Fisheries New Zealand
Tini a Tangaroa

Review of sustainability measures for spiny rock lobster (CRA 3) for 2024/25

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Stock being reviewed

Red or Spiny rock lobster[1] / Kōura papatea (CRA 3) – Gisborne

Red or Spiny rock lobster, Crayfish, Kōura papatea
Jasus edwardsii,

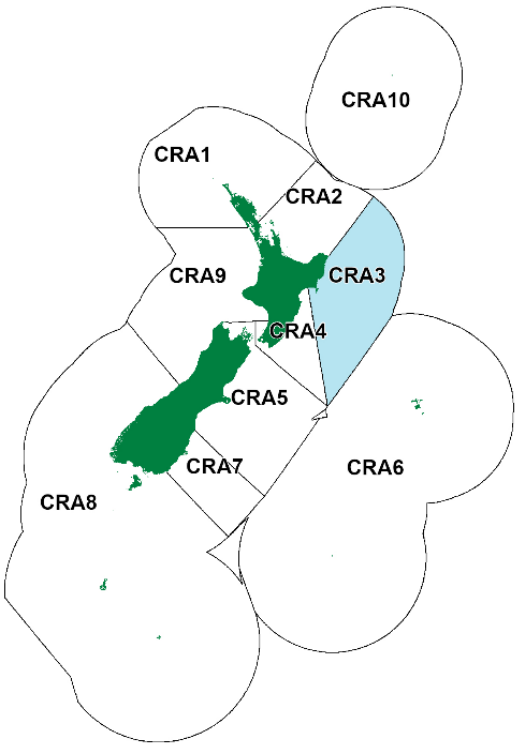

Figure 1: Quota Management Areas (QMAs) for spiny rock lobster, with CRA 3 highlighted.

1 Why are we proposing a review?

1. Fisheries New Zealand (**FNZ**) with input from the National Rock Lobster Management Group (**NRLMG**) is reviewing the sustainability measures for spiny rock lobster in Quota Management Area CRA 3 for the 1 April 2024 fishing year (Figure 1).

2. Spiny rock lobster (*Jasus edwardsii*) supports important shared fisheries. They are a taonga for tāngata whenua, a popular species for recreational fishers to catch, and support valuable export markets, regionally important industries, and employment. They are also ecologically important predators in New Zealand's rocky reef ecosystems, feeding on a wide range of prey.

3. The last Total Allowable Catch (**TAC**) adjustment (a reduction) for CRA 3 was in 2021. This followed the 2020 CRA 3 rapid update assessment that indicated that the spawning biomass[2] of this stock was projected to stay stable or decline slightly over the next couple of years.

4. A rapid update of the 2019 stock assessment at end of the 2022/23 fishing year (31 March 2023) indicated a steady increase in the overall CRA 3 biomass since 2019, but with differing regional trends in biomass to the north and south of Māhia Peninsula. In the north (**Region 1**), the fishable (vulnerable) biomass (which had been below its target level) has increased steadily since 2020, having reached a level well above the management target by March 2023. But in the south (**Region 2**), the vulnerable biomass has declined steadily and significantly since 2012 and is now at or about its target level.

5. Anecdotal reports indicate that some commercial fishers in CRA 3 have experienced significant impacts to their operation following Cyclone Hale in January 2023 and Cyclone Gabrielle in February 2023. The greatest impact of these cyclones has occurred in Region 1, where substantial volumes of terrestrial sediment and woody debris have smothered nearshore reef

[1] Hereafter referred to as spiny rock lobster.
[2] Biomass of sexually mature females.

environments, to the extent that some previously productive fishing grounds are no longer or are barely economically viable.

6. The estimates provided by the 2023 rapid update assessment are no longer considered to be indicative of current stock status, because it is not possible to model the impact of the cyclones given their recent occurrence and the limited data that have become available since that time. It is assumed, however, that the CRA 3 stock may now be below the target vulnerable biomass level as a result of these cyclones, and that damage to the marine environment will also have an impact on levels of juvenile lobster recruitment in the near future.

7. While the extent to which the current biomass in CRA 3 may be below the target level is unknown, these recent extreme weather events will have impacted both the northern and southern CRA 3 regional fisheries in different ways. The impact of the cyclones along the coast of Region 1 will have likely reversed the recent trend in increasing vulnerable biomass. This may lead to a transfer of fishing effort into Region 2, placing further fishing pressure on this already declining component of the CRA 3 stock. As a result of these combined effects, the vulnerable biomass in both areas could potentially decline further to a level below their respective targets in the near future.

8. This review considers if the current TAC setting for CRA 3 is appropriate, and if a reduction is warranted.

9. This review also considers if the CRA 3 recreational daily limit is appropriate, and if an adjustment of this limit could complement any modification on the TAC.

10. FNZ is consulting on options to either maintain or decrease the current TAC of CRA 3 under section 13(2A) of the Fisheries Act 1996 (**the Act**), which specifies that decisions to set or vary the TAC must not be inconsistent with the objective of maintaining the stock at or above or moving the stock towards or above a level that can produce the maximum sustainable yield (**MSY**).[3]

2 Summary of proposed options

11. Four options for a TAC adjustment are proposed for CRA 3, as outlined in Table 1. Two options for modifying the recreational daily limit are also proposed for CRA 3, as outlined in Table 2.

Table 1: Proposed management options (in tonnes) for CRA 3 from 1 April 2024.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Option 1 (*Status quo*)	302	195	20	12	75
Option 2	248 (↓ 54)	156 (↓ 39)	20	12	60 (↓ 15)
Option 3	220 (↓ 82)	136 (↓ 59)	20	12	52 (↓ 23)
Option 4	194 (↓ 108)	117 (↓ 78)	20	12	45 (↓ 30)

Table 2: Proposed recreational daily limit options (in number of rock lobsters) for CRA 3 from 1 April 2024.

	Combined daily limit[4]	Max spiny rock lobster daily limit
Option A *(current settings)*	6	6
Option B	6	3 (↓ 3)

12. FNZ welcomes feedback and submissions on the options proposed, or any alternatives.

[3] Maximum sustainable yield is the largest long-term average catch or yield that can be taken from a stock under prevailing ecological and environmental conditions, and the current selectivity patterns exhibited by fisheries. It is the maximum amount of fishing that a stock can sustain without impairing its renewability through natural growth and reproduction.
[4] Combined daily limit of spiny and packhorse rock lobster.

3 About the stock

3.1 Biology[5]

3.1.1 Distribution and movement

13. Spiny rock lobsters, *Jasus edwardsii*, are distributed around New Zealand and Southern Australia. They are mainly found on reef habitat, though sometimes form aggregations on sand, although their water depth distribution around New Zealand is not well understood.

14. Mating occurs after moulting in autumn and eggs hatch in spring into larvae. Larval development can last 12 to 24 months and occurs far offshore. The amount of larvae that settle onto inshore reefs can vary over time and between regions.

15. Studies have shown that spiny rock lobster larvae that settle in CRA 3 appear to mostly originate from the east coast of the North Island (CRA 2 to CRA 5), due to entrainment in the Wairarapa Eddy, as well as some small contribution from CRA 1 and CRA 9 (Chiswell et al, 2008). However, larvae hatched in one area may be retained in that area by local eddy systems, carried to other areas by currents, or lost to New Zealand entirely.

16. Spiny rock lobsters are generally considered to have low mobility (and hence more vulnerable to habitat disturbance such as increased sedimentation), however they do exhibit some patterns of movement on various spatial and temporal scales. They can move into shallow water seasonally for moulting and mating, and females move to the edges of reefs to spawn their eggs. Some migrations consist of large numbers of rock lobster moving together. Movements of up to 460 km by spiny rock lobster have been recorded. However, spiny rock lobsters generally have high site fidelity with a small home range once settled (i.e., less than 5 km), but they have small-scale seasonal inshore-offshore movement patterns.

