NATIONAL ROCK LOBSTER MANAGEMENT GROUP

Review of Rock Lobster Sustainability Measures for 2020/21

Proposal to Alter Total Allowable Catches, Allowances, and Total Allowable Commercial Catches

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Contents

Page

1 How to get more information and have your say

1. The National Rock Lobster Management Group (which includes Fisheries New Zealand) invites you to make a submission on the proposals set out in this Discussion Document. All submissions must be received by Fisheries New Zealand no later than 5pm on **Wednesday 5 February 2020.**

2. Please see the Fisheries New Zealand sustainability consultation webpage (https://www.fisheries.govt.nz/news-and-resources/consultations/review-of-sustainability-measures-for-1-april-2020) for related information, a helpful submissions template, and information on how to submit your feedback.

3. Written submissions should be emailed to FMSubmissions@mpi.govt.nz

   or sent directly to:

   Sustainability Review April 2020
   Fisheries Management
   Fisheries New Zealand
   P O Box 2526
   Wellington 6140.

2 Rock lobster stocks being reviewed

Red or spiny rock lobster[1] (CRA 1, CRA 3, CRA 4, CRA 7, and CRA 8)
Jasus edwardsii, kōura, crayfish

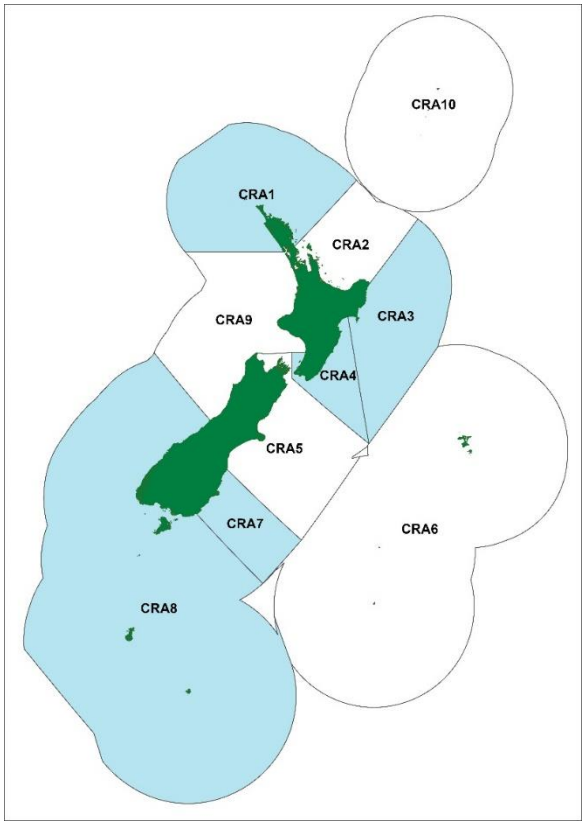

Figure 1: Map of rock lobster Quota Management Areas, showing stocks under review in blue.

[1] Hereafter referred to as rock lobster.

3 Summary

4. The National Rock Lobster Management Group (NRLMG) proposes that the Total Allowable Catch (TAC), allowances and the Total Allowable Commercial Catch (TACC) be reviewed for rock lobster in Quota Management Areas CRA 1 (Northland), CRA 3 (Gisborne), CRA 4 (Wellington/Hawke's Bay), CRA 7 (Otago), and CRA 8 (Southland) from 1 April 2020 (Figure 1).

5. The CRA 1 and CRA 3 proposals are based on new stock assessment information. The assessment results suggest the spawning biomass for each stock is above the soft limit of 20% of the unfished level, at which it is Fisheries New Zealand policy to implement a formal, time-constrained rebuilding plan. However, TAC changes are required to ensure that CRA 1 and CRA 3 stocks do not decline from current levels.

6. The CRA 4, CRA 7, and CRA 8 proposals are based on the operation of management procedures (i.e. formal decision rules). Management procedures are designed to move or maintain stock abundance at or above agreed target biomass reference levels, while recognising a range of customary Māori, recreational, and commercial values.

7. Table 1 provides a summary of the options proposed for rock lobster for the fishing year beginning on 1 April 2020.

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:** *Status quo*	273.062	131.062	20	50	72
	Option 1.2: Based on the new CRA 1 stock assessment	203 ↓ (26%)	110 ↓ (16%)		32 ↓ (36%)	41 ↓ (43%)
CRA 3 Gisborne	**Option 3.1:** *Status quo*	351.9	222.9	20	20	89
	Option 3.2: Based on the new CRA 3 stock assessment	303 ↓ (14%)	195 ↓ (13%)		13 ↓ (35%)	75 ↓ (16%)
CRA 4 Wellington Hawke's Bay	**Option 4.1:** *Status quo*	513.8	318.8	35	85	75
	Option 4.2: Based on the CRA 4 management procedure	569.4 ↑ (11%)	374.4 ↑ (17%)			
CRA 7 Otago	**Option 7.1:** *Status quo*	117	97	10	5	5
	Option 7.2: Based on the CRA 7 management procedure	146.9 ↑ (26%)	126.9 ↑ (31%)			
CRA 8 Southland	**Option 8.1:** *Status quo*	1220.6	1129.6	30	33	28
	Option 8.2: Based on the CRA 8 management procedure	1282.7 ↑ (5%)	1191.7 ↑ (5%)			

8. Decreases are proposed to the CRA 1 and CRA 3 recreational allowances and the allowances for other sources of fishing-related mortality to reflect the estimates that were used in the 2019 stock assessment models.

9. The decreases to the CRA 1 and CRA 3 recreational allowances, in conjunction with decreases to the CRA 1 and CRA 3 TACCs, are proposed to reflect the shared nature of these fisheries. While the percentage decreases to the CRA 1 and CRA 3 recreational allowances are greater than the decreases to the TACCs, it is proposed to reduce the TACCs by a greater tonnage amount. The proposed allowances for recreational fishing do not constrain harvest and it is not proposed that the recreational daily bag limit is decreased at this time.

10. The Minister has discretion when making allowances for various sectors. If submitters have different views on the level at which CRA 1 and CRA 3 allowances should be set, these views are welcomed along with supporting rationale.

11. No changes are proposed to the CRA 4, CRA 7, and CRA 8 recreational or other mortality allowances, but will be reconsidered following new stock assessments in 2020 or 2021. No change is proposed to the customary allowance for any stock, because best available information suggests that the current settings allow for current levels of catch.

12. Operation of the CRA 5 (Canterbury/Marlborough) management procedure suggested that no change was needed to the TAC from April 2020. There is also no new information to suggest that TAC changes are needed for the CRA 2 (Hauraki Gulf/Bay of Plenty) and CRA 9 (Taranaki/Westland) fisheries.

13. A rebuilding strategy has been in place for the CRA 2 fishery since April 2018 and commercial catch-per-unit-effort (CPUE) information suggests abundance is increasing. The Minister of Fisheries (the Minister) has decided to reduce the CRA 2 recreational daily bag limit from three to six rock lobsters, and introduce telson clipping for recreationally caught rock lobsters. These measures will come into effect from 1 April 2020. A review of the CRA 2 TAC, allowances, TACC, and other management controls is proposed at the time of the next CRA 2 stock assessment (currently proposed for 2021).

4 Quota Management System

14. Within New Zealand, rock lobster is managed using the Quota Management System (QMS). The fishing year for rock lobster runs from 1 April to 31 March (fishing year). For more information about the QMS go to: www.mpi.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/.

5 Legal basis for managing fisheries in New Zealand

15. The Fisheries Act 1996 (the Act) provides the legal basis for managing fisheries in New Zealand, including the Minister's responsibilities for setting and varying sustainability measures. See the separate document *Overview of legislative requirements and other considerations* on the Fisheries New Zealand sustainability consultation webpage at hwww.fisheries.govt.nz/news-and-resources/consultations/review-of-sustainability-measures-for-1-april-2020 for more information.

6 Input and participation of tangata whenua

6.1 Kaitiakitanga

16. Tangata Tiaki/Kaitiaki exercise kaitiakitanga on behalf of their hapū. Collectively Iwi Fisheries Forums and Forum Fisheries Plans provide a view of the objectives and outcomes iwi seek from the management of their fishery interests and can provide an indication of how iwi exercise kaitiakitanga[2] over fisheries resources. Iwi views from Forum meetings and submissions received from iwi can also provide information on kaitiakitanga.

17. Te Waka a Māui me Ōna Toka Iwi Forum (South Island), Te Hiku o te Ika Fisheries Forum (Far North), Mid-North Iwi Fisheries Forum, Te Taihauauru Iwi Fisheries Forum (Taranaki/ Wanganui) and the Mai Paritu tae atu ki Turakirae Iwi Fisheries Forum (Hawke's Bay/Wairarapa) were provided with an overview of rock lobster stocks that were likely to be reviewed as part of the April 2020 sustainability round. Specific consultation options were not available for their consideration at most of the Forum meetings in November 2019; however, no significant concerns were expressed with the proposed reviews. The Te Hiku o te Ika and the

[2] The Act defines kaitiakitanga to mean "the exercise of guardianship; and, in relation to any fisheries resources, includes the ethic of stewardship based on the nature of the resources, as exercised by the appropriate tangata whenua in accordance with tikanga Māori", where tikanga Māori refers to Māori customary values and practices.

Mid-North Iwi Fisheries Forums expressed support for the proposed decrease to the CRA 1 TAC, to ensure that the fishery can continue to support local communities. Fisheries New Zealand is now undertaking targeted engagement with iwi on the consultation options.

18. Additional input and participation of tangata whenua is provided through the NRLMG. A Te Waka a Māui me Ōna Toka Iwi Forum representative is a member of the NRLMG, who directly inputs into decision-making on behalf of South Island tangata whenua. A representative of Te Ohu Kaimoana is also is a member of the NRLMG, who supports relevant iwi to provide feedback on rock lobster proposals each year.

19. The NRLMG considers that the options presented in this document will contribute towards maintaining kaitiakitanga for the Iwi Fisheries Forum's and support the objectives of their Fisheries Plans.

6.2 Mātaitai reserves and temporary closures

20. When making allowances for Māori customary non-commercial fishing interests, the Minister must take into account the mātaitai reserves and temporary closures in an area. There are a number of mātaitai reserves and temporary closures that fall within each of the rock lobster stocks under review, including:
    a) CRA 1 – Te Puna Mātaitai, and Maunganui Bay, Marsden Bank and Mair Bank temporary closures;
    b) CRA 3 - Te Hoe Mātaitai, Horokaka Mātaitai, Toka Tamure Mātaitai, and Hakihea Mātaitai;
    c) CRA 4 - Moremore Mātaitai (a & b);
    d) CRA 7 – Moeraki Mātaitai, Puna-wai-Toriki Mātaitai, Otakou Mātaitai, and Waikouaiti Mātaitai;
    e) CRA 8 - Waikawa Harbour/Tumu Toka Mātaitai, Motupōhue (Bluff Hill) Mātaitai, Oreti Mātaitai, Pikomamaku Mātaitai, Te Whaka a Te Wera Mātaita, Kaihuka Mātaitai, Horomamae Mātaitai, Waitutu Mātaitai, Okuru/Mussel Point Mātaitai, Tauparikaka Mātaitai, Mahitahi/Bruce Bay Mātaitai, Manakaiaua/Hunts Beach Mātaitai, and Okarito Lagoon Mātaitai.

21. The proposals in this document are unlikely to limit the ability to take rock lobsters for customary purposes or have an effect on the mātaitai reserves in each area.

7 Background information

7.1 Management approach for rock lobster

22. The overall management approach for rock lobster fisheries is to monitor and manage them closely to provide for use while ensuring sustainability. The use of regular scientific assessments, responsive management procedures, and regular review of rock lobster TACs is consistent with this approach. Being able to respond to changes in rock lobster abundance is important because rock lobster populations can fluctuate rapidly in response to changes in the environment.

23. Since 1992, the NRLMG has acted as the primary advisor to Ministers 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 Fisheries New Zealand[3].

24. 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 Māori, amateur, commercial, and environmental concerns and values".

[3] A review of the NRLMG's membership is currently underway, with decisions expected early in 2020.

