NATIONAL ROCK LOBSTER MANAGEMENT GROUP

Review of Rock Lobster Sustainability Measures for 1 April 2016

Consultation Document

MPI Discussion Paper No: 2016/05

Prepared by the National Rock Lobster Management Group

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Contents

Page

1 Submission information

The multi-stakeholder National Rock Lobster Management Group (NRLMG) welcomes written submissions on the proposals contained in this document. 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.

All written submissions must be received by the Ministry for Primary Industries (MPI), on behalf of the NRLMG, no later than 5 pm on **11 February 2016.**

Written submissions should be sent directly to:

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

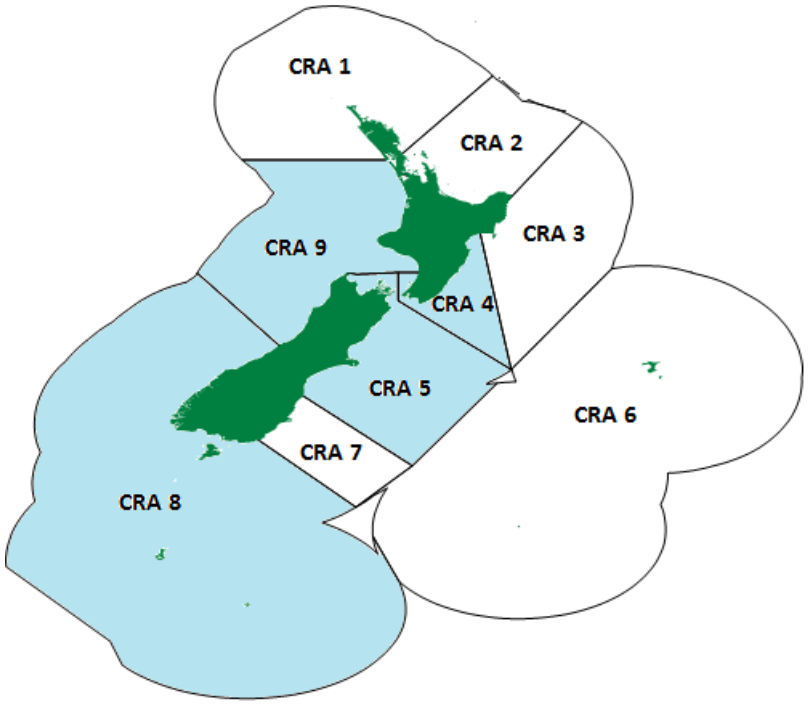
or emailed to FMsubmissions@mpi.govt.nz

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 blue.



The NRLMG is seeking information and views from tangata whenua and stakeholders to inform a review of rock lobster sustainability measures for 1 April 2016.

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.

Management procedures are in place for all rock lobster stocks except CRA 6 (Chatham Islands). Each procedure is operated every year and recommends a catch limit result that is consistent with the Minister's statutory obligations for setting catch limits. Management procedures are designed to move or maintain stock abundance above agreed reference levels using a comprehensive approach that recognises a range of customary Maori, recreational and commercial benefits.

Table 2.1 provides a summary of the options proposed for rock lobster for the April 2016 fishing year. These include:

- TAC and TACC decreases for the CRA 4 (Wellington/Hawkes Bay) fishery with no changes to the non-commercial allowances;
- Replacing the current CRA 5 (Canterbury/Marlborough) management procedure with a new procedure, increasing the TAC and recreational allowance, decreasing the allowance for other sources of fishing-related mortality, and making no change to the customary allowance and TACC;
- Replacing the current CRA 8 (Southern) management procedure with a new procedure and decreasing the TAC and other mortality allowance, while retaining the non-commercial allowances and TACC; and
- A TAC and TACC decrease for the CRA 9 (Westland/Taranaki) fishery with no changes to the non-commercial allowances.

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.

For the CRA 5 fishery, however, the NRLMG is proposing that additional recreational regulatory measures be consulted upon for implementation in October 2016 to support the ongoing sustainable utilisation of this fishery. These additional measures include the introduction of 'telson clipping' and an accumulation limit of 18 rock lobsters (3 daily bag limits) for recreational fishers. Frequent monitoring of recreational rock lobster harvest through MPI approved survey methodologies is also proposed.

Table 2.1: TAC, allowance and TACC proposals for CRA 4, CRA 5, CRA 8 & CRA 9.

Stock	Option		TAC	Customary	Recreational	Other mortality	TACC
CRA 4	CRA4_01:	Use the current CRA 4 management procedure and decrease the TAC by decreasing the TACC by 4.5 %	641 t ↓	35 t	85 t	75 t	446 t ↓
	CRA4_02:	Decrease the CRA 4 TAC by decreasing the TACC by 10% (industry proposal subject to endorsement from CRA 4 quota share owners)	615 t ↓	35 t	85 t	75 t	420 t ↓
	CRA4_03:	Retain the current CRA 4 TAC, allowances and TACC	662 t	35 t	85 t	75 t	467 t
CRA 5	CRA5_01:	Use the new CRA 5 management procedure and set the following TAC and allowances, while retaining the TACC	507 t ↑	40 t	87 t ↑	30 t ↓	350 t
	CRA5_02:	Use the current CRA 5 management procedure and retain the TAC, allowances and TACC	467 t	40 t	40 t	37 t	350 t
CRA 8	CRA8_01:	Use the new CRA 8 management procedure and set the following TAC and allowances, while retaining the TACC	1030 t ↓	30 t	33 t	5 t ↓	962 t
	CRA8_02:	Use the current CRA 8 management procedure and retain the TAC, allowances and TACC	1053 t	30 t	33 t	28 t	962 t
CRA 9	CRA9_01:	Use the current 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 commercial catch rates ('catch-per-unit-effort' or 'CPUE'). Commercial CPUE is considered a reliable indicator of abundance and is supported by scientific modelling to provide an overall assessment of stock status.

Management procedures are used in all rock lobster fisheries except for CRA 6 and CRA 10. In 2015, new management procedures have been evaluated for the CRA 5 and CRA 8 rock lobster fisheries.

The Minister agreed to use the current CRA 5 management procedure to guide TAC setting in the CRA 5 fishery until the 2017-18 fishing year. However, the NRLMG agreed to carry out a new stock assessment and management procedure evaluations for the CRA 5 fishery one year earlier than was originally scheduled to ensure the Minister's statutory obligations were being met. The early review was based on feedback from interested stakeholders, and new monitoring information that suggested recreational catches had increased, the recreational allowance was being exceeded, and there had been declines in commercial CPUE in some parts of the CRA 5 fishery.

In 2013 the Minister agreed to use the current CRA 8 management procedure to guide TAC setting in the CRA 8 fishery until the 2018-19 fishing year. The stock assessment and management procedure evaluations for the CRA 8 fishery were brought forward by two years based on a request from the CRA 8 rock lobster industry to explore greater utilisation opportunities (if considered sustainable).

The stock assessments for the CRA 7 and CRA 8 rock lobster fisheries are carried out as one assessment because of the periodic movement of CRA 7 rock lobsters into CRA 8. This new assessment provided an opportunity to update the operating model for the current CRA 7 procedure and re-evaluate its performance. The Minister agreed to use the current CRA 7 procedure until the 2017-18 fishing year. However, since it has been re-evaluated with a new model the NRLMG proposes that the Minister agree to continue using the current CRA 7 procedure for five years from the 2016-17 to 2020-21 April fishing years. For further information on the specifications of the current CRA 7 procedure refer to Appendix 4.

Based on the use of the proposed new and current management procedures, changes to the *status quo* are proposed for the CRA 4, CRA 5, CRA 8 and CRA 9 rock lobster fisheries.

Operation of the CRA 1, CRA 2, CRA 3 and CRA 7 management procedures suggested no change was needed to the management settings for these fisheries from April 2016[1].

3.2 MANAGEMENT APPROACH

The NRLMG is the primary advisor to the Minister for Primary Industries 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*"

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 fisheries 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 unless a review is requested and approved by the NRLMG. 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.

[1] The current CRA 1, CRA 2, CRA 3 and CRA 7 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 2016-17 fishing year.

Table 4.1 provides an outline of the use of current management procedures and when they are scheduled for review. New CRA 5, CRA 7 and CRA 8 management procedures have been evaluated this year.

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

	CRA 1	CRA 2	CRA 3	CRA 4	CRA 5	CRA 7	CRA 8	CRA 9
First year of the current management	2015	2014	2015	2012	2012	2013	2013	2014
Year of scheduled review	2019	2018	2019	2016	2015	2015	2015	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 include: 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 larval settlement levels. The most important inputs to the assessment are commercial 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 and at the November Mid-year Fisheries Assessment 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 an 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 document[2]:

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 available 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.

Two new indicators have also been calculated in the last two years: 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 Rock Lobster Fisheries Assessment Working Group 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 4	CRA 5	CRA 8	CRA 9
Bmsy	✓	✓	✓	✓
Bref	✓	✓	✓	-
Bmin	✓	✓	✓	✓
SSB	✓	✓	✓	-
Btot	-	✓	✓	-
Ntot	-	✓	✓	-

4.3 NOVEMBER 2015 FISHERIES ASSESSMENT PLENARY REPORT

For further information on rock lobster biology, stock assessment and stock status refer to the November 2015 Fisheries Assessment Plenary Report. This report is available for download from the MPI website under the Publications section: http://www.mpi.govt.nz/news-and-resources/publications/.

4.4 THE MPI HARVEST STRATEGY STANDARD

In October 2008, MPI released the Harvest Strategy Standard (HSS) for New Zealand fisheries. The Harvest Strategy Standard 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 Harvest Strategy Standard.

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 assessment 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 for the purposes of setting a TAC. 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 mātaitai 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 mātaitai 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 mātaitai 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 TAC[4]. 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.