3.1.2 Growth, maturity and reproduction

17. While a technique for ageing spiny rock lobsters has not been developed, they are thought to be relatively long-lived. Spiny rock lobster occurs both in New Zealand and southern Australia, where this species (known there as southern rock lobster) is considered to live at least 20 years (Linnane et al., 2021).

18. Sexual maturity in females is reached from 34 to 77 mm tail width (**TW**) depending on locality within New Zealand (Annala et al., 1980). For instance, in CRA 1 (Tauroa Point), 50% maturity appears to be about 55 mm TW, compared with about 60 – 70 mm TW in CRA 7 (Otago) and CRA 8 (Southern).[6]

19. Female spiny rock lobsters produce eggs once a year and can produce between 40,000 and 600,000 eggs in a single reproductive event, with larger females producing more eggs than smaller individuals. Eggs incubate for 3 to 4 months on the underside of the female's tail, held in place by small hairs.

20. Mating takes place after moulting in autumn, and the eggs hatch in spring. Most larval development takes place in oceanic waters tens to hundreds of kilometres offshore for up to 24 months. Near the edge of the continental shelf, the final-stage phyllosoma metamorphoses into the settling stage, the puerulus, which swims to shore. Puerulus settlement takes place mainly at depths less than 20 m, but not uniformly over time or between regions. Settlement indices measured on collectors can fluctuate widely from year to year. The time lag from puerulus settlement to recruitment in the stock assessment models (at 32–34 mm TW) was estimated to be between two and three years, depending on locality, based on an analysis of juvenile growth information from Gisborne Wharf and Stewart Island (Roberts & Webber, 2022).

[5] Information in this section references the FNZ Fisheries Assessment Plenary 2023, except where cited otherwise.
[6] Noting that mature females are absent from catches in CRA 7 and the Southland/Stewart Island statistical areas of CRA 8, and that some of these are likely to move to the CRA 8 Fiordland statistical areas prior to maturity, based on historical tagging data (McKoy, 1983).

3.1.3 Predator-prey interactions

21. Spiny rock lobsters consume a broad range of prey, including molluscs, crustaceans, annelid worms, macroalgae, echinoderms, sponges, bryozoans, fish, foraminifera, and brachiopods. Spiny rock lobsters prefer soft-sediment bivalves over rocky reef prey, and likely make nocturnal foraging movements away from the reef (Flood, 2021). Their feeding rates shift seasonally in relation to moulting and reproductive cycles (Kelly et al., 1999).

22. Spiny rock lobsters also consume sea urchins (*Evechinus chloroticus*), with the consumption of larger urchins limited to large spiny rock lobsters. Spiny rock lobster can have a significant role in mitigating the occurrence of sea urchin (kina) barrens based on research from northern NZ (Doheny et al., 2023).

23. The ecological role spiny rock lobster plays in sea urchin abundance, and hence the occurrence of sea urchin barrens, is discussed further under heading 7.4.2 *'Biological diversity of the aquatic environment'*.

24. Predation on spiny rock lobsters is known from a variety of fish species. Published scientific observations suggest octopus, rig, blue cod, grouper, southern dogfish, seals, and other spiny rock lobsters are predators of spiny rock lobsters.

3.2 Fishery characteristics

25. CRA 3 is a shared fishery, highly valued by customary, commercial, and recreational fishers, and extends from East Cape around the Māhia Peninsula to Wairoa.

26. The TAC was last modified in 2021,[7] where it was reduced from 351.9 tonnes to 302 tonnes (a 14% reduction) based on the results of the 2020 rapid assessment update.[8] Specifically, the Total Allowable Commercial Catch (**TACC**) was reduced from 222.9 tonnes to 195 tonnes (a 13% reduction), the recreational allowance was reduced from 20 tonnes to 12 tonnes, and the allowance for all other mortality caused by fishing was reduced from 89 tonnes to 75 tonnes.

27. Virtually all CRA 3 commercial harvest is by spiny rock lobster targeted potting. In the 2022/23 fishing year, there were 26 commercial vessels operating in CRA 3. Since 2013, the number of commercial vessels targeting spiny rock lobster in CRA 3 has fluctuated between 25 and 31 vessels each year.

3.3 Management background

3.3.1 CRA 3 management background

28. Within New Zealand, spiny rock lobsters are managed within the Quota Management System (**QMS**)[9] using a range of both output controls (catch limits, minimum legal sizes) and input controls (regulations including area and gear restrictions, and daily limits). The fishing year for spiny rock lobster runs from 1 April to 31 March.

29. The overall management approach for spiny rock lobster fisheries is to monitor and manage them to provide for use while ensuring sustainability, per the purpose of the Act. Being able to adapt and respond quickly to changes observed in spiny rock lobster abundance is important because their populations can fluctuate rapidly in response to changes in the environment which can affect recruitment, abundance, and availability. Therefore, the management of spiny rock lobster is slightly different compared to other fish stocks where the use of regular scientific

[7] Review of sustainability measures – 2021 April round.
[8] Rapid assessment updates use new information (such as updated commercial catch information, recreational harvest estimates, length frequency and growth information) to update the most recent full stock assessment model. Results from these rapid updates provide updated estimates of stock status to guide management settings in between full stock assessment years.
[9] For more information about the QMS go to https://www.mpi.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/.

assessments and reviews of spiny rock lobster stocks is necessitated in order to be consistent with the Act.

30. Since 1992, the National Rock Lobster Management Group (**NRLMG**) has assisted with advice on catch limits, regulatory changes, and management actions relating to spiny rock lobster fisheries. The NRLMG is a national-level, multi-stakeholder group comprising representatives of tangata whenua, recreational, and commercial fishing sectors, environmental organisations, and FNZ.

31. The NRLMG's management goal is for all spiny 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, recreational, commercial, and environmental concerns and values."

32. The Rock Lobster Working Group (**RLWG**)[10] agreed that CRA 3 was best evaluated by separating the QMA into two regions defined by the component statistical areas. Specifically, Region 1 encompasses statistical areas 909 (East Cape) and 910 (Gisborne) while Region 2 is the 911 (Māhia) statistical area (see Figure 2).