7.2 Rock lobster science and monitoring information

25. Full scientific assessments of most rock lobster stocks are carried out every four to five years. These assessments estimate the current status of the stock relative to the desired levels of abundance, and also show how the stock has responded to previous management controls.

26. In between years, management procedures have been used in most rock lobster stocks. Management procedures set out pre-agreed management actions that will be taken in response to changes in commercial catch rates (CPUE), an indicator of relative rock lobster abundance. Management procedures are designed to set a TAC that maintains the stock at or above a level that can produce the maximum sustainable yield.

27. Management procedures are generally in place for five years before they are reviewed. This ensures that TAC setting remains compliant with the statutory structure set out in the Act. A review involves a new stock assessment and management procedure evaluations to determine whether there are opportunities for increased use, or sustainability risks that require a management response.

28. Electronic reporting of catch and effort information is currently being implemented in New Zealand's commercial fisheries. It is currently unknown how this change in the data collection procedure will affect the commercial CPUE that is used to drive management procedures in the future. Because of the phased implementation of the new electronic reporting system during 2019, the current agreed management procedures for CRA 4, CRA 5, CRA 7 and CRA 8 could be operated this year. No new management procedures were developed for CRA 1 and CRA 3 following the new stock assessments because of the commercial reporting change.

29. The Rock Lobster Fisheries Assessment Working Group is currently considering alternative assessment approaches to use as the basis for advice to the Minister and decisions on TAC changes beyond April 2020. Further work will also be carried out on exploring alternative biomass reference levels for rock lobster in 2020.

7.3 Definition of stock reference points

30. For rock lobster, the biomass level that can produce the maximum sustainable yield has not been reliably calculated for any stock. Agreed stock reference points are instead used. Table 2 provides a summary of the stock reference points that are relevant to the evaluation of the proposals presented in this document for each stock.

Table 2: Summary of key stock reference points that are discussed for each stock in this document.

Reference point	Description	Stock				
		CRA 1	CRA 3	CRA 4	CRA 7	CRA 8
Vulnerable biomass	Beginning of season autumn-winter vulnerable biomass (legal males and females not bearing eggs)	✓	✓	✓	✓	✓
Spawning biomass	Beginning of season autumn-winter spawning biomass (mature females)	✓	✓	✓	x	✓
Total biomass	Beginning of season autumn-winter total biomass (all males and females)	✓	✓	x	x	x
Agreed target biomass reference level	Beginning of season autumn-winter vulnerable biomass associated with a period in the fishery that showed good productivity and was demonstrably safe.	X	x	✓	✓	✓

8 Review of the CRA 1 (Northland) rock lobster fishery

8.1 CRA 1 fishery overview

Māori customary fishing

31. Rock lobster (kōura) is a taonga species for tangata whenua. Information on CRA 1 (Northland) customary Māori catches is available under the Fisheries (Kaimoana) Regulations 1998, and regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013. In the 2017 calendar year, approximately 580 rock lobsters were reported as customary harvest from CRA 1. This information is considered incomplete, because customary take of rock lobster that occurs under the Amateur Regulations for the purposes of hui and tangi is not required to be reported.

32. An estimate of 10 tonnes was used in the 2019 CRA 1 stock assessment model to represent customary catches.

Recreational fishing

33. Rock lobster is a popular recreational fish species to catch in CRA 1 (Northland). Recreational fishers are not required to report the quantities of rock lobsters they catch, other than reporting by recreational charter vessels.

34. For the 2019 CRA 1 stock assessment, recreational catch estimates from the 1994 and 1996 Otago University surveys, the 2011/12 and 2017/18 National Panel Surveys, and the 2013/14 Blue Water Marine Research (Holdsworth) survey were used to construct a recreational catch trajectory, by assuming that recreational catch was proportional to the CRA 1 spring-summer commercial CPUE from statistical areas 903 and 904 (the upper east coast of the North Island where the majority of recreational fishing take place in CRA 1) (Figure 2)[4].

35. The stock assessment model input of CRA 1 recreational catch was 31.5 tonnes for 2018. The 2017/18 National Panel Survey estimate of CRA 1 recreational catch was 15.91 tonnes (±14.7 tonnes).

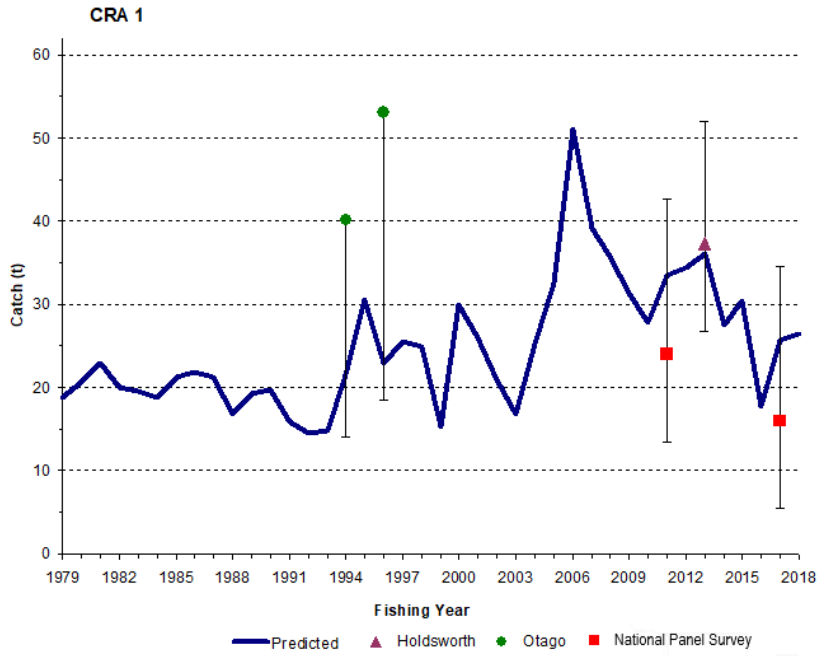

Figure 2: CRA 1 recreational catch trajectory for the 2019 CRA 1 stock assessment (error bars are ±2 standard errors, with Otago estimates suppressed).

[4] The National Panel Surveys occurred over an October fishing year (October to September), and the Blue Water Marine Research Survey occurred over an April fishing year (April to March).

Other mortality

36. There are other sources of mortality caused by fishing, such as illegal catch and handling mortality. It is difficult for Fisheries New Zealand to get an accurate estimate of illegal catch, given that illegal activity is not easily detected. Accurately identifying and effectively constraining illegal take of rock lobster continues to be high priority for the NRLMG.

37. In the 2019 CRA 1 stock assessment, the Rock Lobster Fisheries Assessment Working Group agreed to use a fixed percentage of 20% of the total commercial catch each year from 1981 to 2018 to represent illegal take (Figure 3). The Working Group also scaled the catch proportionately to commercial CPUE for each year over the same period, to suggest illegal take could vary with available abundance. Before 1980, export discrepancies (the difference between reported catch totals and total exported weight) were used to estimate illegal catch. For the 2018/19 fishing year, while uncertain, the illegal catch estimate assumed for the model was approximately 38 tonnes.

38. The CRA 1 stock assessment also assumed that handling mortality was 10% of returned lobsters until 1990, and then 5% thereafter. The model estimate of handling mortality was 2.4 tonnes for 2018.

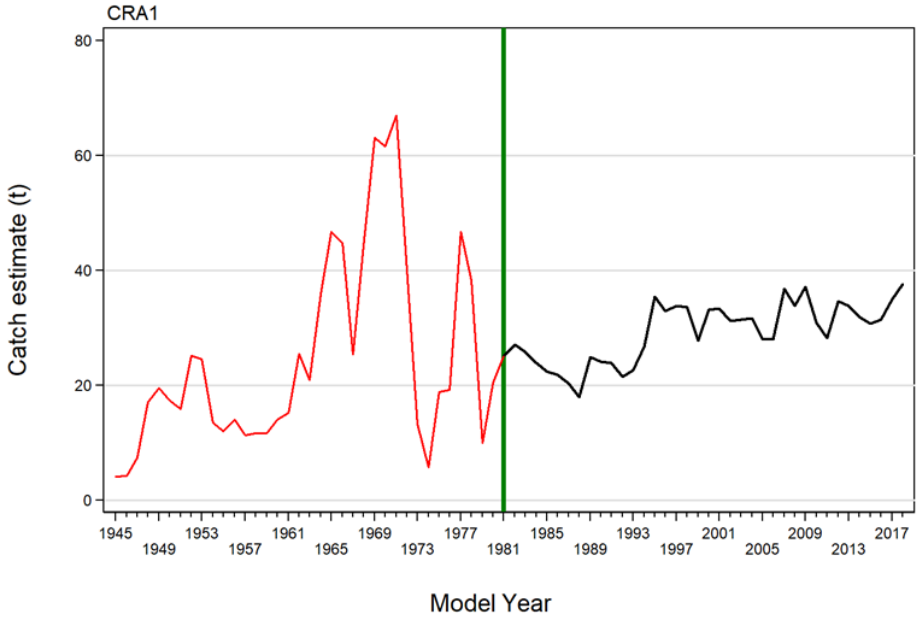

Figure 3: CRA 1 illegal catch trajectory assumed for the 2019 CRA 1 stock assessment[5].

Commercial fishing

39. Annual landings and the TACC for CRA 1 (Northland) since 1990 are shown in Figure 4. Before 1995, there was a New Zealand-wide rock lobster stock assessment with catches apportioned to each Quota Management Area, and TACCs were not set on an annual basis to reflect available abundance.

40. CRA 1 commercial landings have remained at or near the 131 tonne TACC since the early 1990s (Figure 4). Between 2015 and 2019 a formally adopted CRA 1 management procedure was used to annually review the TACC to ensure that catches reflect available abundance. In the 2017/18 fishing year, there were 12 vessels operating in CRA 1, a total that has reduced by around three vessels since the mid-2000s.

41. The current asset value of the CRA 1 fishery is estimated to be over $134 million based on the current TACC and the 2017/18 fishing year average quota share price (no price information was available for 2018/19). The average CRA 1 Annual Catch Entitlement (ACE) value (the

[5] The vertical green line refers to when a new approach to estimating illegal catch was applied in 1981.

earnings quota owners receive when selling their ACE) for the 2018/19 fishing year was $42,323 per tonne.

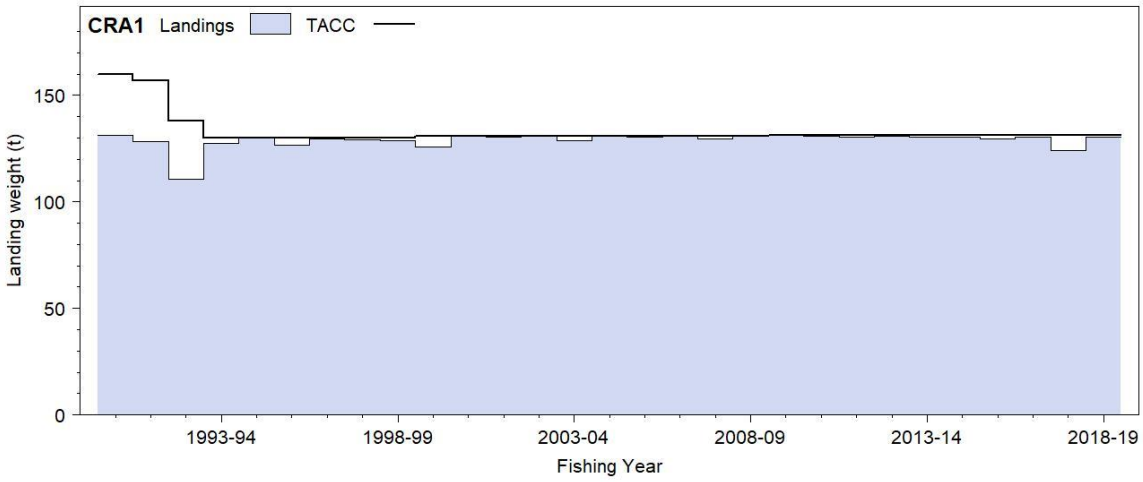

Figure 4: CRA 1 commercial landings and the TACCs from 1990 to 2019.