6 Review of the CRA 4 (Wellington/Hawkes Bay) rock lobster fishery

6.1 CRA 4 STOCK STATUS

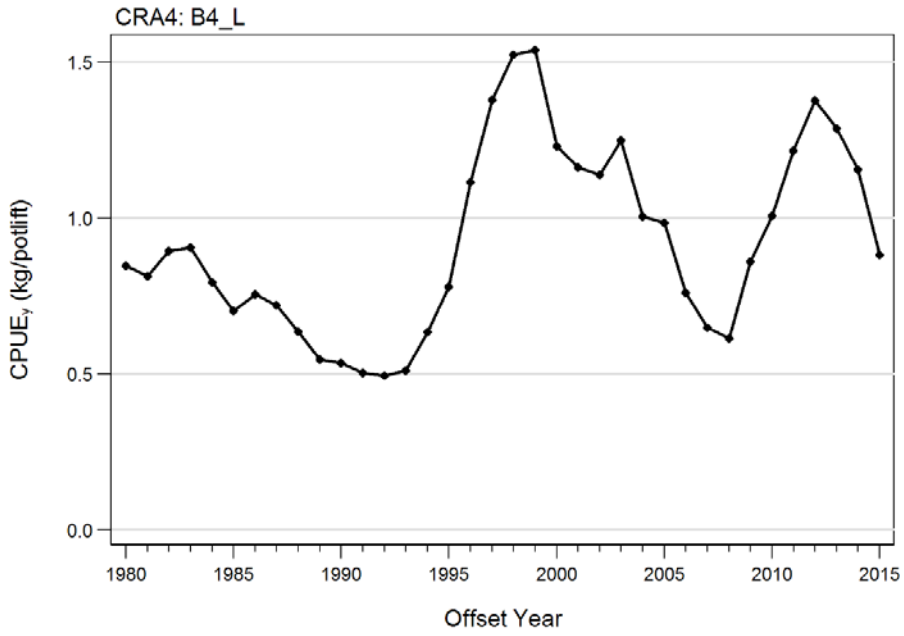
Based on the most recent commercial CPUE information, CRA 4 stock biomass in 2015 was considered virtually certain (>99%) to be above *Bmsy* and *Bref*[5]. Spawning stock biomass in 2011 was above 20% of its unfished level with greater than 99% probability (based on the 2011 CRA 4 stock assessment).

Standardised CPUE is considered to be a reliable indicator of relative stock size in CRA 4 and is the abundance indicator used in the CRA 4 management procedure. The history of offset year (i.e. October through September) CRA 4 commercial CPUE is shown in Figure 8.1. CPUE increased from 2008 to 2012, but has since declined.

[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%40deemedreg_fisheries+act+1996_resel_25_a&p=1

[5] *Bref* for CRA 4 is the pre-season autumn-winter vulnerable biomass associated with the period 1979-88.

Figure 6.1: The history of CPUE in CRA 4, 1980 – 2015 (offset years) (based on the procedure for preparing data for CPUE standardisation called "B4_L"[6])



6.2 PROPOSED CRA 4 OPTIONS

Table 6.1 provides a summary of the options proposed for CRA 4. The current CRA 4 management procedure and advice from the CRA 4 Rock Lobster Industry Association has been used to guide TAC setting options. The proposals to decrease the TAC and TACC are expected to ensure the CRA 4 stock is maintained above agreed reference levels.

Table 6.1: Proposed options for CRA 4

Option	TAC	Customary	Recreational	Other mortality	TACC
CRA4_01: Use the current CRA 4 management procedure and decrease the TAC by decreasing the TACC by 4.5 %	641 t ↓	35 t	85 t	75 t	446 t ↓
CRA4_02: Decrease the CRA 4 TAC by decreasing the TACC by 10% (industry proposal subject to endorsement from CRA 4 quota share owners)	615 t ↓	35 t	85 t	75 t	420 t ↓
CRA4_03: Retain the current CRA 4 TAC, allowances and TACC	662 t	35 t	85 t	75 t	467 t

6.2.1 TAC setting

The current CRA 4 TAC is 662 tonnes.

Best available information (i.e. recent commercial CPUE information) suggests the CRA 4 stock is above *Bmsy*. Accordingly the Minister may set the CRA 4 TAC to maintain the stock at or above *Bmsy* (section 13(2)(a)).

[6] The "B4_L" procedure for preparing data for CPUE standardisation does not capture fish returned to water like the "F2_LFX" procedure used in other stocks, which better represents the estimation/landing process.

- *Use the CRA 4 management procedure and decrease the CRA 4 TAC (Option CRA4_01)*

Under Option CRA4_01 the CRA 4 TAC would be decreased to 641 tonnes. The proposed TAC decrease is specified by the CRA 4 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 current CRA 4 management procedure are set out below and in Appendix 1.

Ongoing application of the CRA 4 management procedure is expected to exceed the requirements of the MPI Harvest Strategy Standard and maintain the stock above *Bref* with greater than 99% probability and above *Bmin* with greater than 99% probability. Simulation testing indicates it would maintain the stock above *Bref* with 99% probability.

This option will decrease the current utilisation benefit of the fishery. How this reduction is shared amongst the fishery sectors will depend on allocation decisions. Historically, only the TACC has been increased or decreased to give effect to the variations in the TAC.

Overall it is expected that ongoing application of the CRA 4 management procedure will at least maintain fishing opportunities for all sectors by maintaining stock abundance above the agreed reference levels.

- *Decrease the CRA 4 TAC by a greater amount than specified by the CRA 4 management procedure (Option CRA4_02)*

Under Option CRA4_02 the CRA 4 TAC would be decreased to 615 tonnes. This proposed TAC decrease (and consequent 10% TACC decrease) has been suggested by the CRA 4 Rock Lobster Industry Association (CRAMAC 4) as an option to be considered and confirmed by CRA 4 quota share owners during the consultation period. This option arises from discussions at the CRA 4 Rock Lobster Industry Association's recent Annual General Meeting and has been included in this document at their request.

A larger TAC decrease than specified by the CRA 4 management procedure will provide greater certainty that the stock will be maintained above *Bref*.

This option will also decrease the current utilisation benefit of the fishery. How the reduction is shared amongst sectors depends on allocation decisions. Historically, only the TACC has been varied.

- *Retain the current CRA 4 TAC (Option CRA4_03)*

Under Option CRA4_03 the CRA 4 TAC would stay at its current level for the 2016-17 fishing year.

This option is not supported by the NRLMG. Maintaining the current TAC could result in a further decline in CRA 4 stock abundance and this could affect the utilisation benefit for all fishing sectors.

6.2.2 Setting of non-commercial allowances

- *Customary Maori allowance*

No change is proposed to the 35 tonne customary Maori allowance for CRA 4.

Information on CRA 4 customary catches is available under the Fisheries (Kaimoana) Regulations 1998 and regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013[7]. In the last five April fishing years, an average of about 9,460 rock lobsters were reported as landed each year in CRA 4 under the regulations. Noting the incompleteness and uncertainty in the CRA 4 customary harvest information, it is assumed current harvest is within the 35 tonne allowance allocated for customary Maori interests at this time.

An estimate of 20 tonnes was used in the last 2011 CRA 4 stock assessment model to represent customary catches (blue line in Figure 6.2 below).

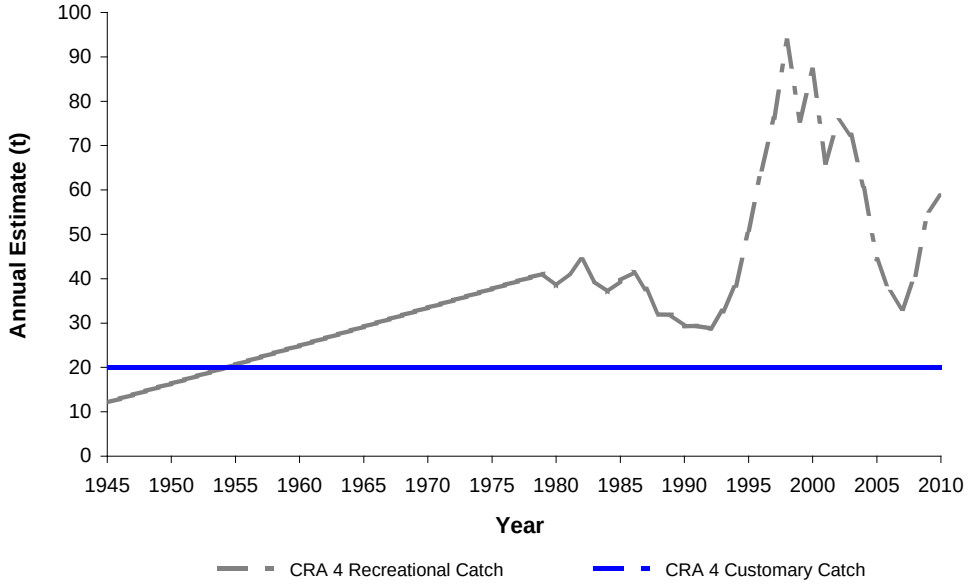
- *Recreational allowance*

No change is proposed to the 85 tonne recreational allowance for CRA 4.

In the 2011 CRA 4 stock assessment, recreational catch estimates from 1994 and 1996 recreational harvest surveys were used to construct a recreational catch trajectory (Figure 6.2). The model assumed that recreational catch was proportional to the spring-summer commercial CPUE for CRA 4. The resulting recreational catch trajectory showed a strong increasing trend up to the end of 1990s, following by a steep drop to 2007-08, which since recovered by 2010-11. The largest annual catch since 1979-80 was estimated at 89 tonnes in 1998-99 and averaged 44 tonnes per year since 1979-80.

The model assumptions of recreational catch suggest the 85 tonne recreational allowance adequately allows for likely levels of recreational harvest from the CRA 4 fishery at this time.

Figure 6.2: Recreational (grey line) catch trajectory (kg) for the 2011 stock assessment of CRA 4 made proportional to spring-summer CPUE. The blue line is the customary catch trajectory used in the 2011 assessment. Section 111 catches which were taken by commercial fishers for non-commercial purposes were added to the 2011 recreational catch trajectory (i.e. a maximum of 4.8 tonnes).



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

- *Other mortality allowance*

No change is proposed to the 75 tonne CRA 4 allowance for other sources of fishing-related mortality (i.e. for illegal catch only).

There is no reliable information on current levels of illegal catch. The Rock Lobster Fisheries Assessment Working Group used available MPI estimates from 1990 to 2004 in the 2011 stock assessment model to estimate illegal catches. For the 2010-11 fishing year the illegal catch estimate from the model was 40 tonnes. It is assumed that estimated levels of illegal catch are within the other mortality allowance.

