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Sustainability Review 2019
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12 February 2019

Submission: Review of rock lobster TACs in CRA 3, 4 and 8

Recommendations

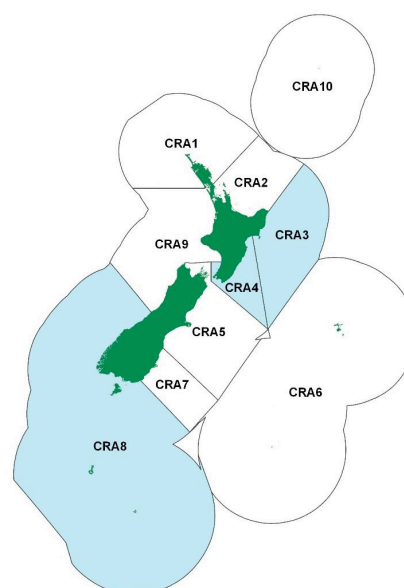
1. The Minister addresses the sustainability concerns of non-commercial interests by agreeing to stop the use of management procedures based on fluctuations in annual Catch Per Unit of Effort (CPUE).
2. The Minister review the membership and role of the National Rock Lobster Management Group.
3. The Minister removes the concessions enabling commercial fishers to take male rock lobster with tail width smaller than 54 mm
4. The Minister acknowledges that a 6.3% reduction in the TACC is insufficient to prevent the continuing decline of the CRA 3 stock and he requests independent scientific advice on how to respond to a 30% reduction in standardised commercial catch rate in CRA 3 in the last 4 years before setting TACC for 2019-20.
5. The Minister acknowledges that CRA 4 is rebuilding from a low base and acts in a precautionary manner by rejecting the proposed 19.2%, 61 tonne, increase in Total Allowable Commercial Catch (TACC) in CRA 4.
6. The Minister applies a cap of 30 tonnes to future annual TACC increases in CRA 4, until the fishery rebuilds to the reference biomass level with 70% probability.
7. The Minister rejects the proposed 5.5%, 59 tonne, increase in TACC in CRA 8 while the commercial size concession applies.
8. The Minister makes precautionary decisions for our crayfish stocks in acknowledgement of the uncertainty involved in transitioning to electronic logbook reporting.
9. The Minister's decisions needs to reflect his statutory obligations to protect the ecosystem, and the social, economic and cultural wellbeing of all New Zealanders not just commercial interests and those of the National Rock Lobster Management Group.

The submitters

10. 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 3, 4 and 8, with submissions due 12 February 2019.
11. The New Zealand Sport Fishing Council is a recognised national sports organisation with over 34,000 affiliated members from 56 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.
12. Spearfishing New Zealand (SNZ) is an Incorporated Society authorised by its constitution to represent the interests of freedive spearfishers in New Zealand. SNZ support initiatives that they consider are beneficial to their members and those that will contribute to rebuilding fisheries to a healthy level that will support better utilisation of our marine resources. SNZ support this submission. Together we are 'the submitters'.
13. 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].
14. 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, our affected clubs and other representatives organisations including the New Zealand Underwater Association.
15. 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

16. Rock lobster is an important species and fishery for all sectors in the three 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.
17. 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 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.

18. 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 permitted under the concession.
19. CRA 4 was the second largest rock lobster fishery in New Zealand for many years, with miles of rugged rocky coast line 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 4 times and increased 4 times over the last 10 years.

MPI proposals

20. Most rock lobster management in New Zealand is currently based on stock assessment models for each quota management area and management procedures that generate proposed changes to the TACC for the years between assessments. The proposed changes to rock lobster Total Allowable Catches (TACs) for the fishing year beginning on 1 April 2019 are outlined in Table 1. These are the result of running management procedures that use commercial catch per unit effort (CPUE) to develop the following management options -
 - A TACC decrease of 6.3% for the CRA 3 (Gisborne) fishery to ensure stock abundance is maintained, with no changes to the other allowances;
 - TACC increases of 19.4% for the CRA 4 (Hawke’s Bay to Wellington), and 5.5% for CRA 8 (South Coast/Fiordland) fisheries to provide increased commercial utilisation opportunities;
 - A decrease is proposed in the allowance for other fishing related mortality in CRA 4 to reflect the current estimates used in the CRA 4 stock assessment model.

