



Review of Rock Lobster Sustainability Measures for 1 April 2015

Final Advice Paper

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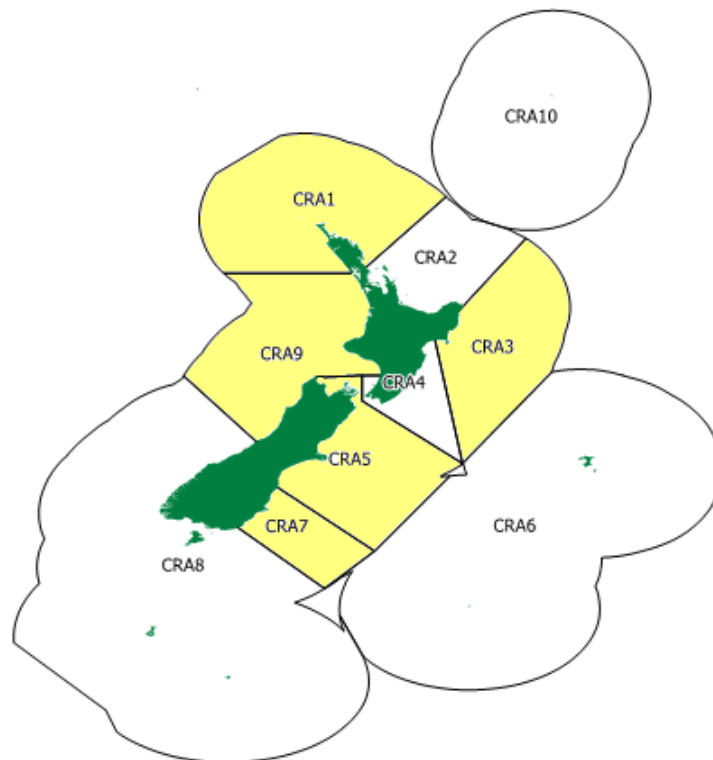
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1 Executive summary

Figure 1.1: Map of rock lobster Quota Management Areas showing stocks under review in yellow.



You are being asked to make decisions on sustainability measures for five rock lobster stocks for the fishing year beginning 1 April 2015. The total allowable catch (TAC), allowances and total allowable commercial catch (TACC) proposals presented in this paper for your decision are based on new stock assessment information and/or the results from the operation of management procedures (“decision rules”).

Your decisions relate to:

- 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;
- Decreasing the TACs for the CRA 5 (Canterbury/Marlborough) and CRA 9 (Westland/Taranaki) fisheries based on the use of management procedures or retaining the current settings;
- Increasing the TAC for the CRA 7 (Otago) fishery based on the use of the CRA 7 management procedure or retaining the current settings.

Table 1.1 provides a summary of the final proposals for each rock lobster stock under review. These proposals were developed by the National Rock Lobster Management Group (NRLMG) after consideration of best available information and tangata whenua and stakeholder views.

Table 1.1: TAC, allowances and TACC final proposals for CRA 1, CRA 3, CRA 5, CRA 7 and CRA 9.

Noting: Recreational members of the NRLMG have abstained from supporting options for CRA 5 and CRA 9 based on their views that, in principle, management procedures should be followed once adopted.

Stock	Option	TAC	Customary	Recreational	Other mortality	TACC
CRA 1	CRA1_01: Use the <u>new Rule 8d</u> 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 Rule 8d</u> 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 Rule 9d</u> 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 Rule 9d</u> CRA 1 management procedure and set the following TAC, allowances and TACC (<i>NRLMG preferred option</i>)	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) (<i>Current setting</i>)	N/A	N/A	N/A	N/A	131.062 t
CRA 3	CRA3_01: Use the <u>new Rule 4</u> CRA 3 management procedure and retain the TAC, allowances and TACC (<i>NRLMG preferred option, with current settings</i>)	389.95 t	20 t	20 t	89 t	260.95 t
	CRA3_02: Use the <u>new Rule 6</u> 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 (<i>Customary, commercial and MPI preferred option – current settings</i>)	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 (<i>NRLMG preferred option</i>)	117.72 t ↑	10 t	5 t	5 t	97.72 t ↑
	CRA7_02: Retain the current CRA 7 TAC, allowances and TACC (<i>Current settings</i>)	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 (<i>Customary, commercial and MPI preferred option – current settings</i>)	115.8 t	20 t	30 t	5 t	60.8 t

A central consideration when choosing whether to use a management procedure to guide TAC setting in a fishery, is whether the procedure enables you to set a TAC that complies with section 13 of the Fisheries Act 1996 (the Act). The management procedures discussed in this paper are designed to move stock biomass to, or maintain the biomass of each stock at, a size at or above a level that can produce the maximum sustainable yield (i.e. *Bmsy*) or at a level that is not inconsistent with this objective.

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 that 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 (as considered by some members of the NRLMG for CRA 5 and CRA 9 this year).

2 NRLMG recommendations

The NRLMG reached agreement on single recommendations for CRA 1, CRA 3 and CRA 7, but were unable to reach consensus recommendations for CRA 5 and CRA 9.

CRA 1

The NRLMG recommends that you agree to Option CRA1_04, which is to use the new CRA 1 management procedure called '*Rule 9d*' and, based on the new procedure, set a TAC of 273.062 tonnes, set allowances for customary Māori of 20 tonnes, recreational of 50 tonnes and other sources of fishing-related mortality at 72 tonnes, and set the TACC at 131.062 tonnes.

Option CRA1_04 has support from all sector members of the NRLMG and the Ministry for Primary Industries (MPI). The 2014 CRA 1 stock assessment results suggest there are no sustainability concerns for the CRA 1 fishery and the use of the new management procedure will help to ensure the stock is managed above the desired target level.

CRA 3

The NRLMG recommends that you agree to Option CRA3_01, which is to use the new CRA 3 management procedure called '*Rule 4*' and, based on this new procedure, retain the current TAC, allowances and TACC.

Option CRA3_01 is supported by all sector members of the NRLMG and MPI. Customary NRLMG members note, however, that given the limited consultation period this position does not necessarily reflect the collective view of iwi interests in the fishery.

In comparison to the other management procedure consulted on (Option CRA3_02 – *Rule 6*), Option CRA3_01 has a more timely response to changing stock abundance. The ability to deal with signals in changing abundance immediately is crucial to the management of this fishery.

The 2014 CRA 3 stock assessment results suggest that there are no sustainability concerns for the fishery at this time with 2013 biomass well above *B_{msy}* (3.3 to 4.7 times). 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 sustainability reference points. The new CRA 3 management procedure is expected to maintain the stock above *B_{msy}* with greater than 99% probability.

The recreational NRLMG members, however, continue to express concerns about the size limit inequality in the CRA 3 fishery and the availability of rock lobsters close to Gisborne. These matters are outside the scope of this paper and will be considered by a separate process (see Appendix 1 for further discussion).

CRA 5

Customary and commercial NRLMG members, and MPI, recommend that you agree to Option CRA5_02, which is to retain the current CRA 5 TAC, allowances and TACC. Recreational NRLMG members have abstained from supporting options for CRA 5 based on their view that a management procedure should, in principle, be followed once adopted.

Option CRA5_02 involves a decision not to follow the CRA 5 management procedure that has been used in the fishery since 2012.

Note that most other rock lobster management procedures have a 5% minimum change threshold, but this was not applied to the CRA 5 procedure when developed. If a 5% minimum change threshold were applied in CRA 5, no change to the *status quo* would be proposed this year.

No change to the *status quo* is also preferred by the customary and commercial NRLMG members, and MPI, because latest research information suggests that recreational harvest levels have increased in the fishery and that allocation decisions need to be considered in association with a new stock assessment model and management procedure evaluations (i.e. should recreational removals be constrained or simply allowed for?). This work is proposed for 2015 in conjunction with comprehensive community engagement.

Making no change to the CRA 5 catch limit for one year is unlikely to pose a sustainability risk because recent monitoring information suggests the stock is above sustainability indicators. CRA 5 stock biomass in 2014 was considered virtually certain (>99%) to be above *B_{msy}*.

CRA 7

The NRLMG recommends that you agree to Option CRA7_01, which is to use the existing CRA 7 management procedure and, based on the procedure, increase the TAC and TACC by 31.72 tonnes. This option has support from all sector members of the NRLMG and MPI. Recreational members, however, note that some recreational fishers prefer the *status quo* given the size limit inequality in the fishery.

The CRA 7 fishery has had a history of significant changes to the TACC (ranging between 44 and 189 tonnes in the last 10 years). This recent peak in abundance arises from strong juvenile settlement since 2009.

CRA 7 stock biomass in 2014 was considered to be about as likely as not (40-60%) to be above the target reference level (no *Bmsy* estimate is available for CRA 7). Ongoing application of the CRA 7 management procedure is expected to maintain the stock above the target with greater than 89% probability.

The TACC increase has the potential to generate approximately \$2.2 million in additional earnings for the commercial sector. No change is proposed to the non-commercial allowances because available information suggests current levels of harvest are minimal and it is considered that the allowances adequately allow for customary and recreational fishing interests at this time.

CRA 9

Customary and commercial NRLMG members, and MPI, recommend that you agree to Option CRA9_02, which is to retain the current CRA 9 TAC, allowances and TACC. Recreational NRLMG members have abstained from supporting options for CRA 9 based on their view that a management procedure should, in principle, be followed once adopted.

Option CRA9_02 involves a decision not to follow the CRA 9 management procedure that was used for the first time in this fishery in 2014. Customary and commercial members of the NRLMG, and MPI, consider there are good reasons not to follow the recommendation of the CRA 9 management procedure this year.

In 2014, you agreed to use the CRA 9 management procedure for the first time and increase the TACC from 47 to 60.8 tonnes. If the results of the management procedure were followed this year (Option CRA9_01), a TACC decrease of 24% to 46 tonnes would be recommended (slightly below the 47 tonne TACC that had applied from 1992 to 2014).

