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Sustainability Review 2019
Fisheries Management
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5 February 2020

Submission: Review of rock lobster TACs in CRA 1, 3, 4, 7, and 8 for 2020/21

Recommendations

1. The Minister revoke the concessions that allow commercial fishers to take male rock lobster with a tail width less than the recreational size limit of 54 mm tail width in CRA 3, 7 and 8.
2. The Minister acknowledge the concession in CRA 3 is unfair and must be removed to provide for the needs of customary and amateur fishers in the wider Gisborne/East Cape region.
3. The Minister must acknowledge that Catch per Unit Effort (CPUE) data collected using the electronic reporting system will not be comparable to the existing time series of data collected on paper forms.
4. Given the lack of comparable CPUE data the Minister must direct FNZ to both stop using management procedures based on commercial catch rates (CPUE) to maximise commercial yield, and develop a new approach to timely management reviews.
5. The Minister directs FNZ to complete the work to establish an agreed method of setting management targets for rock lobster in 2020 that will meet stakeholder and environmental standards in line with kaitiakitanga and international best practice.
6. The Minister acknowledges that the interim management targets for CRA 1 and CRA 3 will do nothing to rebuild the stock, and only has a 50% probability of halting the decline in abundance in these fisheries.
7. The Minister must require that the process and rationale for the last minute changes to agreed management targets for CRA 1 and CRA 3 are fully documented and published.
8. The Minister and the National Rock Lobster Management Group accept that many crayfish stocks are just not as productive as they used to be, and historic TACs cannot be seen as a baseline or management target.

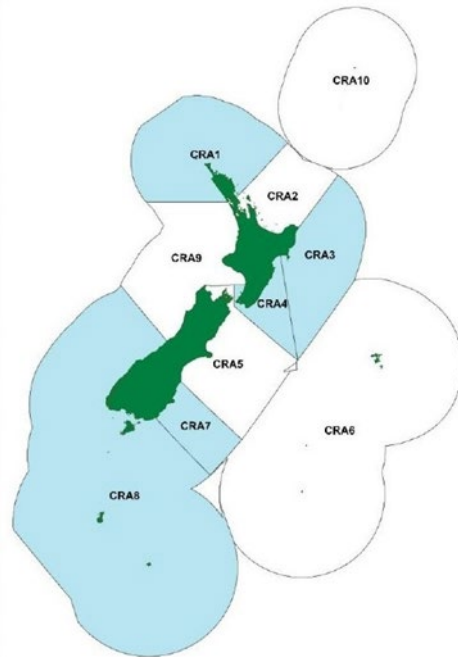
9. Fisheries New Zealand commits to ensuring that future proposals include more than a single alternative management option in stocks where rebuilding is required, as in CRA 1 and CRA 3.
10. The Minister insists that the interim management targets for CRA 1 and CRA 3 are reassessed with full science working group involvement and reviewed by the Plenary in 2020.
11. The Minister retains the existing recreational allowance of 20 tonnes in CRA 3.
12. The Minister delays management changes in CRA 4 until the new stock assessment and long-term management targets are available in 2021.
13. The Minister retains the current TAC of 117 tonnes and TACC of 97 tonnes in CRA 7.
14. The Minister must revoke the concession before approving any TAC and TACC increases in CRA 7 and CRA 8.
15. The Minister increase the allowance for other fishing related mortality in CRA 8 to 35 tonnes if the TACC is increased again this year.

The submitters

16. The New Zealand Sport Fishing Council (NZSFC) appreciates the opportunity to submit on the proposals to review Total Allowable Catch (TAC), allowances and the Total Allowable Commercial Catch (TACC) for rock lobster (*Jasus edwardsii*) in Quota Management Areas CRA 1, 3, 4, 7 and CRA 8. Advice was received on 13 December 2019 with submissions due 5 February 2020.
17. The New Zealand Sport Fishing Council is a recognised national sports organisation with over 36,200 affiliated members from 55 clubs nationwide. The Council has initiated LegaSea to generate widespread awareness and support for the need to restore abundance in our inshore marine environment. Also, to broaden NZSFC involvement in marine management advocacy, research, education and alignment on behalf of our members and LegaSea supporters. www.legasea.co.nz.
18. The New Zealand Angling and Casting Association (NZACA) is the representative body for its 35 member clubs throughout the country. The Association promotes recreational fishing and the camaraderie of enjoying the activity with fellow fishers. The NZACA is committed to protecting fish stocks and representing its members' right to fish.
19. Together we are '*the submitters*'. The submitters are committed to ensuring that sustainability measures and environmental management controls are designed and implemented to achieve the Purpose and Principles of the Fisheries Act 1996, including "maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations..." [s8(2)(a) Fisheries Act 1996].
20. The submitters note and appreciate the consultation timeframe of about 30 working days for this process. This is an improvement from the 18 working days that had become standard MPI practice. This time frame has allowed some consultation with local recreational interests, affected clubs and other representatives organisations including the New Zealand Underwater Association and Spearfishing New Zealand.
21. Our representatives are available to discuss this submission in more detail if required. We look forward to positive outcomes from this review and would like to be kept informed of future developments. Our contact is Helen Pastor, secretary@nzsportfishing.org.nz.