6.2.3 TACC

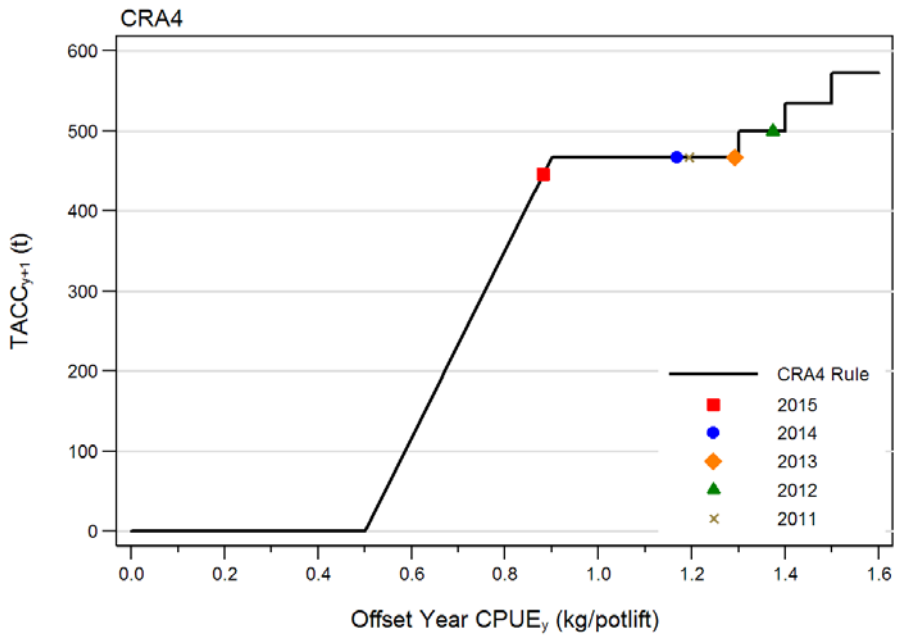
The current CRA 4 TACC is 467 tonnes.

- *Option CRA4_01 – Decrease the CRA 4 TACC by 21 tonnes (as guided by the CRA 4 management procedure)*

Under Option CRA4_01 the CRA 4 TACC would be decreased to 446 tonnes from April 2016, as guided by the use of the CRA 4 management procedure. The proposed 21 tonne TACC decrease has the potential to result in a loss of revenue for the industry of approximately $1.51 million (based on 2015 average port price information).

A graphical representation of the CRA 4 management procedure 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 2015 standardised offset year CPUE was 0.882 kg/potlift and when the rule was operated with this CPUE it resulted in a TACC of 446 tonnes (shown by the red square on the graph).

Figure 6.3: The CRA 4 management procedure, showing the TACCs resulting from the rule evaluations performed in 2011 through 2015 for the 2012-13 through 2016-17 fishing years (shown as coloured shapes).



- *Option CRA4_02 – Decrease the CRA 4 TACC by 47 tonnes*

Under Option CRA4_02 the CRA 4 TACC would be decreased to 420 tonnes from April 2016. The proposed 47 tonne TACC decrease has the potential to result in a loss of revenue for the industry of approximately $3.38 million (based on 2015 average port price information).

This option is proposed by the CRA 4 Rock Lobster Industry Association (CRAMAC 4) because they consider that the 21 tonne decrease as specified by the CRA 4 management procedure does not go far enough to ensure the stock is maintained above agreed reference levels. During the consultation period, the CRA 4 Association will seek endorsement from all CRA 4 quota share owners for this proposal.

- *Option CRA4_03 – Retain the current CRA 4 TACC*

Under Option CRA4_03 the CRA 4 TACC would stay at its current level. This option would maintain the current utilisation benefits of the commercial fishery.

This option is not supported by the NRLMG or the CRA 4 Rock Lobster Industry Association. Maintaining the current TACC could result in stock abundance declining further and consequently could affect utilisation benefits for all fishing sectors.

7 Review of the CRA 5 (Canterbury/Marlborough) rock lobster fishery

7.1 CRA 5 STOCK STATUS

A new stock assessment was carried out for the CRA 5 fishery in 2015 (the previous was in 2010)[8]. The 2015 assessment results suggest there are no sustainability concerns for the CRA 5 fishery as stock biomass in 2014 was well above reference levels. The ratios of 2014 stock biomass to these reference levels were: 2.9 to 4.1 times *Bmsy*, 1.8 to 2.4 times *Bref*[9] and 4.4 to 4.7 times *Bmin*. Spawning stock biomass in 2015 was 78 to 97% of the unfished level. Total biomass in 2015 was about 67% of the unfished level and the total number of rock lobsters was about 70 to 83% of the unfished level.

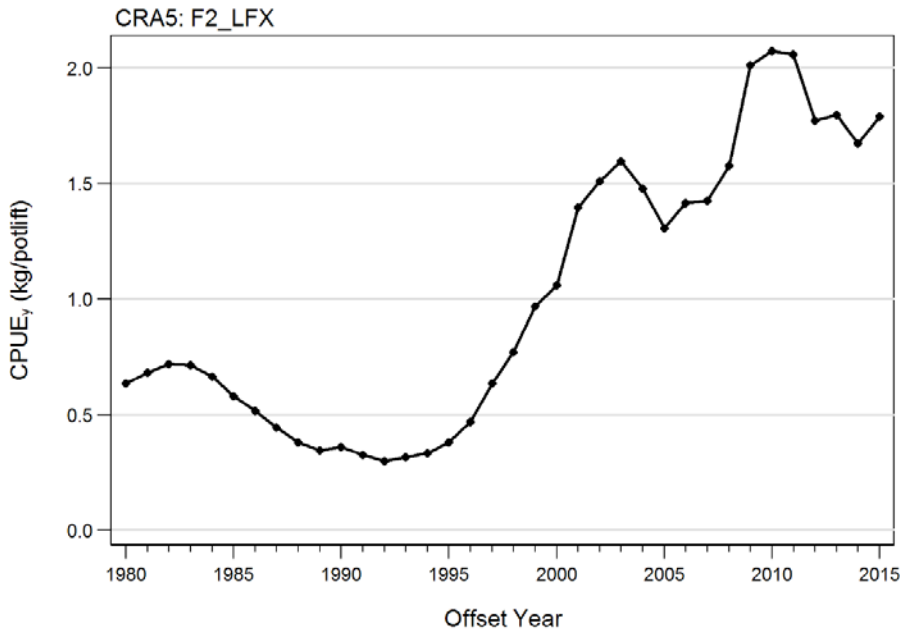
With 2014 catch levels and recent recruitments, stock biomass is projected to decline in the next four years by 8 to 10%, but would remain well above the reference levels (*Bmsy* and *Bref*).

Standardised CPUE is considered to be a reliable indicator of relative stock size in CRA 5 and is the abundance indicator used in the proposed new CRA 5 management procedure. The history of offset year (i.e. October through September) CRA 5 commercial CPUE is shown in Figure 7.1. CPUE increased steadily from 2005 to 2010 and then generally declined up until a slight increase observed in 2015.

[8] Two alternative CRA 5 stock assessment base cases were considered in 2015. The proposed new CRA 5 management procedure was evaluated under both alternative base cases concurrently.

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

Figure 7.1: The history of CPUE in CRA 5, 1980 – 2015 (offset years) (based on the procedure for preparing data for CPUE standardisation called "F2_LFX"[10])



7.2 PROPOSED CRA 5 OPTIONS

Table 7.1 provides a summary of the options proposed for CRA 5. The proposed new and current CRA 5 management procedures have been used to guide TAC setting options. These procedures are designed to maintain the CRA 5 stock above agreed reference levels.

Table 7.1: Proposed options for CRA 5

Option	TAC	Customary	Recreational	Other mortality	TACC
CRA5_01: Use the new CRA 5 management procedure and set the following TAC and allowances, while retaining the TACC	507 t ↑	40 t	87 t ↑	30 t ↓	350 t
CRA5_02: Use the current CRA 5 management procedure and retain the TAC, allowances and TACC	467 t	40 t	40 t	37 t	350 t

7.2.1 Use of a new management procedure

It is proposed that a new management procedure is used to guide TAC setting in the CRA 5 fishery for five years from the 2016-17 to 2020-21 fishing years. The NRLMG proposes that this new management procedure (Option CRA5_01) replaces the current CRA 5 management procedure (Option CRA5_02) that has been in use in the fishery since 2012.

The development of the new CRA 5 management procedure was guided by feedback received from a multi-sector meeting in Blenheim in August 2015 where future aspirations for the fishery were discussed. Common goals that were identified at the meeting included:

[10] The "F2_LFX" procedure for preparing data for CPUE standardisation is designed to better represent the estimation/landing process than a previous procedure and adjusts for change in data reporting practices.

- Maintaining good levels of abundance for all sectors (with "good" being taken to mean current (2014/15) levels of abundance, which is a stock size well above *Bmsy*);
- Ensuring sustainability and availability of rock lobsters for all sectors.

Use of the new CRA 5 management procedure should not pose a risk to stock sustainability. Ongoing application of the new CRA 5 management procedure is expected to exceed the requirements of the MPI Harvest Strategy Standard and maintain the stock above *Bmsy* with greater than 99% probability and *Bmin* with greater than 99% probability. For further information on the specifications of the new CRA 5 procedure refer to Appendix 2.

Simulation-testing of the new CRA 5 management procedure suggests it will continue to provide for utilisation benefits for all sectors in CRA 5. Stock biomass is expected to be maintained well above the agreed reference levels (i.e. *Bmsy* and *Bref*) (Table 7.1).

Table 7.1: Summary of indicator results from base case evaluations for the new CRA 5 management procedure (Option CRA5_01).

Stock Indicators[11]	*Results*
The proportion of years in which biomass was less than:	
- Bmsy	0 to 0.03 %
- Bref	0 %
- Bmin	0 %
Catch Indicators	
Minimum commercial catch	350 t
Average commercial catch	350 t
Minimum recreational catch	59 to 60 t
Average recreational catch	63 to 65 t
Average commercial CPUE	1.4 to 1.5 kg/potlift
Stability – probability of a change in the TACC	12 to 18 %

The main difference between the new and current CRA 5 management procedures is in the length of the "plateau". Under the new procedure the TACC is 350 tonnes between CPUEs of 1.2 and 2.2 kg/potlift, whereas under the current procedure the TACC is 350 tonnes between CPUEs of 1.4 and 2.0 kg/potlift. Effectively the new procedure proposes a TACC decrease at a lower CPUE than the current procedure and proposes a TACC increase at a higher CPUE. The new management procedure also has a minimum change threshold for the TACC of 5%.

7.2.2 TAC setting

The current CRA 5 TAC is 467 tonnes.

Best available information (from the 2015 stock assessment) 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)).