Table 1: Proposed management options (in tonnes) for CRA 3, 4 and 8 from 1 April 2019.

Stock	Option	TAC	TACC	Allowances		
				Customary Māori	Recreational	Other mortality
	CRA3_01: <i>Status quo</i>	366.86	237.86			
CRA 3	CRA3_02: Based on the operation of the CRA 3 management procedure	351.9 ↓ (4.1%)	222.9 ↓ (6.3%)	20	20	89
	CRA4_01: <i>Status quo</i>	513.8	318.8			75
CRA 4	CRA4_02: Based on the operation of the CRA 4 management procedure	558 ↑ (8.6%)	380 ↑ (19.2%)	35	85	58 ↓ (22.7%)
	CRA8_01: <i>Status quo</i>	1,161.7	1,070.7			
CRA 8	CRA8_02: Based on the operation of the CRA 8 management procedure	1,220.6 ↑ (5.1%)	1,129.6 ↑ (5.5%)	30	33	28

Management Procedures

21. As per previous submissions, the submitters do not support the use of management procedures designed to maximise yield. The management procedures do not adequately take into account 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. Some, but not all of this decline, is explained by a reduction in biomass and an increase in water temperature.
22. The stock assessments on which management procedures are based estimate Maximum Sustainable Yield (MSY) and very low biomass levels, and do not take account of efficiency gains made by rock lobster fishers since 1980. 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 is not reflected in the management procedures or stock assessment process for these stocks. In 2018 these efficiency gains were factored into the CRA 2 stock assessment and that provided a turning point in realising the previous assessments of future abundance were too optimistic. If it's good enough to apply efficiency gains in CRA 2 then it is only reasonable to apply the same precautionary approach in assessing CRA 3, 4 and 8.
23. The current management targets used to develop management procedures are under review and may be too low in many cases. The management procedure process appears to advantage commercial interests and at the expense of the ecosystem, and the social, economic and cultural wellbeing of the majority of New Zealanders.

National Rock Lobster Management Group

24. MPI advise the National Rock Lobster Management Group (NRLMG) is a *“national-level, multi-stakeholder group comprising representatives of customary, recreational and commercial fishing sectors and MPI”*. The submitters continue to object to the exclusive nature of the NRLMG. The NZSFC is the largest representative organisation of recreational fishing interests in the country, with over 34,000 members. Through LegaSea we also work with a number of interested organisations, including the New Zealand Angling and Casting Association and New Zealand Underwater, collectively representing over 60,000 people. Currently our representatives can attend NRLMG meetings as observers only.
25. We remind MPI that crayfish are a taonga, a treasured species, for many New Zealanders not just the few who sit around the NRLMG table. To achieve some transparency we recommend the Minister review the membership and role of the NRLMG.

Remove the concessions

26. There is no mention in the discussion document that commercial concessions apply in CRA 3 and CRA 8, enabling commercial fishers to take crayfish smaller than the Minimum Legal Size (MLS) applying to recreational harvest; this is a serious omission of relevant information from the “Consultation Document”. This omission denies submitters the opportunity to learn how the exploitation of concession fish has caused ongoing conflict between commercial interests and non-commercial fishers who resent the impacts of this exploitation on their ability to harvest legal size crayfish.

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

27. The submitters and NZSFC member clubs in Crayfish 3 (CRA 3) have made it very clear that the concession that allows commercial fishers to take smaller rock lobster than recreational fishers is unfair and must be removed. In 2014 the NZSFC member clubs with an interest in CRA 3 developed a policy that aims to increase the size and abundance of rock lobster and ensure the needs of customary and amateur fishers are met. <http://nzsfrc.fishing.net.nz/index.cfm/PageID/411/ViewPage/Crayfish-3-policy>