8.2 CRA 1 stock status

42. A new stock assessment was conducted for CRA 1 in 2019. The assessment results suggest 2019 vulnerable biomass is 16% of the unfished level, and total biomass is 26% of the unfished level. Spawning biomass in 2019 was 37% of the unfished level, well above the soft limit of 20% where it is Fisheries New Zealand policy to implement a formal, time-constrained rebuilding plan (Figure 5).

43. Over the next five years, with 2019 catch levels and recent recruitment, vulnerable biomass is projected to decline from 16% to 14% of the unfished level by 2023 and total biomass is projected to decline to 24% of the unfished level by 2023. Spawning biomass is projected to remain constant.

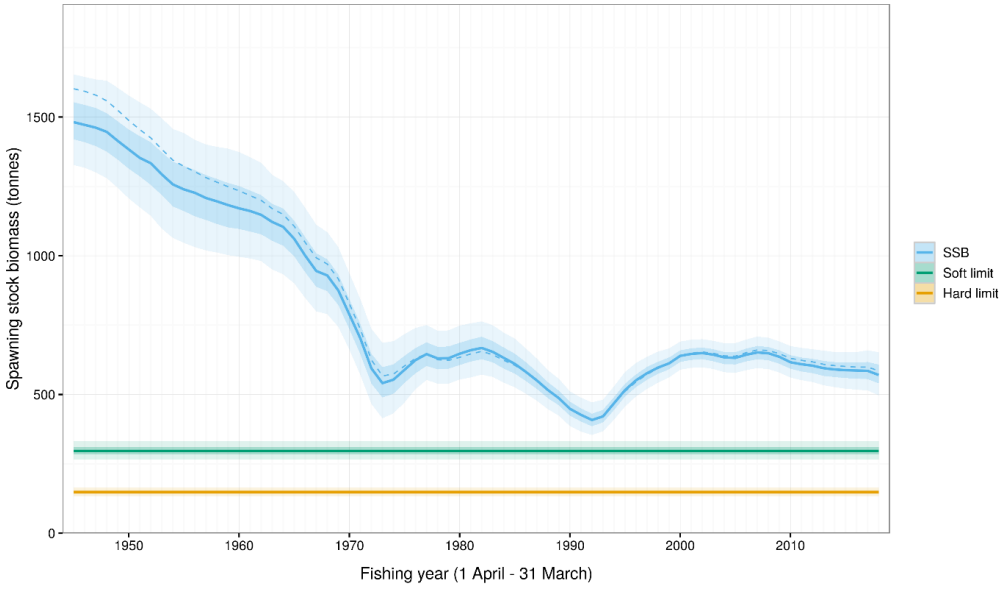

Figure 5: CRA 1 spawning biomass (SSB), including the soft limit (20% SSB_0)[6], and the hard limit (10% SSB_0)[7].

[6] The soft limit is 20% of the unfished spawning biomass; the level at which it is Fisheries New Zealand policy to implement a formal, time-constrained rebuilding plan.
[7] The hard limit is 10% of the unfished spawning biomass level; the level at which it is Fisheries New Zealand policy to consider closing the fishery.

8.3 Proposed CRA 1 options

44. Table 3 provides a summary of options proposed for CRA 1 (Northland). The results from the new CRA 1 stock assessment have been used to guide the options for varying the TAC.

Table 3: Proposed TAC, allowance and TACC options (in tonnes) for CRA 1 from 1 April 2020.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	Other mortality
Option 1.1: *Status quo*	273.062	131.062	20	50	72
Option 1.2: Based on the new CRA 1 stock assessment	203 ↓ (26%)	110 ↓ (16%)		32 ↓ (36%)	41 ↓ (43%)

Varying the TAC

45. There is no agreed target biomass reference level for CRA 1. The best available information suggests CRA 1 vulnerable biomass will decline at current catch levels, but spawning biomass will remain fairly constant and above the soft limit of 20% over the next five years.

46. Under Option 1.1 (*status quo*), the CRA 1 TAC would stay at its current level of 273.062 tonnes from 1 April 2020. This option is not supported by the NRLMG, because maintaining the TAC is predicted to result in a decline in CRA 1 vulnerable biomass over the next five years.

47. Under Option 1.2 (proposed change), the CRA 1 TAC would be decreased by 70 tonnes from 273.062 to 203 tonnes. This decrease is proposed to ensure that CRA 1 vulnerable biomass is maintained at current levels over the next five years with 50% probability (an interim reference level). Spawning biomass is predicted to increase by 3% under this option and remain well above the soft limit of 20%.

48. Since there is currently no agreed target biomass reference level for CRA 1, it is proposed that the CRA 1 TAC is reviewed again from 1 April 2021. This will be after work is carried out on exploring alternative biomass reference levels for CRA 1 in 2020. No management procedure is proposed for CRA 1 at this time, because of the effects of electronic reporting on the commercial CPUE that is used to operate a procedure.

Varying allowances and the TACC

49. Table 4 provides a summary of information on current non-commercial allowances for CRA 1 (Northland) and stock assessment assumptions of non-commercial catch.

Table 4: Current CRA 1 allowances and model assumptions of non-commercial catches (in tonnes).

CRA 1 (Northland)	Customary Māori	Recreational	Other mortality	Total
Current allowances	20	50	72	142
Non-commercial catch assumptions for the 2019 stock assessment	10	Assumed to vary with biomass. Estimated at 31.5 for 2018.	38 illegal. 2.4 handling mortality.	81.9

Māori customary fishing

50. No change is proposed to the 20 tonne customary Māori allowance for CRA 1. While noting the incompleteness and uncertainty in the CRA 1 customary harvest information, it is assumed that current harvest is within the 20 tonne allowance allocated for customary Māori interests.

Recreational fishing

51. It is proposed that the CRA 1 recreational allowance is reduced from 50 tonnes to 32 tonnes. While the percentage decrease to the CRA 1 recreational allowance is greater than the decrease to the TACC, it is proposed that the TACC will be reduced by a greater tonnage amount (21.062 versus 18 tonnes). The allowances for recreational fishing do not constrain harvest and it is not proposed that the recreational daily bag limit is decreased at this time.

52. The current allowance of 50 tonnes was set in 2015 based on best available information at the time. Recreational catch estimates from the 2013/14 Blue Water Marine Research survey and the 2017/18 National Panel Survey, and stock assessment assumptions of recreational catch suggest that the current CRA 1 recreational catch is likely to be lower than the allowance. The extent to which CRA 1 recreational harvest may have decreased in recent years is uncertain.

53. The Minister has discretion when making allowances for various sectors. If submitters have different views on the level at which the CRA 1 recreational allowance should be set, these views are welcomed along with supporting rationale.

54. The CRA 1 TAC will be reviewed again from 1 April 2021. Whether a review of recreational management controls is needed to manage catch can be considered at that time.

Other mortality

55. It is proposed that the 72 tonne CRA 1 allowance for other sources of fishing-related mortality (i.e. illegal catch and handling mortality) be reduced to 45 tonnes, to reflect the model estimates used in the stock assessment.

Total Allowable Commercial Catch

56. Under Option 1.1 (*status quo*), the CRA 1 TACC would stay at its current level of 131.062 tonnes. This option would maintain the current commercial utilisation opportunities, but increase risks to the future sustainability of the stock.

57. Under Option 1.2 (proposed change), the CRA 1 TACC would be decreased to 110 tonnes from 1 April 2020. The proposed 21 tonne TACC decrease has the potential to result in a loss of annual revenue to the catching sector alone of approximately $1.8 million (based on 2018/19 average port price information of $85.839 per kg).

9 Review of the CRA 3 (Gisborne) rock lobster fishery

9.1 CRA 3 fishery overview

Māori customary fishing

58. Rock lobster (kōura) is a taonga species for tangata whenua. Information on CRA 3 (Gisborne) customary Māori catches is available under the Fisheries (Kaimoana) Regulations 1998, and regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013. In the 2017 calendar year, approximately 10,400 rock lobsters were reported as customary harvest from CRA 3. This information is considered incomplete, because customary take of rock lobster that occurs under the Amateur Regulations for the purposes of hui and tangi is not required to be reported.

59. An estimate of 20 tonnes was used in the 2019 CRA 3 stock assessment model to represent customary catches.

Recreational fishing

60. Rock lobster is a popular recreational fish species to catch in CRA 3 (Gisborne). Recreational fishers are not required to report the quantities of rock lobsters they catch, other than reporting by recreational charter vessels. For the 2019 CRA 3 stock assessment, recreational catch estimates from the 1994 and 1996 Otago University surveys and the 2011/12 and 2017/18 National Panel Surveys were used to construct a recreational catch trajectory, by assuming that recreational catch was proportional to the CRA 3 spring-summer commercial CPUE (Figure 6).

61. The stock assessment model estimate of CRA 3 recreational catch was approximately 11 tonnes for 2018. The 2017/18 National Panel Survey estimate of CRA 3 recreational catch was 12.21 tonnes (±6.2 tonnes).

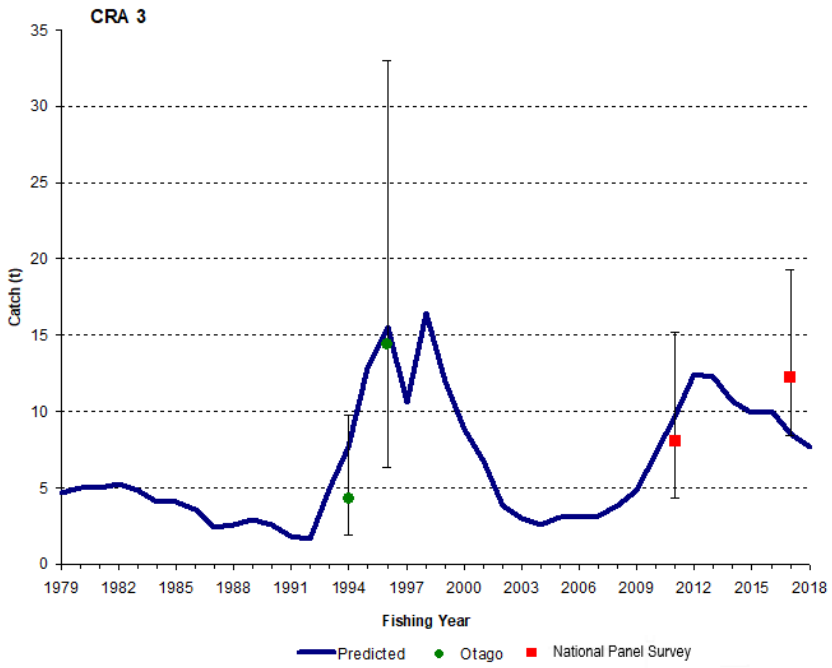

Figure 6: CRA 3 recreational catch trajectory for the 2019 CRA 3 stock assessment (error bars are ±2 standard errors).

Other mortality

62. In the 2019 stock assessment, the Rock Lobster Fisheries Assessment Working Group agreed to use a fixed percentage of 20% of the total commercial catch each year from 1981 to 2018 to represent illegal take (Figure 7). The Working Group did not scale the catch proportionately to commercial CPUE over the same period, because this approach led to large and unrealistic illegal catch estimates, especially for the mid-1990s and 2012-14. A constant average of illegal catch, although uncertain, was assumed from 1981 (Figure 7, horizontal black line). Before 1980, export discrepancies (the difference between reported catch totals and total exported weight) were used to estimate illegal catch. For the 2018/19 fishing year, the illegal catch estimate assumed for the model was approximately 61 tonnes.

63. The CRA 3 stock assessment also assumed that handling mortality was 10% of returned lobsters until 1990, and then 5% thereafter. The model estimate of handling mortality was approximately 10 tonnes for 2018.