The NRLMG has concerns about the CRA 9 management procedure's utility because of the small amount of commercial fisheries information available to support its operation (six core vessels fishing a small part of the total management area). The TACC decrease that is recommended by the procedure may reflect changes in fishing practices and reporting rather than a reflection of available abundance. It is considered improbable that stock abundance has declined as much as catch-per-unit-effort or CPUE is suggesting between one fishing year and the next.

Making no change to the CRA 9 TAC for one year is unlikely to pose a sustainability risk because the 2013 stock assessment suggested that the stock is well above sustainability indicators. CRA 9 stock biomass in 2014 was considered very likely (>90%) to be above *Bmsy*.

A thorough scientific review of CRA 9 fisheries information and the management procedure will be undertaken in 2015 to determine the appropriate management approach for the fishery.

3 Purpose

3.1 RATIONALE FOR MANAGEMENT INTERVENTION

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 for rock lobster.

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 a previous Minister agreed to use a rebuilding CRA 3 management procedure up 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 ROCK LOBSTER MANAGEMENT APPROACH

The NRLMG is the primary advisor to you 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).

¹ The current CRA 2, CRA 4 and CRA 8 management procedures are not discussed further in this paper 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 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 usually reviewed every five years to ensure that TAC setting remains compliant with the statutory structure set out in the Act. The review 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 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 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 extensively simulation-tested, including 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 that the most up-to-date CPUE information is used in management procedure operations 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 paper²:

- a) The statutory reference level, **Bmsy**, the stock size that can produce the maximum sustainable yield. Section 13 of the Act requires you 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.

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.

- 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 you consider 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 paper because the RLFAWG 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 paper.

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

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%.

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].

For rock lobster:

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

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

5 Consultation

Decisions to vary TACs are made under section 13(4) of the Act; therefore, the consultation requirements of section 12(2) apply. Decisions to vary TACCs are made under section 20(2), to which the consultation requirements of section 21(2) apply. These provisions require consultation with such persons or organisations representative of those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned, including Maori, environmental, commercial and recreational interests.

The NRLMG consulted on proposals to review sustainability measures for five rock lobster stocks from 20 January to 17 February 2015. A standard consultation process of posting the consultation document on the MPI website and alerting stakeholders to this through a letter sent to numerous tangata whenua, recreational and commercial contacts.

5.1 SUBMISSIONS RECEIVED

51 submissions were received from the following organisations, groups and individuals on the consultation document:

Alex Flavell-Johnson	Leigh Jenden
Andrew Dellow	Luke Carter
Baden Phillips	Mark B
Bart Cheetham	Mark Foo
Bruce O'Brien	Matt Cameron
Burkhart Fisheries Ltd.	Melody McLaughlin
Christian Jensen	Mike Woodbury
Corne Ferreira	NZ Rock Lobster Industry Council (NZ RLIC)
Tairawhiti Rock Lobster Industry Association (CRAMAC 3)	NZ Angling and Casting Association (NZACA)
Canterbury Marlborough Rock Lobster Industry Association (CRAMAC 5)	NZ Sport Fishing Council (NZSFC)
Otago Rock Lobster Industry Association (CRAMAC 7)	Ngai Tahu Seafood
CRA 9 Industry Association (CRAMAC 9)	Ngati Kuri Trust Board
Derek Bradley	Ngati Porou Seafoods
Gary Horan	Ngati Whatua Fisheries
Geoff and Kim Basher	Paul Reinke
Gerard Phillips	Rob Bolland
Gisborne Tatapouri Sports Fishing Club (GTSFC)	Ryan Datson
Glenn Pope	Sam Millar
Grant Hunt	Steve
Gregg Fishing	Stu Shaw
Hilton Leith	Ted Howard (on behalf of the NZ Recreational Fishing Council)
Iwi Collective Partnership	Te Ohu Kaimoana
Jacob Brown	Tim Bulmer
Jason Elliott	Tyrone Mapp
Jason Willis	V&C Fishing
Jordan Downes	

Full copies of the submissions are available in Appendix 7. Each submission is discussed further below as relevant to each stock and in the other matters section in Appendix 1.

About a third of the submissions received related to matters outside the sustainability measures proposed in this paper.

Initial consultation was also undertaken with tangata whenua and fishing representatives in July 2014 on proposals for the CRA 1 and CRA 3 fisheries. The development of the new CRA 1 management procedures was guided by feedback received from a multi-sector meeting in Kerikeri. The development of the new CRA 3 management procedures was guided by feedback received from a multi-sector meeting in Gisborne.

6 Legal considerations

Your statutory considerations for TAC and TACC setting are discussed below and for each individual stock as relevant in the following sections.

6.1 PURPOSE OF THE ACT (SECTION 8)

The purpose of the Act is to provide for the utilisation of fisheries resources while ensuring sustainability. The options presented in this paper for each rock lobster stock provide for the utilisation of these stocks while ensuring sustainability.

6.2 ENVIRONMENTAL PRINCIPLES (SECTION 9)

Section 9 of the Act requires that you take the following environmental principles into account when exercising or performing functions, duties, or powers in relation to the utilisation of fisheries resources or ensuring sustainability:

- a) Associated or dependent species should be maintained above a level that ensures their long-term viability;
- b) Biological diversity of the aquatic environment should be maintained;
- c) Habitats of particular significance for fisheries management should be protected.

The NRLMG considers that all options presented in this paper satisfy your obligations under section 9 of the Act. Rock lobster is taken by potting and hand gathering fishing methods which have relatively low level of bycatch. The main method that commercial fishers utilise to target rock lobster is potting which is assumed to have very little direct impact on the aquatic environment.

6.3 INFORMATION PRINCIPLES (SECTION 10)

Section 10 of the Act requires that you take the following information principles into account:

- a) Decisions should be based on the best available information;
- b) Decision makers should take into account any uncertainty in the available information;
- c) Decision makers should be cautious when information is uncertain, unreliable, or inadequate;
- d) The absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.

The NRLMG considers that the best available information has been used as the basis for the recommendations in this paper. All science information on which the management proposals are based on, has been peer-reviewed by one of MPI's Fisheries Assessment Working Groups and meets the MPI Research and Science Information Standard for New Zealand Fisheries.

6.4 SUSTAINABILITY MEASURES (SECTION 11)

Under section 11 of the Act, before setting or varying any sustainability measure for any stock, you must:

- a) Section 11(1)(a): take into account any effects of fishing on any stock and the aquatic environment. Rock lobster fishing methods (potting and hand gathering) are assumed to have very little direct impact on non-target species and the aquatic environment.
- b) Section 11(1)(b): take into account any existing controls under the Act that apply to the stock or area concerned. A range of management controls apply to the stocks discussed in this paper including minimum legal sizes, daily bag limits for recreational fishers, method restrictions, and protection of egg-bearing females. No changes are proposed to these existing controls.
- c) Section 11(1)(c): take into account the natural variability of the stock. Recruitment to rock lobster stocks is highly variable. This variability was taken into account during development of the management procedures discussed in this paper.
- d) Sections 11(2)(a) and (b) require you to have regards to any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991 and any management strategy or management plan under the Conservation Act 1987 that apply to the coastal marine area and that you consider relevant. The NRLMG is not aware of any such policy statements, plans or strategies that should be taken into account for the stocks.
- e) Section 11(2)(c): have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 that apply to the coastal marine area and you consider relevant. A very small offshore area of the CRA 1 quota management area falls within the Park boundaries. The recommended option presented for CRA 1 in this paper to retain the TACC is consistent with the objectives stated in the park provisions. The CRA 2 rock lobster fishery mainly falls within the Park boundaries and no changes to sustainability measures are proposed for this stock this year (the TAC was reduced in 2014).
- f) Section 11(2)(d): have regard to any planning document lodged by a customary marine title group under section 91 of the Marine and Coastal Area (Takutai Moana) Act 2011. No planning documents applicable to this fishery have been lodged.
- g) Section 11(2A)(b): take into account any relevant fisheries plan approved under section 11A. The application of the Draft National Fisheries Plan for Inshore Shellfish Fisheries is discussed in section 3 of this paper.
- h) Sections 11(2A)(a) and (c): take into account any conservation or fisheries services, or any decision not to require such services. The NRLMG does not consider that existing or proposed services materially affect the proposals for these stocks. No decision has been made to not require a service in this fishery at this time.

6.5 TAC SETTING (SECTION 13)

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

Under section 13(2) of the Act you must set a TAC that maintains a stock 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) you 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 you are required to apply section 13 (2A) of the Act instead. Section 13 (2A) requires you 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), you must have regard to such social, cultural and economic factors that are considered relevant.

The management procedures discussed in this paper 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, you must also have regard to:

- a) Interdependence of stocks: is where there is a direct trophic (i.e. a stock is likely to be directly affected by the abundance of another stock) or symbiotic relationship between stocks. Rock lobsters are predators of molluscs and other invertebrates and predation upon rock lobsters is known from octopus, blue cod, groper, southern dogfish, rig and seals. Although there is uncertainty, the options proposed are unlikely to have any significant effect on the interdependence of stocks.
- a) Biological characteristics and environmental conditions: a variety of environmental factors are thought to influence the productivity of rock lobster populations including water temperature, ocean currents, latitude, shelter availability and food availability. Studies have also shown that lobsters grow at different rates around New Zealand and female lobsters become mature at different sizes. Variability in growth, maturity, available biomass, and recruitment were taken into account during the development of management procedures for the rock lobster stocks discussed in this paper.

6.6 TACC SETTING (SECTIONS 20 AND 21)

When setting a TACC for a stock under section 20 of the Act, section 21 requires you 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, you have 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 paper.

When allowing for Maori customary non-commercial fishing interests you 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 paper. 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, you 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 paper.

7 CRA 1 (Northland) rock lobster fishery

7.1 FINAL CRA 1 PROPOSALS

Table 7.1 below shows the final proposals for CRA 1, which are the same as those consulted on.