ROCK LOBSTER – PROPOSALS

Crayfish 3 (CRA 3) East Cape to Mahia

28. MPI advise “*Maintaining the current TAC could result in a further decline in CRA 3 stock abundance and could affect the goal of maintaining stock biomass at or above B_{MSY} .*” (the biomass that will support maximum sustainable yield).
29. MPI propose a decrease to the Total Allowable Catch (TAC) by reducing the Total Allowable Commercial Catch (TACC) by 6.3%, to 223 tonnes, or to retain the status quo.
30. NRLMG and MPI must not use the Theoretical B_{MSY} as a goal or a target for any stock. MPI developed the Harvest Strategy Standard specifically to help set targets that take account of uncertainty in data and stock assessment models and natural fluctuations in population size. For long lived stocks like rock lobster the target must be about 50% of the unfished biomass, to fit with international best practice.
31. Rock lobster stock assessments are particularly complicated and the estimates of unfished biomass, using average recruitment observed over the last 30 years, seem to fall well short of the abundance observed in the first half of the 20th Century, let alone the virgin population.
32. The current (2014) stock assessment for CRA 3 has quite different results depending on which assumed growth rate is used. The figures quoted here are from the fixed growth rate base case. The 2014 estimate of the vulnerable biomass (mostly male rock lobster) at the beginning of the autumn/winter season was 704 tonnes, while the estimate of B_{MSY} was very low, just 213 tonnes. Given that 75% of commercial catch is taken in autumn and winter it seems ludicrous that the theoretical maximum sustainable yield is available when the vulnerable biomass is 213 t at the start of autumn/winter. The estimated level of minimum biomass and B_{MSY} are shown on a plot of annual biomass over time from the 2014 stock assessment in Figure 1.