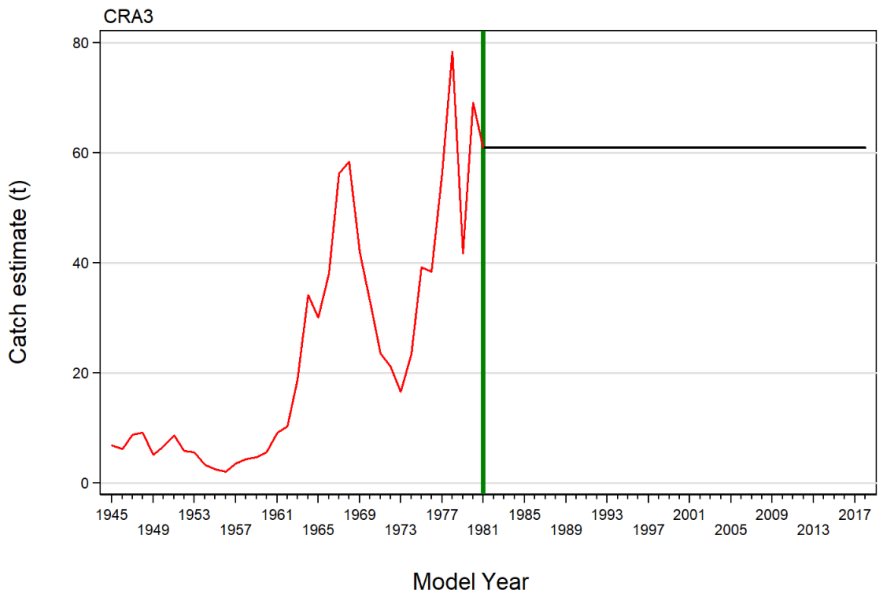

Figure 7: CRA 3 illegal catch trajectory for the 2019 CRA 3 stock assessment[8].

Commercial fishing

64. Annual landings and the TACC for CRA 3 (Gisborne) since 1990 are shown in Figure 8. Before 1995, there was a New Zealand-wide rock lobster stock assessment with catches apportioned to each Quota Management Area, and TACCs were not set on an annual basis to reflect available abundance.

65. In 2003 and 2004, the CRA 3 TACC was substantially under-caught because of voluntary ACE shelving by the CRA 3 industry, which was informed by a management procedure. Between 2009 and 2019 formally adopted CRA 3 management procedures have been used to annually review the TACC to ensure that catches reflect available abundance. Twenty-five vessels caught at least one tonne of rock lobster in the 2017/18 fishing year, and the number of commercial vessels operating in CRA 3 has been below 30 since 2005/06.

66. The current asset value of the CRA 3 fishery is estimated to be over $208 million based on the current TACC and the 2017/18 fishing year average quota share price (no price information was available for 2018/19). The average CRA 3 ACE value (the earnings quota owners receive when selling their ACE) for the 2018/19 fishing year was $52,375 per tonne.

[8] The vertical green line refers to when a new approach to estimating illegal catch was applied in 1981.

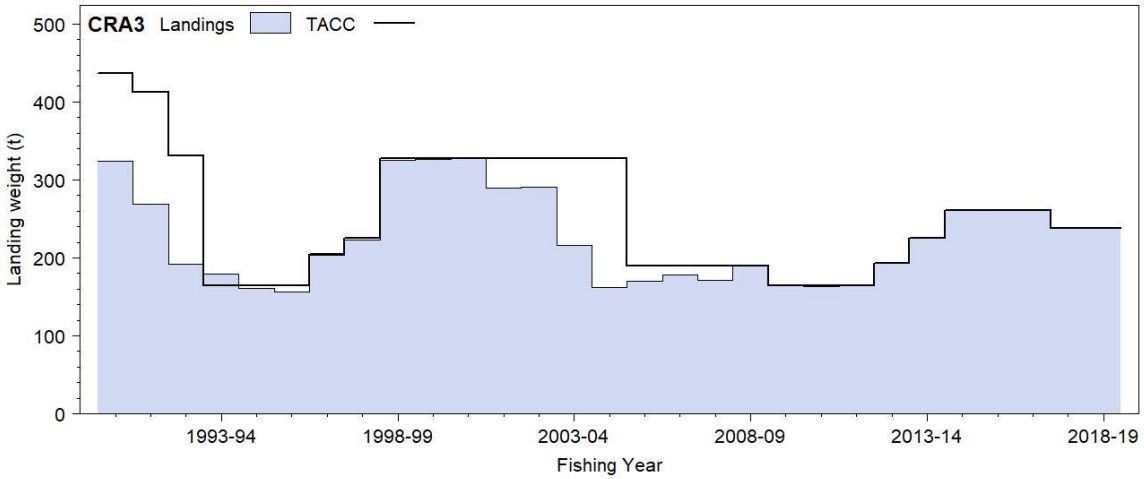

Figure 8: CRA 3 commercial landings and the TACCs from 1990 to 2019.

9.2 CRA 3 stock status

67. A new stock assessment was conducted for CRA 3 in 2019 with two different stock assessment base cases. The assessment results suggest 2019 vulnerable biomass is 18-19% of the unfished level, and 2019 total biomass is between 52% and 61% of the unfished level. Spawning biomass in 2019 was 80% of the unfished level, well above the soft limit of 20% (Figure 9).

68. Over the next five years, with 2019 catch levels and recent recruitment, CRA 3 vulnerable biomass is projected to decline to 15% of the unfished level by 2023, and total biomass is projected to remain the same at 52-60% of the unfished level by 2023. Spawning biomass is projected to remain constant.

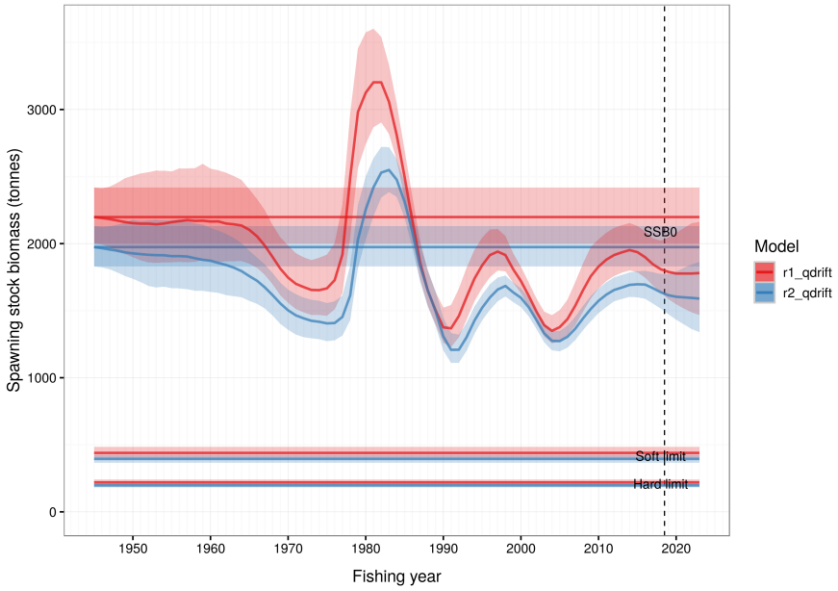

Figure 9: CRA 3 spawning stock biomass (SSB) trajectory for two different stock assessment base cases[9]. Also plotted is the unfished SSB (SSB_0), the soft limit (20% SSB_0), and the hard limit (10% SSB_0).

[9] Red line: r1_qdrift using tagging information for lobsters at liberty for longer than 365 days (i.e. higher growth rates); and, blue line: r2_qdrift using all tagging information (i.e. lower growth rates)).

9.3 Proposed CRA 3 options

69. Table 5 provides a summary of options proposed for CRA 3 (Gisborne). The results from the new CRA 3 stock assessment have been used to guide the options for varying the TAC.

Table 5: Proposed TAC, allowance and TACC options (in tonnes) for CRA 3 from 1 April 2020.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	Other mortality
Option 3.1: *Status quo*	351.9	222.9	20	20	89
Option 3.2: Based on the new CRA 3 stock assessment	303 ↓ (14%)	195 ↓ (13%)		13 ↓ (35%)	75 ↓ (16%)

Varying the TAC

70. There is no agreed target biomass reference level for CRA 3. The best available information suggests CRA 3 vulnerable biomass will decline at current catch levels, but spawning biomass will remain well above the soft limit of 20% over the next five years.

71. Under Option 3.1 (*status quo*), the CRA 3 TAC would stay at its current level of 222.9 tonnes from 1 April 2020.This option is not supported by the NRLMG, because maintaining the TAC is predicted to result in a decline in CRA 3 vulnerable biomass over the next five years.

72. Under Option 3.2 (proposed change), the CRA 3 TAC would be decreased by 48.9 tonnes from 351.9 to 303 tonnes. This decrease is proposed to ensure that CRA 3 vulnerable biomass is maintained at current levels over the next five years with 50% probability. Spawning biomass is predicted to increase slightly under this option (by 1%) and remain well above the soft limit of 20%.

73. Since there is currently no agreed target biomass reference level for CRA 3, it is proposed that the CRA 3 TAC is reviewed again from 1 April 2021. This will be after work is carried out on exploring alternative biomass reference levels for CRA 3 in 2020. No management procedure is proposed for CRA 3 at this time, because of the effects of electronic reporting on the commercial CPUE that is used to operate a procedure.

Varying allowances and the TACC

74. Table 6 provides a summary of information on current non-commercial allowances for CRA 3 (Gisborne) and stock assessment assumptions of non-commercial catch.

Table 6: Current CRA 3 allowances and model assumptions of non-commercial catches (in tonnes).

CRA 3 (Gisborne)	Customary Māori	Recreational	Other mortality	Total
Current allowances	20	20	89	129
Non-commercial catch assumptions for the 2019 stock assessment	20	Assumed to vary with biomass. Estimated at 11 for 2018.	61 illegal. 10 handling mortality.	102

Māori customary fishing

75. No change is proposed to the 20 tonne customary Māori allowance for CRA 3. While noting the incompleteness and uncertainty in the CRA 3 customary harvest information, it is assumed that current harvest is within the 20 tonne allowance allocated for customary Māori interests.

Recreational fishing

76. It is proposed that the CRA 3 recreational allowance is reduced from 20 tonnes to 13 tonnes. While the percentage decrease to the CRA 3 recreational allowances is greater than the decrease to the TACC, it is proposed that the TACC will be reduced by a greater tonnage amount (27.9 versus 7 tonnes). The allowances for recreational fishing do not constrain harvest and it is not proposed that the recreational daily bag limit is decreased at this time.

77. The current allowance of 20 tonnes was set in 2005 based on best available information at the time. Recreational catch estimates from surveys and stock assessment assumptions of recreational catch suggest that the current CRA 3 recreational catch could be lower than the allowance.

78. The Minister has discretion when making allowances for various sectors. If submitters have different views on the level at which the CRA 3 recreational allowance should be set, these views are welcomed along with supporting rationale.

79. The CRA 3 TAC will be reviewed again from 1 April 2021. Whether a review of recreational management controls is needed to manage catch can be considered at that time.

Other mortality

80. It is proposed that the 89 tonne CRA 3 allowance for other sources of fishing-related mortality (i.e. illegal catch and handling mortality) be reduced to 75 tonnes, to reflect the model estimates used in the stock assessment.

Total Allowable Commercial Catch

81. Under Option 3.1 (*status quo*), the CRA 3 TACC would stay at its current level of 222.9 tonnes. This option would maintain the current commercial utilisation opportunities, but increase risks to the future sustainability of the stock.

82. Under Option 3.2 (proposed change), the CRA 3 TACC would be decreased to 195 tonnes from 1 April 2020. The proposed 28 tonne TACC decrease has the potential to result in a loss of annual revenue to the catching sector alone of approximately $2.4 million (based on 2018/19 average port price information of $85.839 per kg).

Other matters – CRA 3 differential minimum legal size

83. The NRLMG is currently considering whether a change is required to the CRA 3 differential minimum legal size regime. CRA 3 commercial fishers can land male rock lobsters at or above 52 mm tail width, rather than 54 mm tail width, during June, July and August. Commercial fishers also voluntarily refrain from fishing in statistical areas 909 (East Cape) and 910 (Gisborne) from 1 September to 15 January. Recreational fishers are concerned that the commercial differential size is affecting the availability of rock lobsters to them over summer in the near shore waters close to Gisborne.

84. The Minister requested that the NRLMG look at different CRA 3 minimum legal size options as part of the 2019 CRA 3 stock assessment. This assessment was completed in November 2019.

85. The NRLMG will be providing the Minister with advice on this matter in late February 2020. This will determine the next steps and whether public consultation on regulatory amendments should be progressed.