Table 7.1: Final TAC, allowance and TACC proposals for CRA 1 (tonnes)

Option	TAC	Customary	Recreational	Other mortality	TACC
CRA1_01: use the new <i>Rule 8d</i> CRA 1 management procedure and set the following	269.62	10	50	72	137.62 t ↑
CRA1_02: use the new <i>Rule 8d</i> CRA 1 management procedure and set the following	279.62	20	50	72	137.62 t ↑
CRA1_03: use the new <i>Rule 9d</i> CRA 1 management procedure and set the following	263.062	10	50	72	131.062
CRA1_04: use the new <i>Rule 9d</i> CRA 1 management procedure and set the following	273.062	20	50	72	131.062
CRA1_05: Retain the current settings (TACC only)	N/A	N/A	N/A	N/A	131.062

7.2 SUMMARY OF CRA 1 SUBMISSIONS

7.2.1 Support for Options CRA1_01 or 02

Ngati Kuri Trust Board and Ngati Whatua support Option CRA1_02 – use the new *Rule 8d* CRA 1 management procedure and set for the first time a TAC of 279.62 tonnes, a customary allowance of 20 tonnes, recreational allowance of 50 tonnes and an allowance of 72 tonnes for other sources of fishing-related mortality. Under this option the TACC would increase from 131.062 to 137.62 tonnes.

Te Ohu Kaimoana also noted they are comfortable with the *Rule 8d* CRA 1 management procedure if commercial are able to reach agreement on how any TACC increase can be caught without causing spatial or sustainability issues.

7.2.2 Support for Options CRA1_03 or 04

The Iwi Collective Partnership expressed support for Option CRA1_03 or 04 (the difference between these options is that CRA1_03 proposes a 10 tonne customary allowance instead of 20 tonnes.). This submitter did not have a view on what the customary allowance should be.

Te Ohu Kaimoana and NZ RLIC support Option CRA1_04 – use the new *Rule 9d* CRA 1 management procedure and set for the first time a TAC of 273.062 tonnes, a customary allowance of 20 tonnes, recreational allowance of 50 tonnes and an allowance of 72 tonnes for other sources of fishing-related mortality. Under this option the TACC would be retained at 131.062 tonnes.

Individual submitters (Flavell-Johnson, Bradley, Downes, Leith and Shaw) supported no increase to the TACC but did not express a preference for Option CRA1_03 or 04 in their submissions.

7.2.3 Other comments

The submission from the NZSFC (endorsed by NZACA) stated no support for Options CRA1_01 and CRA1_02 (TACC increase options) and CRA 1_05 (no setting of a TAC and allowances). They do support the setting of a CRA 1 TAC and allowances without the need to apply a new management procedure.

The NZSFC do not support the use of new management procedures for CRA 1 because they consider it is a high risk strategy that does not allow for non-commercial fishing interests as required under the Act. The NZSFC instead propose different settings: a TAC of 296.062 tonnes, a customary allowance of 20 tonnes, a higher recreational allowance of 75 tonnes, a slightly lower allowance of 70 tonnes for other sources of fishing-related mortality and retention of the current TACC.

Individual submitters (Brown, Bradley, Bulmer, Carter, Datson, Downes, Foo and Pope) expressed concerns about the health of localised recreational fishing areas. Many of these submitters considered that this was related to an increase in commercial effort and some supported a TACC decrease.

Submitter Bradley also considered the proposed 50 tonne recreational allowance was inadequate and greater fishing restrictions needed to be applied to commercial.

Some of these other comments are discussed further in Appendix 1.

7.3 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. The 2013 biomass is well above *B_{msy}* (100% above), *B_{ref}* (73% above) and *B_{min}* (66% above)⁴. 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 lobsters are about 62% of the unfished level. With 2013 catch levels and recent recruitments, biomass is projected to stay near current levels.

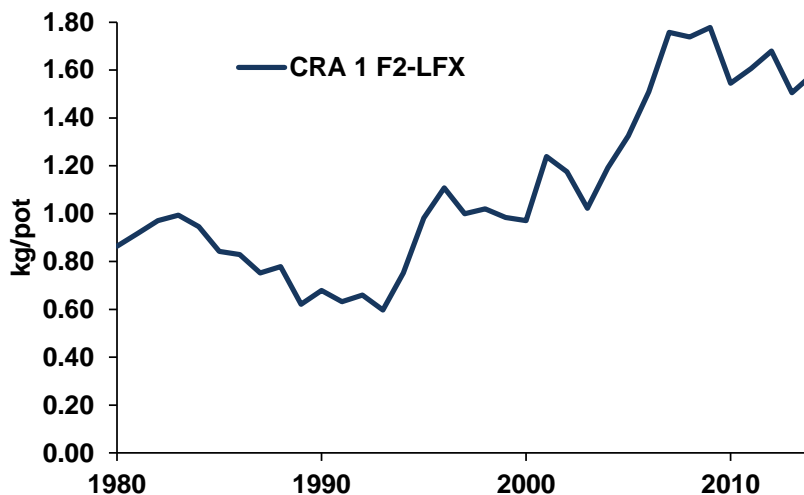
⁴ *B_{ref}* for CRA 1 is the pre-season autumn-winter vulnerable biomass associated with the period 1979-88.

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 are spatial 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). Similar concerns about CPUE were expressed in the submissions from Ngati Whatua and the Iwi Collective Partnership.

The RLFAGW looked into the differences in statistical area CPUE as part of the 2014 stock assessment and agreed to assess CRA 1 as a single stock based on similar sizes of fish by sex and season among the five statistical areas. This suggests that exploitation rates across the entire management area are 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 7.1. CPUE rose above 1.5 kg/potlift in 2006 and has remained above 1.5kg/potlift since then.

Figure 7.1: The history of CPUE in CRA 1, 1980 – 2014 (offset years).



7.4 ANALYSIS OF CRA 1 FINAL PROPOSALS

7.4.1 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).

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 7.2). Ongoing application of either CRA 1 management procedure is expected to meet the MPI Harvest Strategy Standard and maintain the stock above *B_{msy}* with greater than 50% probability and *B_{min}* with greater than 90% probability. For further information on the specifications of the new CRA 1 management procedures refer to Appendix 2.

Table 7.2: 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 Indicators⁵		
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 suggests 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 in the performance of 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 the following sections).

7.4.2 TAC setting

No TAC has been previously set for CRA 1.

Best available information suggests the CRA 1 stock is above *Bmsy*. Accordingly you 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.

⁵ An explanation of the stock indicators is provided in section 4.2.

- 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. This is because it is proposed that the effective 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 the case 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.

7.4.3 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 7.3)

Table 7.3: 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 small catches reported under the Fisheries (Kaimoana) Regulations 1998 and regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013⁶.

Options CRA1_01 and 03 reflect the constant 10 tonnes of customary catch that was assumed in the recent CRA 1 assessment model on MP advice, 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. Te Ohu Kaimoana note in their submission that there are 8 iwi in CRA 1, 91 marae and the highest Maori population of all rock lobster management areas. The NRLMG considers that this justifies the setting of a 20 tonne customary allowance.

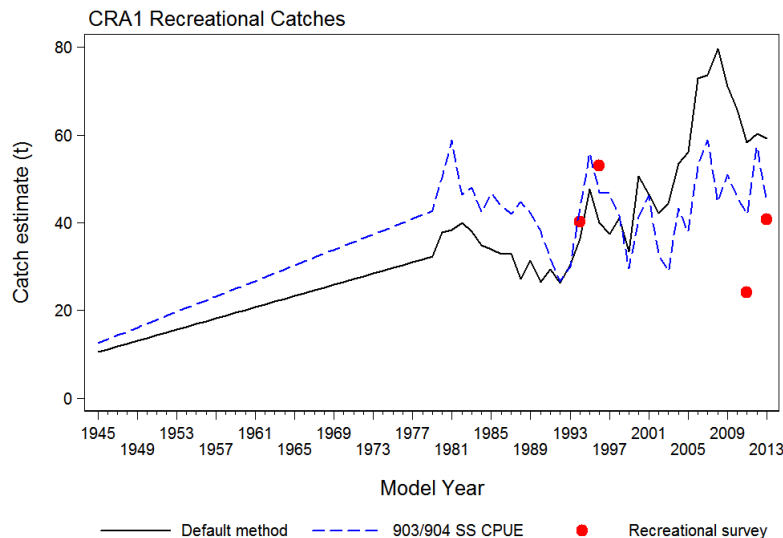
⁶ Previously regulation 27A of the Fisheries (Amateur Fishing) Regulations 1986.

- *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 most 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 7.2).

Figure 7.2: 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).



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.

Submissions from the NZSFC and Bradley suggest the 50 tonne allowance is inadequate. The NZSFC would like the recreational allowance set at 75 tonnes to allow for the maximum estimated recreational catch (i.e. from the model above).

The NRLMG acknowledges the 2013 recreational survey estimate of 42 tonnes may be an underestimate for CRA 1. However, this is the best estimate at this time to guide recreational allowance setting and a change to the allowance will be considered when new information becomes available. It is considered that the proposed 50 tonne recreational allowance adequately allows for recreational fishing interests at this time.

- *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.

Submissions from Ngati Kuri Trust Board, NZ RLIC, NZSFC and Te Ohu Kaimoana comment on the illegal take estimate and that it is possibly excessive. The NZ RLIC is particularly concerned that the estimate could be overestimating productivity of the stock. The NRLMG and RLFAWG have little confidence in the estimates of illegal catch because the estimates cannot be verified. This matter is discussed further in Appendix 1.

7.4.4 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.