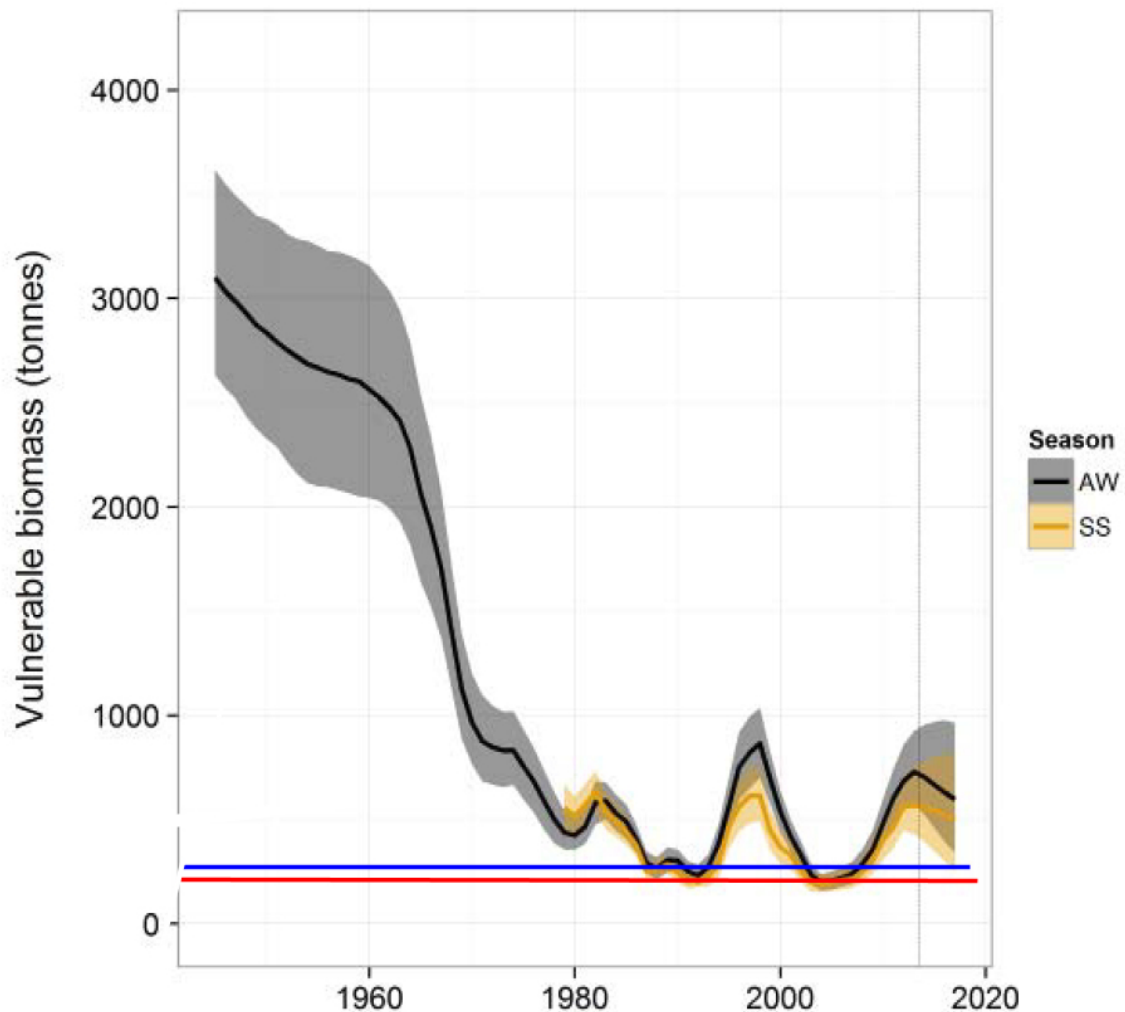


Figure 1: CRA 3 autumn/winter (AW) biomass since 1945 and spring summer (SS) biomass since 1979 estimated in the 2014 stock assessment. The theoretical estimate of the biomass that will support maximum sustainable yield (B_{MSY} of 213 tonnes) is the blue line, the lowest biomass observed used as a minimum reference point (B_{min} of 194 tonnes) is the red line. The last year of the assessment was 2014 indicated by the vertical line and biomass was projected forward 5 years. A new CRA 3 assessment is due in 2019.

33. The submitters note that the goal of maintaining stock biomass at or above B_{MSY} , as stated in the Fisheries Act 1996, is an ineffectual management goal for crayfish stocks. In 2018 work was initiated to determine new management targets for all rock lobster stocks, but this work remains uncompleted because the NRLMG diverted resources into an unscheduled stock assessment for CRA 6 (Chatham Islands).
34. Estimated catch data since 1963 shows commercial catch fished down the vulnerable biomass. There have been large fluctuations in the CRA 3 stock over the last 30 years with low periods in the early 1990's and mid 2000's. Vulnerable biomass was higher in 2014 (704 t), but this is just 23% of the estimated vulnerable biomass in 1945 (Figure 1). It is impossible to reconcile the spring/summer vulnerable biomass in Figure 1, which includes female rock lobster, with the statement in the discussion document that the female spawning stock biomass is 70% to 107 % of the original unfished biomass in 2013. Hopefully the 2019 CRA 3 assessment will produce realistic results.

35. The catch rate used in the management procedure in 2014 was 2.2 kg per pot lift, now it is 1.54 kg per pot lift. This represents a 30% decline over 4 years. While CRA 3 is an area with high settlement and recruitment, it is obvious to most people outside the NRLMG that the CRA 3 fishery is in decline and a 6.3% reduction in commercial quota is insufficient to prevent this decline from continuing. As happened in CRA 2:

- the old stock assessment method is overly optimistic;
- the estimate of BMSY is ridiculously low;
- there is no modern management target set; and
- the management procedure fails to adequately respond to declining biomass.

Fishery independent potting survey

36. A serious problem with rock lobster tail fan necrosis (TFN) in CRA 3 was reported in the scientific journal *Marine and Freshwater Research* in 2009. A three-year potting survey, 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 found the incidence of TFN for males was 2% inside the reserve and 17% outside the reserve.² The proportion of rock lobster with TFN was particularly high for rock lobster in fished areas with tail widths from 50 to 56 mm (Figure 2). 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.