10 Review of the CRA 4 (Wellington/Hawke's Bay) rock lobster fishery

10.1 CRA 4 fishery overview

Māori customary fishing

86. Rock lobster (kōura) is a taonga species for tangata whenua. Information on CRA 4 (Wellington/Hawke's Bay) customary Māori catches is available under the Fisheries (Kaimoana) Regulations 1998, and regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013. In the 2017 calendar year, approximately 430 rock lobsters were reported as customary harvest from CRA 4. This information is considered incomplete, because customary take of rock lobster that occurs under the Amateur Regulations for the purposes of hui and tangi is not required to be reported.

87. An estimate of 20 tonnes was used in the 2016 CRA 4 stock assessment model to represent customary catches.

Recreational fishing

88. Rock lobster is a popular recreational species to catch in CRA 4 (Wellington/Hawke's Bay). Recreational fishers are not required to report the quantities of rock lobsters they catch, other than reporting by recreational charter vessels. For the 2016 CRA 4 stock assessment, recreational catch estimates from the 1994 and 1996 Otago University surveys and the 2011/12 National Panel Survey were used to construct a recreational catch trajectory, by assuming that recreational catch was proportional to the CRA 4 spring-summer commercial CPUE (Figure 10). In 2015, the model estimate of CRA 4 recreational catch was 37.5 tonnes. The 2017/18 National Panel Survey estimate of CRA 4 recreational catch was 41.38 tonnes (±18.7 tonnes).

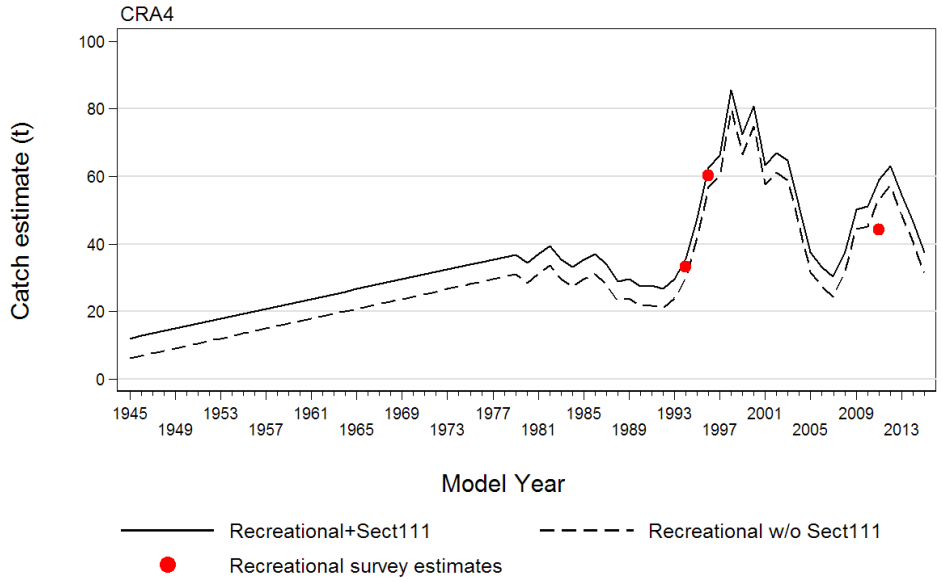

Figure 10: CRA 4 recreational catch trajectories for the 2016 CRA 4 stock assessment model. The solid black line includes section 111 catches taken by commercial fishers for non-commercial purposes, and the dashed black line is without.

Other mortality

89. In the most recent (2016) stock assessment for CRA 4, the Rock Lobster Fisheries Assessment Working Group used available Ministry of Fisheries estimates from 1990 to 2004 to estimate illegal catches. Before 1980, export discrepancies (the difference between reported catch totals and total exported weight) were used to estimate illegal catch. For the 2015/16 fishing year, while uncertain, the illegal catch estimate assumed for the model was 40 tonnes.

90. The CRA 4 assessment also assumed that handling mortality was 10% of returned lobsters until 1990, and then 5% thereafter. The model estimate of handling mortality was 18.14 tonnes for 2015.

Commercial fishing

91. Annual landings and the TACC for CRA 4 (Wellington/Hawke's Bay) since 1990 are shown in Figure 11. Before 1995, there was a New Zealand-wide rock lobster stock assessment with catches apportioned to each Quota Management Area, and TACCs were not set on an annual basis to reflect available abundance.

92. In 2007 and 2008, the CRA 4 TACC was substantially under-caught because industry used a voluntary management procedure to guide ACE shelving (Figure 11). Between 2012 and 2019 formally adopted CRA 4 management procedures have been used to review the TACC annually to ensure catches reflect available abundance. In the 2017/18 fishing year, 39 vessels caught at least one tonne of rock lobster.

93. The current asset value of the CRA 4 fishery is estimated to be over $370 million based on the current TACC and the 2018/19 fishing year average quota share price. The average CRA 4 ACE value (the earnings quota owners receive when selling their ACE) for the 2018/19 fishing year was $52,375 per tonne.

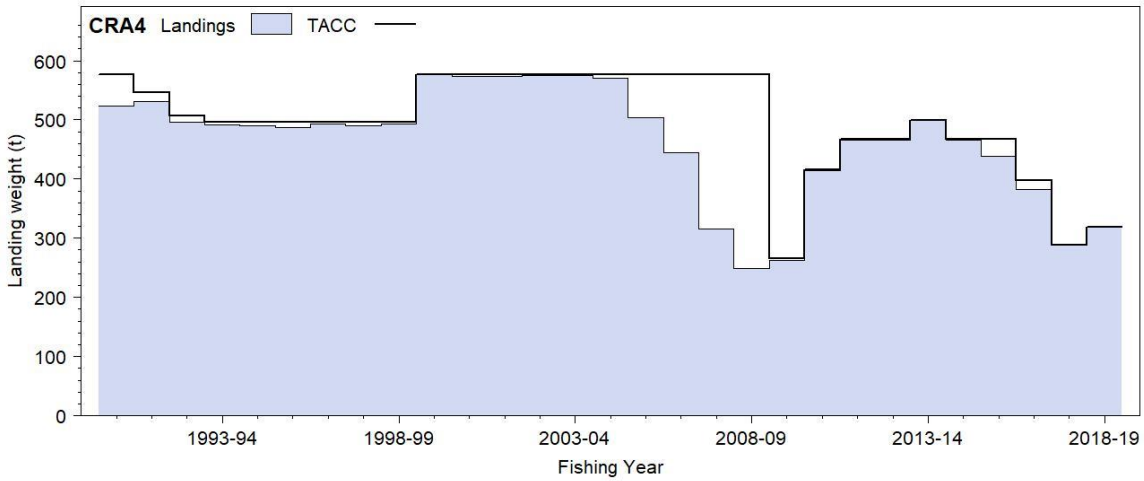

Figure 11: CRA 4 commercial landings and TACCs from 1990 to 2019.

10.2 CRA 4 stock status

94. The results of the CRA 4 stock assessment conducted in 2016 suggested that vulnerable biomass was below the agreed target biomass reference level[10] by 25%. Autumn-winter spawning stock biomass in 2016 was 51% of the unfished level, well above the soft limit of 20%.

95. Following the 2016 stock assessment results, 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 target biomass reference level in the next five years. The operation of the management procedure in its first year resulted in a substantial TAC reduction for 1 April 2017 from 592 to 484 tonnes.

96. Standardised CPUE is the abundance indicator used in the CRA 4 management procedure. The history of CRA 4 commercial CPUE is shown in Figure 12. CPUE has increased since 2016 from 0.7 to 0.9 kg/potlift in 2019, suggesting rock lobster abundance in CRA 4 has increased. The CRA 4 CPUE value for 2018/19 offset year (October to September) did not differ with or without the inclusion of electronic reporting data.

[10] The vulnerable biomass associated with the period 1979/88.

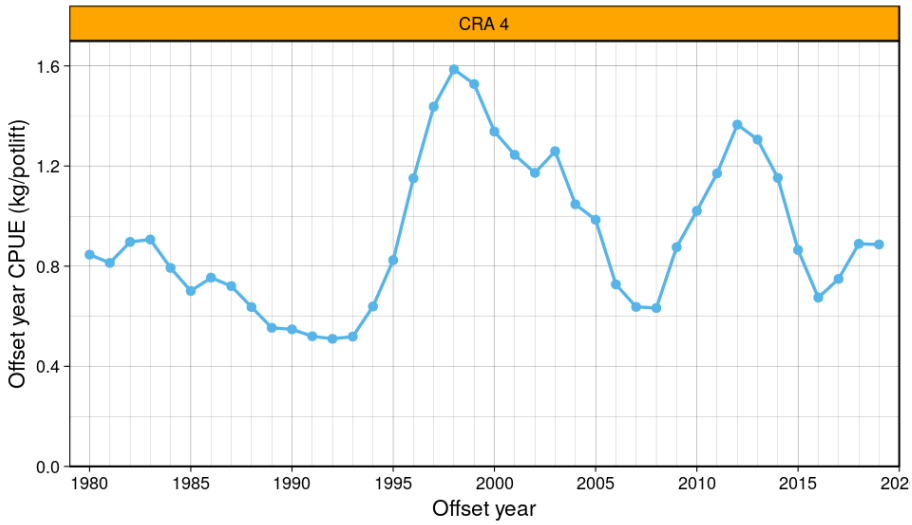

Figure 12: CRA 4 offset year (October to September) CPUE from 1980 to 2019.

10.3 Proposed CRA 4 options

97. Table 7 provides a summary of options proposed for CRA 4 (Wellington/Hawke's Bay). The current CRA 4 management procedure was used to guide the options for varying the TAC.

Table 7: Proposed TAC, allowance and TACC options (in tonnes) for CRA 4 from 1 April 2020.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	Other mortality
Option 4.1: *Status quo*	513.8	318.8	35	85	75
Option 4.2: Based on the CRA 4 management procedure	569.4 ↑ (11%)	374.4 ↑ (17%)			

Varying the TAC

98. Best available information suggests CRA 4 stock abundance has increased, since the 2016 stock assessment found that stock biomass was below the agreed target biomass reference level by 25%.

99. Under Option 4.1 (*status quo*), the CRA 4 TAC would stay at its current level of 513.8 tonnes from 1 April 2020. Compared with Option 4.2 (proposed change), this option could result in increased abundance in the CRA 4 fishery in the short-term, increased non-commercial catches and catch rates, and higher CPUE for commercial fishers, which may result in reduced harvesting costs.

100. Under Option 4.2 (proposed change), the CRA 4 TAC would be increased by 55.6 tonnes from 513.8 to 569.4 tonnes. The proposed TAC increase is guided by the use of the current CRA 4 management procedure that was agreed for use in 2017. The NRLMG supports the use of management procedures, unless there are compelling reasons raised in submissions or from other fisheries monitoring information to not follow the procedure.

101. The CRA 4 management procedure was designed to maintain the stock above the agreed target biomass reference level with greater than 50% probability. Simulation testing indicates it would maintain the stock above this level with 92% probability. Maintaining the stock above the reference level is likely to provide increased utilisation benefits for all sectors.

102. When the CRA 4 management procedure was operated for April 2019, an 8.6% TAC increase was proposed (similar to what is proposed for April 2020). The Minister decided to take a

cautious approach and retain the CRA 4 TAC of 513.8 tonnes, because he considered it was "in the best interest for the long-term sustainable utilisation of the stock" [11].

103. This is the last year the CRA 4 management procedure will be operated. A CRA 4 stock assessment is proposed for 2020 to provide a comprehensive update on stock status and an approach for future TAC setting.

Varying allowances and the TACC

104. Table 8 provides a summary of information on current non-commercial allowances for CRA 4 (Wellington/Hawke's Bay) and stock assessment assumptions of non-commercial catch.

Table 8: Current CRA 4 allowances and model assumptions of non-commercial catches (in tonnes).

CRA 4 (Wellington/Hawke's Bay)	Customary Māori	Recreational	Other mortality	Total
Current allowances	35	85	75	195
Non-commercial catch assumptions for the 2016 stock assessment	20	Assumed to vary with biomass. Estimated at 37.5 for 2015.	40 illegal. 18 handling mortality.	115.5

Māori customary fishing

105. No change is proposed to the 35 tonne CRA 4 customary Māori allowance. While noting the incompleteness and uncertainty in the CRA 4 customary harvest information, it is assumed that current harvest is well within allowance for customary Māori interests at this time.