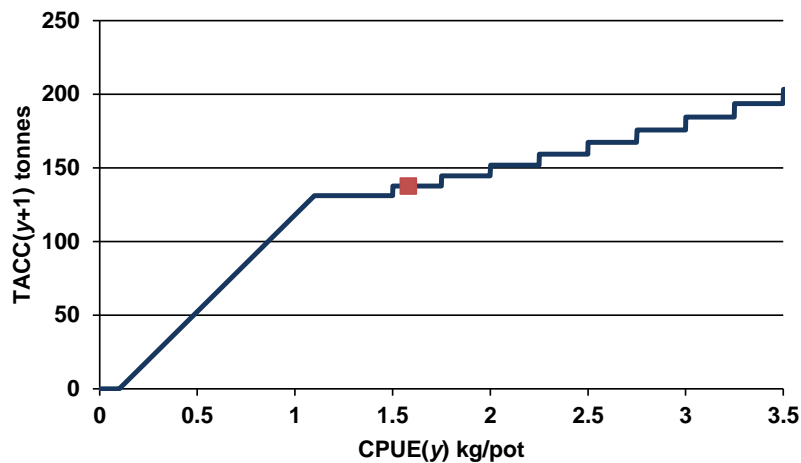
- *Options CRA1_01 and CRA1_02 – Increase the CRA 1 TACC by 6.558 tonnes*

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 7.3. 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 TACC increase proposed under Options CRA1_01 and 02 would have the potential to generate approximately \$460,000 in additional revenue for the commercial sector (based on average 2014 port price information).

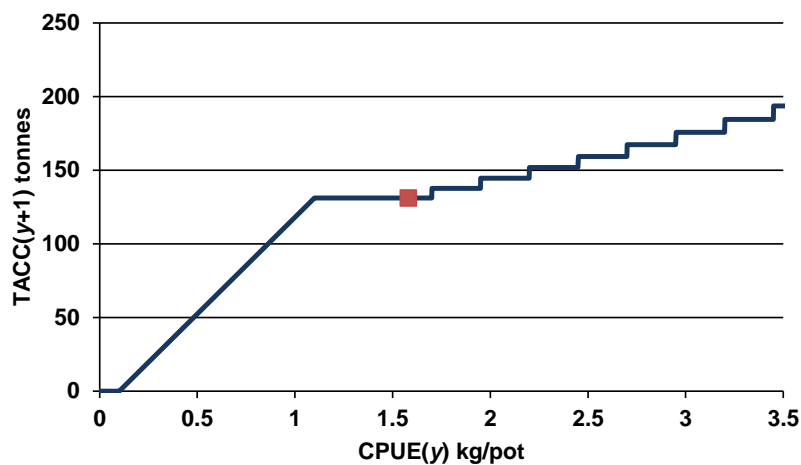
Figure 7.3: The new *Rule 8d* CRA 1 management procedure, showing the TACC for the 2015-16 fishing year resulting from the rule operation performed in 2014.



- 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 7.4 (the red square on the graph relates to the proposed TACC of 131.062 tonnes).

Figure 7.4: The new *Rule 9d* CRA 1 management procedure, showing the TACC for the 2015-16 fishing year resulting from the rule operation performed in 2014.



8 CRA 3 (Gisborne) rock lobster fishery

8.1 FINAL CRA 3 PROPOSALS

Table 8.1 below shows the final proposals for CRA 3, which are the same as those consulted on.

Table 8.1: Final TAC, allowance and TACC proposals for CRA 3 (tonnes)

Option	TAC	Customary	Recreational	Other mortality	TACC
CRA3_01: use the new <i>Rule 4</i> CRA 3 management procedure and retain the TAC	389.95	20	20	89	260.95
CRA3_02: use the new <i>Rule 6</i> CRA 3 management procedure and retain the TAC					

8.2 SUMMARY OF CRA 3 SUBMISSIONS

8.2.1 Support for Option CRA3_01

CRAMAC 3, the Iwi Collective Partnership, Ngati Porou Seafoods and NZ RLIC support Option CRA3_01 – use the new *Rule 4* CRA 3 management procedure and retain the current TAC, allowances and TACC. These submitters support this option because the *Rule 4* procedure should have more timely response to changing abundance (particularly between CPUEs of 1 and 2 kg/potlift). It is considered that this would have better outcomes for the sustainability of the fishery.

8.2.2 Support for Option CRA3_02

In Te Ohu Kaimoana’s written submission they expressed support for Option CRA3_02 - use the new *Rule 6* CRA 3 management procedure and retain the current TAC, allowances and TACC. However, the NRLMG was subsequently informed that due to the limited time available for consultation they were unable to thoroughly canvass the views of all iwi and are not in a position to express support for either CRA 3 option.

The Iwi Collective Partnership also considered that Option CRA3_02 is appropriate, but has a preference for Option CRA3_01.

8.2.3 Other comments

The submission from Howard (on behalf of the NZ Recreational Fishing Council) discusses a number of technical concerns with the 2014 CRA 3 stock assessment model and also outlines thoughts on what is at the heart of the recreational issue close to Gisborne.

The GTSFC and NZSFC (endorsed by NZACA) do not support the new management procedures proposed for CRA 3 and express concerns that MPI has ignored the CRA 3 policy that they developed in 2014 despite widespread support.

The NZSFC are particularly concerned that recreational harvest is being constrained by low levels of availability and the size ‘concession’. This submitter recommends that the size concession is removed and the exploitation of the stock is reduced, which includes setting a lower TAC of 334 tonnes, a higher customary allowance of 30 tonnes, a higher recreational

allowance of 50 tonnes, retaining the 89 tonne other mortality allowance and reducing the TACC from 260.95 to 165 tonnes.

Individual submitter Horan expressed difficulties in finding legal sized crayfish in most of his diving spots in the fishery.

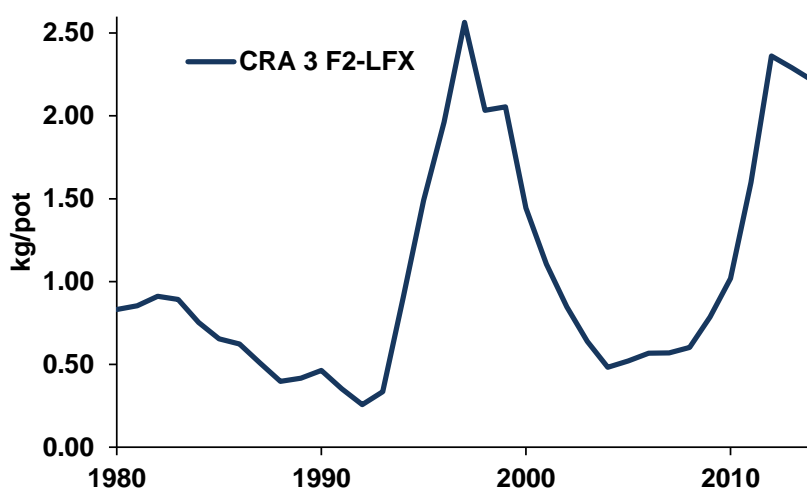
Some of these other comments are discussed further in Appendix 1.

8.3 CRA 3 STOCK STATUS

A new stock assessment was carried out for the CRA 3 fishery in 2014 (the last was in 2008)⁷. 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)⁸. 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 8.1. CPUE has increased steadily from 2008 to 2013, with a slight decline observed in 2014.

Figure 8.1: The history of CPUE in CRA 3, 1980 – 2014 (offset years).



8.4 ANALYSIS OF CRA 3 FINAL PROPOSALS

8.4.1 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.

⁷ 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.

⁸ *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.

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 8.2). 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 3.

Table 8.2: Summary of indicator results from base case evaluations for CRA 3 Rule 4 and Rule 6.

	<i>Rule 4</i> Option CRA3_01	<i>Rule 6</i> Option CRA3_02
Stock Indicators⁹		
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 performance 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 8.4.4 below).

8.4.2 TAC setting

The current CRA 3 TAC is 389.95 tonnes.

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

⁹ An explanation of the stock indicators is provided in section 4.2.

- *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.

8.4.3 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.

The NZSFC submit that the customary allowance should be increased to 30 tonnes with no specific basis provided. Based on reported customary catches under the Fisheries (Kaimoana) Regulations 1998 and regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013¹⁰, the NRLMG considers 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 (approximately 13 tonnes). An estimate of 20 tonnes was used in the 2014 stock assessment model to represent customary catches.

- *Recreational allowance*

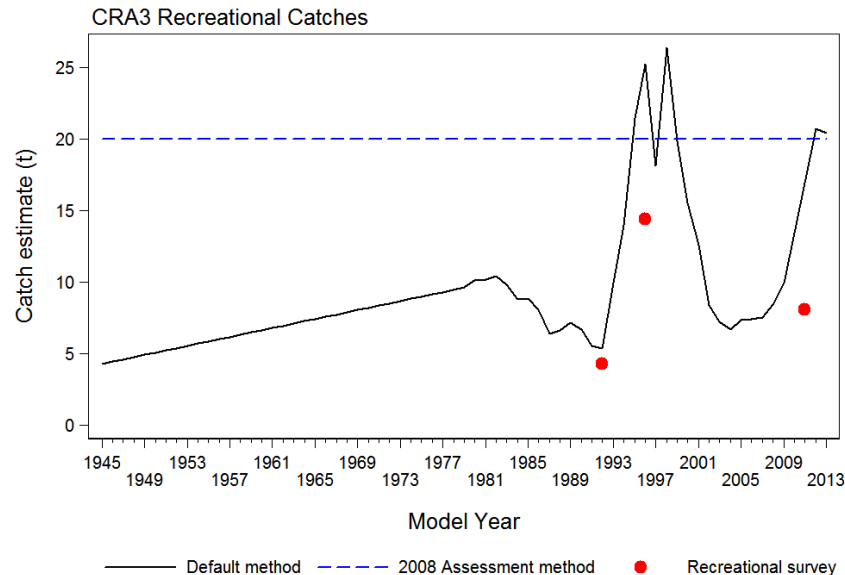
No change is proposed to the 20 tonne recreational allowance for CRA 3 under Options CRA3_01 and 02.

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 8.2).

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.

¹⁰ Previously regulation 27A of the Fisheries (Amateur Fishing) Regulations 1986.

Figure 8.2: 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).



In their submission the NZSFC considers that the CRA 3 fishery is now so depleted that surveys of recreational catch estimate just 8 tonnes of catch. The NRLMG considers that the 2011/12 recreational survey estimate of 8 tonnes is likely to be an underestimate and may not reflect the actual level of harvest, rather than reflecting a depleted fishery. MPI has recently commissioned a research project to design a methodology to collect recreational harvest estimates in the future so that a better understanding of the CRA 3 fishery is gained.