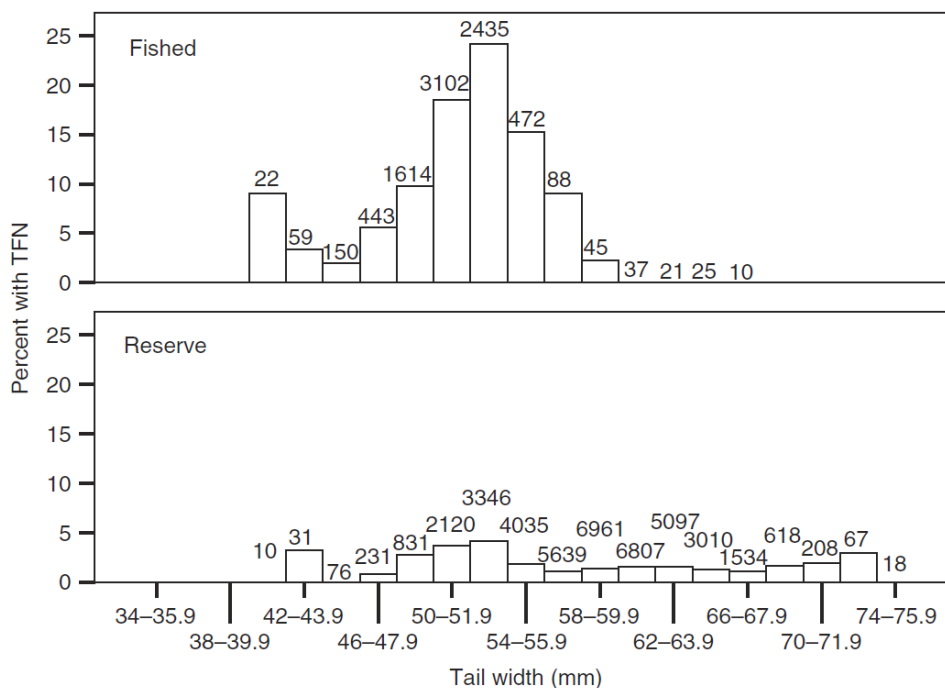


Figure 2: Percentage of males affected by tail fan necrosis (TFN) outside and within Te Tapuwae o Rongokako Marine Reserve, by tail width. Sample sizes are shown above each bar (source Freeman & McDiamond 2009).

² Freeman and McDiamond. (2009). Healthier lobsters in a marine reserve: effects of fishing on disease incidence in the spiny lobster, *Jasus edwardsii*.

37. 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 (Figure 3). 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).

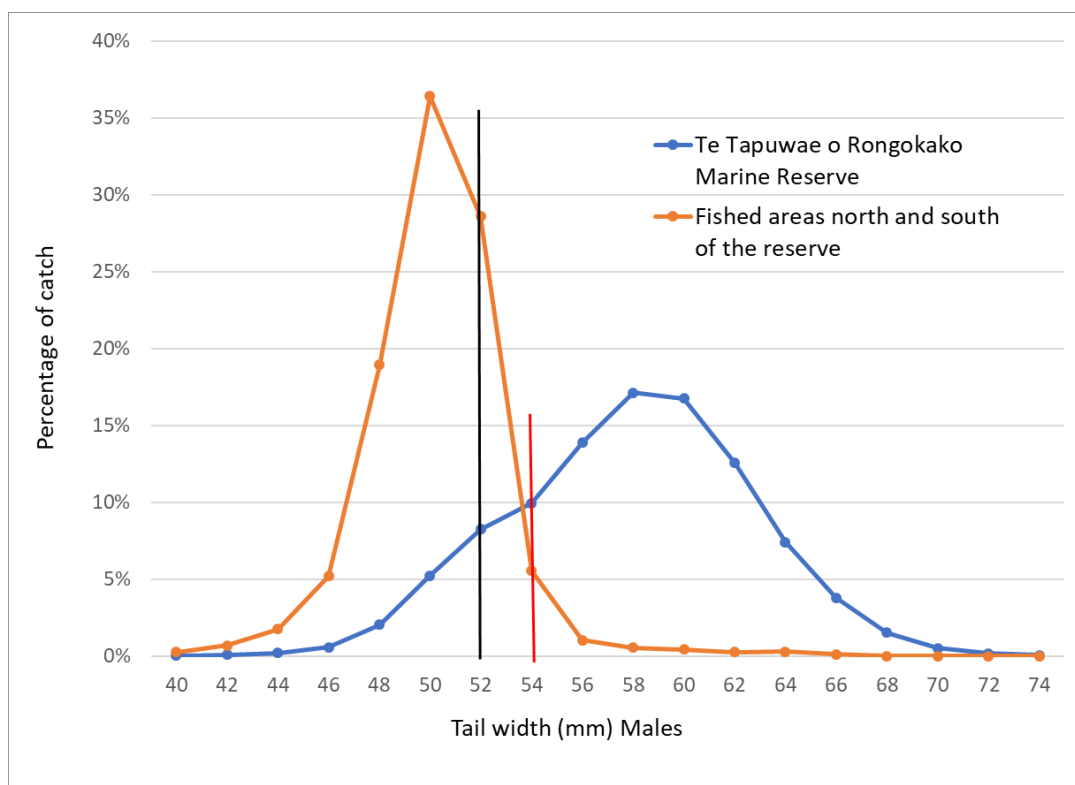


Figure 3: Percentage of male rock lobster by 2 mm tail width bin outside (orange) and within Te Tapuwae o Rongokako Marine Reserve (blue) using the sample sizes in Figure 2. The winter commercial male tail with size limit of 52 mm is the black vertical line the recreational size limit of 54 mm is the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