Background

22. Rock lobster is an important species and fishery for all sectors in the quota management areas under review. In the past rock lobster were abundant and played a significant role in coastal ecosystems. Large catches were taken out of some ports in the 1920s for canning and export to Europe. Widespread commercial rock lobster fishing has occurred since 1945. Updated estimates of recreational harvest are available from the 2017–18 National Panel Survey. Few of the 7000 New Zealand residents on the panel caught rock lobster, so the estimates are best in areas where most fishing occurred.



23. CRA 1 is fished on the east and west coast of Northland. Since 1999 a large proportion of the commercial catch has come from the Three Kings area, a group of 13 islands about 55 kilometres northwest of Cape Reinga. A new stock assessment for CRA 1 was completed in 2019.
24. CRA 3 supports an unusual fishery, dominated by large numbers of small male rock lobster north of Tūranganui-a-Kiwa / Poverty Bay, while in the south rock lobster are generally larger and females are often caught. There is also a concession to allow commercial fishers to take small male rock lobster in winter months in CRA 3, which is used in the northern area. Anecdotal information suggests that a significant portion of the winter commercial catch is between 52 mm and 54 mm tail width, as permitted under the concession. A new stock assessment for CRA 3 was completed in 2019.
25. CRA 4 was the second largest rock lobster fishery in New Zealand for many years, with miles of rugged rocky coastline and high rock lobster settlement rates. There have been periods of low commercial catch rates and the Total Allowable Commercial Catch (TACC) has been reduced four times and increased four times over the last 10 years.
26. CRA 7 supports relatively small commercial, customary and recreational fisheries. Most of the of rock lobster available in the fishery are young fish that tend to migrate into CRA 8 after a few years. Catch rates tend to fluctuate with strong and weak years of recruitment. A concession is in place that allows commercial fishers to retain males between 52 mm and 54 mm tail width year round. There is no information provided on how much this concession is used or why it is still needed.
27. CRA 8 supports by far the largest commercial rock lobster fishery, with the highest catch rates for commercial and recreational fishers in New Zealand. While there is no doubt the population has been fished down, the remote rugged coastline and cool water supports a productive stock of red rock lobster. Commercial fishers have a concession to take male rock lobster below the minimum legal size that applies to recreational catch. There is no information provided on how much this concession is used or why it is still needed.

Management proposals

28. Fisheries New Zealand and the National Rock Lobster Management Group (NRLMG) have released a [Discussion Document](#) proposing changes to the total allowable catch (TAC) for rock lobster in five quota management areas from 1 April 2020. In some areas fishers have changed to the new electronic reporting system which provides more detailed information, but the catch rates (CPUE) that have been used to inform decision rules may not be directly comparable with the previous system.
29. The results of the new stock assessments in CRA 1 and CRA 3 and application of existing management procedures in other areas have been used to develop the proposed management options in Table 1.
30. The alternatives to the status quo includes:
- A TACC decrease of 16% for CRA 1 (Northland) and 13% for the CRA 3 (Gisborne) fishery with reductions to the other allowances for recreational catch and other mortality in line with the estimates used in last year's stock assessments;
 - TACC increases of 17% for the CRA 4 (Hawke's Bay to Wellington), 31% for CRA 7 (Otago) and 5% for CRA 8 (South Coast/Fiordland) fisheries to provide increased commercial utilisation opportunities.

Table 1: Proposed management options (in tonnes) for CRA 1, CRA 3, CRA 4, CRA 7, and CRA 8 from 1 April 2020.

| Stock | Option | TAC | TACC | Allowances | | |
|------------------------------------|---|---------------|---------------|-----------------|--------------|-----------------|
| | | | | Customary Māori | Recreational | Other mortality |
| CRA 1 Northland | Option 1.1: <i>Status quo</i> | 273.062 | 131.062 | | 50 | 72 |
| | Option 1.2: Based on the new CRA 1 stock assessment | 203 ↓ (26%) | 110 ↓ (16%) | 20 | 32 ↓ (36%) | 41 ↓ (43%) |
| CRA 3 Gisborne | Option 3.1: <i>Status quo</i> | 351.9 | 222.9 | | 20 | 89 |
| | Option 3.2: Based on the new CRA 3 stock assessment | 303 ↓ (14%) | 195 ↓ (13%) | 20 | 13 ↓ (35%) | 75 ↓ (16%) |
| CRA 4 Wellington Hawke's Bay | Option 4.1: <i>Status quo</i> | 513.8 | 318.8 | | | |
| | Option 4.2: Based on the CRA 4 management procedure | 552.4 ↑ (8%) | 374.4 ↑ (17%) | 35 | 85 | 75 |
| CRA 7 Otago | Option 7.1: <i>Status quo</i> | 117 | 97 | | | |
| | Option 7.2: Based on the CRA 7 management procedure | 146.9 ↑ (26%) | 126.9 ↑ (31%) | 10 | 5 | 5 |
| CRA 8 Southland | Option 8.1: <i>Status quo</i> | 1220.6 | 1129.6 | | | |
| | Option 8.2: Based on the CRA 8 management procedure | 1282.7 ↑ (5%) | 1191.7 ↑ (5%) | 30 | 33 | 28 |