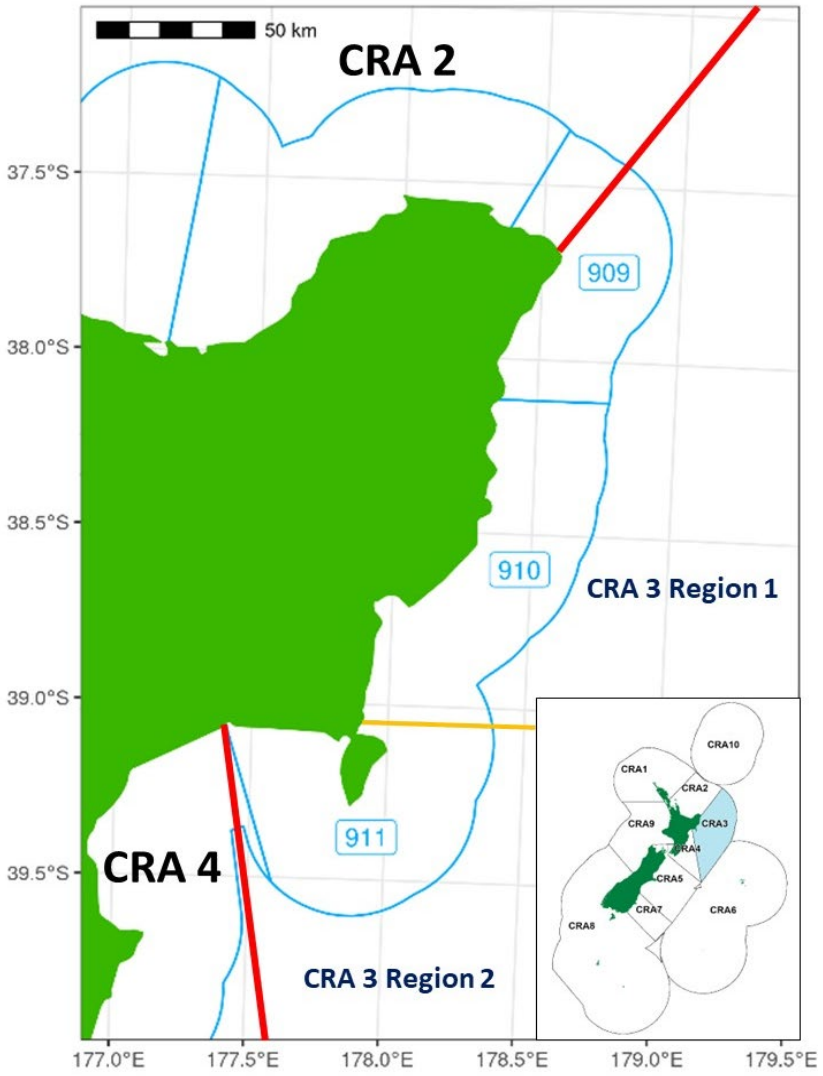

Figure 2: The CRA 3 Quota Management Area, showing statistical areas. Region 1 is statistical areas 909 and 910, Region 2 is statistical area 911.

[10] A Science Working Group convened by FNZ.

33. This regional modelling of CRA 3 was based on an analysis of spiny rock lobster length frequency data within each region, that showed a consistent difference between areas. Length distributions in Region 2 are broader than in Region 1, for most of the compared years, seasons, and by sex.

34. Furthermore, the standardised Catch Per Unit Effort (**CPUE**) trends for the two regions diverged after 2012, with Region 2 remaining flat or increasing slightly and Region 1 decreasing.

3.3.2 Differential minimum legal size (MLS) in CRA 3

35. Commercial operators in Region 1 are currently allowed to land smaller males during winter (at least 52 mm TW during June, July, and August) and have agreed not set their pots in the water between 1 September and 15 January (a voluntary seasonal closure). At other times of year, the commercial MLS is 54 mm TW for males, which is the same as the recreational MLS for male spiny rock lobsters year-round.

36. The differential MLS is closely linked to this agreed voluntary commercial seasonal closure, which means that commercial potting in Region 1 does not occur in the spring/summer period when recreational activity is high.

37. In Region 2, commercial fishers have agreed not to land the smaller males during winter and there is no seasonal voluntary closure. This is because there is a greater proportion of female spiny rock lobsters caught in the Māhia fishery than in the rest of CRA 3. Essentially, Region 2 in Māhia operates as a 54 mm male fishery all year round, the same as other rock lobster fisheries across New Zealand.

38. The differential MLS and the voluntary closure are the remaining parts of a package of measures put in place to address stock depletion in the early 1990s, which also involved substantial catch reductions. There have been several reviews of the CRA 3 differential MLS regime since it was introduced in 1993.

39. FNZ conducted a preliminary review of the CRA 3 differential MLS regime in 2022 to advise the previous Minister for Oceans and Fisheries on potential options for the future of this regime. The review was underpinned by the 2019 CRA 3 stock assessment, which provided the opportunity to assess the effect of different MLS regimes on the CRA 3 fishery and was peer-reviewed by the RLWG. All options considered were projected to have a negligible effect on the CRA 3 stock biomass. After reviewing this work in 2022, the Minister decided to maintain the differential MLS.

40. The differential MLS regime enables commercial fishers to fulfil strong market demand over winter and land lobsters in better condition for export, and it is also strongly linked to the commercial voluntary seasonal closure in northern CRA 3. The seasonal closure reduces competition (and potentially conflict) between commercial and non-commercial fishers over the busy summer season.

4 Status of the stock[11]

4.1 Recent extreme weather events

41. On 12-16 February 2023, Cyclone Gabrielle caused unprecedented damage across parts of the North Island, especially the Gisborne and Hawke's Bay regions. The cyclone produced strong winds and torrential rainfall causing loss of life, significant flooding, and damage to the environment (land and marine). The marine environment experienced significant inflows of fresh water, increased sedimentation, and input of land-based debris. Cyclone Gabrielle's effects have impacted several communities and industries, including fisheries in Fisheries Management Area 2 (**FMA 2**).[12]

[11] For more on how New Zealand fish stocks are assessed, visit https://www.mpi.govt.nz/fishing-aquaculture/fisheries-management/fish-stock-status/.
[12] FMA 2 overlaps the CRA 3 QMA.

42. Since Cyclone Gabrielle, the National Institute of Water and Atmospheric Research (**NIWA**) has conducted three surveys within FMA 2 to understand the immediate impacts of the cyclone.

43. The first two surveys (in April and June 2023) showed that visibility above the seabed was poor at most locations due to the presence of a layer of suspended sediments, particularly at sites less than 50 metres deep. Nearly all substrates, sampled by the sediment multi-corer, were land-derived silty muds, with varying amounts of fine sand. It was apparent that swell waves were likely resuspending fine-grained sediment at shallow sites and winnowing[13] the seabed, as was evident with the poor visibility observed by the survey team.

44. It is expected that the full impact of Cyclone Gabrielle on CRA 3 can only be fully understood in four to five years' time. This creates a significant source of uncertainty for understanding the impact on spiny rock lobster habitat, and in turn the CRA 3 fishery. However, juvenile rock lobsters are highly dependent on rocky habitats for hiding in crevices from predators and so are highly vulnerable to smothering by sediment deposition. It is therefore expected that Cyclone Gabrielle may have impacted CRA 3 recruitment.

45. Prior to Cyclone Gabrielle, the region had also been subject to Cyclone Hale in January 2023 and other significant rain events over the last 5 years, notably in March 2022, June 2021, and July 2020. Collectively these extreme weather events fall within the 2020–2023 La Niña event.[14]

46. The cumulative long-term impacts of these weather events on spiny rock lobster habitat in CRA 3 is unknown. However, there were reliable reports of localised significant mortalities of spiny rock lobsters in the area after Cyclone Hale. The impact of these weather events on the coastal marine environment are likely to have been more significant for statistical areas 909 and 910 (Region 1) than area 911 (Region 2), due to the high river output associated with these areas.

47. Anecdotal evidence from fishers in Region 1 following Cyclone Gabrielle suggests that there has been a decrease in spiny rock lobster catch, despite maintained/increased fishing effort, and pots encountering debris (i.e., wooden sticks). There were also reports of localised sedimentation of the marine environment, such as Tokomaru Bay.

48. In October 2023, NIWA conducted a further survey in FMA 2 on board the research vessel *Kaharoa*, continuing the investigation into the sedimentation impacts on the marine environment.

49. Analysis of the October 2023 survey results is not expected until after December. However, a noted observation from this voyage is that reefs north and south of Waiapu River appear depauperate,[15] likely having been impacted by Cyclone Gabrielle, though the Waiapu River is known to deliver extremely large amounts of sediment outside of extreme weather events. While there is no pre-cyclone data to confirm if this finding is a result of Cyclone Gabrielle, this observation corroborates anecdotal evidence from fishers in the area.

50. Other observations from the October 2023 survey were that kelp forests at shallower depths were observed west of Māhia Peninsula (indicating some resilience to the cyclone) and land derived wood and logs were widespread both on the seabed and on the ocean surface. The evidence of localised areas more impacted than others implies the possibility of localised depletion of spiny rock lobster.

4.2 Stock assessment and monitoring information

51. Full scientific stock assessments of spiny rock lobster stocks are usually carried out every four to five years, except for the data limited CRA 9 stock (Westland/Taranaki).[16] These

[13] Winnowing is the removal of fine material from a coarser sediment by flowing water.
[14] La Niña is an oceanic and atmospheric weather event that is part of the broader El Niño–Southern Oscillation (ENSO) climate pattern.
[15] Lacking in species diversity and abundance.
[16] The small number of fishers in CRA 9 and low fishing pressure means that there is no currently accepted stock assessment for CRA 9. The stock is monitored using commercial catch and biological information from the fishery. The CRA 9 TAC and TACC are the smallest of the nine fished spiny rock lobster stocks.

assessments estimate the status of the stock relative to B_{MSY}[17] and show how the stock has responded to previous management controls, and other influences on abundance and recruitment.

