years (shown as coloured shapes).



- *Option CRA9_02 – Retain the current CRA 9 TACC*

Under Option CRA9_02 the CRA 9 TACC would stay at its current level. This option would maintain the current utilisation benefit of the commercial fishery, but would increase risk to stock sustainability.

11 Other matters – uncertainty in non-commercial removals

Accurate information about non-commercial removals is necessary for fisheries management decisions. Information on the level of commercial removals is well known for rock lobster, while there is considerable uncertainty associated with the levels of customary, recreational and illegal removals.

The lack of accurate information on non-commercial and illegal catch contributes to uncertainty of stock assessments, detracts from the effectiveness of agreed harvest strategies, and undermines the incentives created by the quota management system.

There is a risk that non-commercial removals increasing without control could undermine rebuild strategies and have negative effects on commercial ownership and utilisation rights and opportunities.

Information on the level of recreational harvest of rock lobsters has started to improve in recent years through specific onsite surveys and the 2011-12 National Panel Survey. Customary harvest information is complete in some localised areas through the adoption of the Fisheries (Kaimoana Customary Fishing) Regulations 1998 and the Fisheries (South Island Customary Fishing) Regulations 1999. However, for many areas there is still no mandatory requirement for customary authorisers to report summary harvest levels.

The level of illegal estimates is of most concern to the NRLMG because they make up a substantial portion of the TAC (299 tonnes nationally). Many of the illegal take estimates for rock lobster have not been updated since the early 2000s. Consequently, the current levels of illegal take and associated historical pattern are highly uncertain and the NRLMG and RLFAGW have little confidence in the estimates.

MPI is proposing to explore a new method of calculating illegal take for rock lobster in 2015. The NRLMG is highly supportive of this work and is available to input into the development of any new methodology.

12 Conclusion

The NRLMG supports the use of management procedures in all of New Zealand's rock lobster fisheries. Use of management procedures to guide TAC setting allows for much more rapid management responses than does the conventional approach of periodic stock assessment followed by decision making. Having infrequent stock assessments can cause delays to the implementation of management actions required for stock sustainability.

The NRLMG considers once a management procedure has been agreed for use, it should be followed unless there are compelling reasons in a particular case not to follow it.

Appendix 1: New CRA 1 management procedure specifications

In 2014 a new version of the multi-stock length-based stock assessment model was developed for CRA 1. This assessment model was used to set the operating model for evaluating new CRA 1 management procedures. Management procedures have not been used for the CRA 1 fishery before.

Eighteen different CRA 1 management procedure options were considered by the NRLMG late in 2014. The NRLMG have put forward two of these ‘final’ rules for consideration, called *Rule 8d* and *Rule 9d*.

Some important elements of the CRA 1 management procedures are:

- a) The output variable is TACC (tonnes);
- b) Offset-year standardised CPUE is used as an input to the rule to determine the TACC for the fishing year that begins in the following April;
- c) CPUE is calculated using the 2012 *F2_LFX* procedure which uses:
 - landings to a licensed fisher receiver, along with recreational landings from a commercial vessel and the amount of rock lobsters returned to the water in accordance with Schedule 6 of the Act (i.e. highgraded rock lobsters),
 - estimates, by vessel, of the ratio of annual landed catch divided by annual estimated catch to correct every landing record in a quota management area for the vessel;
- d) The management procedure is to be evaluated every year (no “latent year”), based on offset-year CPUE;
- e) The minimum change threshold for the TACC is 5%. There is no maximum change threshold for the TACC.

The CRA 1 management procedures are both plateau step rules, which are illustrated in Figures 6.3 and 6.4 above.

For *Rule 8d*: between CPUEs of 0 to 0.1 kg/potlift the TACC is zero, the TACC then increases linearly with CPUE to 1.1 kg/potlift, and between CPUEs of 1.1 to 1.5 kg/potlift the TACC is 131.062 tonnes. As CPUE increases above 1.5 kg/potlift, the TACC increases in steps with a width of 0.25 kg/potlift and a height of 5% of the preceding TACC.

For *Rule 9d*: between CPUEs of 0 to 0.1 kg/potlift the TACC is zero, the TACC then increases linearly with CPUE to 1.1 kg/potlift, and between CPUEs of 1.1 to 1.7 kg/potlift the TACC is 131.062 tonnes. As CPUE increases above 1.7 kg/potlift, the TACC increases in steps with a width of 0.25 kg/potlift and a height of 5% of the preceding TACC.

Table A provides the results of the operation of the proposed new CRA 1 management procedures for the 2015-16 fishing year.