[11] An explanation of the stock indicators is provided in section 4.2.

- *Use the new CRA 5 management procedure and increase the CRA 5 TAC (Option CRA5_01)*

Under Option CRA5_01 the CRA 5 TAC would be increased to 507 tonnes. This TAC is guided by the use of the new CRA 5 management procedure, which enables the Minister to set a TAC that maintains the stock above agreed reference levels.

This option should not change the current utilisation benefit of the fishery because it is proposed that the recreational allowance and allowance for other sources of fishing-related mortality (i.e. illegal catch) are updated to reflect current estimates of removals. These changes to allowances result in the proposed TAC increase.

- *Use the current CRA 5 management procedure and retain the CRA 5 TAC (Option CRA5_02)*

Under Option CRA5_02 the CRA 5 TAC would stay at its current level. This TAC is guided by the use of the current CRA 5 management procedure that the Minister agreed to use until the 2017-18 fishing year. Important elements of the current CRA 5 management procedure are set out below and in Appendix 3.

Ongoing application of the current CRA 5 management procedure (and operation of the proposed new procedure), is expected to exceed the requirements of the MPI Harvest Strategy Standard and maintain the stock above *Bref* with greater than 99% probability and above *Bmin* with greater than 99% probability. Simulation-testing indicates it would maintain the stock above *Bref* with 99% probability.

The current management procedure is safe to use; however, the NRLMG does not support its use for the April 2016 fishing year. The NRLMG prefers to base future management of the CRA 5 fishery on the proposed new CRA 5 management procedure because it reflects the best available information, including updated estimates of sector catches (Option CRA5_01).

7.2.3 Setting of non-commercial allowances

- *Customary Maori allowance*

No change is proposed to the 40 tonne customary Maori allowance for CRA 5 under Options CRA5_01 and 02.

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 2013[12]. In the last five April fishing years, an average of about 4,300 rock lobsters were reported as landed each year in CRA 5 under the regulations. Noting the incompleteness and uncertainty in the CRA 5 customary harvest information, it is assumed current harvest is within the 40 tonne allowance allocated for customary Maori interests at this time.

An estimate of 10 tonnes was used in the 2015 stock assessment model to represent CRA 5 customary catches (red line in Figure 7.2 below).

[12] Previously regulation 27A of the Fisheries (Amateur Fishing) Regulations 1986.

- *Recreational allowance*

It is proposed that the 40 tonne recreational allowance for CRA 5 is increased to 87 tonnes under Option CRA5_01 to reflect best available information that suggests recreational harvest has increased.

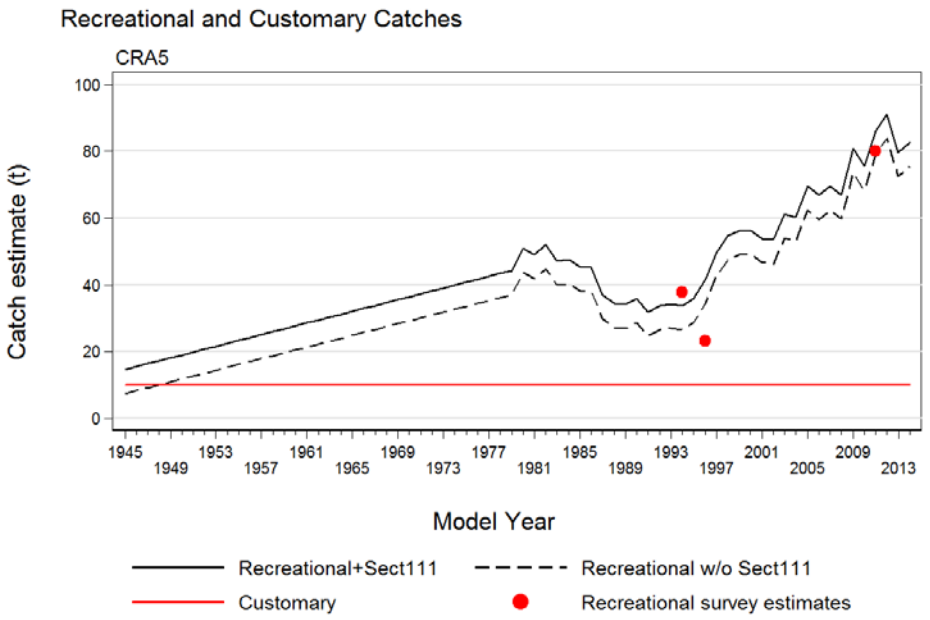
In the 2015 CRA 5 stock assessment, recreational catch estimates from 1994 and 1996 recreational harvest surveys, and an 80 tonne estimate that was specified by MPI for the 2011-12 fishing year, were used to construct a recreational catch trajectory (Figure 7.2).

The 80 tonne recreational harvest estimate that MPI recommended to be used in modelling for the 2011-12 fishing year took into account:

- The 43.47 tonne 2011–12 National Panel Survey CRA 5 recreational harvest estimate is acknowledged, but assumed to be an underestimate to an unknown degree;
- The latest Kaikoura and Motunau boat ramp survey in 2012–13, which estimated that 54.56 tonnes of rock lobster were harvested by recreational fishers and charter operators in these areas;
- Anecdotal reports from recreational fishers and MPI compliance that recreational rock lobster harvest is perceived to be high at times (particularly in Kaikoura).

The model assumed that the recreational catch estimates were proportional to spring-summer commercial CPUE for statistical area 917 (Kaikoura). The ratio between recreational catch and CPUE was not modelled as a linear relationship (1 to 1) because this was not considered credible by the Rock Lobster Fisheries Assessment Working Group; a power function was used instead. The resulting recreational catch trajectory showed a strong increasing trend from the early 1990s (Figure 7.2).

Figure 7.2: Recreational catch trajectories (kg) for the 2015 stock assessment of CRA 5. Trajectories with (solid black line) and without (dashed black line) the additional Section 111 catches which were taken by commercial fishers for non-commercial purposes are shown (i.e. a maximum of 7.22 tonnes of section 111 catches). Customary catch used in the CRA 5 stock assessment is shown as the solid red line (a constant 10 tonnes).



The recreational information described above suggests recreational catches are exceeding the 40 tonne allowance for CRA 5 recreational interests. The 2014 recreational catch estimate (from Figure 7.2) was 82.8 tonnes including 7.2 tonnes of recreational catch taken by commercial fishers under s111 of the Act.

It is considered that an 87 tonne recreational allowance for CRA 5 will adequately allow for recreational interests at this time.

Given that there are currently no sustainability concerns for the CRA 5 fishery, the NRLMG are not proposing to vary other recreational management measures (i.e. the individual daily bag limit) to constrain recreational harvest to the current allowance. No change is proposed to the recreational allowance under Option CRA5_02, but this option is not supported by the NRLMG.

Preliminary input from the Te Waka a Māui me Öna Toka Forum (the MPI iwi forum that covers the South Island) is that tangata whenua do not support increasing the recreational allowance. Instead the Forum considers better information on recreational catch should be obtained and steps are taken to constrain recreational catch before increasing the allowance.

- *Other mortality allowance*

It is proposed that the 37 tonne allowance for other sources of fishing-related mortality (i.e. for illegal catch only) is decreased to 30 tonnes under Option CRA5_01. No change is proposed for the other mortality allowance under Option CRA5_02.

MPI suggested that a 30 tonne illegal catch estimate be used in the CRA 5 stock assessment to represent catches in 2014. This estimate was based on an assessment of detected illegal removals based on prosecutions, observed activities, intelligence and intangible anecdotal knowledge, and other information provided by MPI Fishery Officers.

The Rock Lobster Fisheries Assessment Working Group used available MPI estimates from 1990 to 2003 in the stock assessment to estimate illegal catches. The missing years from 2004 to 2013 were filled in by scaling the illegal catch down from the 52 tonnes estimated for 2003 to 30 tonnes in 2014.

Despite the NRLMG and Rock Lobster Fisheries Assessment Working Group having little confidence in the estimates of illegal catch because the estimates cannot be verified, a 30 tonne allowance for other mortality is considered adequate at this time.

7.2.4 TACC

The current CRA 5 TACC is 350 tonnes.

Under Options CRA5_01 and 02 the CRA 5 TACC would stay at its current level.

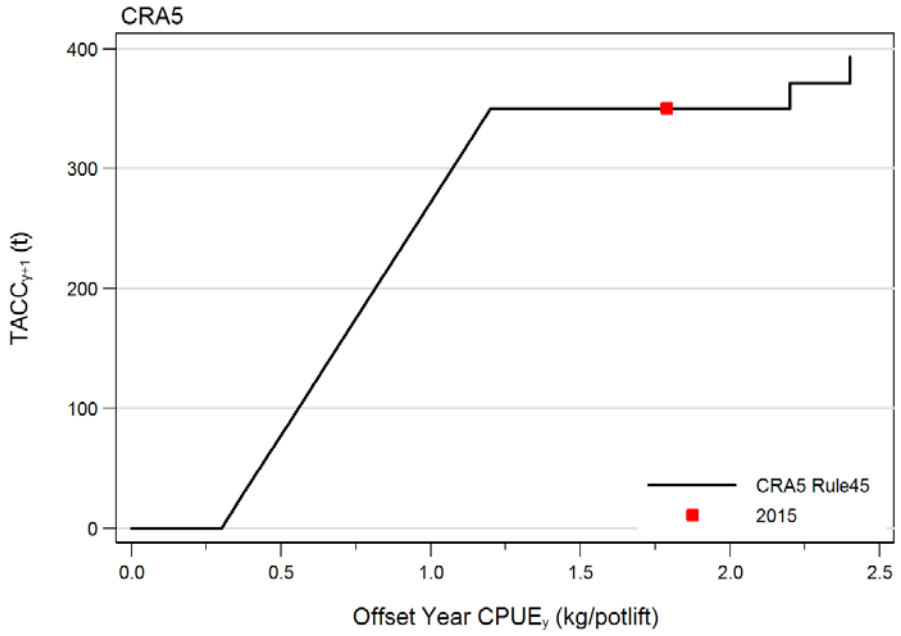
- *Option CRA5_01 – Retain the current CRA 5 TACC (as guided by the new CRA 5 management procedure)*

Under Option CRA5_01 the proposed retention of the current CRA 5 TACC is guided by the use of the new CRA 5 management procedure. This option would maintain the current utilisation benefits of the commercial fishery. The Canterbury Marlborough Rock Lobster Industry

Association (CRAMAC 5) supports this option because it is more likely to ensure their goals of catch stability, security and enhanced economic performance are achieved.