Management Procedures

31. The submitters do not support the use of management procedures designed to maintain commercial catches and maximise yield. The Minister must acknowledge that current management procedures do not adequately take into account efficiency gains made by rock lobster fishers since 1980 or the downward trend in productivity of all rock lobster stocks in New Zealand (Breen 2018)¹. This decline appears to be particularly problematic in eastern North Island fisheries.
32. The last three stock assessments for CRA 1, CRA 2 and CRA 3 have raised serious concerns about low levels of the vulnerable biomass in each area and in each case the TACC has been fixed for five years rather than being reviewed annually using management procedures. The standardised commercial catch rate (kilos per pot lift) used to inform changes to the TACC includes self-reported estimates of the weight of released fish (apart from CRA 8). Retention rates and reporting behaviour have changed over time yet this was not reflected in the management procedures or previous stock assessments for these stocks. In 2018 efficiency gains were factored into the CRA 2 stock assessment and that provided a turning point, showing that previous estimates of current and future abundance were too optimistic.
33. We are concerned that the management targets used to develop existing management procedures rely on outdated analysis and may be too low in most cases.
34. The management procedure process advantages commercial interests at the expense of the ecosystem, and the social, economic and cultural wellbeing of the majority of New Zealanders. We submit a new approach to timely management reviews is required.

National Rock Lobster Management Group

35. For several years we have been asking Fisheries New Zealand and the Minister to review the membership and role of the National Rock Lobster Management Group (NRLMG). Currently our representatives can attend NRLMG meetings as observers only. While this has provided insight into how the group functions, it has only reinforced our belief that change is needed. Last minute changes to the management targets for CRA 1 and CRA 3 without any review by the full Rock Lobster Fishery Assessment Working Group or a Plenary Meeting is clear evidence that the Rock Lobster Industry Council holds sway over the NRLMG and FNZ. This is a serious concern for the submitters and public interests, and adds more uncertainty to the advice provided to the Minister when making decisions.
36. In June 2019 we responded, in good faith, to a Fisheries New Zealand survey on aspects of the NRLMG. In our submission we emphasised the need to review the Group's Terms of Reference. However, a recent letter from the Minister indicates membership changes but no improvements to the Group's Terms of Reference². The New Zealand Sport Fishing Council will respond to the Minister's letter in due course.

¹ Breen (2018) Trends in surplus production in New Zealand rock lobster stocks.

² B19-0704. Hon Stuart Nash. 28 January 2020.

37. We remind MPI and the Minister that crayfish are a taonga, a treasured species, for many New Zealanders not just the few who sit around the NRLMG table and much more transparency is needed.

Remove the concessions

38. The submitters and NZSFC member clubs in CRA 3 have made it very clear repeatedly that the concession that allows commercial fishers to take male rock lobster below the 54 mm recreational minimum legal size, those with a tail width of 52 mm or 53 mm, is unfair and must be removed. In 2014 these groups developed a [Crayfish 3 policy](#) that aims to increase the size and abundance of rock lobster in CRA 3 and ensure the needs of customary and amateur fishers are met. That policy has been shared with FNZ and the NRLMG.
39. The Minister must revoke the concession before approving any Total Allowable Catch (TAC) and Total Allowable Commercial Catch (TACC) increases in CRA 7 (Otago) and CRA 8 (Southland).

ROCK LOBSTER – PROPOSALS

Crayfish 1 (CRA 1) Northland

CRA 1 stock assessment

40. CRA 1 has a range of environments from rugged exposed coastline to the west, to the Three Kings area with upwellings and strong currents, and East Northland with extensive rocky coastline warmer waters and sheltered bays. Since the late 1990s there has been a significant increase in the proportion of catch taken from the reporting areas for the Three Kings area (901) and the west coast (939) where catch rates are higher and less from East Northland (903 and 904) where catch rates are lower. While area is taken into account in the analysis of CRA catch rates, much of the data used in the stock assessment comes from the north western area.
41. The assumption that growth rates and recruitment are the same for the north western area and East Northland is probably wrong, but there has been insufficient data collected from the East Northland commercial fishery to use separate areas in the stock assessment model.
42. There have however been some important changes to the model assumptions, including taking account of increased fishing efficiency over time and having a separate catch rate analysis (CPUE) for the pre-1990 commercial data. The estimate for other sources of mortality was reduced based on a general assessment that it was unrealistically high and a new method of estimating annual recreational harvest between surveys was used. The biomass reference points (Bref and B min) derived from the previous assessments have been dropped.
43. The overall effect of model changes and adding 5 years of available data on the trend in stock abundance in CRA 1 is a change, from a gradually increasing trend in vulnerable biomass over the last 25 years to a flat or declining trend over that period (red line in Figure 1). The base case estimated vulnerable biomass to be 15.5% of unfished biomass while spawning stock (mature female) biomass was at 37%.