52. Electronic reporting of catch and effort information was implemented in New Zealand's commercial fisheries during 2019. In 2020, the RLWG reviewed the data from the first year of electronic reporting (1 April 2019 to 31 March 2020), by comparing the data with that generated from the previous paper reporting system. The RLWG concluded that CPUE estimated under the new electronic reporting system was likely to differ from CPUE estimated under the paper form system and is not comparable. The reasons for this appear to include data being collected on a different spatial and temporal scale, new reporting codes, and some issues with operators incorrectly interpreting the new reporting requirements. Alternatively, the current electronic reporting regime could be highlighting previously unknown errors that the paper reporting system could have had. The differences in reporting between the two systems are currently being investigated by FNZ.

53. Until April 2020, management procedures were used for most spiny rock lobster stocks (including CRA 3) between full stock assessment years. Management procedures indicate pre-agreed management actions that would be taken in response to changes in CPUE, an indicator of relative spiny rock lobster abundance.

54. The disruption to the time series of CPUE data means that the previously used management procedure for CRA 3 can no longer be implemented, given its reliance on a consistently reported CPUE time series, that has now been interrupted following the introduction of electronic reporting. Rapid updates are being undertaken as an interim annual monitoring measure, and as an alternative to management procedures.

55. The most recent full stock assessment for CRA 3 was conducted in 2019, and the next full stock assessment is due in 2024.

56. Two alternative measures of biomass for the CRA 3 stock have been provided by the 2019 assessment model and subsequent rapid assessment updates. These are for the:

- Spawning Stock Biomass (**SSB**) – sexually mature females only. This includes females that are sexually mature but smaller than the minimum legal size who are not vulnerable to the fishery (i.e., cannot be landed legally).
- Vulnerable Biomass (**VB**) – vulnerable biomass refers to that portion of a stock's biomass that is available to fisheries, i.e., legally harvestable adult spiny rock lobsters, (that are also often referred to as the exploitable biomass). For spiny rock lobsters this is limited to male and female fish above the Minimum Legal Size (**MLS**) at the beginning of the autumn-winter season, excluding berried females.

57. Two alternative measures of stock biomass are required because:

- The Harvest Strategy Standard for New Zealand Fisheries (**HSS**) specifies that the 10% hard limit and 20% soft limit should be determined relative to the SSB of the unfished level; and
- A *MSY* related target can only be calculated from the vulnerable biomass component of the stock, that provides yield from the fishery.

58. Estimates of B_{MSY} are produced by the most recent stock assessment for each rock lobster stock, which inherently reflect the biological and fishery characteristics that are unique to each stock. These B_{MSY} estimates are calculated in a way that is consistent with the requirements of the Act, to maintain stocks at or above a level that can produce the *MSY*, while meeting the risk constraints in the HSS.

59. The 2019 stock assessment was based on two base case models that were used to assess the status of the CRA 3 stock. The use of two base case models reflects the uncertainty associated with growth rate estimates for this stock. The *r1_qdrift* model was only fitted to tag-recapture

[17] The average stock biomass that results from taking an average catch of *MSY* (maximum sustainable yield) under various types of harvest strategies.

data for lobster that had been at liberty for at least 12 months, whereas the alternative *r2_qdrift* model was fitted to all of the available tag-recapture data including short term recaptures, from which slower growth rates were estimated. The RLWG and a subsequent independent review by the Plenary Working Group[18] both supported the use of the two base case models, to inform the management of the CRA 3 fishery. Therefore, the range of results reported for CRA 3 reflects the differing views of stock status provided by these two alternative models.

60. The 2019 assessment showed that biomass had declined steadily from 1997 to 2003 and then increased strongly after 2009, to a peak occurring around 2012. Both models estimated a decline in the vulnerable biomass since 2012, to a level close to the interim vulnerable biomass reference level (B_R). Projections of both these base case models out to 2023 indicated a further decline in stock abundance given 2019 catch levels.

4.3 Summary of the 2023 rapid assessment update

61. A rapid update of the 2019 stock assessment model was conducted for CRA 3 in 2023. Rapid update assessments incorporate updated input data sets, such as revised commercial catch information, recreational harvest estimates, length frequency, and growth information, to inform an up-to-date assessment of current stock status and to potentially guide management settings in between full stock assessment years.

62. The 2023 rapid assessment update for CRA 3 included four years of additional data that have been collected since the 2019 full stock assessment. The reported commercial catch that was taken up until the 2022/23 fishing year (31 March 2023) was also incorporated into this model.

63. The November 2023 Fisheries Assessment Plenary[18] reviewed the rapid update assessments for all rock lobster stocks and noted that as the updates only included data up to March 2023, they do not reflect the impacts of Cyclone Hale and Cyclone Gabrielle (January and February 2023). Therefore, FNZ consider that the 2023 rapid update assessment should not be used to inform the current management of this stock.

64. The CRA 3 rapid assessment update does, however, indicate the state of the stock up until the time that these cyclones occurred. For both of the base case models, the vulnerable biomass in Region 1 has recovered from a period of steady decline between 2013 to 2019, to a level substantially higher that the reference level in 2023. In Region 2, both base case assessment models indicated that the vulnerable biomass had declined steeply since 2014 and was just at or about its reference level in 2023 (see Figure 3).

[18] Fisheries Assessment Plenaries summarise fisheries, biological, environmental, and stock assessment information for NZ's commercial fish species and groups. The Plenaries, which are released annually in May and November (two different versions covering different stocks) provide our best available information on stock status for QMS fish stocks, including rock lobster. FNZ incorporates new research and information into the plenaries on an annual basis. This research and information is reviewed through a 'Plenary Working Group' process (led by FNZ's science team) that includes input from fisheries scientists, subject matter experts and fisheries stakeholders. The 2023 November Fisheries Assessment Plenary is accessible at: https://www.mpi.govt.nz/dmsdocument/60529-Fisheries-Assessment-Plenary-November-2023-Stock-Assessments-and-Stock-Status-Introductory-Section-to-Yellowfin-Tuna.