38. This survey may not be representative of all fished areas on the East Coast north of Gisborne, but it does show the significant impact of intensive fishing on the size and availability of rock lobster in CRA 3. There are over 5 times more rock lobster at 52 and 53 mm (29%) compared to those at 54 and 55 mm (5.5%) in area outside the marine reserve. Inside the marine reserve 84% of male rock lobster were over 54 mm while outside the reserve just 8% were over 54 mm tail width. This is clear evidence of the impact of the commercial size concession on the availability of reasonable size crays for non-commercial fishers in important areas of CRA 3.

39. **The submitters recommend** that the Minister rejects the CRA 3 management procedure, removes the concession to take male rock lobster with tail width smaller than 54 mm, and requests independent scientific advice on how to respond to a 30% reduction in standardised commercial catch rate in the last 4 years. The Minister’s decision needs to reflect his statutory obligations to protect the ecosystem, and the social, economic and cultural wellbeing of all New Zealanders not just commercial interests .

Crayfish 4 (CRA 4) Hawke Bay to Wellington

40. MPI advise *“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.”*
41. MPI now propose to increase the Total Allowable Catch (TAC). Within this, MPI propose to increase the Total Allowable Commercial Catch (TACC) by 61 tonnes, 19.2%, and decrease the allowance for other fishing related mortality by 17 tonnes which is 23%, or to retain the status quo.
42. The rock lobster science working group has selected an autumn/winter vulnerable biomass of 561 tonnes a reference level, that may provide the maximum sustainable yield in CRA 4. There is an objective to move the stock from where it was in 2016 (416 t) toward the reference level and the TACC was reduced by 108 tonnes in 2017.
43. Operation of the management procedure increased the TACC by 30 t in 2018 and now a 61 t increase is proposed in 2019. These increases have been driven by increases in commercial catch rates, but these were coming off a low level in 2016 of about 0.69 kg per pot lift.
44. The result of the 2016 stock assessment shows a similar pattern to the CRA 3 assessment with a cycle of high and low periods since the early 1990's (Figure 4). The reference biomass of 561 t is not an ambitious target, around 18% of vulnerable biomass at the start of the 1945 year. What's more, the minimum biomass reference point is 324 t and is actually larger than the theoretical B_{MSY} of just 284 t (Figure 4).
45. The submitters do not consider that a 19.2% increase in commercial catch rates (CPUE) is a reliable measure of the increase in CRA 4 stock abundance. In fact, an increase of this magnitude in a single year suggests behavioural change by fishers, not just an increase in rock lobster abundance.
46. 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.
47. In 2018 the CRA 2 CPUE standardisation included vessel effects for the first time in any rock lobster assessment, to account for some changes in fishing efficiency since 1990. The result was a more realistic trend in CPUE and improved fits in the stock assessment model.
48. 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. The Minister needs to be well informed of the increased uncertainty and risks if the best available information, i.e. CPUE standardisation by vessel, is omitted from the assessment of CRA 4.
49. Previously the NRLMG have noted that CPUE is not only affected by changes in abundance, and that large changes in the TAC will affect fishing patterns and catch rates. *“In reality, future CPUE will not be independent of the TAC. For example, setting a lower TAC would result in a higher CPUE the following year than would setting a higher TAC”.*