Recreational fishing

106. No change is proposed to the 85 tonne recreational allowance for CRA 4. While there is uncertainty in the assumption made in the CRA 4 stock assessment to represent recreational catch, it is considered to be well within the current 85 tonne allowance. The CRA 4 2017/18 National Panel Survey recreational harvest estimate of 41.4 tonnes is also within the current allowance.

107. A new CRA 4 stock assessment is proposed for 2020 and will provide updated estimates of recreational harvest. This information will inform whether a change is required to the recreational allowance, or whether a review of other recreational management controls is needed to manage catch.

Other mortality

108. No change is proposed to the 75 tonne CRA 4 allowance for other sources of fishing-related mortality. While information suggests estimates of illegal take and handling-related mortality could be below the allowance, these estimates will be updated during the proposed CRA 4 stock assessment in 2020. This information will be considered in future allowance setting.

Total Allowable Commercial Catch

109. Under Option 4.1 (*status quo*), the CRA 4 TACC would stay at its current level of 318.8 tonnes. This option would maintain the current level of utilisation of the commercial fishery, without realising the potential for increased sustainable utilisation opportunities for commercial fishers.

110. Under Option 4.2 (proposed change), the CRA 4 TACC would be increased to 374.4 tonnes from 1 April 2020, as guided by the use of the current CRA 4 management procedure.

[11] Minister's stakeholder decision letter on April 2019 sustainability measures: www.fisheries.govt.nz/dmsdocument/33511-ministers-decision-letter-april-2019

111. A graphical representation of the CRA 4 management procedure is provided in Figure 13. The graph shows the proposed TACC for 2020 (pink cross symbol), as a function of CPUE in 2019 (0.9 kg/potlift).

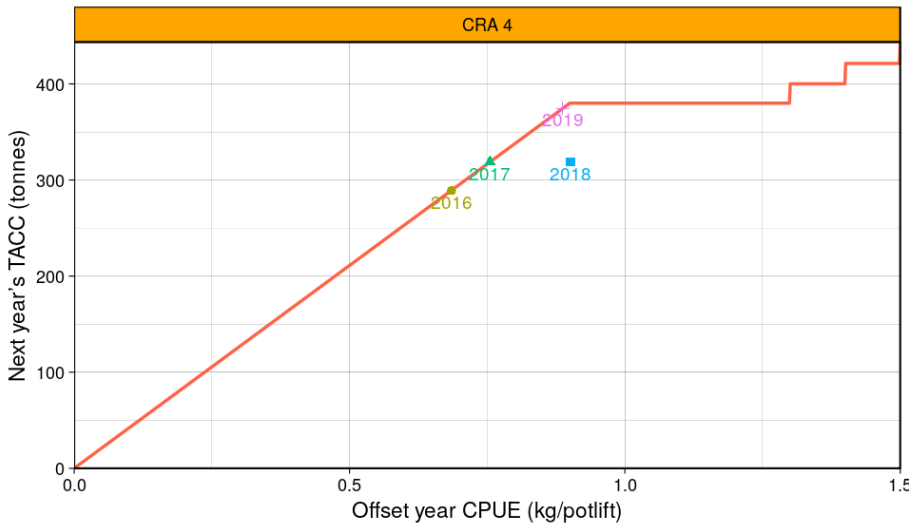

Figure 13: History of the CRA 4 management procedure. The coloured symbols show the 2016 to 2019 offset year (October to September) CPUE and the resulting TACCs.

112. The proposed 55.6 tonne TACC increase has the potential to result in an increase of annual revenue to the catching sector alone of approximately $4.77 million (based on 2018/19 average port price information of $85.839 per kg).

11 Review of the CRA 7 (Otago) rock lobster fishery

11.1 CRA 7 fishery overview

Māori customary fishing

113. Rock lobster (kōura) is a taonga species for tangata whenua. Reporting of customary Māori catch of rock lobster is fully operational in CRA 7 (Otago). In the 2017 calendar year, less than 1 tonne of rock lobster was reported as harvested from CRA 7.

114. An estimate of 1 tonne was used in the 2015 CRA 7 stock assessment model to represent customary catches.

Recreational fishing

115. The CRA 7 rock lobster fishery supports a relatively small recreational fishery off the Otago coastline.

116. There are no reliable recreational catch survey estimates for CRA 7. In the absence of any reliable information, in the 2015 CRA 7 stock assessment recreational catch estimates were assumed to be at 1 tonne in 1945 and were increased to 5 tonnes in 1979. A constant estimate of 5 tonnes was assumed from 1979 to 2014 for recreational catch. In addition, 1.7 tonnes of section 111 catches taken by commercial fishers for non-commercial purposes were included. There is no reliable National Panel Survey estimate for CRA 7 given the low number of fishers and events covered in the survey and the high variance (0.09 tonnes in 2017/18 ($\pm$0.2 tonnes)).

Other mortality

117. In the most recent (2014) CRA 7 stock assessment, the Rock Lobster Fisheries Assessment Working Group used available Ministry of Fisheries estimates from 1990 to 2002 and assumed 1 tonne per year from 2002-14. An estimate of handling-related mortality is not currently available for CRA 7, but will be generated by the CRA 7 stock assessment proposed for 2021.

Commercial fishing

118. Annual landings and the TACC for CRA 7 (Otago) since 1990 are shown in Figure 14. Before 1995, there was a New Zealand-wide rock lobster stock assessment with catches apportioned to each Quota Management Area, and TACCs were not set on an annual basis to reflect available abundance.

119. Since 1996, a CRA 7 management procedure has been used to guide the review of the TACC annually to ensure catch reflects available abundance (Figure 14). Despite this, there have been some years where the TACC has not been fully caught. Since the 2011/12 fishing year, vessel numbers have remained low, ranging from 9 to 12 vessels.

120. Fisheries New Zealand estimates the current asset value of the CRA 7 fishery to be over $73 million based on the current TACC and the 2017/18 fishing year average quota share price (no price information was available for 2018/19). The average CRA 7 ACE value (the earnings quota owners receive when selling their ACE) for the 2018/19 fishing year was $36,883 per tonne.

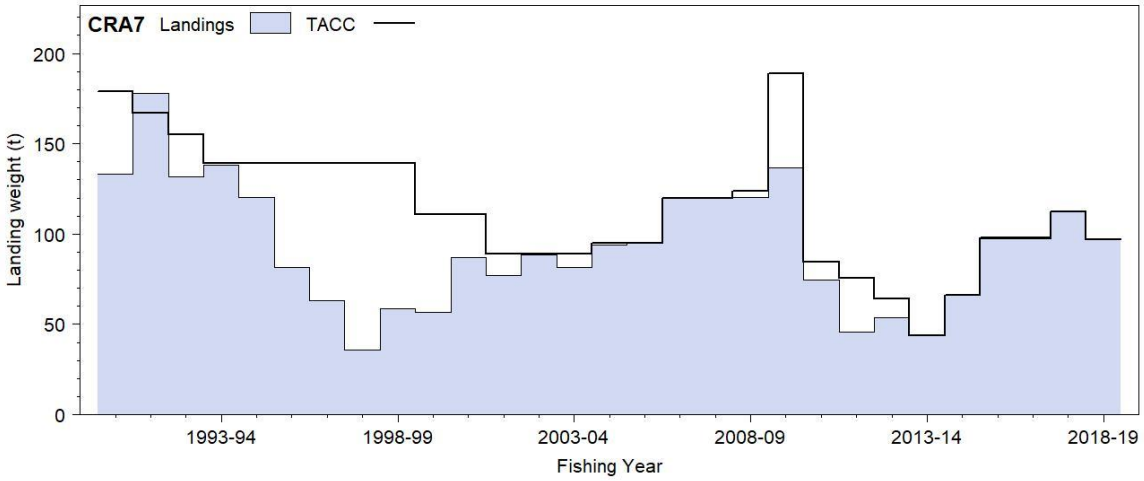

Figure 14: CRA 7 commercial landings and TACCs from 1990 to 2019.

11.2 CRA 7 stock status

121. The results of the CRA 7 stock assessment conducted in 2015 suggested there were no sustainability concerns for the CRA 7 fishery. The 2015 vulnerable biomass was twice the agreed target biomass reference level[12]. There are no reliable spawning biomass estimates available for CRA 7 because of the high level of emigration estimated for the stock.

122. 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. 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 (Figure 15). CRA 7 CPUE has increased substantially from 2012, suggesting CRA 7 abundance has increased.

[12] The average pre-season autumn-winter vulnerable biomass associated with the period 1979/81, when the stock showed good productivity.

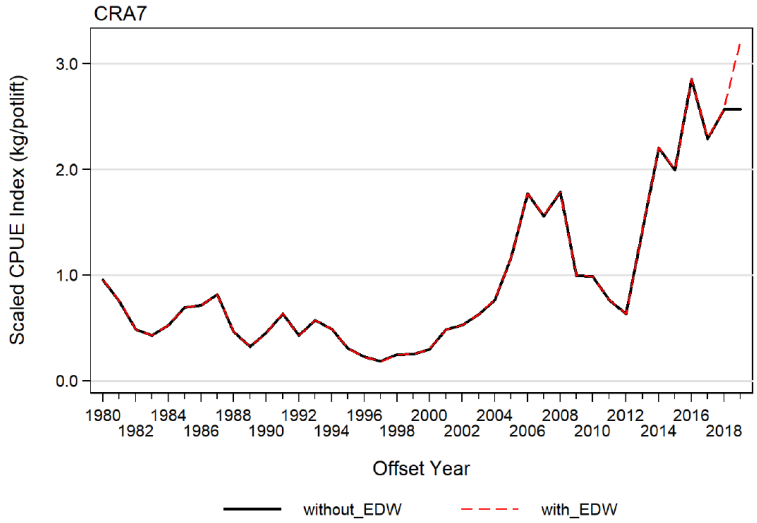

Figure 15: CRA 7 offset year (October to September) CPUE from 1980 to 2019, without and with electronic reporting data (EDW) included in the 2018/19 CPUE value.

11.3 Proposed CRA 7 options

123. Table 9 provides a summary of options proposed for CRA 7 (Otago). The current CRA 7 management procedure was used to guide the options for varying the TAC.

Table 9: Proposed TAC, allowance and TACC options (in tonnes) for CRA 7 from 1 April 2020.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	Other mortality
Option 7.1: *Status quo*	117	97	10	5	5
Option 7.2: Based on the CRA 7 management procedure	146.9 ↑ (26%)	126.9 ↑ (31%)			

Varying the TAC

124. The best available information suggests CRA 7 stock biomass is very likely to be at or above the agreed target biomass reference level.

125. The two CRA 7 TAC options are guided by the use of the CRA 7 management procedure that was agreed to in 2013; however, two different 2018/19 offset year CPUE values have been used to operate the procedures.

126. Under Option 7.1 (*status quo*), the CRA 7 TAC would stay at its current level of 117 tonnes from 1 April 2020. This option is based on the operation of the CRA 7 management procedure with a 2018/19 CPUE value without the inclusion of the new electronic reporting data. Compared with Option 7.2 (proposed change), this option could result in increased abundance in the CRA 7 fishery in the short-term, increased non-commercial catches and catch rates, and higher CPUE for commercial fishers, which may result in reduced harvesting costs.

127. Under Option 7.2 (proposed change), the CRA 7 TAC would be increased to 146.9 tonnes. This option is based on the operation of the CRA 7 management procedure with a 2018/19 CPUE value that has the new electronic reporting data included. The NRLMG has some reservations in using electronic data to operate the CRA 7 management procedure, because it is not yet known how comparable the paper-based and electronic CPUE series will be.

128. The CRA 7 management procedure was designed to maintain the stock above agreed target biomass reference level with greater than 50% probability. Simulation testing indicates it would maintain it above this level with 98% probability. This is likely to provide increased utilisation benefits for all sectors.

129. This is the last year the current CRA 7 management procedure will be operated, because of the effects of electronic reporting on the commercial CPUE that is used to operate the procedure. A new CRA 7 stock assessment is proposed for 2021. It is likely that the TAC increase proposed could be fixed until April 2022, when new information becomes available from the stock assessment to inform TAC setting.