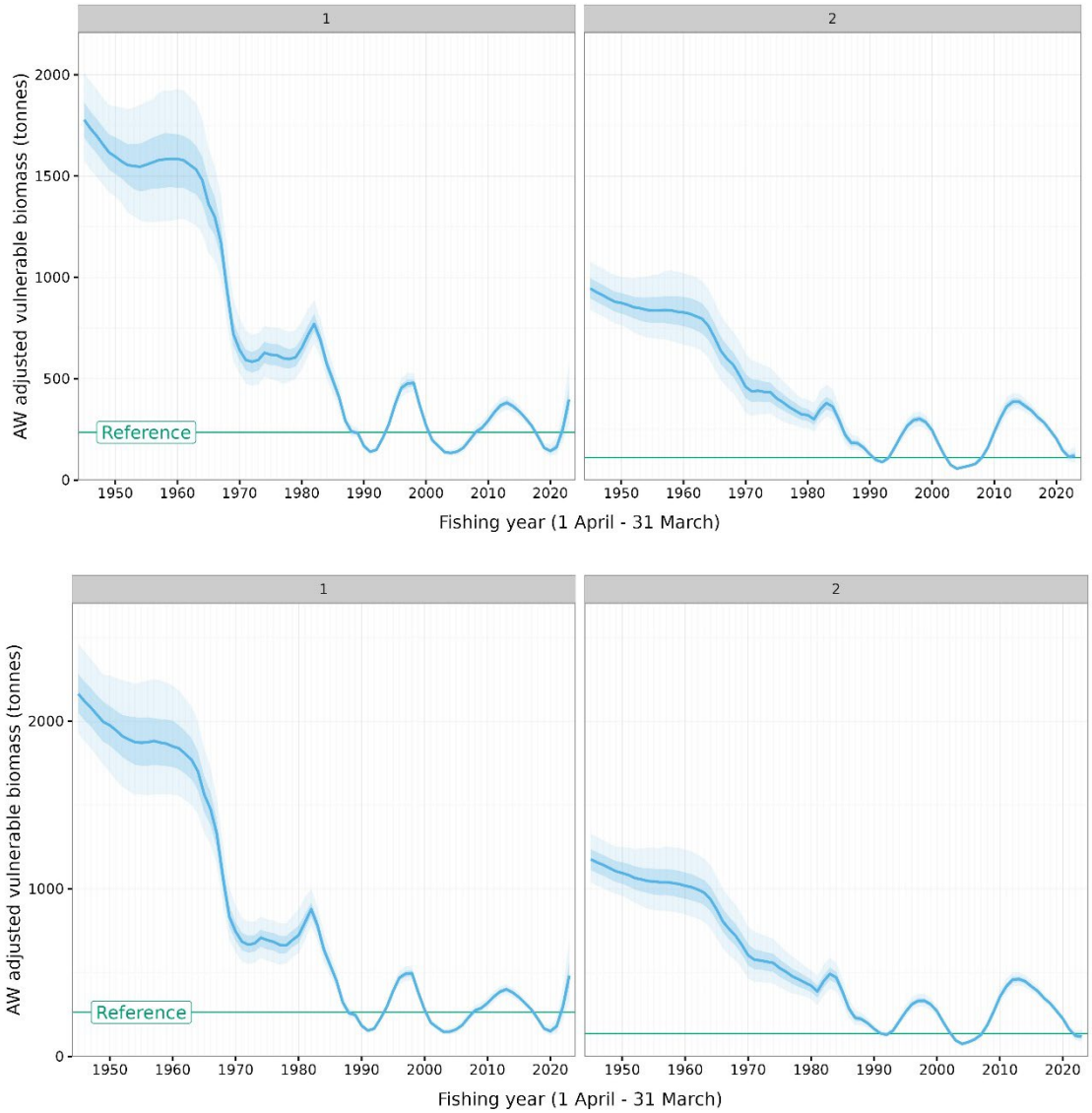

Figure 3: CRA 3 Region 1 (statistical areas 909, East Cape, and 910, Gisborne, combined) and Region 2 (statistical area 911, Māhia) Autumn/Winter adjusted vulnerable biomass levels over time, r1_qdrift base case (top) and r2_qdrift base case (bottom).

65. The rapid update assessment also indicated that, over the last five years up until the cyclones, the intensity of fishing effort had been declining in Region 1 and increasing in Region 2 of CRA 3.

66. The 2023 rapid assessment update estimated that the overall CRA 3 vulnerable biomass was above the reference level up until the cyclones in early 2023; both base case models showed that the vulnerable biomass for CRA 3 was about 50% greater than the reference level.

4.4 Current status of CRA 3 (post-Cyclone Gabrielle)

67. The rapid assessment update estimated that over three-quarters of the CRA 3 vulnerable biomass comes from Region 1 (i.e., the most productive region of the two). As discussed in '*Recent extreme weather events*', cyclone impacts are considered to be more significant in Region 1 due to higher river output.

68. FNZ considers that the CRA 3 biomass (especially in Region 1) may have declined as a direct result of impacts of the cyclones. Furthermore, it is considered highly likely that the amount of available spiny rock lobster habitat may have declined, possibly significantly, which has implications for the environment's ability to support current and future biomass, recruitment, and therefore historic target levels.

69. In light of the declining fishing effort and expected greater cyclone impacts in Region 1, there are concerns that this will lead to a greater shift in fishing effort to Region 2 (that was shown to have the lower proportion of CRA 3 biomass and was on a declining trajectory prior to the cyclones).

70. As well an increasing trend in fishing effort over the last five years there is no closed season for Region 2 (see heading 3 '*Management background*'). This means there is less constraint on fishing effort in Region 2 when compared to Region 1.

71. FNZ considers the rapid assessment model will no longer have any predictive power about current or near future stock status in the short term, because it is considered that the cyclones will have had a substantive impact on the productivity and dynamics of the CRA 3 stock. The status of the CRA 3 stock cannot be estimated therefore, relative to the vulnerable biomass target reference level, despite concerns that it may now be below that level.

72. For stocks in which the MSY is not able to be reliably estimated using the best available information, section 13(2A) of the Act specifies that decisions to set or vary the TAC must not be inconsistent with the objective of maintaining the stock at or above or moving the stock towards or above a level that can produce the MSY. As the status of the stock relative to BMSY is uncertain for CRA 3, a precautionary approach is proposed to set the TAC.

5 Catch information and current settings within the TAC

5.1 Commercial

73. Annual landings and the TACC for CRA 3 since 1990 are shown in Figure 4.

74. In 2003 and 2004, the CRA 3 TACC was substantially under-caught because of voluntary Annual Catch Entitlement (**ACE**) shelving [19] by the CRA 3 industry, which was informed by a management procedure. Between 2009 and 2019 formally adopted CRA 3 management procedures were used to annually review the TACC to ensure that catches reflected available abundance. The COVID-19 pandemic, particularly the effective closure of the Chinese market for a period coupled with low prices for exports, contributed to an under-catch in all spiny rock lobster fisheries (including CRA 3) TACC in 2019/20.

75. For the 2022/23 fishing year CRA 3 landings were reported as 157.6 tonnes, 37.4 tonnes (19%) under-caught against the current TACC. Over the last 5 years, the average under catch against the TACC for each year has been 25 tonnes, which is 13% of the current TACC.

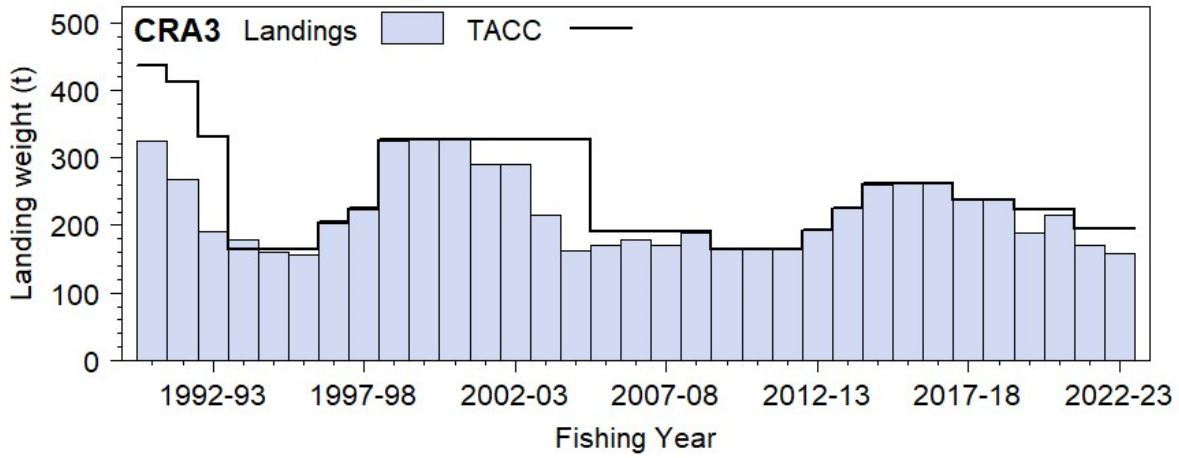

Figure 4: CRA 3 commercial landings and the TACCs from 1990 to 2022.

[19] ACE shelving is a formal agreement among quota owners in a stock to forgo harvesting a specified proportion of the TACC by each transferring an agreed proportion of their ACE to a separate account.