New reference points

44. There has been ongoing discussion and work on developing new target reference points for CRA stock management. A modelling approach has been used to select target biomass for rock lobster. While the science working group agreed on the method, the NRLMG did not like the results, which they considered were too conservative. It is very important that work continues on finding an agreed method of setting management targets for rock lobster that will meet stakeholder and environmental standards in line with kaitiakitanga [guardianship] and international best practice. This work must be a priority in 2020.
45. The Rock Lobster Fisheries Assessment Working Group agreed on a method of setting interim targets for CRA 1 and CRA 3, based on the previous management procedure. This proposal was agreed to at the Rock Lobster Plenary meeting in November 2019. The intent was to hold the commercial catch rate (CPUE) at reasonable level. However, the CRA 1 projections were that biomass at the current catch would decline, and to reach the catch rate target in 5 years would require significant cuts to the TACC.
46. The submitters object to the process that followed the Plenary meeting. The NZSFC and other stakeholders were shut out of the process that followed, which appeared to be a negotiation between Rock Lobster Industry Council and Fisheries New Zealand on how to set a target that would be acceptable to quota holders. The result was a take it or leave it proposal to maintain current vulnerable biomass at 15.5% of unfished level in the short term.
47. **This is yet another example of the current dominance of commercial interests in fisheries management decisions**, even in science working groups and the National Rock Lobster Management Group.
48. We acknowledge that the science does not always get it right, but there is no justification for backroom deals. Good process and transparency must be maintained.
49. To achieve good process and transparency in decision-making **we make the following recommendations:**
 - The rationale and process for that last-minute change to the agreed management targets in CRA 1 and CRA 3 must be thoroughly documented and published.
 - Work needs to continue on setting independent science based management targets for CRA, and this must be a priority in 2020.
 - The role of Rock Lobster Industry Council in managing and directing the rock lobster science process must be reviewed.
 - The workload and resourcing of the stock assessment team must be reassessed to ensure it is reasonable.
 - There needs to a wider acceptance that many rock lobster stocks are just not as productive as they used to be, and historic TACs cannot be seen as a baseline or management target.

CRA 1 Management

50. Overall the 2019 stock assessment is an improvement on the previous CRA 1 assessments. **There is an urgent need for more commercial logbook data to track recruitment and more tagging data to determine current growth rates. These data must be collected for east coast areas as well as northwest Northland.** There are anecdotal reports of declining CRA stocks and concerns

about sustainability from commercial and non-commercial fishers. This fits with the current status of the vulnerable biomass of 498 t for all of CRA 1 (Figure 1)

51. The estimate of recreational catch from the 2017-18 National Panel Survey was 16 tonnes but the confidence interval was large (CV of 46%). It is likely that the recreational catch has been declining over recent years on the east coast of Northland where the main fishing effort is. This fits with the decline in spring/summer commercial catch rates in East Northland over the last six years. In 2013-14 a survey that combined data from over 12,000 boat trips with National Panel Survey data from shore based trips estimated the recreational harvest from CRA 1 at 37.3 t (CV 17%) with an additional 4.4 tonnes taken as recreational catch from commercial fishing vessels. The total of 41.7 t was probably an underestimate as the interview survey did not cover boats returning to swing moorings or boats staying out overnight on survey days.
52. The management proposals are based on a revised interim target that was not presented to the Plenary meeting and only revealed at the final NRLMG meeting of the year. **The projections show that the stock will decline if the current catch levels are retained** (even using the reduced catch estimates for recreational harvest and illegal take).
53. We submit our concerns that the short term objective is to maintain vulnerable biomass at current levels and this will do nothing to rebuild the stock, and it may not halt the current decline in abundance in East Northland.