A graphical representation of the new procedure is provided in Figure 7.3. The graph shows the proposed TACC for the next year as a function of offset-year CPUE in the current year. The 2015 standardised offset year CPUE was 1.789 kg/potlift[13] and when the rule was operated with this CPUE it resulted in a TACC of 350 tonnes (shown by the red square on the graph).

Figure 7.3: The new CRA 5 management procedure, showing the TACC for the 2016-17 fishing year resulting from the rule evaluation performed in 2015. CPUE used as input to this rule is calculated with the F2-LFX procedure.



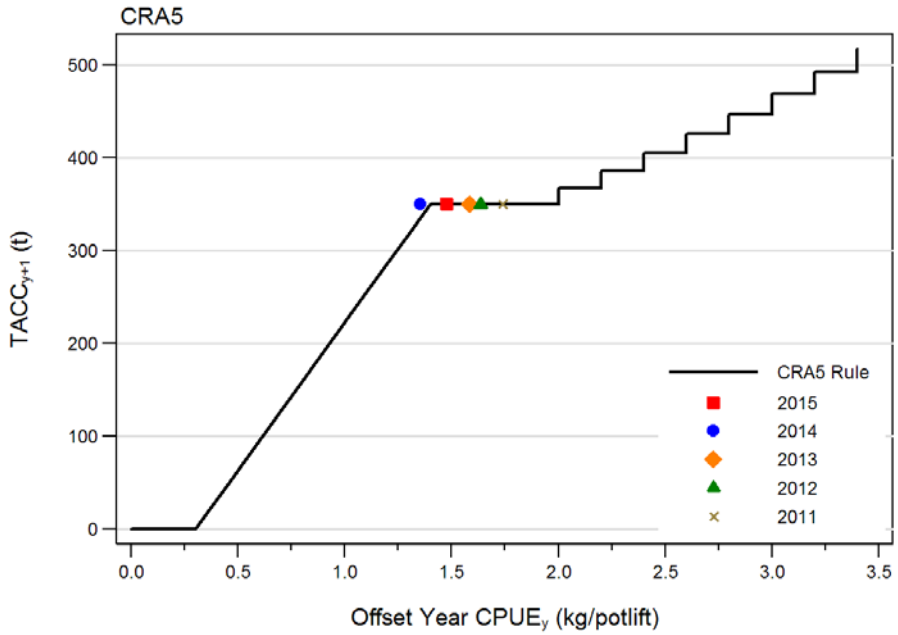
- *Option CRA5_02 – Retain the current CRA 5 TACC (as guided by the current CRA 5 management procedure)*

Under Option CRA5_02 the proposed retention of the current CRA 5 TACC is guided by the use of the current CRA 5 management procedure. This option would maintain the current utilisation benefits of the commercial fishery. However, the NRLMG prefers for TACC setting to be guided by the new CRA 5 management procedure (Option CRA5_01).

A graphical representation of the current procedure is provided in Figure 7.4. When the rule was operated with the 2015 standardised offset year CPUE of 1.478 kg/potlift[14] it resulted in no change to the current TACC (shown by the square in the graph).

[13] This CPUE is based on the "F2_LFX" procedure for preparing data for CPUE standardisation.
[14] This CPUE is based on the "B4_L" procedure for preparing data for CPUE standardisation does not capture fish returned to water like the "F2_LFX" procedure.

Figure 7.4: The current CRA 5 management procedure, showing the TACCs resulting from the rule evaluations performed in 2011 through 2015 for the 2012-13 through 2016-17 fishing years (shown as coloured shapes). CPUE used as input to this rule is calculated with the B4-L procedure.



7.3 ADDITIONAL MEASURES FOR CRA 5

The NRLMG proposes that additional measures be considered for implementation in 2016 to support the ongoing sustainable utilisation of the CRA 5 fishery.

7.3.1 Recreational measures

It is proposed that the measures that currently apply to recreational rock lobster fishing in the Te Korowai o Te Tai o Marokura – Kaikoura Marine Management Area are extended to the rest of the CRA 5 rock lobster fishery. This includes the:

- Introduction of 'telson clipping' – the requirement for a recreational fisher to cut one-third of the central/middle telson off the tail fan of a rock lobster on taking; and
- An accumulation limit of 18 rock lobsters (3 daily bag limits), along with bag and labelling conditions for a single days catch.

Telson clipping and an accumulation limit are likely to discourage illegal black market sales and restrict the ability to store large quantities of rock lobster for illegal purposes. These measures have been successfully implemented in the Kaikoura Marine Area.

It is proposed that these recreational measures would come into force on 1 October 2016 (to accommodate required government processes for regulatory change). Formal consultation on the proposals is likely to occur with tangata whenua and fishery stakeholders in March 2016. Preliminary feedback from the Te Waka a Māui me Öna Toka Forum (the MPI iwi forum that covers the South Island) suggests there is tangata whenua support for the telson clipping and accumulation limit proposals in the CRA 5 fishery.

The NRLMG is not proposing to amend other recreational regulatory controls at this time (i.e. to the individual daily bag limit and method and gear restrictions).

7.3.2 Research and monitoring

Accurate information about recreational removals is necessary for good fisheries management decisions. There is uncertainty in the trend in CRA 5 recreational catches and whether they will continue to increase.

It is proposed that frequent monitoring of recreational rock lobster harvest, through MPI approved survey methodologies and reported amateur charter vessel information, is carried out to determine trends in recreational harvest from the CRA 5 fishery. This information will be used to monitor the recreational fishery and inform whether any additional management controls will be needed in the future. Several amateur harvest surveys are proposed for parts of the CRA 5 fishery, including the recreational onsite survey that is currently underway for the Marlborough Sounds and Tasman and Golden Bays[15].

8 Review of the CRA 8 (Southern) rock lobster fishery

8.1 CRA 8 STOCK STATUS

A new stock assessment was carried out for the CRA 8 fishery in 2015 (the previous was in 2012). The 2015 assessment results suggest there are no sustainability concerns for the CRA 8 fishery. Stock biomass in 2015 was above *Bmsy* by 1.8 times, *Bref*[16] by 1.4 times and *Bmin* by 4.1 times. Spawning stock biomass in 2015 was 44% of the unfished level. Total biomass in 2015 was about 27% of the unfished level and the total numbers of rock lobster are 42 % of the unfished level.

With 2014 catch levels and recent recruitments, stock biomass is projected to remain near its current level.

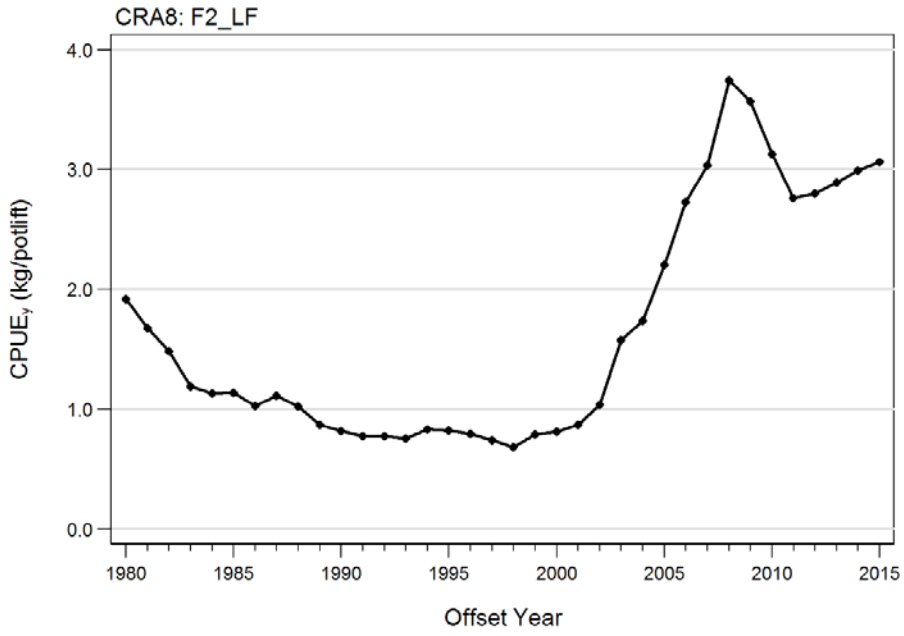
Standardised CPUE is considered to be a reliable indicator of relative stock size in CRA 8 and is the abundance indicator used in the proposed new CRA 8 management procedure. A new procedure for preparing data for CPUE standardisation, which is unique to CRA 8, is used in the proposed new procedure. This CPUE relates to the fish that were landed only and does not capture fish returned to the water like the "F2_LFX" procedure. The CRA 8 industry considered it unrealistic to drive a management procedure with CPUE based on all rock lobsters brought on board when only a part of the catch is retained. Retention of large fish is low in CRA 8 and it is estimated that about 40% by weight of legal rock lobsters that are caught are returned to the water. This new CPUE is called "money-fish CPUE", "$CPUE", or "F2_LF".

The history of offset year (i.e. October through September) CRA 8 commercial $CPUE is shown in Figure 8.1. $CPUE increased steadily from 1998 to 2008, declined slightly before increasing again from 2011.

[15] http://business.scoop.co.nz/2015/09/24/niwa-counting-fish-in-marlborough-sounds/

[16] *Bref* for CRA 8 is the pre-season autumn-winter vulnerable biomass associated with the period 1979-81.

Figure 8.1: The history of $CPUE in CRA 8, 1980 – 2015 (offset years) (based on the procedure for preparing data for CPUE standardisation called "F2_LF" or "$CPUE").



8.2 PROPOSED CRA 8 OPTIONS

Table 8.1 provides a summary of the options proposed for CRA 8. The proposed new and current CRA 8 management procedures have been used to guide TAC setting options. These procedures are designed to maintain the CRA 8 stock above agreed reference levels.

Table 8.1: Proposed options for CRA 8

Option	TAC	Customary	Recreational	Other mortality	TACC
CRA8_01: Use the new CRA 8 management procedure and set the following TAC and allowances, while retaining the TACC	1030 t ↓	30 t	33 t	5 t ↓	962 t
CRA8_02: Use the current CRA 8 management procedure and retain the TAC, allowances and TACC	1053 t	30 t	33 t	28 t	962 t

8.2.1 Use of a new management procedure

It is proposed that a new management procedure is used to guide TAC setting in the CRA 8 fishery for five years from the 2016-17 to 2020-21 fishing years.