76. Since 2018 there has been a decline in fishing effort within Region 1 of CRA 3 (Figure 5), with the sharpest decline in 2019. In 2018/19 fishing year there were 148,503 pot lifts recorded while in 2019/20 fishing year there were 88,722 pot lifts (a 40% decline). There has been a small increase in subsequent years, with 99,711 pot lifts recorded in the 2022/23 fishing year, however, this is still a 33% decline from 2018/19 pot lift levels.

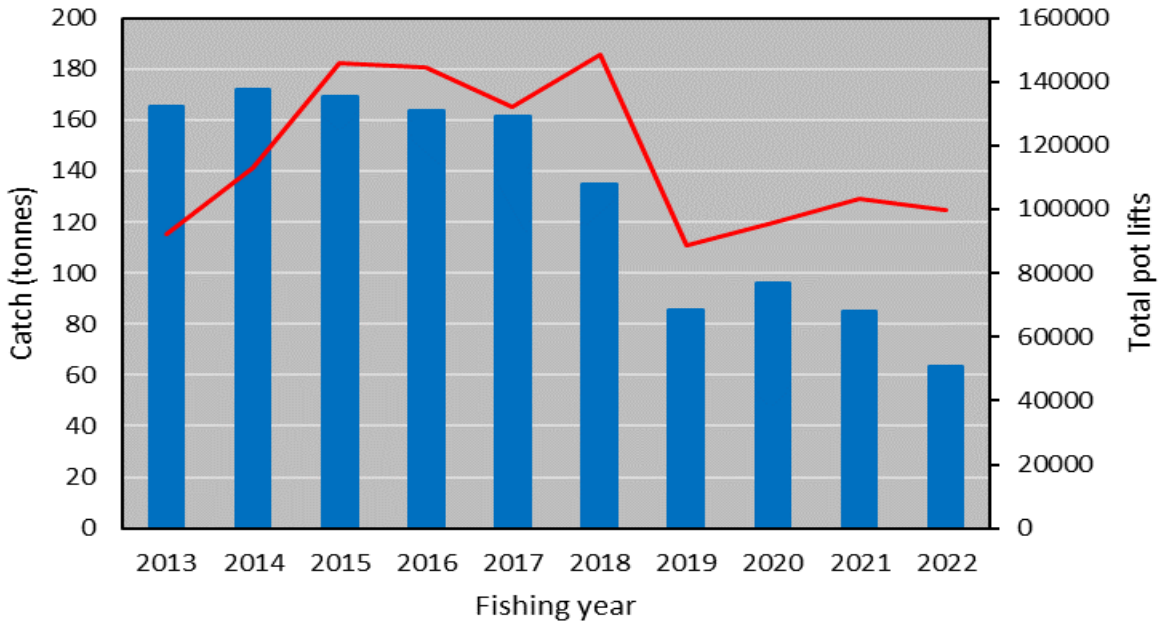

Figure 5: Region 1 (statistical areas 909, East Cape, and 910, Gisborne, combined) spiny rock lobster catch and effort over the last decade for spiny rock lobsters targeted by rock lobster potting. The blue bars are catch and the red line is the trend in total pot lifts.

77. Since 2018 there has been a sharp increase in fishing effort within Region 2 of CRA 3 (Figure 6). In the 2018/19 fishing year 39,412 pot lifts were recorded, and having followed an upwards trend, there were 85,701 potting events recorded in the 2022/23 fishing year (an increase of 117% over the last 5 years).

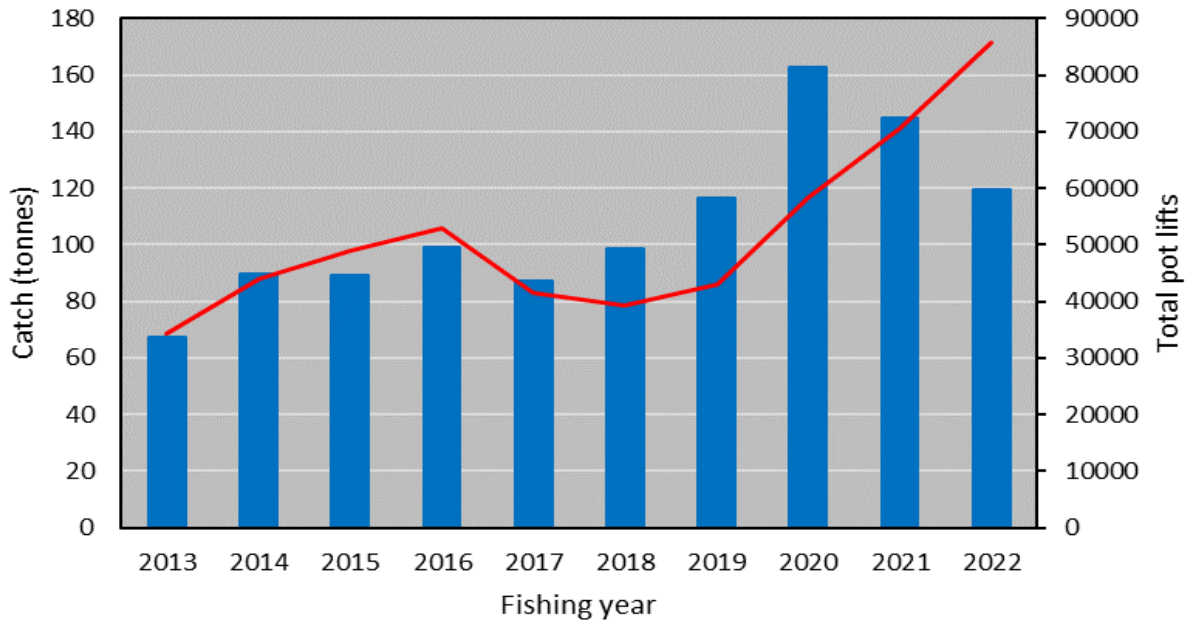

Figure 6: Region 2 (statistical area 911, Māhia) spiny rock lobster catch and effort over the last decade for spiny rock lobsters targeted by rock lobster potting. The blue bars are catch and the red line is the trend in total pot lifts.

5.2 Customary Māori

78. CRA 3 customary catch is provided for by the Fisheries (Kaimoana Customary Fishing) Regulations 1998, and regulations 50-52 of the Fisheries (Amateur Fishing) Regulations 2013 (**Amateur Regulations**).

79. In the last five years, 3,929 unspecified units[20] of spiny rock lobster were reported as customary harvest from CRA 3 on average each year. This information is considered incomplete, because customary take that occurs under the Amateur Regulations for the purposes of hui and tangi is not required to be reported.

80. An estimate of 20 tonnes was used in the 2019 CRA 3 stock assessment model to represent customary catches, and the current customary allowance is 20 tonnes.

81. It appears that the customary allowance for CRA 3 is appropriate. However, FNZ welcomes input from tangata whenua to inform advice on this allowance.

5.3 Recreational

82. Relevant sources of information for estimating recreational catch include the results of National Panel Surveys and creel surveys,[21] the model estimate from the most recent stock assessment and estimates from the more recent rapid update.

83. 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 abundance, estimated from trends in spring-summer commercial CPUE (Figure 7).