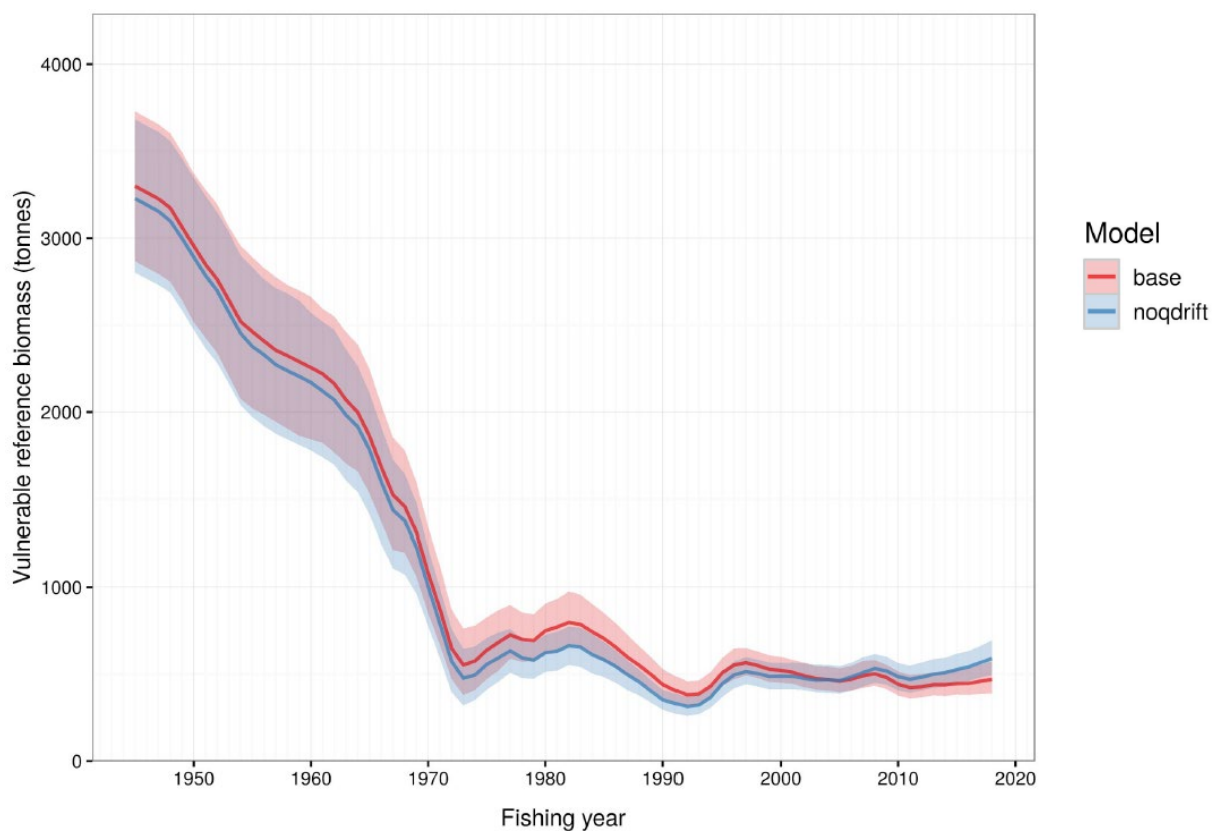


Figure 1. The stock assessment estimates of the legal sized male rock lobsters at the beginning of each fishing year in tonnes. The base case estimates start at 3216 t in 1945 and end at 498 t in 2018, red line. If there is no allowance for steady improvements in fishing gear and technology since 1990 (labelled no Q drift) the end point is 654 t, blue line.

54. **We submit that the CRA 1 stock needs to be rebuilt.** The current size of the overall vulnerable biomass at 15.5% of the unfished level is well below where it should be and is close to the lowest biomass ever. Given the much lower commercial catch rates in East Northland it is highly likely the vulnerable biomass in the area is below 10% of the unfished level, very similar to where CRA 2 was two years ago. Low stock abundance is severely limiting access to the fishery for recreational and customary fishers in East Northland.
55. **In 2019 the NZSFC requested FNZ include an additional consultation option** that would start to rebuild the CRA 1 stock. This was deferred for a year by the NRLMG, on basis that time ran out.
56. More work is required on real management targets in the coming year, there will also be a review of CRA 1 and CRA 3 management options, plus two new stock assessments. Fisheries New Zealand and the National Rock Lobster Management Group need to consider the resources available in the stock assessment team and their workload to ensure that there is sufficient time to develop and discuss a range of management options.
57. **The submitters support option 1.2 as there is effectively no other choice at this time.**

Crayfish 3 (CRA 3) East Cape to Mahia

CRA 3 stock assessment

58. CRA 3 is another area with extensive rocky coastline and reef areas suitable for rock lobster. However, the distribution of crayfish is unusual, with an abundance of small males and few females north of Gisborne, and larger crayfish with more females further south, around Mahia Peninsula.
59. In the past CRA 3 was assessed with a one area model. In recent years there have been different trends in stock abundance between the north and the south. In CRA 3 there was enough information to split the assessment into two areas.
60. Other changes to the model assumptions include taking account of increased fishing efficiency over time and having a separate catch rate analysis (CPUE) for the pre-1990 commercial data. The estimate for other sources of mortality was reduced based on a general assessment that it was unrealistically high and a new method of estimating annual recreational harvest between national surveys was used. The biomass reference points (Bref and B min) derived from the previous assessments have been dropped.
61. The overall effect of model changes and adding 5 years of available data on the trend in stock abundance in CRA 3 is to lower estimates of overall biomass. At times there are large numbers of small CRA but this varies in what appears to be a long-term cycle. The peak of the current cycle was in 2013 and stock biomass has been in a gradual decline since then (Figure 2).
62. The base case estimated vulnerable biomass to be around 18% or 19% of unfished biomass while spawning stock (mature female) biomass was at 80%.

63. The very high spawning biomass is a result of the assumption in the stock assessment model that equal numbers of male and female rock lobster settle and grow. Catch sampling shows that few females are ever caught so the model estimates that they are somewhere in CRA 3, but just not vulnerable to fishing. This is one reason why the female biomass as a proportion of unfished spawning stock biomass is not a good measure of stock status in many New Zealand crayfish stocks.