The NRLMG considers that the 20 tonne recreational allowance adequately allows for likely levels of recreational harvest from the CRA 3 fishery at this time.

- *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.

Submissions from NZSFC and Te Ohu Kaimoana comment on the illegal take estimate and suggest that it may be excessive. The NRLMG and RLFAWG have little confidence in the estimates of illegal catch because the estimates cannot be verified. MPI considers that there are currently moderate to high levels of illegal fishing activity in the CRA 3 fishery, but based on MPI compliance information illegal activities are thought to have decreased in recent years due to targeted and varied enforcement efforts. The NRLMG does not propose that the CRA 3 other mortality allowance is varied until a better estimate of illegal take becomes available (refer Appendix 1).

8.4.4 TACC

The current CRA 3 TACC is 260.95 tonnes.

The NZSFC submit that the current TACC must be reduced to 165 tonnes. Based on the 2014 CRA 3 stock assessment results and management procedure evaluations, the NRLMG does not consider that a 38% decrease to the TACC is warranted at this time to ensure sustainable utilisation. Under either proposed management procedure option, if CPUE declines in the fishery the CRA 3 TACC will be decreased accordingly.

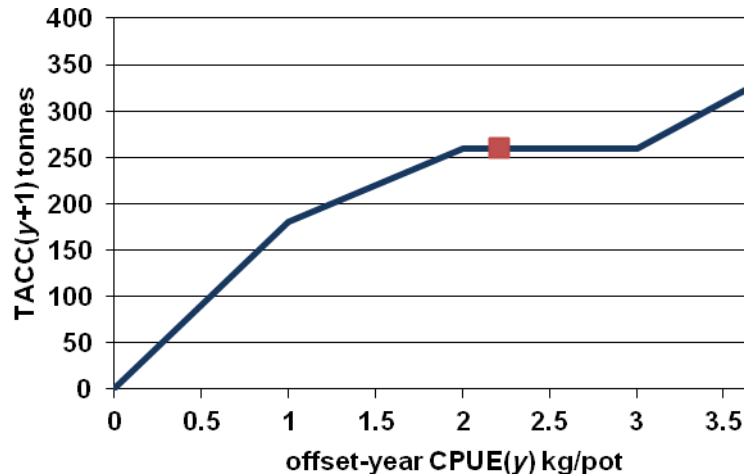
Under Options CRA3_01 and 02 the CRA 3 TACC would stay at its current level.

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

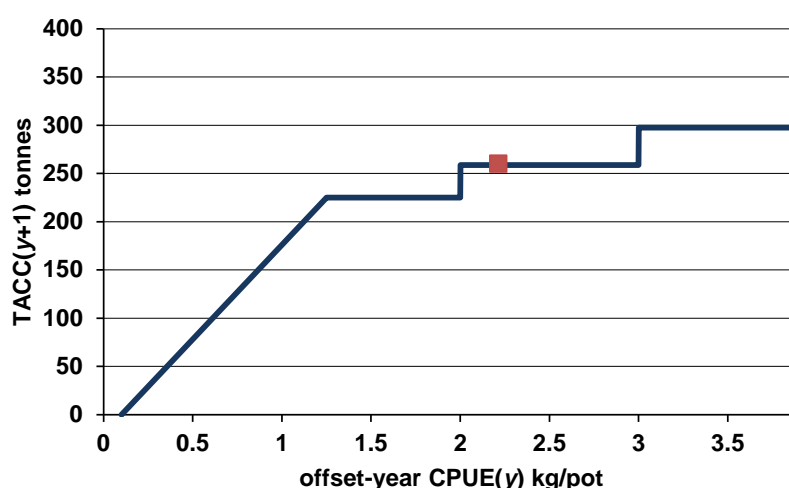


- *Option CRA3_02 – Retain the current CRA 3 TACC (as guided by the new Rule 6 CRA 3 management procedure)*

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 8.4. 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 8.4: The new *Rule 6* CRA 3 management procedure, showing the TACC for the 2015-16 fishing year resulting from the rule operation performed in 2014.



9 CRA 5 (Canterbury/Marlborough) rock lobster fishery

9.1 FINAL CRA 5 PROPOSALS

Table 9.1 below shows the final proposals for CRA 5, which are the same as those consulted on.

Table 9.1: Final TAC, allowance and TACC proposals for CRA 5 (tonnes)

Option	TAC	Customary	Recreational	Other mortality	TACC
CRA5_01: use the CRA 5 management procedure and decrease the TAC	452.81 ↓	40	40	37	335.81 ↓
CRA5_02: retain the current TAC	467	40	40	37	350

9.2 SUMMARY OF CRA 5 SUBMISSIONS

9.2.1 Support for Option CRA5_01

No submitters expressed support for Option CRA5_01 – use the current CRA 5 management procedure and decrease the TAC and TACC by 14.19 tonnes.

9.2.2 Support for Option CRA5_02

Burkhart Fisheries, CRAMAC 5 (with support from Basher, Greg Fishing, Ngai Tahu Seafoods, Reinke and V & C Fishing), NZ RLIC and Te Ohu Kaimoana support Option CRA5_02 – retain the current CRA 5 TAC, allowances and TACC.

CRAMAC 5, NZ RLIC and Te Ohu Kaimoana note that the CRA 5 management procedure does not have a minimum 5% change threshold, unlike four of the other management procedures used in rock lobster fisheries. If the 5% minimum change were applied to the CRA 5 management procedure, no change to the CRA 5 TACC would be proposed this year (the management procedure recommends a 4% decrease).

These submitters suggest that making no change to the TACC this year is unlikely to pose a risk to sustainability particularly given that a review of the fishery will be carried out later this year.

9.2.3 Other comments

NZSFC (endorsed by NZACA) submit that, rather than following declines in abundance with small incremental reductions to the TACC, a large TACC change must be made to ensure sustainability and abundance for future generations. The NZSFC instead propose different settings: a reduced TAC of 430 tonnes, a customary allowance of 40 tonnes (current setting), a higher recreational allowance of 50 tonnes, a slightly higher allowance of 40 tonnes for other sources of fishing-related mortality, and a lower TACC of 300 tonnes.

Millar and Hunt both expressed concerns about dwindling crayfish numbers in localised dive spots (i.e. around Banks Peninsula and Kaikoura). Millar was disappointed to see the recreational daily bag limit remain at six when the 'Te Korowai' rules were implemented in August 2014.

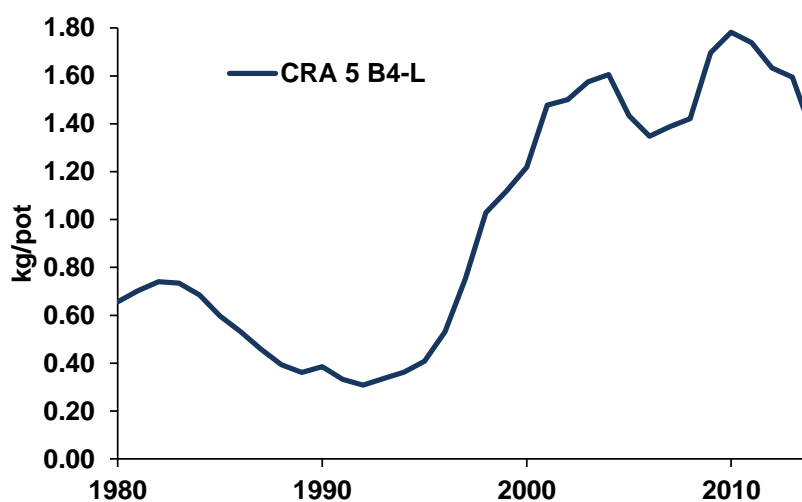
Some of these other comments are discussed further in Appendix 1.

9.3 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 B_{msy} , B_{ref} and B_{min} ¹¹. 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 9.1. CPUE has decreased since 2009, but remains at high levels.

Figure 9.1: The history of CPUE in CRA 5, 1980 – 2014 (offset years).



¹¹ B_{ref} for CRA 5 is the pre-season autumn-winter vulnerable biomass associated with the period 1979-88.

9.4 ANALYSIS OF CRA 5 FINAL PROPOSALS

9.4.1 TAC setting

The current CRA 5 TAC is 467 tonnes.

Best available information suggests the CRA 5 stock is above *Bmsy*. Accordingly you 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 a previous 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 4.

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 involves a decision not to follow the CRA 5 management procedure that has been used in the fishery since 2012.

The NRLMG is highly supportive of the use of management procedures unless there are good reasons not to follow their recommendations; customary and commercial NRLMG members, and MPI, consider there are good reasons in this case. Recreational NRLMG members, however, have abstained from expressing a view because in principle they support use of management procedures.

A minimum change threshold was not applied to the CRA 5 management procedure when developed. If a 5% minimum change threshold were applied in CRA 5, there would be no proposed change to the TAC for April 2015.

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. The CRA 5 TACC has been set at 350 tonnes since 1999.

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, management procedure evaluations and comprehensive community engagement. This work is scheduled to occur in 2015 and its outcomes will be used to inform sustainability measures for CRA 5 for April 2016.

9.4.2 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 2013¹². 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 9.2).