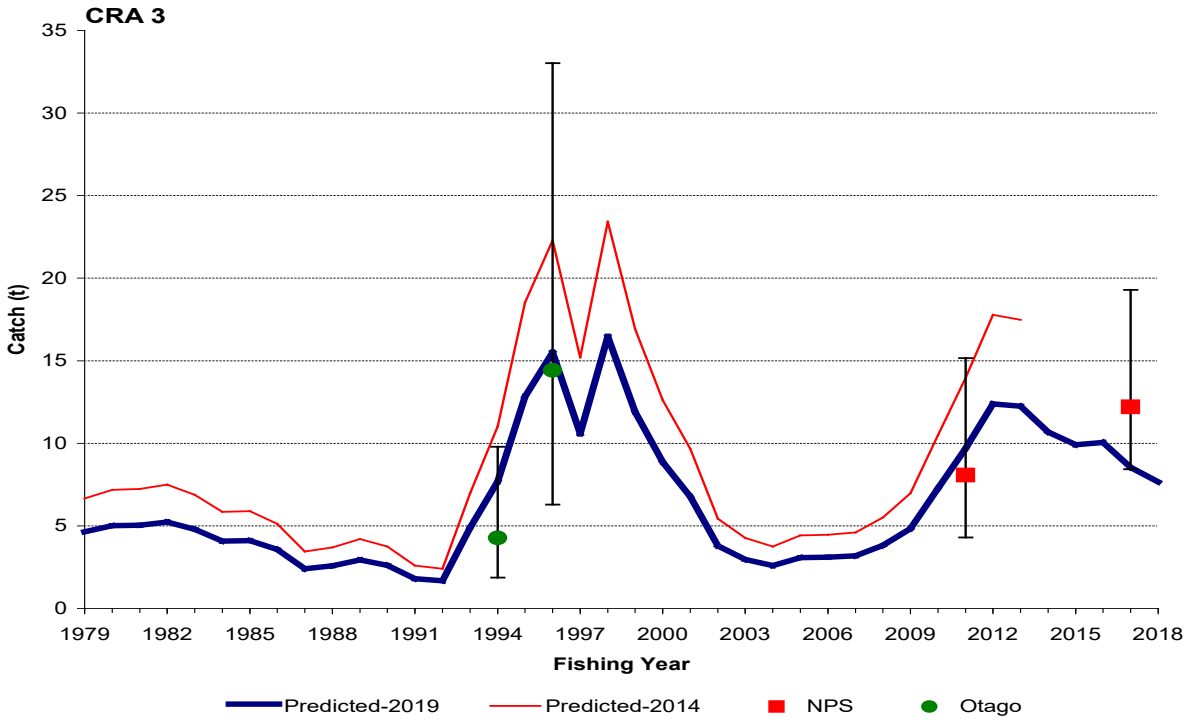

Figure 7: CRA 3 recreational catch trajectory for the 2019 CRA 3 stock assessment (error bars are ±2 standard errors).

[20] Customary harvest of rock lobster is usually reported as kilograms or number of individuals. However, in some cases (such as in CRA 3) the unit used is not specified.
[21] Creel surveys involve interviewing fishers, asking how many fish were caught, and measuring any fish caught.

84. The 2017/18 National Panel Survey estimate of CRA 3 recreational catch was 12.2 tonnes (CV[22] of 0.26).

85. The 2023 CRA 3 rapid assessment update modelled recreational catch at 11.80 tonnes, within the current recreational allowance for CRA 3 of 12 tonnes.

86. Within CRA 3 there is a recreational daily bag limit of 6 rock lobsters. Spiny rock lobsters are subject to a recreational MLS of 54 mm TW for male spiny rock lobsters and 60 mm TW for female spiny rock lobsters.

87. Potting and hand gathering by diving are the predominant methods for recreational spiny rock lobster harvest.

88. Most (59%) fishing trips for spiny rock lobster result in three or fewer individuals being caught.

89. Commercial fishers can take home spiny rock lobsters for personal use with approval under section 111 of the Act. These lobsters must be declared on landing forms using the destination code 'F'. Table 3 outlines the reported section 111 landings between 2018 and 2023.

Table 3: CRA 3 Section 111 commercial landings of spiny rock lobster (in tonnes, summed from landing destination code 'F') by fishing year. Note that with electronic reporting of catch and effort information being implemented in New Zealand's commercial fisheries during 2019, there is uncertainty in the reporting of section 111 landings after this date (discussed further under '*Stock assessment and monitoring information*').

Fishing year	Tonnes
2018/19	2.9
2019/20	3.1
2020/21	3.5
2021/22	3.1
2022/23	2.3

90. The National Panel Survey was run for the October 2022/23 fishing year that, once analysed, will provide updated estimates of recreational harvest of spiny rock lobster in CRA 3. While this may provide up to date recreational harvest figures, this may have been impacted by the cyclones in early 2023.

5.4 Other sources of mortality caused by fishing

91. Other sources of mortality caused by fishing in CRA 3 include illegal catch, handling mortality caused by the return of under-sized lobsters, berried female lobsters, and high-grading[23], as well as predation on lobsters by octopus and other predators within pots.

92. In the 2019 stock assessment, the RLWG agreed to use a fixed percentage of 20% of the total commercial catch each year from 1981 to 2018 to represent illegal take (Figure 8). 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 take, although uncertain, was assumed from 1981 (Figure 8, 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, while uncertain, the illegal catch estimate assumed for the model was approximately 61 tonnes.

[22] The coefficient of variation (**CV**) measures the extent of variability in relation to the mean (it is the ratio of the standard deviation to the mean).

[23] High-grading is the practice of selectively harvesting fish so that only the best quality fish are landed to achieve the highest economic return. This means that some spiny rock lobster which would be legal to land are returned to the water to maximise the value of spiny rock lobster that are landed.

93. The 2019 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 2018/19.

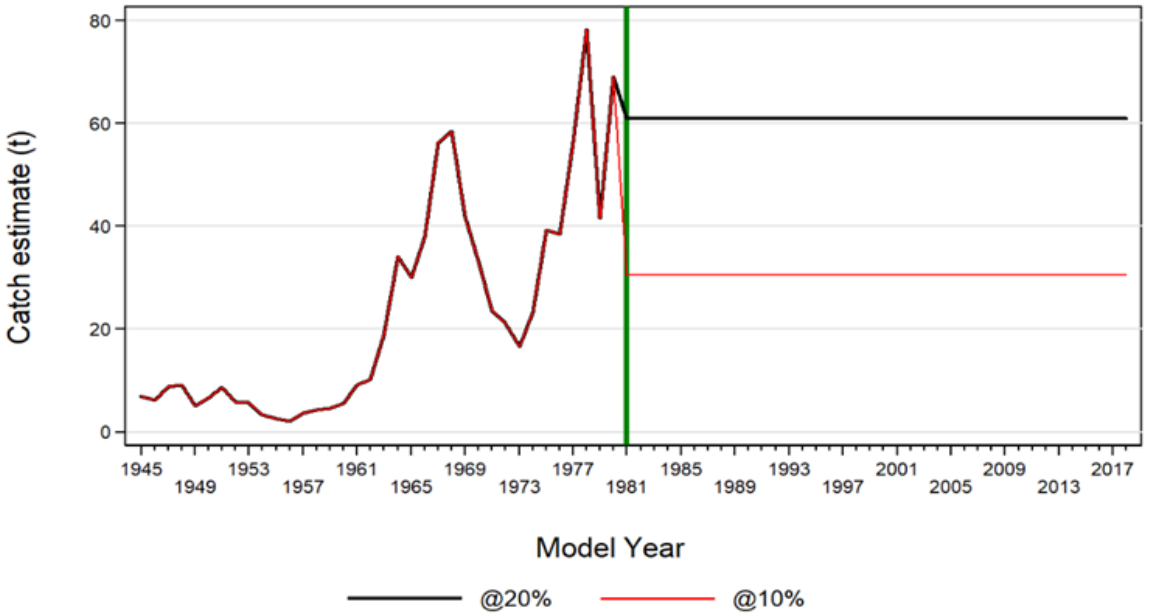

Figure 8: CRA 3 illegal catch trajectory for the 2019 CRA 3 stock assessment.[24]

94. The 2023 CRA 3 rapid assessment update modelled illegal catch at 59.9 tonnes. The *r1_qdrift* calculated the handling mortality median value at 14.3 tonnes and the *r2_qdrift* calculated the handling mortality median value at 13.3 tonnes; 13.8 is the average of these two calculations. This suggests that the 'other sources of mortality caused by fishing' in CRA 3 is 74 tonnes.