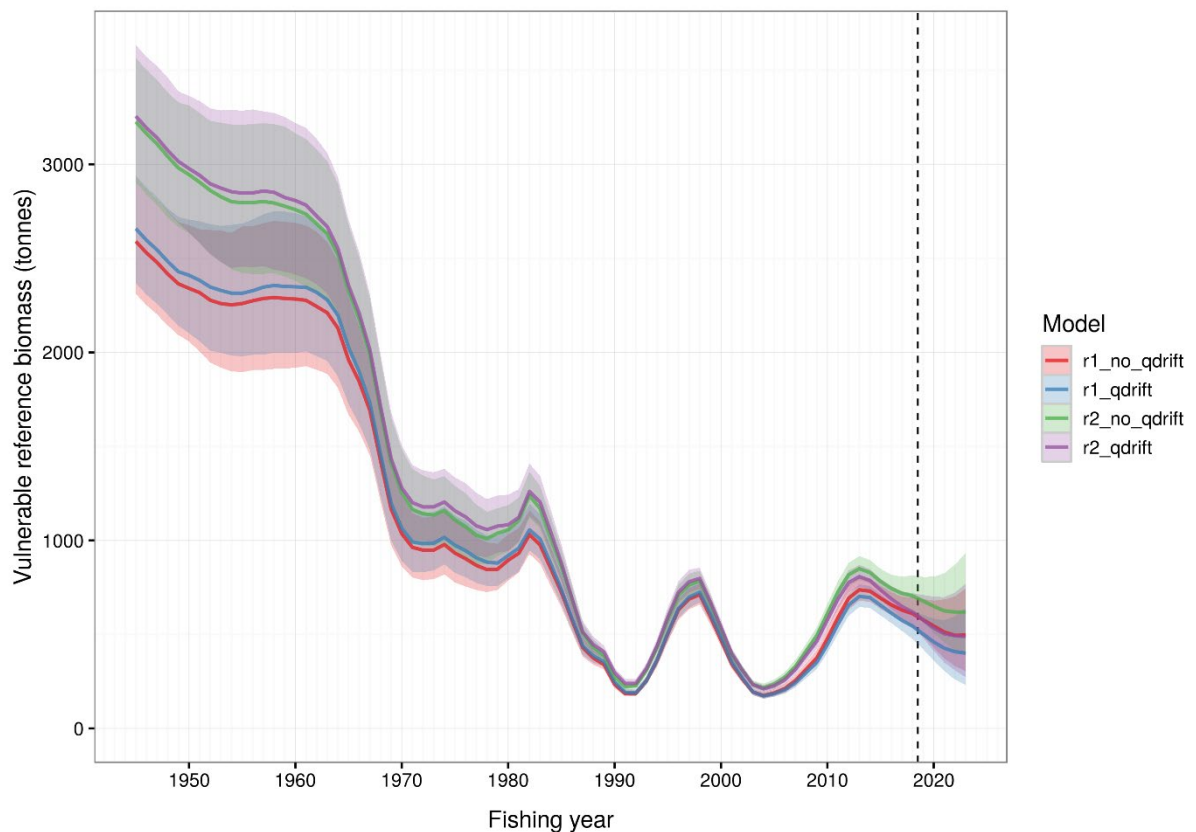


Figure 2: The CRA 3 stock assessment estimates of the legal sized male rock lobsters at the beginning of each fishing year in tonnes. The range of models include with and without an allowance for commercial fishing efficiency gains (Q drift) and two growth rate assumptions (r1 and r2). The dotted vertical line is 2019 with the model projections to 2023 to the right.

New reference points

64. As with CRA 1, there has been ongoing discussion and work on developing new target reference points for CRA stock management. The Rock Lobster Fisheries Assessment Working Group agreed on a method of setting interim targets for CRA 1 and CRA 3, based on the previous management procedure. This proposal was agreed to at the Rock Lobster Plenary meeting in November with the intent of holding the commercial catch rate (CPUE) at a reasonable level.
65. However, the CRA 3 projections were that biomass at the current catch would decline. **In order to reach the catch rate target in 5 years significant cuts to the TACC would be required.**
66. The submitters object to the process that followed the Plenary meeting. The NZSFC and other stakeholders were shut out of the process that followed, which appeared to be a negotiation between the Rock Lobster Industry Council and Fisheries New Zealand on how to set a target that

would be acceptable to quota holders. The result was a take it or leave it proposal to maintain current vulnerable biomass in CRA 3 at 18% or 19% of unfished level in the short term.

67. **This is yet another example of the current dominance of commercial interests in fisheries management decisions**, even in science working groups and the National Rock Lobster Management Group.
68. The science does not always get it right, but there is no justification for backroom deals. Good process and transparency must be maintained.
69. It is very important that work continues on finding an agreed method of setting management targets for rock lobster that will meet stakeholder and environmental standards in line with kaitiakitanga [guardianship] and international best practice.
70. To achieve good process and transparency in decision-making **we make the following recommendations:**
 - The rationale and process for that last-minute change to the agreed management targets in CRA 1 and CRA 3 must be thoroughly documented and published.
 - Work needs to continue on setting independent science based management targets for CRA, and this must be a priority in 2020.
 - The role of Rock Lobster Industry Council in managing and directing the rock lobster science process must be reviewed.
 - The workload and resourcing of the stock assessment team must be reassessed to ensure it is reasonable.
 - There needs to a wider acceptance that many CRA stocks are just not as productive as they used to be, and historic TACs cannot be seen as a baseline or management target.

CRA 3 Management

71. Overall the 2019 stock assessment is an improvement on the previous CRA 3 assessments. The same long term cycle seen in previous assessments is apparent with the CRA 3 stock 4 or 5 years into the declining phase (Figure 2). This fits with the current estimate of the vulnerable biomass of 501 t to 575 t for all of CRA 3 depending on which growth assumption is used.
72. The estimate of recreational catch in CRA 3 from the 2017-18 National Panel Survey was 12.2 tonnes with a confidence interval (CV) of 26%. This is slightly higher than the previous National Panel Survey estimate but not statistically different. In addition, about 3 tonnes is reported as recreational catch taken from commercial fishing vessels under Section 111 provisions.
73. **The proposed 35% reduction of the recreational allowance, to 13 tonnes, in the discussion document does not cover the current estimates of combined take** under the amateur fishing regulations (12.2 t) and Section 111 provisions (3 t).
74. The recreational harvest of CRA along the East Coast and Mahia Peninsula will vary from year to year, depending on weather and swell conditions over the summer period as well as availability of legal size crayfish. **The submitters recommend the Minister retains the existing recreational allowance of 20 t in CRA 3.** If the recreational allowance is reduced as abundance declines then it must also take account of survey results and be increased as the stock is rebuilt.