Varying allowances and the TACC

130. Table 10 provides a summary of information on current non-commercial allowances for CRA 7 (Otago) and stock assessment assumptions of non-commercial catch.

Table 10: Current CRA 7 allowances and model assumptions of non-commercial catches (in tonnes).

CRA 7 (Otago)	Customary Māori	Recreational	Other mortality	Total
Current allowances	10	5	5	20
Non-commercial catch assumptions for the 2015 stock assessment	1	5	1 (constant from 2002)	7

Māori customary fishing

131. No change is proposed to the 10 tonne customary Māori allowance. Current harvest is considered to be conservative and is well within the allocation for this interest at this time.

Recreational fishing

132. No change is proposed to the 5 tonne recreational allowance for CRA 7. While there is considerable uncertainty in the current estimate of recreational catch, it is considered to be within the current 5 tonne allowance. A new CRA 7 stock assessment is proposed for 2021 and will provide updated estimates of recreational harvest. This information will inform whether a change is required to the recreational allowance, or whether a review of other recreational management controls is needed to manage catch.

Other mortality

133. No change is proposed to the 5 tonne CRA 7 allowance for other sources of fishing-related mortality. There are no new illegal take estimates and an estimate of handling-related mortality is not currently available for CRA 7. These estimates will be considered at the time of the next proposed CRA 7 stock assessment in 2021.

Total Allowable Commercial Catch

134. Under Option 7.1 (*status quo*), the CRA 7 TACC would stay at its current level of 97 tonnes. A graphical representation of the CRA 7 management procedure is provided in Figure 16. The graph shows the proposed TACC for 2020 as a function of CPUE in 2019 (2.57 kg/potlift, without electronic reporting data). This option maintains the current level of commercial utilisation.

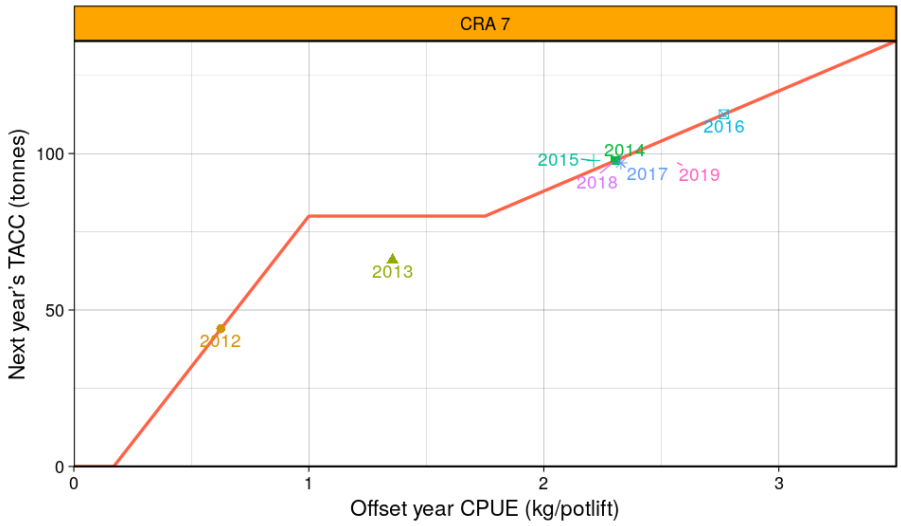

Figure 16: History of the CRA 7 management procedure. The coloured symbols show the 2012 to 2019 CPUE and the resulting TACCs [without electronic reporting data in 2019].

135. Under Option 7.2 (proposed change), the CRA 7 TACC would be increased to 126.9 tonnes from 1 April 2020, as guided by the use of the CRA 7 management procedure (Figure 17). The graph shows the proposed TACC for 2020 as a function of 2019 CPUE (3.22 kg/potlift, with the inclusion of electronic reporting data).

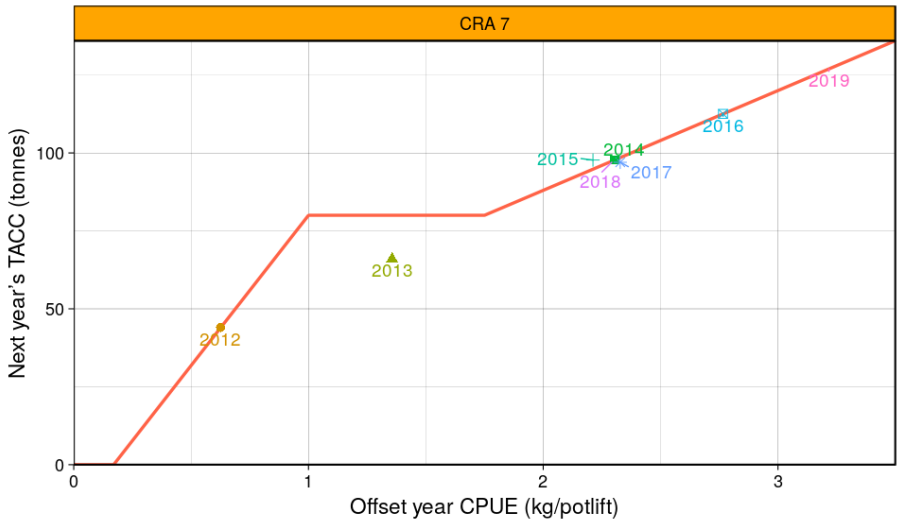

Figure 17: History of the CRA 7 management procedure. The coloured symbols show the 2012 to 2019 CPUE and the resulting TACCs [with electronic reporting data in 2019].

136. The proposed 62.1 tonne TACC increase has the potential to result in an increase of annual revenue to the catching sector alone of approximately $5.33 million (based on 2018/19 average port price information of $85.839 per kg).

12 Review of the CRA 8 (Southland) rock lobster fishery

12.1 CRA 8 fishery overview

Māori customary fishing

137. Rock lobster (kōura) is a taonga species for tangata whenua. Reporting of customary Māori catch of rock lobster is fully operational in CRA 8 (Southland). In the 2017 calendar year, approximately 16,500 rock lobsters, plus 2.3 tonnes, were reported as harvested from CRA 8.

138. An estimate of 6 tonnes was used in the 2015 CRA 8 stock assessment model to represent customary catches from 1963 to 2012, which was then increased proportionately to 15 tonnes in 2014 (the last year of the stock assessment model).

Recreational fishing

139. The CRA 8 (Southland) fishery has a number of areas closed to commercial fishing, which provide non-commercial fishers with exclusive access to rock lobsters. In Fiordland, the inner fiords are closed to commercial rock lobster fishing and were established in 2005 by the Fiordland Marine Guardians under a 'gifts' and 'gains' approach.

140. Overall, little is known about recreational catch in CRA 8. In the 2015 CRA 8 stock assessment, a recreational catch trajectory was constructed as follows: beginning at 1 tonne in 1945 recreational catch was increased to 5 tonnes in 1979, and then from 1979 to 2014 recreational catch was assumed to be a constant 20 tonnes. In addition, 18.8 tonnes of section 111 catches taken by commercial fishers for non- commercial purposes were included. The 2017/18 National Panel Survey estimate of CRA 8 recreational catch was 16.17 tonnes ($\pm$11.4 tonnes).

Other mortality

141. In the most recent (2015) stock assessment for CRA 8, the Rock Lobster Fisheries Assessment Working Group used available Ministry of Fisheries estimates from 1990 to 2002 to estimate illegal catches. An estimate of 3 tonnes was used from 2011-14, with the missing years from 2003-10 interpolated from the 18 tonnes estimated for 2002. An estimate of handling-related mortality is not currently available for CRA 8, but will be generated by the CRA 8 stock assessment proposed for 2021.

Commercial fishing

142. The CRA 8 (Southland) fishery is the largest commercial rock lobster fishery in New Zealand. Annual landings and the TACC for CRA 8 since 1990 are shown in Figure 18. Before 1995, there was a New Zealand-wide rock lobster stock assessment with catches apportioned to each Quota Management Area, and TACCs were not set on an annual basis to reflect available abundance.

143. Since 1996, a CRA 8 management procedure has been used to review the TACC annually to ensure catches reflect available abundance. The TACC has been fully caught from 1998 onwards (Figure 18). In 2017/18 fishing year, 65 vessels reported catching at least 1 tonne of rock lobsters.

144. The current asset value of the CRA 8 fishery is estimated to be over $1.72 billion based on the current TACC and the 2018/19 fishing year average quota share price. The average CRA 8 ACE value (the earnings quota owners receive when selling their ACE) for the 2018/19 fishing year was $51,038 per tonne.

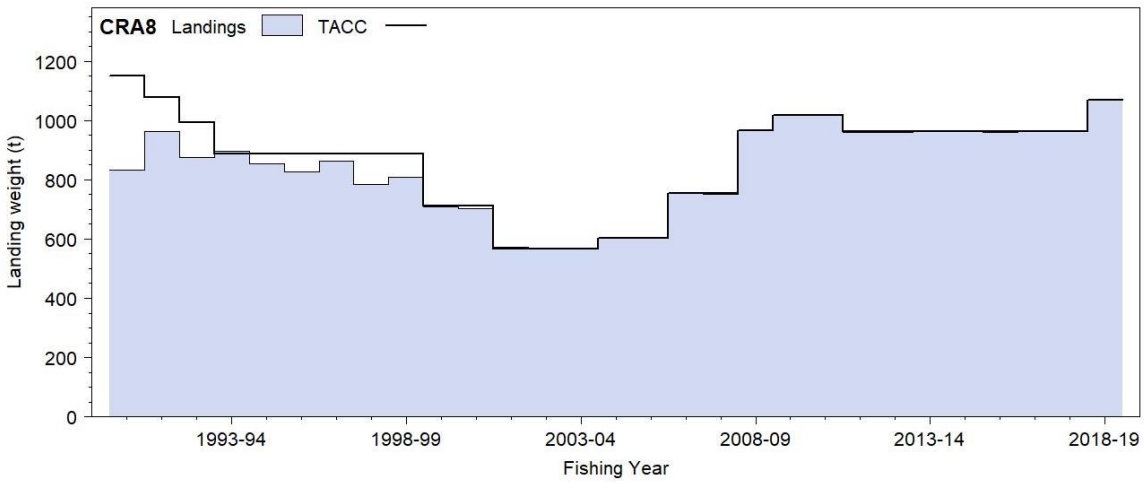

Figure 18: CRA 8 commercial landings and TACCs from 1990 to 2019.

12.2 CRA 8 stock status

145. The results of the CRA 8 stock assessment conducted in 2015 suggested that there were no sustainability concerns for the CRA 8 fishery. Vulnerable biomass in 2015 was 1.4 times the agreed target biomass reference level[13]. Autumn-winter spawning stock biomass in 2015 was 44% of the unfished level, well above the soft limit of 20%.

146. Standardised CPUE is considered to be a reliable indicator of relative stock size in CRA 8, and is the abundance indicator used in the CRA 8 management procedure. The CPUE used for CRA 8 is unique in that it relates only to the fish that were landed and does not consider fish that were of legal size but were legally returned to the water. Unlike other rock lobster fisheries, a lot of fish are returned to the water in CRA 8 to select the premium size: an estimated 40% by weight (from the 2015 stock assessment).

147. The history of CRA 8 commercial CPUE is shown in Figure 19. CPUE has increased steadily since 2015, to the highest CPUE in the observed history in 2019 (a CPUE of 4.83 kg/potlift). The CRA 8 CPUE value for the 2018/19 offset year did not differ with or without the inclusion of electronic reporting data.