The NRLMG proposes that a new management procedure (Option CRA8_01) replace the current CRA 8 management procedure (Option CRA8_02), which has been in use in the fishery since 2013.

Use of the new CRA 8 management procedure should not pose a risk to stock sustainability. Ongoing application of the new CRA 8 management procedure is expected to exceed the requirements of the MPI Harvest Strategy Standard and maintain the stock above *Bmsy* with greater than 99% probability and *Bmin* with greater than 99% probability. For further information on the specifications of the new CRA 8 management procedure refer to Appendix 5.

Simulation-testing of the new CRA 8 management procedure suggests it will continue to provide for utilisation benefits for all sectors in CRA 8. Stock biomass is expected to be maintained well above the agreed reference levels (i.e. *Bmsy* and *Bref*) (Table 8.1).

Table 8.1: Summary of indicator results from base case evaluations for the new CRA 8 management procedure (Option CRA8_01).

Stock Indicators[17]	*Results*
The proportion of years in which biomass was less than:	
- Bmsy	0 %
- Bref	0.5 %
- Bmin	0 %
Catch Indicators	
Minimum commercial catch	962 t
Average commercial catch	1025 t
Minimum recreational catch	36 t
Average recreational catch	36 t
Average commercial "money-fish CPUE"	3.5 kg/potlift
Stability – probability of a change in the TACC	46 %

The main difference between the new and current CRA 8 management procedures is in the CPUE that is used in the rule to determine the TACC. For the new procedure CPUE is calculated using the new "F2_LF" procedure, which gives "$CPUE". The current procedure is based on CPUE from the "F2_LFX" procedure.

8.2.2 TAC setting

The current CRA 8 TAC is 1053 tonnes.

Best available information (from the 2015 stock assessment) suggests the CRA 8 stock is above *Bmsy*. Accordingly the Minister may set the CRA 8 TAC to maintain the stock at or above *Bmsy* (section 13(2)(a)).

- *Use the new CRA 8 management procedure and decrease the CRA 8 TAC (Option CRA8_01)*

Under Option CRA8_01 the CRA 8 TAC would be decreased to 1030 tonnes. This TAC is guided by the use of the new CRA 8 management procedure, which enables the Minister to set a TAC that maintains the stock above agreed reference levels.

This option will not change the current utilisation benefit of the fishery because it is proposed that the allowance for other sources of fishing-related mortality (i.e. illegal catch) is decreased to reflect the current estimate of illegal take. This change to the allowance results in the proposed TAC decrease.

- *Use the current CRA 8 management procedure and retain the CRA 8 TAC (Option CRA8_02)*

Under Option CRA8_02 the CRA 8 TAC would stay at its current level. This TAC is guided by the use of the current CRA 8 management procedure that the Minister agreed to use until the

[17] An explanation of the stock indicators is provided in section 4.2.

2018-19 fishing year. Important elements of the current CRA 8 management procedure are set out below and in Appendix 6.

Ongoing application of the current CRA 8 management procedure (and operation of the proposed new procedure), is expected to exceed the requirements of the MPI Harvest Strategy Standard and maintain the stock above *Bmsy* with greater than 99% probability and above *Bmin* with greater than 99% probability. Simulation-testing indicates it would maintain the stock above *Bref* with 99% probability.

The current management procedure is safe to use; however, the NRLMG does not support its use for the April 2016 fishing year. The NRLMG prefers to base future management of the CRA 8 fishery on the proposed new CRA 8 management procedure because it reflects the best available information, including updated estimates of sector catches (Option CRA8_01).

8.2.3 Setting of non-commercial allowances

- *Customary Maori allowance*

No change is proposed to the 30 tonne customary Maori allowance for CRA 8 under Options CRA8_01 and 02.

Information on customary Maori catch in CRA 8 is available from reports made under the Fisheries (South Island Customary Fishing) Regulations 1999. In the last five April fishing years, an average of about 11,000 rock lobsters were reported as landed each year in CRA 8 under the regulations. Noting some incompleteness in the CRA 8 customary harvest information, it is assumed current harvest is within the 30 tonne allowance allocated for customary Maori interests at this time.

An estimate of 10 tonnes was used in the 2015 stock assessment model to represent CRA 8 customary catches in 2014 (red line in Figure 7.2 below).

- *Recreational allowance*

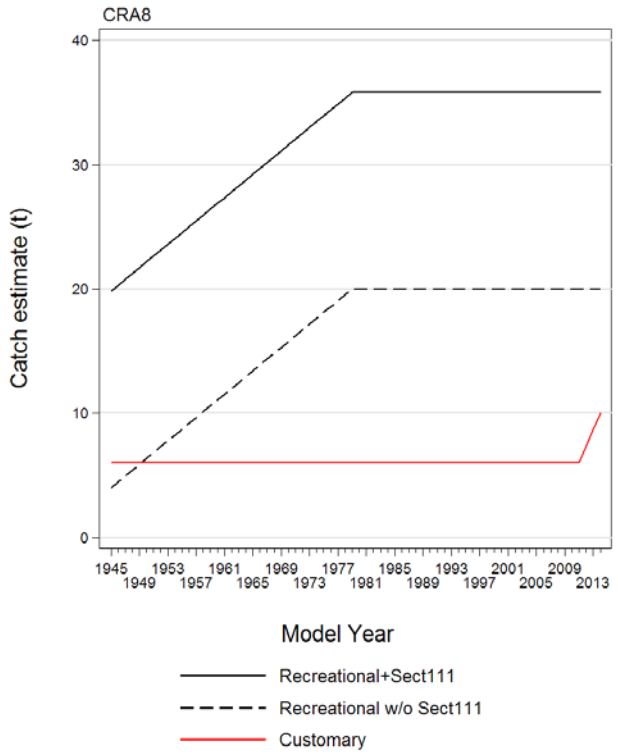
No change is proposed to the 33 tonne recreational allowance for CRA 8 under Options CRA8_01 and 02.

Little is known about recreational catch in CRA 8. Information from the 2011-12 National Panel Survey estimated that 6.9 tonnes of rock lobster were harvested by recreational fishers (including from amateur charter vessels). Given the low number of fishers and events covered in the survey and the high variance, it is assumed that 6.9 tonnes is an underestimate of recreational harvest.

In the 2015 CRA 8 stock assessment, a recreational catch trajectory was constructed as follows: beginning at 1 tonne in 1945 recreational catch was ramped to 5 tonnes in 1979 and then from 1979 to 2014 recreational catch was assumed to be a constant 20 tonnes (Figure 8.2).

Taking into account the uncertainty in the information on CRA 8 recreational harvest, it is assumed that the 33 tonne recreational allowance adequately allows for likely levels of recreational harvest from the CRA 8 fishery at this time.

Figure 8.2: Recreational catch trajectories (kg) for the 2015 stock assessment of CRA 8. Trajectories with (solid black line) and without (dashed black line) the additional Section 111 catches which were taken by commercial fishers for non-commercial purposes are shown (i.e. a maximum of 15.8 tonnes of section 111 catches). Customary catch used in the CRA 8 stock assessment is shown as the solid red line (a constant 6 tonnes from 1945 to 2012 and then increased proportionally to 10 tonnes in 2014).



- *Other mortality allowance*

It is proposed that the 28 tonne allowance for other sources of fishing-related mortality (i.e. for illegal catch only) is decreased to 5 tonnes under Option CRA8_01. No change is proposed for the other mortality allowance under Option CRA8_02.

MPI suggested that a 3 tonne illegal catch estimate be used in the CRA 8 stock assessment to represent catches in 2014. This estimate was based on an assessment of detected illegal removals based on prosecutions, observed activities, intelligence and intangible anecdotal knowledge, and other information provided by MPI Fishery Officers.

The Rock Lobster Fisheries Assessment Working Group used available MPI estimates from 1990 to 2002 in the stock assessment to estimate illegal catches. An estimate of 3 tonnes was used from 2011 to 2014, with the missing years from 2003 to 2010 filled in by scaling the illegal catch down from the 18 tonnes estimated for 2002.

Despite the NRLMG and Rock Lobster Fisheries Assessment Working Group having little confidence in the estimates of illegal catch because the estimates cannot be verified, a 5 tonne allowance for illegal catch is considered adequate at this time.

8.2.4 TACC

The current CRA 8 TACC is 962 tonnes.

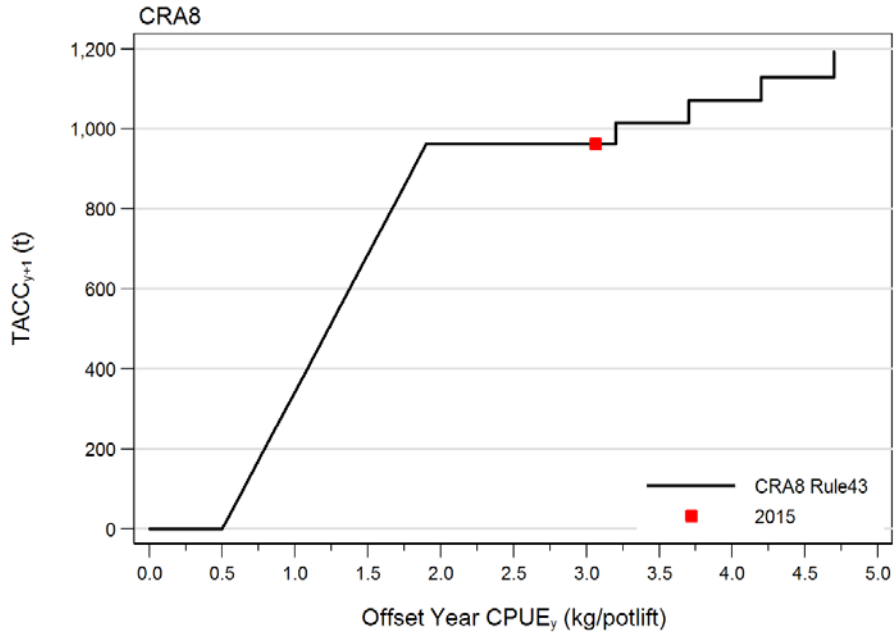
Under Options CRA8_01 and 02 the CRA 8 TACC would stay at its current level.