75. **The submitters strongly support the removal of the concession** for commercial fishers allowing them to harvest male CRA down to 52 mm tail width during winter. This has been an ongoing issue for NZSFC members in the CRA 3 area for many years, particularly in the Gisborne region. The stock assessment shows that there was no change in the productivity of the stock if the concession was removed, but it would remove the unfair advantage that the commercial fishers have on top of their obvious advantage in fishing power and ability to shift fishing effort to maintain catch rates.
76. A three-year potting survey was undertaken using standard rock lobster pots, fished inside the Te Tapuwae o Rongokako Marine Reserve and on similar reef structures to the north and south of the reserve. It found a much higher incidence of tail fin necrosis (TFN) for males outside the reserve (17%) than inside the reserve (2%).³ This incidence is consistent with damage caused by pots and handling. The necrosis blackens and rots the tail reducing commercial value, increases mortality and potentially spreads to other lobsters.
77. The potting survey also provides data on the size distribution of rock lobster caught inside the marine reserve and on adjacent fished areas. The survey was conducted between November 2003 and November 2006, just 4 to 7 years after the reserve was established. 90% of rock lobster caught were male. Even in this short period, there is a remarkable difference in the size of male rock lobster inside the reserve with a broad spread of sizes and mode from 58 to 61 mm. Outside the reserve 84% of males were 48 to 53mm with just 2% were 58 mm or larger. Inside the reserve 60% of rock lobster were 58 mm or larger (Figure 3).

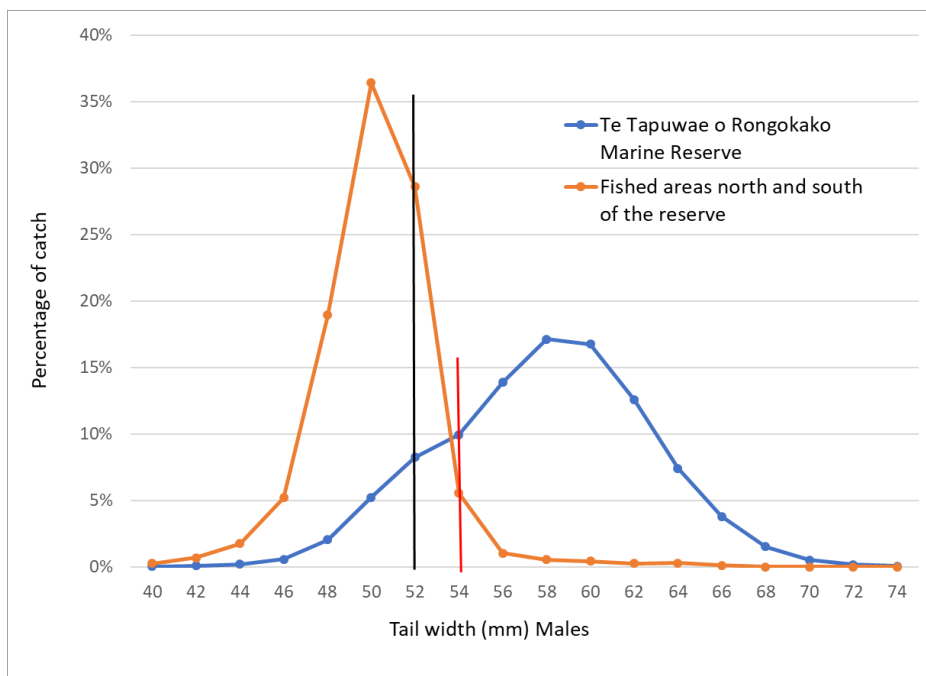


Figure 3: Percentage of male rock lobster by 2 mm tail width bin outside (orange) and within Te Tapuwae o Rongokako Marine Reserve (blue). The winter commercial male tail with size limit of 52 mm is the black vertical line the recreational size limit of 54 mm is the red vertical line.

³ Freeman and McDiamond. (2009). Healthier lobsters in a marine reserve: effects of fishing on disease incidence in the spiny lobster, *Jasus edwardsii*.

78. The management proposals are based on a revised interim target that was not presented to the Plenary meeting and only revealed at the final NRLMG meeting of the year. The projections show that **the stock will decline if the current catch levels are maintained** (even using the reduced catch estimates for recreational harvest and illegal take). The short term objective to maintain vulnerable biomass at current levels is a stop gap measure until long-term management targets can be established.
79. **The submitters support a decrease to the Total Allowable Catch (TAC) to 310 t** by reducing the Total Allowable Commercial Catch (TACC) by 13% to 195 tonnes, retaining the current allowances for Maori customary and recreational fishing interests at 20 t, and reducing the allowance for other sources of mortality by 16% to 75 t.