Table A: Results of the proposed *Rule 8d* and *Rule 9d* CRA 1 management procedures for the 2015-16 fishing year, after operation of all their components including thresholds.

Proposed CRA 1 rules	Offset-year 'F2-LFX' CPUE at time of analysis (kg/potlift)	Rule result: TACC (t)
<i>Rule 8d</i> (Options CRA1_01 and 02)	1.580	137.62
<i>Rule 9d</i> (Options CRA1_03 and 04)	1.580	131.062

Appendix 2: New CRA 3 management procedure specifications

In 2014 a new stock assessment was carried out for CRA 3. This assessment model was used to set the operating model for evaluating new CRA 3 management procedures.

Three different CRA 3 management procedure options were considered by the NRLMG late in 2014. The NRLMG have put forward two of these 'final' rules for consideration, called *Rule 4* and *Rule 6*.

Some important elements of the proposed CRA 3 management procedures are:

- a) The output variable is TACC (tonnes);
- b) Offset-year standardised CPUE is used as an input to the rule to determine the TACC for the fishing year that begins in the following April;
- c) CPUE is calculated using the 2012 *F2_LFX* procedure which uses:
 - landings to a licensed fisher receiver, along with recreational landings from a commercial vessel and the amount of rock lobsters returned to the water in accordance with Schedule 6 of the Act (i.e. highgraded rock lobsters),
 - estimates, by vessel, of the ratio of annual landed catch divided by annual estimated catch to correct every landing record in a quota management area for the vessel;
- d) The management procedure is to be evaluated every year (no "latent year"), based on offset-year CPUE;
- e) The minimum change threshold for the TACC is 5%. There is no maximum change threshold for the TACC.

The proposed new *Rule 4* CRA 3 management procedure is a non-standard rule, illustrated in Figure 7.4 above. For *Rule 4*: the TACC is zero at a CPUE of zero, the TACC increases linearly with CPUE, reaching 180 tonnes at a CPUE of 1.0 kg/potlift. The TACC then increases linearly to reach 260 tonnes at a CPUE of 2.0 kg/potlift. The TACC remains at 260 tonnes until CPUE reaches 3.0 kg/potlift, after which the TACC increases linearly again with a slope of 100 tonnes per 1 kg/potlift.

The proposed new *Rule 6* CRA 3 management procedure is a generalised plateau step rule, illustrated in Figure 7.5 above. For *Rule 6*: between CPUEs of zero and 0.1 kg/potlift the TACC is zero, the TACC increases linearly with CPUE to 225 tonnes at a CPUE of 1.25 kg/potlift. The TACC remains at 225 tonnes until CPUE reaches 2.0 kg/potlift and then increases by 15% in CPUE steps of 1.0 kg/potlift.

Table B provides the results of the operation of the proposed new CRA 3 management procedures for the 2015-16 fishing year.

Table B: Results of the proposed *Rule 4* and *Rule 6* CRA 3 management procedures for the 2015-16 fishing year, after operation of all their components including thresholds.

Proposed CRA 3 rules	Offset-year 'F2-LFX' CPUE at time of analysis (kg/potlift)	Rule result: TACC (t)
<i>Rule 4</i> (Option CRA3_01)	2.214	260.95
<i>Rule 6</i> (Option CRA3_02)	2.214	260.95

Appendix 3: CRA 5 management procedure specifications

In March 2012 the Minister agreed to use the *2011-01 Rule* CRA 5 management procedure from the 2012-13 fishing year until the 2017-18 fishing year.

Some important elements of the current CRA 5 management procedure are:

- a) The output variable is TACC (tonnes);
- b) Offset-year standardised CPUE is used as an input to the rule to determine the TACC for the fishing year that begins in the following April;
- c) CPUE is calculated using the 2003 *B4_L* procedure. This procedure sums all landings (to a licensed fisher receiver) and effort for a vessel within a calendar month and allocates the landings to statistical areas based on the reported area distribution of the estimated catches;
- d) The management procedure is to be evaluated every year (no “latent year”), based on offset-year CPUE;
- e) There are no minimum or maximum change thresholds for the TACC.

The current CRA 5 management procedure is based on a generalised plateau step rule, illustrated in Figure 8.3 above. Between CPUEs of zero and 0.3 kg/potlift the TACC is zero, the TACC then increases linearly with CPUE to 350 tonnes at a CPUE of 1.4 kg/potlift. The TACC remains at 350 tonnes until CPUE reaches 2.0 kg/potlift and then increases by 5% in CPUE steps of 0.2 kg/potlift.

Table D provides an outline of the history of the current CRA 5 management procedure.

Table D: History of the CRA 5 management procedure. ‘Rule result’ is the result of the management procedure after operation of all its components including thresholds; ‘-’ is to be determined by the Minister.