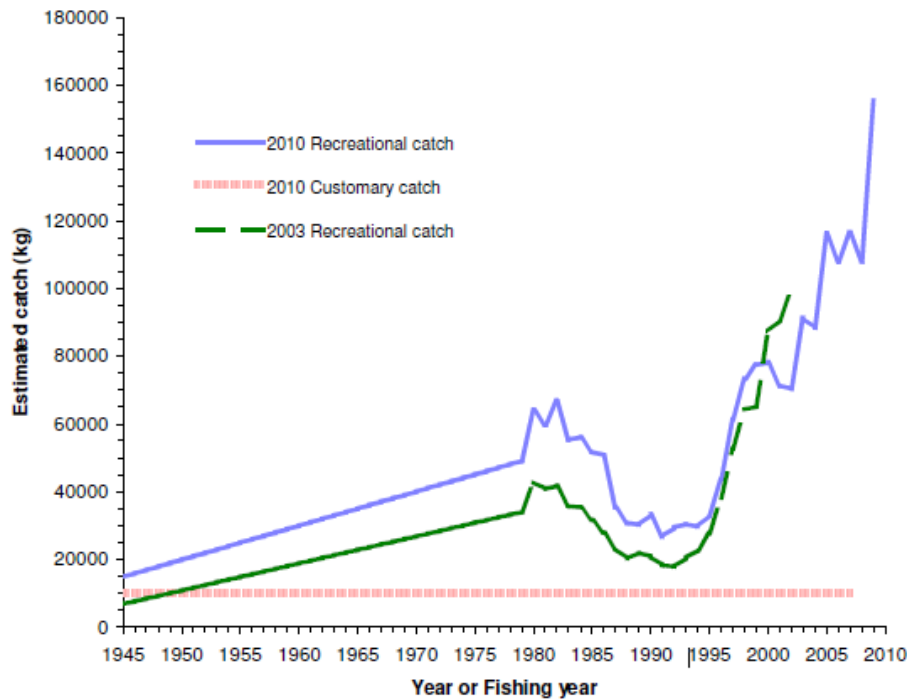
- *Recreational allowance*

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.

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

Figure 9.2: 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).



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).

Burkhart Fisheries, CRAMAC 5, NZRLIC and Te Ohu Kaimoana express concerns about increasing recreational harvest levels and suggest that removals from this sector are now exceeding the 40 tonne recreational allowance. It is proposed that allocation decisions will be considered in 2015 in association with a new stock assessment and management procedure evaluations (i.e. should recreational removals be constrained or simply allowed for?).

The NZSFC consider that you cannot knowingly set a recreational allowance you know will be exceeded. You are free to adjust the CRA 5 TAC and allowances based on your assessment of available information. The only new information available to support an adjustment to the recreational allowance is from the 2012/13 Kaikoura and Motunau survey as described above. This survey information suggests the 40 tonne recreational allowance is being exceeded, but there is uncertainty by how much given the survey area covered a sub-area of CRA 5. The NRLMG prefers to wait for scientific stock modelling results before a change is proposed to the recreational allowance (available later this year).

- *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 NZSFC submit that the other mortality allowance should be increased to 40 tonnes and that they consider it unlikely that there will ever be a better illegal take estimate. The NRLMG does not propose that the CRA 5 other mortality allowance is varied until a better estimate of illegal take becomes available (see Appendix 1).

9.4.3 TACC

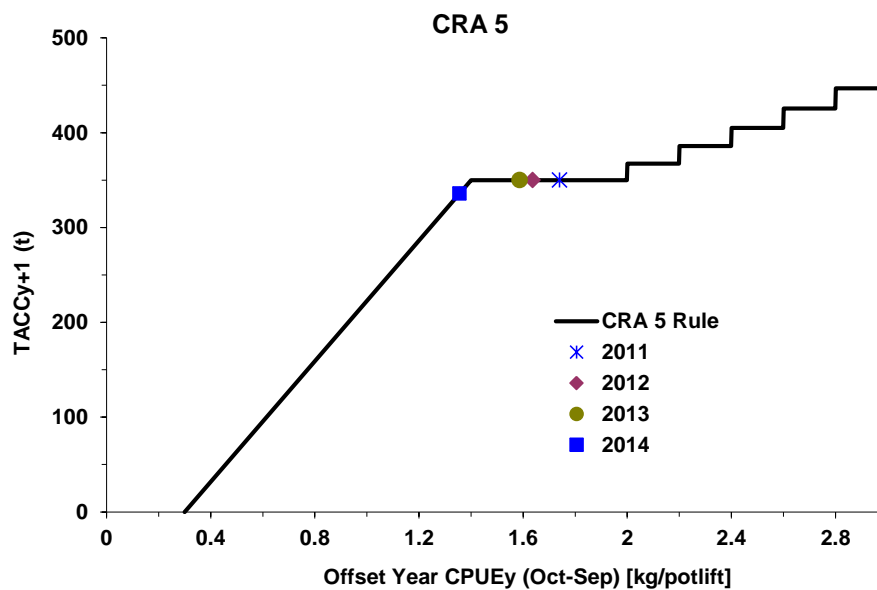
The current CRA 5 TACC is 350 tonnes.

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



The NZSFC submit that the current TACC must be reduced to 300 tonnes. The NRLMG does not consider that a 14% decrease to the TACC is warranted at this time to ensure sustainable utilisation. An updated stock assessment model and management procedure evaluations will be available in 2015 and this should be used to form the basis of any TAC, allowance and TACC decisions.

Industry submitters do not consider that a TACC reduction will improve abundance in the fishery because of the high recreational effort present in the fishery.

- *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 is supported by 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.

10 CRA 7 (Otago) rock lobster fishery

10.1 FINAL CRA 7 PROPOSALS

Table 10.1 below shows the final proposals for CRA 7, which are the same as those consulted on.

Table 10.1: Final TAC, allowance and TACC proposals for CRA 7 (tonnes)

Option	TAC	Customary	Recreational	Other mortality	TACC
CRA7_01: use the CRA 7 management procedure and increase the TAC	117.72 ↑	10	5	5	97.72 ↑
CRA7_02: retain the current TAC	86	10	5	5	66

10.2 SUMMARY OF CRA 7 SUBMISSIONS

10.2.1 Support for Option CRA7_01

CRAMAC 7, NZ RLIC and Te Ohu Kaimoana support Option CRA7_01 – use the current CRA 7 management procedure and increase the TAC and TACC by 31.72 tonnes. Strong puerulus settlement from 2009 to 2013 at Moeraki, combined with a high abundance of legal sized rock lobsters in the current season catch gives CRAMAC 7 the confidence for the future. The 2014/15 TACC was landed in under four months.

10.2.2 Support for Option CRA7_02

No submissions were received on Option CRA7_02 – retain the current CRA 7 TAC, allowances and TACC.

10.2.3 Other comments

The NZSFC (endorsed by NZACA) do not consider that you can increase the TACC while the CRA 7 size ‘concession’ continues. They consider that the increase in CRA 7 CPUE is implausible and that other factors (like migration) must be influencing the CPUE result.

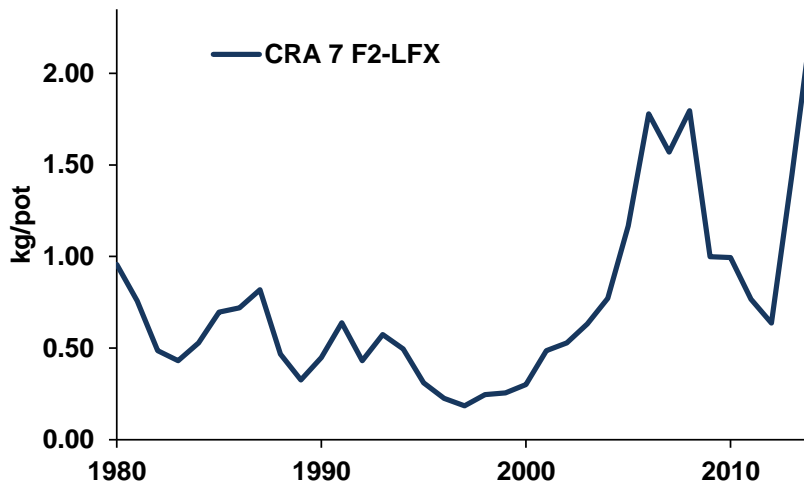
The NZSFC consider that the following management action is required: remove the size concession, monitor CPUE and independently verify CRA 7 abundance. They also recommend the following settings: a reduced TAC of 40 tonnes, a customary allowance of 10 tonnes (current setting), a higher recreational allowance of 10 tonnes, a higher other mortality allowance of 10 tonnes and a reduced TACC of 10 tonnes.

Some of these other comments are discussed further in Appendix 1.

10.3 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*¹³. 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 10.1. CPUE has increased substantially since 2012.

Figure 10.1: The history of CPUE in CRA 7, 1980 – 2014 (offset years).



10.4 ANALYSIS OF CRA 7 FINAL PROPOSALS

10.4.1 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 you 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 5.

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.

¹³ *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.

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).

10.4.2 Setting of non-commercial allowances

- *Customary Maori allowance*

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

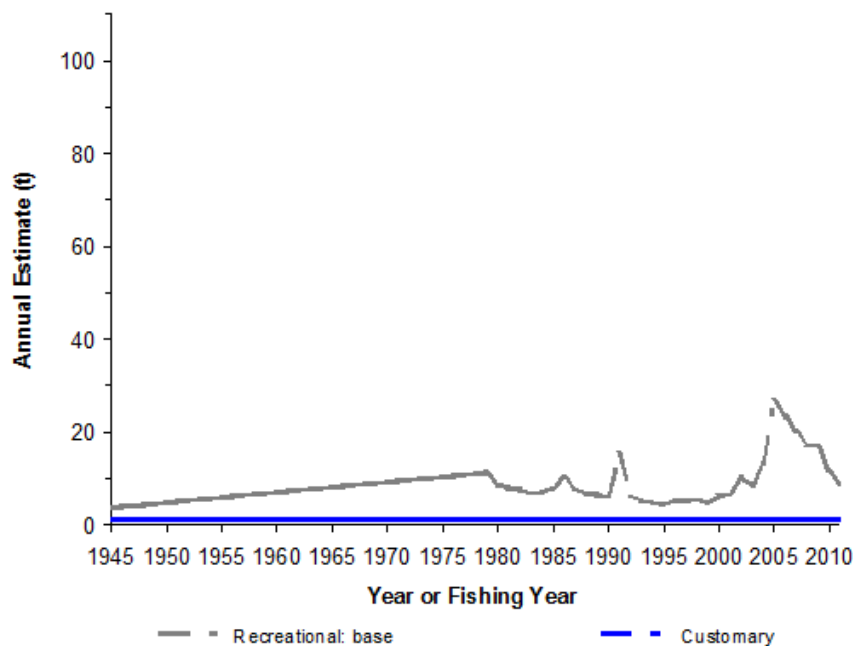
Information suggests the existing CRA 7 customary Maori catch is within the allowance allocated for this sector at this time. Reports of customary harvest under the Fisheries (South Island Customary Fishing) Regulations 1999 suggest there are low levels of rock lobster harvest from CRA 7. An estimate of 1 tonne was used in the 2012 CRA 7 stock assessment model to represent customary catch (blue line in Figure 10.2).