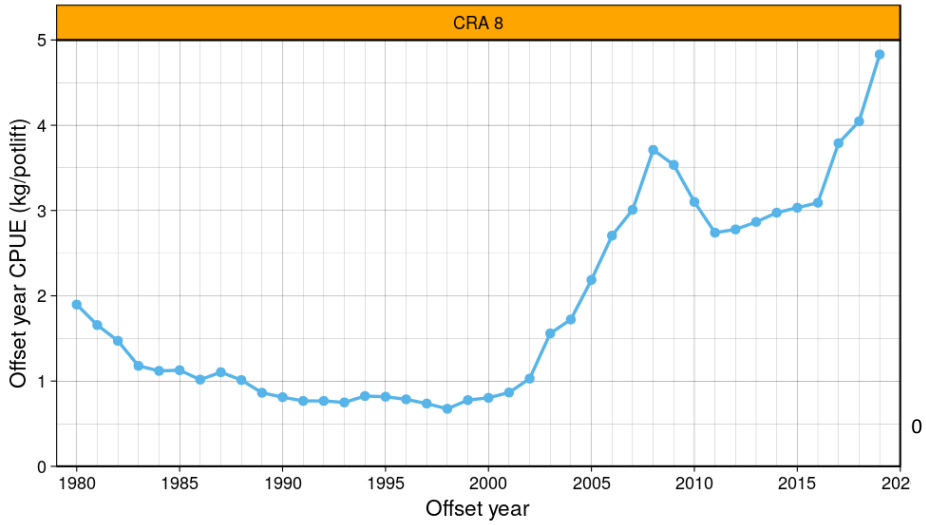

Figure 19: CRA 8 offset year (October to September) CPUE 1980 to 2019.

[13] The average pre-season autumn-winter vulnerable biomass associated with the period 1979/81, when the stock showed good productivity.

12.3 Proposed CRA 8 options

148. Table 11 provides a summary of options proposed for CRA 8 (Southland). The current CRA 8 management procedure was used to guide the options for varying the TAC.

Table 11: Proposed TAC, allowance and TACC options (in tonnes) for CRA 8 from 1 April 2020.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	Other mortality
Option 8.1: *Status quo*	1220.6	1129.6	30	33	28
Option 8.2: Based on the CRA 8 management procedure	1282.7 ↑ (5%)	1191.7 ↑ (5%)			

Varying the TAC

149. The best available information suggests CRA 8 stock biomass is well above the agreed target biomass reference level.

150. Under Option 8.1 (*status quo*), the CRA 8 TAC would stay at its current level of 1220.6 tonnes from 1 April 2020. This option could result in increased abundance in the CRA 8 fishery in the short-term, increased non-commercial catches and catch rates compared with Option 8.2 (proposed change), and higher CPUE for commercial fishers, which may result in reduced harvesting costs. However, this option forgoes the opportunity to take advantage of the proposed TACC increase under Option 8.2.

151. Under Option 8.2 (proposed change), the CRA 8 TAC would be increased to 1282.7 tonnes. The proposed TAC increase is guided by the use of the CRA 8 management procedure that was agreed for use in 2016.

152. The CRA 8 management procedure was designed to maintain the stock above the agreed target biomass reference level with greater than 50% probability. Simulation testing indicates it would maintain the stock above this level with 99% probability. This is likely to provide increased utilisation benefits for all sectors.

153. This is the last year the current CRA 8 management procedure will be used, because of the effects of electronic reporting on the commercial CPUE that is used to operate the procedure. A new CRA 8 stock assessment is proposed for 2021. It is likely that the TAC increase proposed could be fixed until April 2022, when new information becomes available from the stock assessment to inform TAC setting.

Varying allowances and the TACC

154. Table 12 provides a summary of information on current non-commercial allowances for CRA 8 (Southland) and stock assessment assumptions of non-commercial catch.

Table 12: Current CRA 8 allowances and model assumptions of non-commercial catches (in tonnes).

CRA 8 (Southland)	Customary Māori	Recreational	Other mortality	Total
Current allowances	30	33	28	91
Non-commercial catch assumptions for the 2015 stock assessment	15 in 2014	20	3 from 2011 to 2014	38

Māori customary fishing

155. No change is proposed to the 30 tonne customary Māori allowance, because current harvest estimates are considered to be conservative and are well within the current allocation at this time.

Recreational fishing

156. No change is proposed to the 33 tonne recreational allowance for CRA 8. While there is uncertainty in the current estimate of recreational catch, it is considered to be within the current 33 tonne allowance. The CRA 8 2017/18 National Panel Survey recreational harvest estimate of 16.17 tonnes is also within the current allowance.

157. A new CRA 8 stock assessment is proposed for 2021 and will provide updated estimates of recreational harvest. This information will inform whether a change is required to the recreational allowance, or whether a review of other recreational management controls is needed to manage catch.

Other mortality

158. No change is proposed to the 28 tonne CRA 8 allowance for other sources of fishing-related mortality. There are no new illegal take estimates. An estimate of handling-related mortality is also not currently available for CRA 8, and will be generated at the time of the next proposed CRA 8 stock assessment in 2021. This information will be considered in future allowance setting.

Total Allowable Commercial Catch

159. Under Option 8.1 (*status quo*), the CRA 8 TACC would stay at its current level of 1129.6 tonnes. This option would maintain the current level of utilisation of the commercial fishery, without realising the potential for increased sustainable utilisation for commercial fishers.

160. Under Option 8.2 (proposed change), the CRA 8 TACC would be increased to 1191.7 tonnes from 1 April 2020, as guided by the use of the CRA 8 management procedure.

161. A graphical representation of the CRA 8 management procedure is provided in Figure 20. The CRA 8 management procedure is unique in that it uses information only from retained legal state catch. This reflects the focus to both manage at higher biomasses and maximise economic return. The graph shows the proposed TACC for 2020 (pink square symbol), as a function of CPUE in 2019 (4.83kg/potlift).

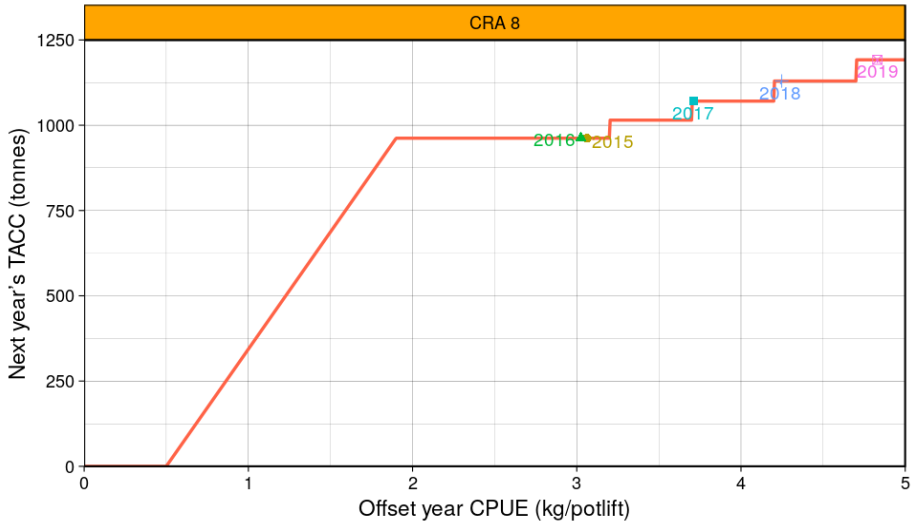

Figure 20: History of the CRA 8 management procedure. The coloured symbols show the 2016 to 2019 offset year (October to September) CPUE and the resulting TACCs.

162. The proposed 62.1 tonne TACC increase has the potential to result in an increase of annual revenue to the catching sector alone of approximately $5.33 million (based on 2018/19 average port price information of $85.839 per kg).

13 Other relevant matters

13.1 Biological and environmental factors

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

Interdependence of stocks

164. In New Zealand rock lobster fisheries extend from the Three Kings Islands in the north to the Auckland Islands in the south, and east to the Chatham Islands. The long larval phase and long-distance movements of adults in some areas suggest a single rock lobster stock around the mainland.

165. The interdependence of stocks also involves the consideration of the effects of fishing on associated stocks harvested affected by fishing for the target stock. Examples include other non-target species (bycatch) or benthic species that are incidentally taken or affected by fishing gear. The role of the target stock in the food chain should also be considered.

166. Potting is the method commercial fishers use to target rock lobster. This method is considered to have very little direct effect on non-target species and benthic species. The most frequently reported incidental species caught via commercial rock lobster potting, in decreasing order of catch across all stocks are: octopus, conger eel, blue cod, trumpeter, sea perch, red cod, butterfish and leatherjackets. This is based on an analysis of estimated incidental catches for the period 1989 to 2003.

167. Rock lobsters feed on a wide range of small shellfish, crabs, starfish and kina, depending on local availability. Predation on rock lobsters is known from octopus, blue cod, groper, southern dogfish, rig and seals.

168. Some scientists have suggested that decreased predation from large reef predators such as rock lobsters, snapper and other fishes is responsible for population increases in sea urchins and destruction of kelp forests. This hypothesis is controversial and the literature equivocal. There is research suggesting that on some rocky reefs in the north of New Zealand, recovery of predators such as rock lobster and snapper inside marine reserves has led to the recovery of macro-algal habitat through predation on urchins. However, there is also contradictory evidence. Sea urchin populations are affected by factors other than predation, such as diseases and temperature effects on recruitment.

Biological characteristics and environmental conditions

169. 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. Lobsters grow at different rates around New Zealand and female lobsters mature at different sizes.

170. Variability in growth, maturity, available abundance, mortality and recruitment were taken into account during the development of the proposals for the rock lobster stocks discussed in this document.

13.2 Deemed values

171. Deemed values are charges commercial fishers must pay for every kilogram of stocks landed in excess of their ACE holdings. The purpose of the deemed value framework is to encourage commercial fishers to balance their catch with ACE.

172. Fisheries New Zealand is reviewing the interim deemed value rates of all stocks, and propose to adjust the interim deemed value rate to 90% of the annual deemed value rate. The interim deemed value rate for most rock lobster stocks is currently set at 90% of the annual deemed value rate, except for CRA 10 (Kermadecs) where the interim rate is 50% of the annual rate. It

is proposed that the CRA 10 interim rate is increased to 90% from 1 April 2020. As there is no fishing in CRA 10, this is an administrative change.

173. For details about this proposal, see the Deemed Values consultation on the Fisheries New Zealand website here: https://www.fisheries.govt.nz/news-and-resources/consultations/review-of-sustainability-measures-for-1-april-2020.

14 Questions for submitters on the proposals

- Which option(s) do you support for revising the TACs, allowances and TACCs? Why?
- If you do not support any of the TAC options listed, what alternative(s) should be considered? Why?
- Are the allowances for customary Māori non-commercial fishing appropriate? Why?
- Are the allowances for recreational fishing appropriate? Why?
- Are the allowances for other sources of fishing-related mortality appropriate? Why?
- What is your view on the proposed TACCs?

15 Further Information

Rock lobster catch and effort data: summaries and CPUE standardisations, 1979/80 to 2017/18: https://www.mpi.govt.nz/dmsdocument/34317/direct.

Operational management procedure for New Zealand rock lobster stocks: https://fs.fish.govt.nz/Doc/24608/FAR-2018-23-CRA-Management-Procedures.pdf.ashx.

November 2019 Fisheries Assessment Plenary Report: https://www.mpi.govt.nz/dmsdocument/38960-fisheries-assessment-plenary-november-2019-stock-assessment-and-stock-status

National Panel Survey of Marine Recreational Fishers 2011/12: https://fs.fish.govt.nz/Doc/23718/FAR_2014_67_2847_MAF2010-01.pdf.ashx.

National Panel Survey of Marine Recreational Fishers 2017/18: https://fs.fish.govt.nz/Doc/24728/FAR-2019-24-National-Panel-Survey-Marine-Recreational-Fishers.pdf.ashx.

Harvest Strategy Standard for New Zealand Fisheries. (2008). Compiled by the Ministry of Fisheries, Wellington, New Zealand: https://fs.fish.govt.nz/Doc/16543/harveststrategyfinal.pdf.ashx.

Recent reviews of rock lobster stocks:

CRA 3, 4 and 8 Sustainability Round Review April 2019: https://www.mpi.govt.nz/dmsdocument/33523-review-of-rock-lobster-sustainability-measures-for-1-april-2019

CRA 2, 4, 7 and 8 Sustainability Round Review April 2018: https://www.mpi.govt.nz/dmsdocument/27966-review-of-rock-lobster-sustainability-measures-1-april-2018

CRA 3, 4 and 7 Sustainability Round Review April 2017: https://www.mpi.govt.nz/dmsdocument/16879-review-of-rock-lobster-sustainability-measures-for-1-april-2017-final-advice-paper

CRA 4 and 8 Sustainability Round Review April 2016: https://www.mpi.govt.nz/dmsdocument/11611-review-of-rock-lobster-sustainability-measures-for-1-april-2016