Year of analysis	Applied to Fishing Year	Offset-year ‘B4-L’ CPUE at time of analysis (kg/potlift)	Rule result: TACC (t)	TAC (t) set by the Minister	TACC (t) set by the Minister
2011	2012–13	1.740	350	467	350
2012	2013–14	1.636	350	467	350
2013	2014–15	1.587	350	467	350
2014	2015–16 (Option CRA5_01)	1.355	335.81	-	-

Appendix 4: CRA 7 management procedure specifications

In March 2013 the Minister agreed to use the *Rule 39* CRA 7 management procedure from the 2013-14 fishing year until the 2018-19 fishing year.

Some important elements of the CRA 7 management procedure are:

- a) The output variable is TACC (tonnes);
- b) Offset-year standardised CPUE is used as an input to the rule to determine the TACC for the fishing year that begins in the following April;
- c) CPUE is calculated using the 2012 *F2_LFX* procedure which uses:
 - landings to a licensed fisher receiver, along with recreational landings from a commercial vessel and the amount of rock lobsters returned to the water in accordance with Schedule 6 of the Act (i.e. highgraded rock lobsters),
 - estimates, by vessel, of the ratio of annual landed catch divided by annual estimated catch to correct every landing record in a quota management area for the vessel;
- d) The management procedure is to be evaluated every year (no “latent year”), based on offset-year CPUE;
- e) The minimum change threshold for the TACC is 10% and the maximum change threshold is 50%.

The CRA 7 management procedure is based on a generalised plateau rule, illustrated in Figure 9.3 above. Between CPUEs of zero and 0.17 kg/potlift the TACC is zero, the TACC then increases linearly with CPUE to 80 tonnes at a CPUE of 1.0 kg/potlift. The TACC remains at 80 tonnes until CPUE reaches 1.75 kg/potlift and then increases linearly.

Table E provides an outline of the history of the current CRA 7 management procedure.

Table E: History of the CRA 7 management procedure. ‘Rule result’ is the result of the management procedure after operation of all its components including thresholds; ‘-’ is to be determined by the Minister.

Year of analysis	Applied to Fishing Year	Offset-year ‘F2-LFX’ CPUE at time of analysis (kg/potlift)	Rule result: TACC (t)	TAC (t) set by the Minister	TACC (t) set by the Minister
2012	2013–14	0.625	43.96	64	44
2013	2014–15	1.356	66.00	86	66
2014	2015–16 (Option CRA7_01)	2.304	97.72	-	-

Appendix 5: CRA 9 management procedure specifications

In March 2014 the Minister agreed to use the *Rule 4041* CRA 9 management procedure from the 2014-15 fishing year until the 2019-20 fishing year.

Some important elements of the CRA 9 management procedure are:

- a) The output variable is TACC (tonnes);
- b) Offset-year standardised CPUE is used as an input to the rule to determine the TACC for the fishing year that begins in the following April;
- c) CPUE is calculated using the 2012 *F2_LFX* procedure which uses:
 - landings to a licensed fisher receiver, along with recreational landings from a commercial vessel and the amount of rock lobsters returned to the water in accordance with Schedule 6 of the Act (i.e. highgraded rock lobsters),
 - estimates, by vessel, of the ratio of annual landed catch divided by annual estimated catch to correct every landing record in a quota management area for the vessel;
- d) The management procedure is to be evaluated every year (no “latent year”), based on offset-year CPUE;
- e) The minimum change threshold for the TACC is 5% and the maximum change threshold of 15% for TACC increases only.

The CRA 9 management procedure is based on a generalised plateau step rule, illustrated in Figure 10.2 above. Between CPUEs of zero and 0.5 kg/potlift the TACC is zero, the TACC then increases linearly with CPUE to 40 tonnes at a CPUE of 1.0 kg/potlift. The TACC remains at 40 tonnes until CPUE reaches 1.4 kg/potlift and then increases by 15% in CPUE steps of 0.75 kg/potlift.

Table F provides an outline of the history of the current CRA 9 management procedure.

Table F: History of the CRA 9 management procedure. ‘Rule result’ is the result of the management procedure after operation of all its components including thresholds; ‘-’ is to be determined by the Minister.

Year of analysis	Applied to Fishing Year	Offset-year ‘F2-LFX’ CPUE at time of analysis (kg/potlift)	Rule result: TACC (t)	TAC (t) set by the Minister	TACC (t) set by the Minister
2013	2014–15	3.141	60.8	115.8	60.8
2014	2015–16 (Option CRA9_01)	2.095	46.0	-	-