- *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 10.2).

Figure 10.2: 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.

The NZSFC submit that the recreational allowance should be increased to 10 tonnes with no specific basis provided. The NRLMG is currently considering whether to undertake an updated stock assessment for CRA 7 later in 2015 and would prefer to wait for the results of this modelling to inform any allowance changes.

- *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.

The NZSFC submit that the other mortality allowance should increase to 10 tonnes. The NRLMG considers 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 (refer Appendix 1).

10.4.3 TACC

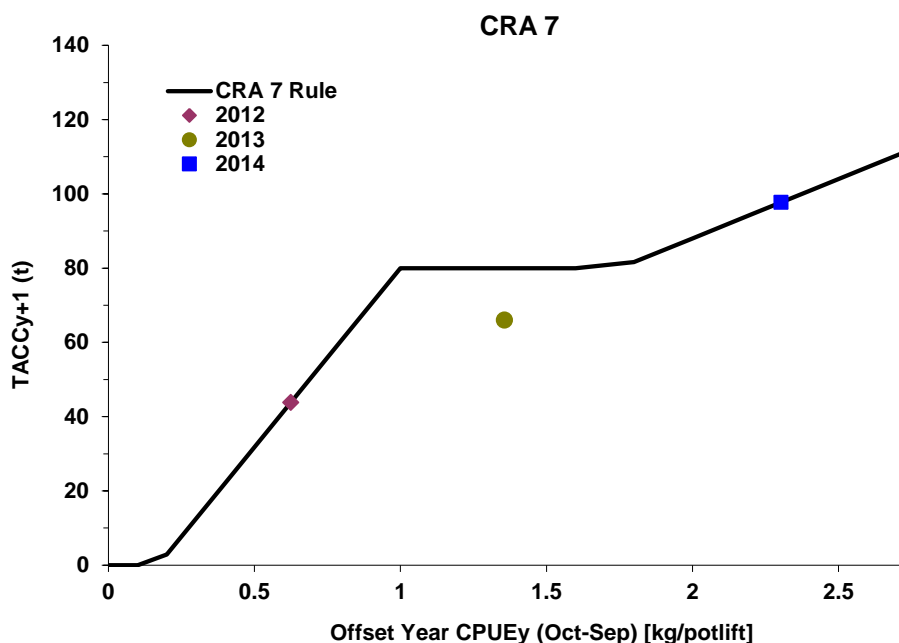
The current CRA 7 TACC is 66 tonnes.

- *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 10.3. 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 10.3: The CRA 7 management procedure, showing the TACs resulting from the rule operation performed in 2012 through 2014 for the 2013-14 through 2015-16 fishing years (shown as coloured shapes).



The NZSFC submit that the TACC should be reduced from 66 to 10 tonnes. The NRLMG does not consider that an 85% TACC reduction is required to meet the purpose of the Act – to provide for utilisation while ensuring sustainability. The CRA 7 fishery has had a history of significant changes to the TACC (ranging between 44 and 189 tonnes in the last 10 years). This recent peak in abundance arises from strong juvenile settlement since 2009. If CPUE declines a TACC reduction will be recommended by the management procedure accordingly.

- *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.

11 CRA 9 (Westland/Taranaki) rock lobster fishery

11.1 FINAL CRA 9 PROPOSALS

Table 11.1 below shows the final proposals for CRA 9, which are the same as those consulted on.

Table 11.1: Final TAC, allowance and TACC proposals for CRA 9 (tonnes)

Option	TAC	Customary	Recreational	Other mortality	TACC
CRA9_01: use the CRA 9 management procedure and decrease the TAC	101 ↓	20	30	5	46 ↓
CRA9_02: retain the current TAC	115.8	20	30	5	60.8

11.2 SUMMARY OF CRA 9 SUBMISSIONS

11.2.1 Support for Option CRA9_01

No submissions were received on Option CRA9_01 – use the CRA 9 management procedure and decrease the TAC and TACC by 14.8 tonnes.

11.2.2 Support for Option CRA9_02

CRAMAC 9, Iwi Collective Partnership, NZ RLIC and Te Ohu Kaimoana support Option CRA9_02 – retain the current CRA 9 TAC, allowances and TACC.

CRAMAC 9 and NZ RLIC supports the use of the CRA 9 management procedure to inform and guide TAC setting; however, in their view it is improbable that CRA 9 stock abundance has declined sufficiently from one season to the next to warrant the TACC reduction proposed under Option CRA9_01. They say that the CRA 9 management procedure is less reliable than management procedures for other rock lobster stocks because of the insufficient catch and effort data available to the CPUE standardisation process.

The industry contend that their position is credible in the circumstance in that the TAC is well within the bounds of sustainability.

The CRA 9 industry propose that a review of the data inputs and management procedure will be carried out in the near future. This review is supported by the NRLMG, the Iwi Collective Partnership and Te Ohu Kaimoana.

11.2.3 Other comments

The NZSFC considers that you are now being asked to respond to a past mistake because the 2014 TACC increase and the failure to show its sustainability means a simple decision to reverse the 2014 decision is now required. The NZSFC recommend the following settings: a reduced TAC of 110 tonnes, retention of the current customary allowance of 20 tonnes, a higher recreational allowance of 40 tonnes, a higher other mortality allowance of 10 tonnes and a reduced TACC of 40 tonnes.

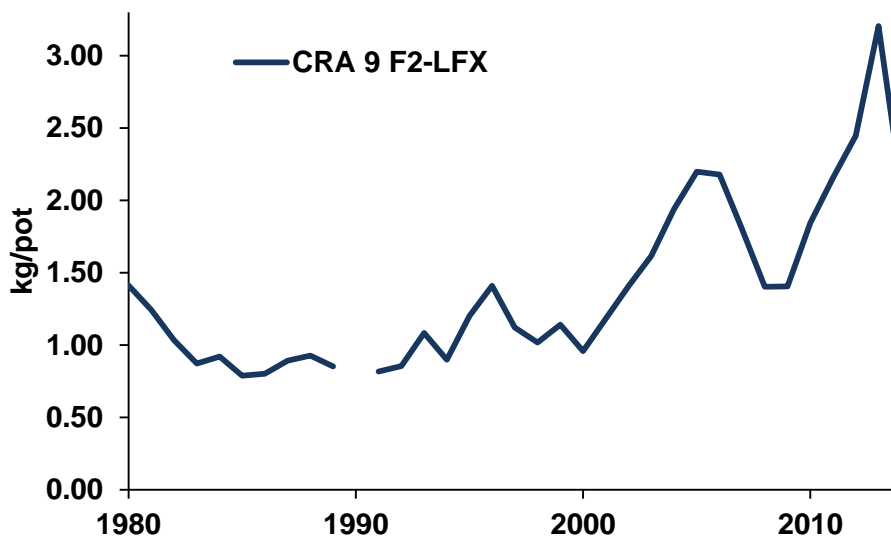
11.3 CRA 9 STOCK STATUS

Based on the most recent commercial CPUE information, CRA 9 stock biomass in 2014 was considered very likely (>90%) to be above *Bmsy* and well above *Bmin*¹⁴. 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 11.1. CRA 9 CPUE increased strongly from 2009 with a decrease observed in 2014.

Figure 11.1: The history of CPUE in CRA 9, 1980 – 2014 (offset years).



¹⁴ *Bref* for CRA 5 is the pre-season autumn-winter vulnerable biomass associated with the period 1979-88.

11.4 ANALYSIS OF CRA 9 FINAL PROPOSALS

11.4.1 TAC setting

The current CRA 9 TAC is 115.8 tonnes.

Best available information suggests the CRA 9 stock is above *Bmsy*. Accordingly you 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 you 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 6.

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.

Option CRA 9_02 involves a decision not to follow the CRA 9 management procedure that has been used in the fishery since 2014. Customary and commercial members of the NRLMG, and MPI, consider there are good reasons not to follow the recommendation of the CRA 9 management procedure this year. Recreational NRLMG members; however, have abstained from expressing support for CRA 9 options based on their view that a management procedure, in principle, should be followed once adopted.

When the CRA 9 management procedure was proposed for use in 2014, the NRLMG acknowledged that there was only a small amount of CRA 9 commercial catch data available for management decisions in comparison to other fisheries. The CRA 9 fishery was not fully utilised with a small number vessels fishing a small part of the management area. Despite this limitation, the NRLMG considered that the conservative nature of the CRA 9 management procedure would help to mitigate against some of this risk while further information is collected.

CRAMAC 9 and NZ RLIC considers that with only six vessels in the CRA 9 fleet, split between north and south island fishing grounds, and each vessel fishing only a small portion of the management area over a relatively short period of time in each season, it is felt CRA 9 CPUE lacks the 'substance' that is observed in other rock lobster management areas where a greater quantity of data is available to inform CPUE standardisation processes.

A number of situations have recently occurred in the CRA 9 fishery that may have impacted on the CPUE results. These situations will be analysed thoroughly as part of a scientific review of CRA 9 fisheries information and the management procedure that will be undertaken in 2015 to determine the appropriate management approach for the fishery.

Retaining the current TAC for one year is unlikely to pose a risk to stock sustainability in the short term because the 2013 stock assessment suggested a low exploitation rate and high proportions of large fish which suggests there is no stock recruitment problem. 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.

11.4.2 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 2013¹⁵. 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 2011/12 National Panel Survey estimate and the assumption that recreational catch is proportional to spring summer commercial CPUE in CRA 9.