- *Option CRA8_01 – Retain the current CRA 8 TACC (as guided by the new CRA 8 management procedure)*

Under Option CRA8_01 the proposed retention of the current CRA 8 TACC is guided by the use of the new CRA 8 management procedure. This option would maintain the current utilisation benefits of the commercial fishery. The CRA 8 Management Committee supports this option because it will help to ensure their goals of catch stability, security and enhanced economic performance are achieved.

A graphical representation of the new 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 2015 standardised offset year $CPUE was 3.062 kg/potlift and when the rule was operated with this CPUE it resulted in a TACC of 962 tonnes (shown by the red square on the graph).

Figure 8.3: The new CRA 8 management procedure, showing the TACC for the 2016-17 fishing year resulting from the rule evaluation performed in 2015. The input CPUE for this rule is calculated with the F2-LF procedure ($CPUE).



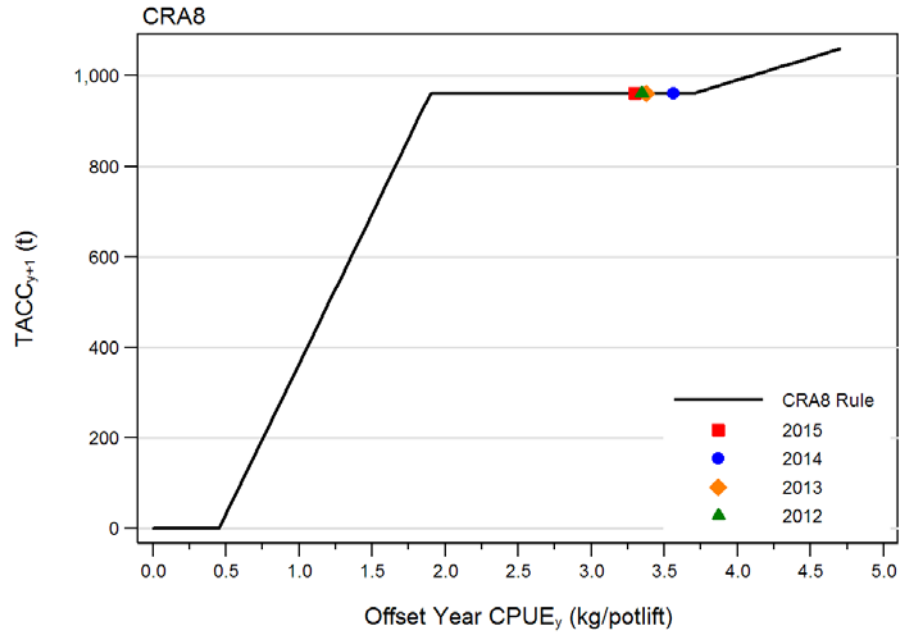
- *Option CRA8_02 – Retain the current CRA 8 TACC (as guided by the current CRA 8 management procedure)*

Under Option CRA8_02 the proposed retention of the current CRA 8 TACC is guided by the use of the current CRA 8 management procedure. This option would maintain the current utilisation benefits of the commercial fishery. However, the NRLMG prefers for TACC setting to be guided by the new CRA 8 management procedure (Option CRA8_01).

A graphical representation of the current procedure is provided in Figure 8.4. When the rule was operated with the 2015 standardised offset year CPUE of 3.297 kg/potlift[18] it resulted in no change to the current TACC (shown by the square in the graph).

[18] This CPUE is based on the "F2_LFX" procedure for preparing data for CPUE standardisation, which captures fish returned to water.

Figure 8.4: The current CRA 8 management procedure, showing the TACCs resulting from the rule evaluations performed in 2012 through 2015 for the 2013-14 through 2016-17 fishing years (shown as coloured shapes). The input CPUE for this rule is calculated with the F2-LFX procedure.



9 Review of the CRA 9 (Westland/Taranaki) rock lobster fishery

9.1 CRA 9 STOCK STATUS

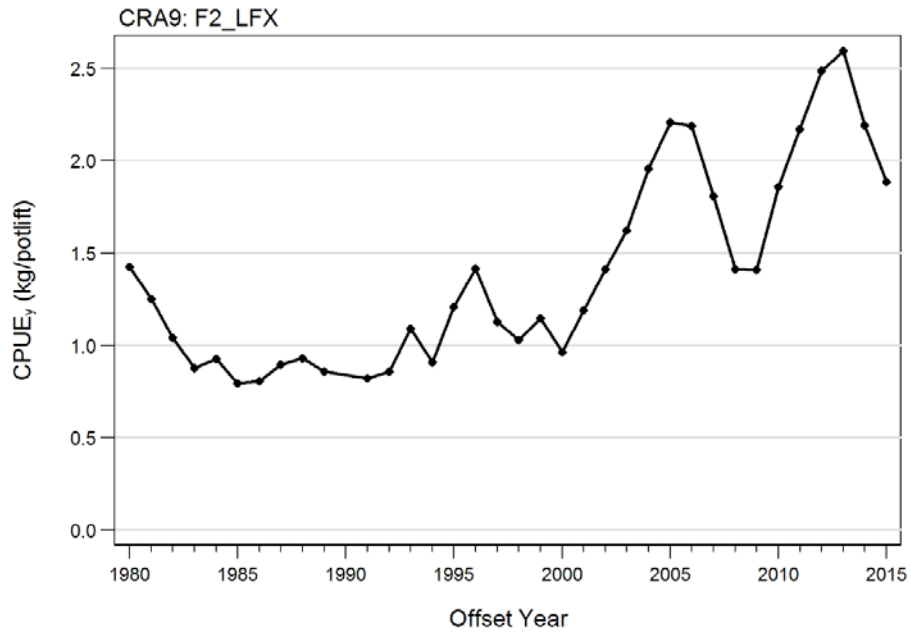
Based on the most recent commercial CPUE information and the 2013 assessment, CRA 9 stock biomass in 2015 was considered likely to be above *Bmsy* and well above *Bmin*. Fishing intensity in 2012 was estimated to be at low levels (12%).

Standardised CPUE is considered to be a reliable indicator of relative stock size in most rock lobster fisheries. In CRA 9 there are now only a few vessels catching rock lobsters in some areas of a very large Quota Management Area. Standardised CPUE in recent years for CRA 9 has been less stable than it was in earlier years when there were more vessels.

A recent audit of the CRA 9 CPUE concluded that the recent low number of vessels and poor reporting problems have contributed to the instability of CPUE in recent years. However, the audit confirmed that the F2-LFX procedure for calculating CPUE was appropriate and that standardisation model options did not affect the CPUE results. It concluded that *the decline in offset year CPUE in the last two years is real* and that *the declining CPUE signal in the last two years is reasonably robust*.

The history of offset year (i.e. October through September) CRA 9 commercial CPUE is shown in Figure 9.1. CRA 9 CPUE increased strongly from 2009 with decreases observed in 2014 and 2015.

Figure 9.1: The history of CPUE in CRA 9, 1980 – 2015 (offset years) (based on the procedure for preparing data for CPUE standardisation called "F2_LFX"[19])



9.2 PROPOSED CRA 9 OPTIONS

Table 9.1 provides a summary of the options proposed for CRA 9. The current CRA 9 management procedure is used to guide TAC setting options, which is expected to ensure the stock is maintained above the agreed reference level.

Table 9.1: Proposed options for CRA 9

Option	TAC	Customary	Recreational	Other mortality	TACC
CRA9_01: Use the current 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

9.2.1 TAC setting

The current CRA 9 TAC is 115.8 tonnes.

Best available information (recent CPUE information) suggests the CRA 9 stock is above *Bmsy*. Accordingly the Minister may set the CRA 9 TAC to maintain the stock at or above *Bmsy* (section 13(2)(a)).

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

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 7.

[19] The "F2_LFX" procedure for preparing data for CPUE standardisation is designed to better represent the estimation/landing process than a previous procedure and adjusts for change in data reporting practices.

Ongoing application of the CRA 9 management procedure is expected to exceed the requirements of the MPI Harvest Strategy Standard and maintain the stock above *Bmsy* with greater than 93% probability and *Bmin* with greater than 99% 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. Historically, only the TACC has been varied.

The CRA 9 management procedure was developed in 2013 using CPUE that was mostly from the period before vessels had reduced to just a few. Because of this, and because the decline in CPUE in the past two years appears to be real, the CRA 9 management procedure remains a viable option for managing this fishery.

- *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 2016-17 fishing year.

Retaining the current TAC for one year is unlikely to pose a risk to stock sustainability in the short term. However, a decision not to follow the results of the CRA 9 management procedure in 2015 would effectively revoke the CRA 9 management procedure. In this case, a small scientific project would be required in 2016 to re-investigate productivity in CRA 9 from fishing patterns, catch and effort data and area-specific length frequencies. The results of this project could be used to recommend an alternative management strategy for CRA 9 from the 2017-18 fishing year onwards.

9.2.2 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 2013[20]. Despite this uncertainty, 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 31 tonnes in 2012. This catch estimate was based on the 2011-12 National Panel Survey estimate and the assumption that recreational catch is proportional to spring summer commercial CPUE in CRA 9. Based on average recreational catch assumptions used in the 2013 assessment (27.9 tonnes over 50 years), it is considered that the current CRA 9 recreational allowance adequately allows for recreational interests.

[20] Previously regulation 27A of the Fisheries (Amateur Fishing) Regulations 1986.

- *Other mortality allowance*

No change is proposed to the 5 tonne CRA 9 allowance for other sources of fishing-related mortality (i.e. illegal catch only).

There is no reliable information on current levels of other sources of fishing-related mortality. The Rock Lobster Fisheries Assessment Working Group 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.