Crayfish 4 (CRA 4) Hawke Bay to Wellington

80. Previous Fisheries New Zealand advice has stated: *“For CRA 4, the biomass level that can produce the maximum sustainable yield (B_{MSY}) is not known. An MSY-compatible reference level, B_{REF} , is instead used for CRA 4. a new CRA 4 management procedure was agreed for use in guiding TAC setting from April 2017. This was to ensure stock biomass was rebuilt towards the agreed reference level in the next five years.”*
81. MPI now propose to increase the Total Allowable Catch (TAC). Within this, MPI propose to increase the Total Allowable Commercial Catch (TACC) by 56 tonnes or 17.4% based on the increase in commercial catch rates over the last two years.
82. The submitters do not consider that the increase in commercial catch rates (CPUE) using the old standardisation procedure is a reliable measure of the increase in CRA 4 stock abundance.
83. As stated in previous submissions, no allowance is made for changes in market demands, fishing operations, increased efficiency, shifts in area fished, changes in discard rates or reporting rates. There is no data collected on many of these factors and no consistent way of taking account of these types of changes in the stock assessment or management procedure.
84. The CRA 1, CRA 2, and CRA 3 CPUE standardisations now include vessel effects to account for some increased fishing efficiency since 1990. There have been significant changes in the CRA 4 fishing fleet since 1990 so the vessel standardisation will likely have resulted in lower current biomass estimates in this area as well. In addition, there have been improvements in the stock assessment assumptions since the last CRA 4 assessment in 2016. The Minister needs to be well informed of the increased uncertainty and risks if the best available information, including CPUE standardisation by vessel, is omitted from the assessment of CRA 4.
85. A CRA 4 stock assessment is proposed for 2020 to provide a comprehensive update on stock status and an approach for future TAC setting.
86. Given the results of the recent CRA 1, CRA 2 and CRA 3 stock assessments **the submitters urge the Minister to delay management changes in CRA 4 until the new assessment and long-term management targets are available.**

87. The National Panel Survey estimate 41 t (CV 23%) of crayfish was harvested by amateur fishers in 2017–18. Fisheries New Zealand propose to retain the current allowance of 85 t until next year when the stock assessment will be complete. **The submitters agree with retaining the current 85 t recreational allowance until the stock assessment is completed.**
88. In Table 1 of the proposal document there is an error in the TAC for option 4.2. While it was proposed in 2019, the Minister decided against reducing the other mortality allowance by 58 tonnes yet it appears to be the value used in the TAC for CRA 4.

Crayfish 7 (CRA 7) Otago

89. Fisheries New Zealand advise for CRA 7 *“There has been a greater uptake of electronic data reporting in CRA 7 than in other areas; therefore, electronic data makes up a greater proportion of the CPUE series. CRA 7 CPUE values for the 2018/19 offset year (October to September) differed by 25% without and with the inclusion of electronic reporting data.”*
90. While it is early days, it appears that the concerns about a step change in commercial catch rates (CPUE) with the introduction of the electronic reporting system are well founded. Again, the submitters do not consider that the increase in commercial catch rates (CPUE) using the old standardisation procedure is a reliable measure of the increase in CRA 7 stock abundance, regardless of which data point is used for 2019. That is because there is no allowance is made for changes in market demands, fishing operations, increased efficiency, shifts in area fished, and changes in discard rates or reporting rates.
91. Another factor is that older fish migrate out of CRA 7, so the catch rate from the previous year may not be a good predictor of availability and abundance in the coming year.
92. **The submitters recommend the Minister retains the current TAC of 117 t and TACC of 97 tonnes in CRA 7 while the concession remains.**
93. The uncertainty about the CPUE will continue for several years. Raising the TACC to 127 t (up 31%) in 2020 may mean that it remains at that level for 5 years as there will be no credible information to determine the current status of the stock.
94. The catch history over the last 20 years shows that annual commercial catches over 120 t in CRA 7 cannot be sustained for long.

Crayfish 8 (CRA 8) South Coast/Fiordland

95. Fisheries New Zealand advise for CRA 8 *“CPUE has increased steadily since 2015, to the highest CPUE in the observed history in 2019 (a CPUE of 4.83 kg/potlift).”*
96. Fisheries New Zealand propose an increase to the Total Allowable Catch (TAC) by increasing the Total Allowable Commercial Catch (TACC) by 62 tonnes, which is a 5.5% increase.

97. CRA 8 is a productive rock lobster fishery with by far the highest commercial catch rates in New Zealand. This is a remarkable turnaround for this fishery considering the catch rates were well below 1 kg per pot lift from 1990 to 2001. Operation of the management procedure increased the TACC by 5.5% t in 2018 and again in 2019. The proposal is for a fourth increase in consecutive years in CRA 8.
98. While the current rebuild is encouraging, CRA 8 used to be a very large stock and a large fishery. The stock assessment in 2015 estimated the start of year vulnerable biomass was still at a relatively low level, 13% of the unfished level. Presumably this includes concession sized rock lobster with tail width of 52 mm and 53 mm.
99. Historically, a concession was introduced to allow commercial fishers to harvest male rock lobster below the 54 mm national minimum legal size when fishing was hard, and a high proportion of catch was small.
100. **The submitters recommend the Minister revoke all concessions in the rock lobster fisheries, including CRA 8,** as the original purpose of the concession is no longer valid.
101. The submitters recommend the Minister revoke the concession before approving any TAC and TACC increase in CRA 8.
102. The submitters recommend the Minister examine the level of concession fish before approving any TAC and TACC increase in CRA 8.
103. The National Panel Survey estimated the recreational harvest in CRA 8 to be about 16 t (CV 36%), well below the current allowance of 33 t. It is concerning to hear of proposals from some groups to severely limit individual catch by recreational fishers on charter boats in Fiordland. If recreational catch is roughly proportional to abundance (as assumed elsewhere) then the allowance for recreational harvest could also be increased if the TAC is to increase.
104. If the Minister decides to increase the TACC again this year then he must also consider an increase in the allowance for other fishing related mortality. A lot of CRA are returned to the sea in CRA 8 based on market preference and price. The TACC will have increased 24% from 962 tonnes over the last 4 years and the 28 tonne allowance for other fishing related mortality has not changed.
105. **The submitters recommend the Minister increase the allowance for fishing related mortality to 35 tonnes if the TACC and TAC is increased again this year.**