The NZSFC submit that the recreational allowance should increase to 40 tonnes with no information provided to support the increase. The NRLMG considers that the current 30 tonne CRA 9 recreational allowance adequately allows for recreational interests and no change is warranted at this time.

- *Other mortality allowance*

No change is proposed to the 5 tonne CRA 9 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 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.

The NZSFC submit that the other mortality allowance should increase to 10 tonnes with no rationale provided. It is considered that the 5 tonnes of other sources of fishing-related

¹⁵ Previously regulation 27A of the Fisheries (Amateur Fishing) Regulations 1986.

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 (see Appendix 1 for further discussion).

11.4.3 TACC

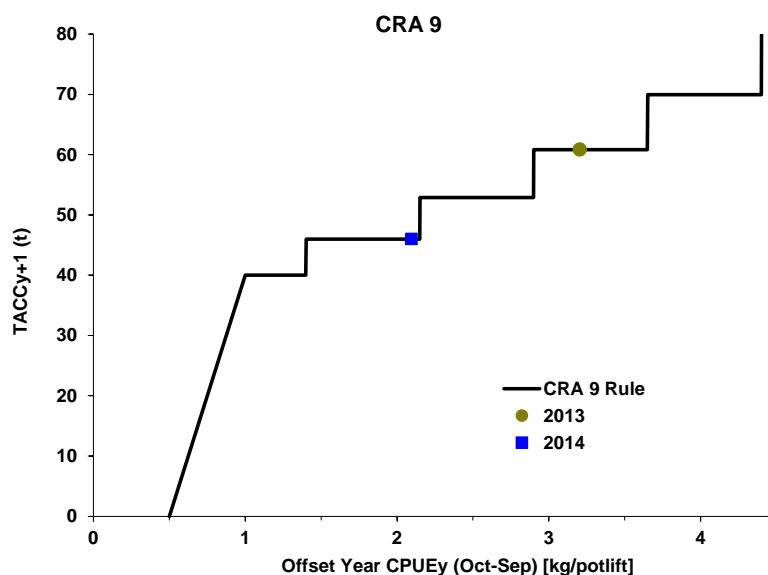
The current CRA 9 TACC is 60.8 tonnes.

- *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 11.2. 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 11.2: The CRA 9 management procedure, showing the TACs resulting from the rule operation performed in 2013 through 2014 for the 2014-15 through 2015-16 fishing years (shown as coloured shapes).



The NZSFC submit that the TACC should be reduced to 40 tonnes; below the level that is proposed by the management procedure. The NRLMG do not consider that this is required for sustainable utilisation. However, if the review of the CRA 9 management procedure in 2015 deems that stock abundance has actually declined reductions to the TAC will be followed.

- *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.

Appendix 1: Other matters

In addition to commenting on the proposed sustainability measures for the five rock lobster stocks discussed in this paper, some submitters commented on or proposed other management matters. Some of these matters are discussed briefly below.

A1.1 FISHERIES ASSESSMENT AND MANAGEMENT APPROACH

Howard and the NZSFC made a number of technical assertions about the rock lobster fisheries assessment approach in their submissions. It is very difficult for the NRLMG to address every point in this paper in a clear and concise way so that a greater understanding of the research and assessment process is gained. Many of the points raised would better be considered at the Rock Lobster Fisheries Assessment Working Group table where technical details of rock lobster assessment are regularly debated.

In the past, the NRLMG has addressed and acknowledged a number of statements that the NZSFC have included in their submissions on CPUE, information and the assessment process. The NRLMG has also invited representatives from the NZSFC to be involved in the stock assessment processes and have taken reasonable steps to involve them in rock lobster management. The NRLMG is disappointed that the NZSFC has not taken up their offer to be involved in stock assessment processes, but will continue to encourage them to participate.

The NRLMG has every confidence in the stock assessment and management approach for rock lobster. As suggested by the NZSFC, the NRLMG does not consider that a full review of rock lobster management is required because research information and experience is showing that the current approach is working to rebuild and maintain healthy rock lobster abundance levels. The rock lobster assessment approach is highly sophisticated and is regularly peer-reviewed by independent scientists to ensure that rock lobster continues to be the best managed species in New Zealand.

A1.2 INPUT AND PARTICIPATION

Based on some of the views presented in submissions by individuals, it is clear to the NRLMG that the rock lobster research and management approach is poorly understood by the general public. The NRLMG is currently thinking of ways to improve the current situation to increase public knowledge and understanding of rock lobster management. This is likely to include communications through various channels.

It is acknowledged that it is difficult to engage recreational fishers in fisheries management, particularly because many representatives are volunteers and have limited resources to participate. This is an issue for engaging the recreational sector that is not unique to rock lobster.

A1.3 LOCALISED ISSUES AND PERCEPTIONS

A number of individual submitters (about a third of the submissions received) expressed concerns about the recreational availability (size and number) of rock lobsters in localised areas, including in the CRA 1, CRA 2 and CRA 4 management areas. Some of these submitters linked their observations to a suggested increase in commercial fishing effort.

The NRLMG notes that the availability of rock lobsters in an area can fluctuate and is not solely related to commercial fishing effort. Rock lobster abundance can vary with changes in environmental factors, including habitat quality, food availability and water temperature. Also, abundance of rock lobsters in a localised area does not necessarily reflect abundance in the wider management area.

The NRLMG advises that the number of commercial vessels involved in targeting rock lobster has decreased considerably from the early 1990s, and was greater in all areas before rock lobster entered the Quota Management System in 1990. In the past decade, annual commercial potlifts have decreased by 21% in the North and South Island stocks.

A1.4 CONSULTATION LENGTH AND TIMING

Several submitters (Datson, Jenden, NZACA and NZSFC) expressed concerns about the length of the consultation period and the time provided to gather views from their constituents. This year the consultation period ran from 20 January to 17 February and the timing was based on ministerial advice.

The NRLMG is currently examining different consultation options for future sustainability rounds, including carrying out consultation from early December to late January as they have traditionally done since the early 1990s. It is important to the NRLMG that the public is given adequate opportunities to input and participate in the management of rock lobster.

A1.5 ALLOCATION AND UNCERTAINTY IN NON-COMMERCIAL REMOVALS

The NZ RLIC considers that the sustainability measures consultation document for April 2015 was incomplete in the context of the intended rock lobster management framework. They consider that support for effective management of all sectors and support for commercial security needs better mention.

The NZRLIC suggests that stronger comments need to be made on the strategic importance of measuring non-commercial catch/effort, enforcing non-commercial allocations, and eliminating allocations to 'fish thieves'.

Accurate information about non-commercial removals is necessary for good 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.

These uncertainties make it challenging for the NRLMG to advise on allocation and trade-offs between sectors. 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 harvest levels.

The level of illegal estimates is of most concern to the NRLMG because the allowance for this extraction makes 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 RLFAWG 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.

A1.6 CRA 3 RECREATIONAL REPRESENTATIVE CONCERNS

The NZSFC and GTSFC request that “the concession enabling commercial fishers to take undersized rock lobsters is revoked” in CRA 3. 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. The NZSFC and GTSFC also suggest that commercial effort should be reduced in localised areas of the CRA 3 fishery.

In addition, the GTSFC and NZSFC express concerns that MPI has ignored the ‘CRA 3 Policy’ that they developed in 2014 despite the support of more than 3000 club members. MPI has considered the policy and note that a number of measures are already in place, including an adequate allowance for illegal and unseen mortality (currently set at 89 tonnes), the voluntary commercial closed season in statistical areas 909 and 910 from 1 September to 15 January in place since 2008, information collected on recruitment (puerulus settlement monitoring) and catch and harvest by sex and size available from log book and catch sampling schemes.

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 in 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 dispute. 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.

Submitter Howard, however, suggests that the situation at the heart of the recreational issue is the concentration of commercial fishing activity, much of it displaced from the creation of the marine reserve to the north of Gisborne. He considers that when abundance is low the ‘concession’ combined with slow growth makes it difficult for recreational fishers to catch-legal sized fish, whereas when abundance is high the concession is much less of an issue.

The NRLMG acknowledges that the Te Tapuwae o Rongokako Marine Reserve, established in 1999 on previously productive fishing ground, displaced commercial and recreational effort and contributed to increased competition for fishing space in areas close to Gisborne. The industry voluntarily applies a closed season from 1 September to 15 January in northern areas of CRA 3 to help minimise this competition for fishing space. The NRLMG has also

focused on rebuilding abundance in the CRA 3 fishery to make a greater availability of rock lobsters for all sectors in this shared fishery.

The perceived size limit equity problem that some non-commercial fishers continue to argue is separate to the CRA 3 management procedure proposals discussed in this paper. The situation in CRA 3 is complex and is unlikely to be related solely to the differential size limit.

The NRLMG and MPI have extensively considered the CRA 3 size limit issue and have provided advice to Ministers several times over the last 10 years. In May 2012, the previous Minister agreed to retain the commercial size concession because removal would have a significant impact on the commercial sector. In 2014, you decided against allowing recreational fishers to take rock lobsters at an equivalent smaller size because the costs of a different recreational MLS regime would have resulted in significant and ongoing compliance costs for MPI that were considered unjustifiable at the time.

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 from the April 2015 sustainability process. MPI is proposing to discuss different options with tangata whenua and stakeholders during 2015. The NZSFC and Te Ohu Kaimoana support this proposed consultation and Te Ohu suggests that CRAMAC 3 members should be involved in the process.

The NZSFC also requests that the size differential in the CRA 7 fishery be revoked. MPI are not considering a review of this regulation at this time.

Appendix 2: 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 7.3 and 7.4 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 3: 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 8.3 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 8.4 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 4: CRA 5 management procedure specifications

In March 2012 a 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 9.3 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 you.

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 5: CRA 7 management procedure specifications

In March 2013 you 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 10.3 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 you.

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 6: CRA 9 management procedure specifications

In March 2014 you 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 11.2 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 you.

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	-	-

Appendix 7: Submissions received on the consultation document