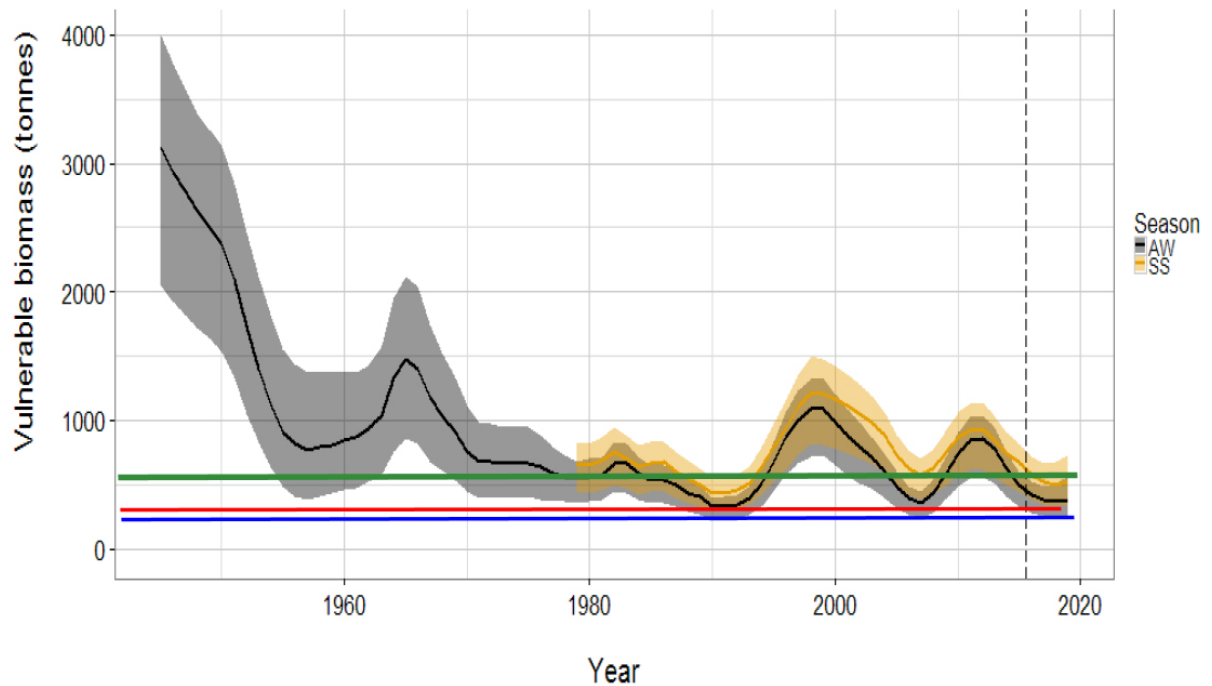


Figure 4: CRA 4 autumn/winter (AW) biomass since 1945 and spring summer (SS) biomass since 1979 estimated in the 2017 stock assessment. The theoretical estimate of the biomass that will support maximum sustainable yield (B_{MSY} of 284 tonnes) is the blue line; the lowest biomass observed used as a minimum reference point (B_{min} of 324 tonnes) is the red line; and the reference biomass used as a management target is 561 t, green line. The last year of the assessment was 2016 indicated by the vertical dashed line and biomass was projected forward 3 years.

50. The introduction of electronic logbooks with the roll out of MPI's IEMRS system will change the reporting requirements for most commercial fishers. There is widespread concern that catch and effort data collected under the new system will "improve" or be so different to the data currently collected using the paper based system that a separate time series of CPUE will be needed. This means that it may take 4 to 5 years to re-establish reliable trends in CPUE. There is a sustainability risk to the stock while CPUE continues to be a major input into management procedures and ultimately catch settings.
51. As we have submitted over many years, rock lobster CPUE does not provide an absolute measure of abundance. At best it provides a relative estimate of trends over time in stock size. The Minister needs to be made aware of the uncertainty and "noise" around year-on-year changes in CPUE.
52. We reiterate our concerns that a 19.2% change in CRA 4 CPUE does not equate to a 19.2% increase in stock abundance with adequate certainty to allow the Minister to increase the TACC by 19.2%. The CRA 4 stock has been in a downward cycle for most of the last 6 years. Indications are that abundance is increasing from a low base. The Minister must take a precautionary approach to ensure the CRA 4 stock continues to rebuild.
53. The Minister could put a cap on the size of annual TACC increases in CRA 4 until the target of reaching the reference biomass has been attained with 70% probability. We submit that a cap of around 30 t per year in CRA 4 would fit with the precautionary approach seen in modern fisheries management.