9.2.3 TACC

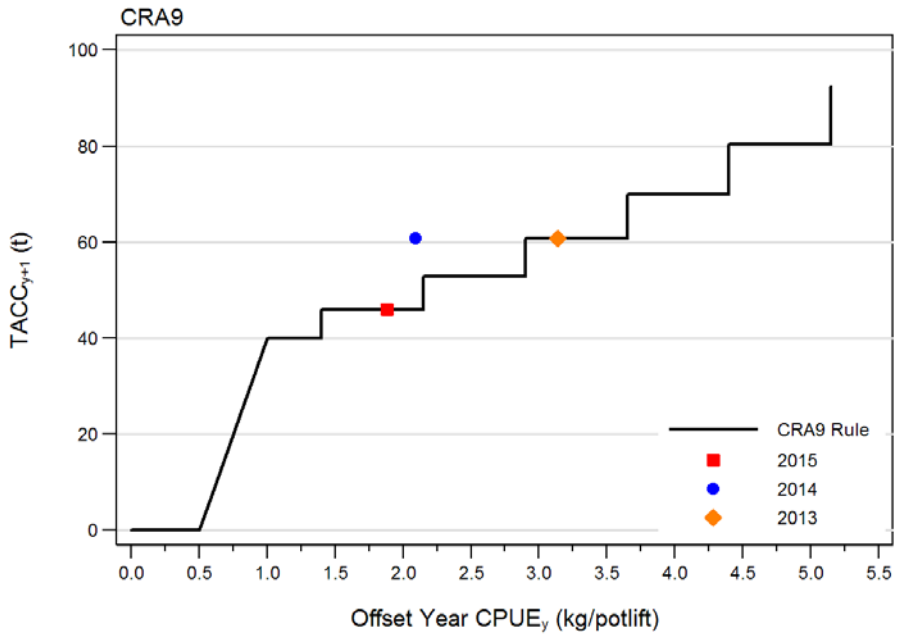
The current CRA 9 TACC is 60.8 tonnes.

- *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 2016, 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 $1.07 million (based on 2015 average port price information).

A graphical representation of the CRA 9 management procedure is provided in Figure 9.2. 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 1.885 kg/potlift[21] and when the rule was operated with this CPUE it resulted in a TACC of 46 tonnes (shown by the red square on the graph).

Figure 9.2: The CRA 9 management procedure, showing the TACCs resulting from the rule evaluations performed in 2013 through 2015 for the 2014-15 through 2016-17 fishing years (shown as coloured shapes). The input CPUE for this rule is calculated with the F2-LFX procedure.



[21] This CPUE is based on the "F2_LFX" procedure for preparing data for CPUE standardisation.

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

Under Option CRA9_02 the CRA 9 TACC would stay at its current level and the current CRA 9 management procedure would be considered revoked. This option would maintain the current utilisation benefit of the commercial fishery in the short-term, but would increase risk to stock sustainability in the medium and long terms. If this option is chosen, a small scientific project must be established in 2016 to develop an alternative management strategy for CRA 9 and determine what the appropriate TACC should be.

10 Conclusion

The NRLMG supports the use of management procedures in New Zealand's rock lobster fisheries where they can be demonstrated to be robust in terms of informing TAC setting decisions. 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.

The NRLMG has based the proposals contained in this discussion document on these principles and seeks information and views from tangata whenua and stakeholders to inform this review of rock lobster sustainability measures for 1 April 2016.

Appendix 1: Current CRA 4 management procedure specifications

In March 2012 a previous Minister agreed to use the *Rule 28a* CRA 4 management procedure from the 2012-13 fishing year until the 2017-18 fishing year.

Some important elements of the CRA 4 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) It has no thresholds for minimum and maximum change, except a maximum 25% increase limit below the first plateau.

The CRA 4 management procedure is based on a generalised plateau step rule, illustrated in Figure 6.3 above. Below a CPUE of 0.5 kg/potlift, the TACC is zero; between a CPUE of 0.5 and 0.9 kg/potlift, the TACC increases linearly with CPUE to a plateau of 467 tonnes, which extends to a CPUE of 1.3 kg/potlift. As CPUE increases above 1.3 kg/potlift, the TACC increases in steps with a width of 0.1 kg/potlift and a height of 7% of the preceding TACC.

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

Table A: History of the CRA 4 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	1.194	466.9	661.9	466.9
2012	2013–14	1.374	499.69	694.7	499.7
2013	2014–15	1.293	467	662	467
2014	2015–16	1.168	467	662	467
2015	2015–16 (Option CRA4_01)	0.882	446.22	-	-

Appendix 2: New CRA 5 management procedure specifications

In 2015 a new stock assessment was carried out for CRA 5. This assessment model was used as the operating model for evaluating new CRA 5 management procedures.

The NRLMG considered numerous CRA 5 management procedure options late in 2015 and have put forward one of these 'final' rules, called *Rule 45*, for consideration.

Some important elements of the proposed new 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 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 CRA 5 management procedure is based on a generalised plateau step rule, illustrated in Figure 7.3 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 1.2 kg/potlift. The TACC remains at 350 tonnes until CPUE reaches 2.2 kg/potlift and then increases by 5.5% in CPUE steps of 0.2 kg/potlift.

Table B provides the results of the operation of the proposed new CRA 5 management procedure for the 2016-17 fishing year.

Table B: Results of the proposed new CRA 5 management procedure for the 2016-17 fishing year, after operation of all its components including thresholds.

Proposed CRA 5 rule	Offset-year 'F2-LFX' CPUE at time of analysis (kg/potlift)	Rule result: TACC (t)
Rule 45 (Option CRA5_01)	1.789	350

Appendix 3: Current 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 7.4 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 C provides an outline of the history of the current CRA 5 management procedure.

Table C: 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	1.355	335.81	467	350
2015	2016–17 (Option CRA5_02)	1.478	350	-	-

Appendix 4: Current 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.

In 2015 a new stock assessment was carried out for CRA 7 in conjunction with CRA 8. This assessment model was used as the operating model for evaluating the performance of the current CRA 7 management procedure. Evaluations have effectively extended the life of the current procedure to the 2020-21 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 current CRA 7 management procedure is based on a generalised plateau slope rule, illustrated in the Figure A below. 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.

Figure A: The current CRA 7 management procedure, showing the TACCs resulting from the rule evaluations performed in 2012 through 2015 for the 2013-14 through 2016-17 fishing years (shown as coloured shapes).

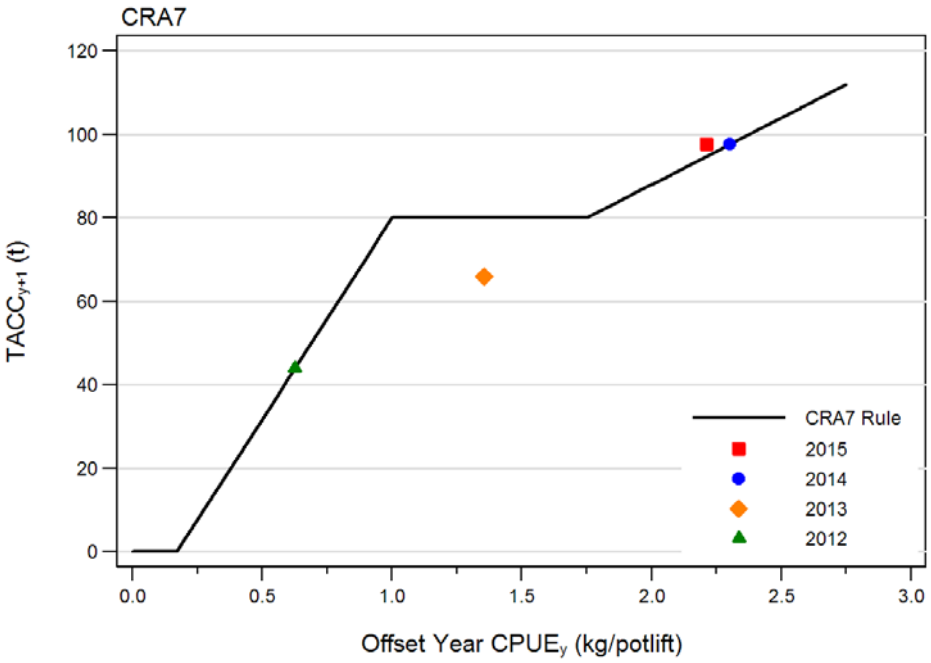


Table D provides an outline of the history of the current CRA 7 management procedure.

Table D: 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	2.304	97.72	117.72	97.72
2015	2016–17	2.212	97.72	-	-

Appendix 5: New CRA 8 management procedure specifications

In 2015 a new stock assessment was carried out for CRA 8. This assessment model was used as the operating model for evaluating new CRA 8 management procedures.

The NRLMG considered two CRA 8 management procedure options late in 2015 and have put forward one of these 'final' rules, called *Rule 43*, for consideration.

Some important elements of the proposed new CRA 8 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 new "F2_LF" procedure, which gives the "money-fish" CPUE, or $CPUE. This procedure uses:
    - landings to a licensed fisher receiver, along with recreational landings from a commercial vessel (it does not include the amount of rock lobsters returned to the water in accordance with Schedule 6 of the Act (i.e. highgraded rock lobsters) as does the F2_LFX procedure),
    - 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 CRA 8 management procedure is based on a generalised plateau step rule, illustrated in Figure 8.3 above. Between CPUEs of zero and 0.5 kg/potlift the TACC is zero, the TACC then increases linearly with CPUE to 962 tonnes at a CPUE of 1.9 kg/potlift. The TACC remains at 962 tonnes until CPUE reaches 3.2 kg/potlift and then increases by 5.5% in CPUE steps of 0.5 kg/potlift.

Table E provides the results of the operation of the proposed new CRA 8 management procedure for the 2016-17 fishing year.

Table E: Results of the proposed new CRA 8 management procedure for the 2016-17 fishing year, after operation of all its components including thresholds.

Proposed CRA 8 rule	Offset-year 'F2-LF' $CPUE at time of analysis (kg/potlift)	Rule result: TACC (t)
Rule 43 (Option CRA8_01)	3.062	962

Appendix 6: Current CRA 8 management procedure specifications

In March 2013 the Minister agreed to use the *Rule 13* CRA 8 management procedure from the 2013-14 fishing year until the 2018-19 fishing year.

Some important elements of the current CRA 8 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%. There is no maximum change threshold for the TACC.

The current CRA 8 Management Procedure is based on a generalised plateau slope rule, illustrated in Figure 8.4 above. Between CPUEs of zero and 0.4535 kg/potlift the TACC is zero, the TACC then increases linearly with CPUE to 962 tonnes at a CPUE of 1.9 kg/potlift. The TACC remains at 962 tonnes until CPUE reaches 3.7 kg/potlift and then increases linearly.

Table F provides an outline of the history of the current CRA 8 management procedure.

Table F: History of the CRA 8 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	3.346	962	1053	962
2013	2014–15	3.377	962	1053	962
2014	2015–16	3.562	962	1053	962
2015	2016–17 (Option CRA8_02)	3.297	962	-	-

Appendix 7: Current 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 9.2 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 G provides an outline of the history of the current CRA 9 management procedure.

Table G: 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	2.095	46.0	115.8	60.8
2015	2016–17 (Option CRA9_01)	1.885	46.0	-	-