Crayfish 8 (CRA 8) South Coast/Fjordland

54. MPI advise for CRA 8 “Stock biomass in 2015 was 1.4 times the agreed reference level, B_{REF} Spawning stock biomass in 2015 was 44% of the unfished level”
55. MPI propose a increase to the Total Allowable Catch (TAC) by increasing the Total Allowable Commercial Catch (TACC) by 60 tonnes, which is 5.5%, or to retain the status quo.
56. CRA 8 is a productive rock lobster fishery and the stock has increased over recent years. The start of year reference biomass selected by the science working group is 1983 tonnes. The commercial catch rate used in the management procedure was 4.25 kg per pot lift (retained rock lobster only) which is a 39% increase from the level in 2015. This is a remarkable turnaround for this fishery which had catch rates well below 1 kg per pot lift for the whole period from 1990 to 2001.
57. Operation of the management procedure increased the TACC by 5.5% t in 2018 and a further 5.5% increase is proposed in 2019. The start of year theoretical B_{MSY} for CRA 8 is 1,465 tonnes but clearly this stock is more productive at current levels than it would be at that low level, which is nearly half of the 2015 start of year biomass (Figure 5).
58. While the current rebuild is encouraging, CRA 8 used to be a very large stock and a large fishery. In 2015 the stock assessment estimated the spawning stock biomass (mature females) to be at 44% of the 1945 level. Looking at the graph in Figure 5, the start of year vulnerable biomass (mainly males) are still at a relatively low level, 13% of the 1945 level. Presumably this includes concession sized rock lobster down to 52 mm tail width.
59. A concession was introduced to allow commercial fishers to harvest male rock lobster below the national minimum legal size when fishing was hard, and a high proportion of catch was small. Clearly the original purpose of the concession is no longer valid and we submit that the concession is removed in CRA 8 and all other rock lobster areas.
60. **NZSFC recommend** that the Minister reject any TACC increase in a rock lobster stock where the concession allowing commercial fishers to take animals below the Minimum Legal Size applies.

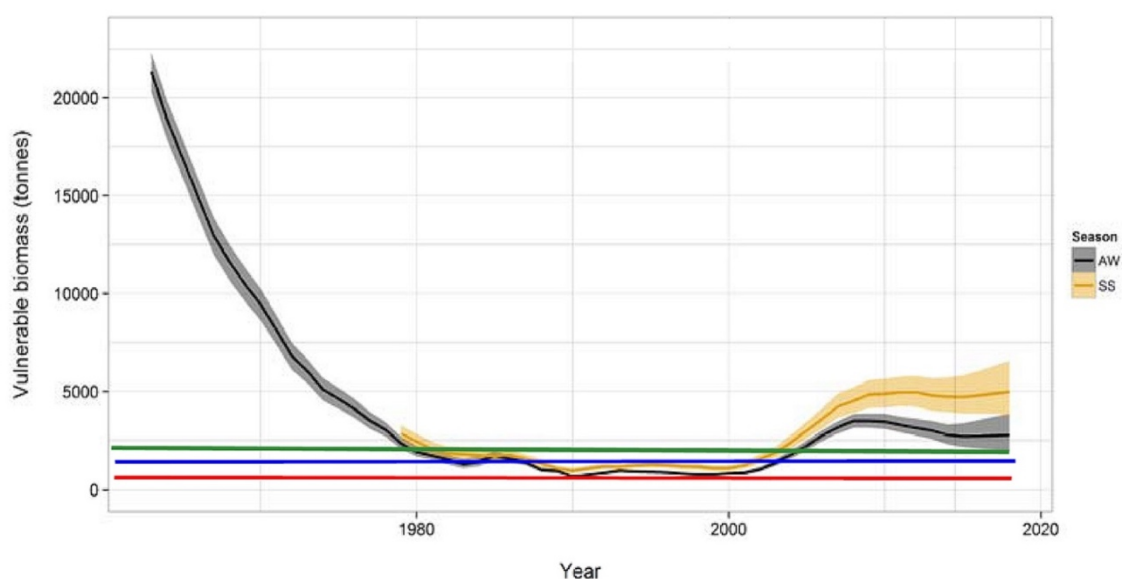


Figure 5: CRA 8 autumn/winter (AW) biomass since 1945 and spring summer (SS) biomass since 1979 estimated in the 2015 stock assessment. The theoretical estimate of the biomass that will support

maximum sustainable yield (B_{MSY} of 1465 tonnes) is the blue line, the lowest biomass observed used as a minimum reference point (B_{min} of 658 tonnes) is the red line and the reference biomass used as a management target is 1983 t, green line.