6 Treaty of Waitangi obligations as set in legislation

95. Section 5(b) of the Act requires that the Act be interpreted, and that people making decisions under the Act will act, in a manner that is consistent with the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (**the Settlement Act**). The Settlement Act provides that non-commercial customary fishing rights continue to be subject to the Principles of the Treaty of Waitangi and give rise to Treaty obligations on the Crown.

96. Section 10 of the Settlement Act requires the Minister to develop policies and programmes to recognise the use and management practices of tangata whenua. The Minister must also recommend the making of customary fishing regulations under section 186 of the Fisheries Act to recognise and provide for customary food gathering by Māori and the special relationship between tangata whenua and those places of customary food gathering importance. Consistent with this section, FNZ has worked with iwi to develop the Fisheries (South Island Customary Fishing) Regulations 1999 and the Fisheries (Kaimoana Customary Fishing) Regulations 1998 to manage the activity of customary fishing.

97. FNZ has also consulted with tangata whenua to develop policies on the best way to establish engagement processes that enable iwi to work together to reach a consensus where possible and to inform the Ministry on how tangata whenua wish to exercise kaitiakitanga in respect of fish stocks in which they share rights and interests and how those rights and interests may be affected by sustainability measures proposed by FNZ. These policies support the requirements under section 12 of the Fisheries Act to provide for the input and participation of tangata whenua into sustainability process and to inform the Minister on how tangata whenua exercise kaitiakitanga.

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

6.1 Input and participation of tangata whenua

98. Section 12 (1)(b) of the Act requires that before undertaking any sustainability process the Minister shall provide for the input and participation of tangata whenua who have a non-commercial interest in the stock or an interest in the effects of fishing on the aquatic environment in the area concerned. In considering the views of tangata whenua, the Minister is required to have particular regard to kaitiakitanga.[25]

99. Input and participation of tangata whenua into the sustainability decision-making process is provided mainly through Iwi Fisheries Forums, which have been established for that purpose. Each Iwi Fisheries Forum can develop an Iwi Fisheries Forum Plan that describes how the iwi in the Forum exercise kaitiakitanga over the fisheries of importance to them, and their objectives for the management of their interest in fisheries. Iwi Fisheries Forums may also be used as entities to consult iwi with an interest in fisheries.[26]

100. The CRA 3 QMA is relevant to the rohe of the Ngāti Porou and Mai Paritu tae atu ki Turakirae Iwi Fisheries Forums.

101. In November 2023, the Mai Paritu tae atu ki Turakirae Iwi Fisheries Forums were supplied with a longlist of stocks being considered for review for the April 2024/25 sustainability round, including CRA 3. No specific feedback for CRA 3 was received.

102. FNZ will undertake further engagement with Iwi Fisheries Forums during consultation to seek input on the options outlined in this proposal and how tangata whenua exercise kaitiakitanga and what the Minister must consider to have particular regard to kaitiakitanga. This process will be mainly through engagement with Iwi Fisheries Forums, as previously agreed with tangata whenua. However, FNZ welcomes any input and submissions from tangata whenua on these options.

6.2 Kaitiakitanga

103. Information provided by forums, and iwi views on the management of fisheries resources and fish stocks, as set out in Iwi Fisheries Plans, are ways that tangata whenua can exercise kaitiakitanga in respect of fish stocks.

104. There is no Fisheries Plan for Ngāti Porou, and the Fisheries Plan for Mai Paritu tae atu ki Turakirae is currently being developed.

105. Currently within the Ngāti Porou Iwi Fisheries Forum there are nine completed hapū plans that are awaiting sign off by the relevant hapū management unit. FNZ invites hapū to provide their views on this review of sustainability measures for CRA 3, and provide copies of the approved plans.

106. Spiny rock lobster is considered taonga by Ngāti Porou and Mai Paritu tae atu ki Turakirae.

107. FNZ is seeking input from tangata whenua on how the proposed options for CRA 3 may or may not provide for kaitiakitanga as exercised by tangata whenua, and how tangata whenua consider the proposal may affect their rights and interests in this stock.

6.3 Mātaitai reserves and other customary management tools

108. When setting or varying any TACC under section 21(4) of the Act and allowing for Māori customary non-commercial interests, the Minister must take into account any gazetted mātaitai reserves and fishing method restrictions or prohibitions in the relevant quota management area.

[25] The Fisheries 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.

[26] However, FNZ also engages directly with Iwi (outside of Forums) on matters that affect their fisheries interests in their takiwa (district) and consults with any affected Mandated Iwi Organisations and Iwi Governance Entities where needed.

109. There are four mātaitai reserves and two section 186A temporary closures within CRA 3 (Table 4).

Table 4: Customary fisheries management areas in CRA 3.

Customary area	Management type
Hakihea Mātaitai Horokaka Mātaitai Toka Tamure Mātaitai Te Hoe Mātaitai	**Mātaitai reserve** Commercial fishing is not permitted within mātaitai reserves unless regulations state otherwise.
Tangoiro/Waihirere closure area Motuoroi closure area	**Temporary closures** Section 186A temporary closures are used to restrict or prohibit fishing of any species of fish, aquatic life or seaweed or the use of any fishing method.

110. Within the Te Hoe Mātaitai Reserve the taking of spiny rock lobster is prohibited, within the Toka Tāmure Mātaitai Reserve spiny rock lobster are subject to a daily limit of three fish, and within the Horokaka Mātaitai Reserve spiny rock lobster are subject to a seasonal closure between 1 May and 30 September as well as a daily limit of three fish when the season is open.

111. As the proposed options intend to either maintain or decrease fishing effort in CRA 3, it is not anticipated that the options proposed would negatively impact the availability of spiny rock lobster in these areas. However, any positive impacts are unknown.

7 Environmental and sustainability considerations under the Act

7.1 Overview

112. The TAC change proposed for CRA 3 would be made under section 13 of the Act. This is a sustainability measure. Before setting or varying a sustainability measure, the Minister must adhere to section 11 of the Act. When making a decision the Minister must also act consistently with the requirements in section 5, and sections 8-10 (Purpose and Principles of the Act).

113. The requirements and details of each of these sections are set out below, in the following order:

a) Section 5 (Application of international obligations and Treaty of Waitangi (Fisheries Claims) Settlement Act 1992);

b) Section 8 (Purpose);

c) Section 9 (Environmental principles);

d) Section 11 (Sustainability measures);

e) Section 13 (Setting a Total Allowable Catch); and

f) Section 10 (Information principles).

7.2 Application of international obligations and the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 – section 5 of the Act

114. The Minister must act in a manner consistent with both the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 and New Zealand's international obligations relating to fishing. Discussion of these relevant obligations is provided in the *Overview of legislative requirements and other considerations* document available on our website (https://www.mpi.govt.nz/dmsdocument/60415).

7.3 Purpose of the Act – section 8 of the Act

115. The Act's purpose is to "provide for the utilisation of fisheries resources while ensuring sustainability." Guidance on the meaning of section 8 and how it should be applied for decision making (for all the stocks being reviewed as part of this round) is provided in the *Overview of legislative requirements and other considerations* document available on our website (https://www.mpi.govt.nz/dmsdocument/60415).

7.4 Environmental principles – section 9 of the Act

116. The environmental principles that must be taken into account when considering sustainability measures for CRA 3 are as follows:

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

117. It is important to note that in some cases FNZ has made assumptions about environmental interactions based on fisher reported data that may not have been independently verified (for example, by an on-board FNZ observer).

118. Over the past five years there has been no observer coverage in CRA 3. Given this, there is increased uncertainty associated with estimates of environmental interactions in the fishery.

7.4.1 Associated or dependent species – section 9(a)

119. Associated or dependent species include marine mammals, seabirds, fish, and invertebrate species caught as bycatch in the spiny rock lobster fishery, as well as any non-harvested species taken or otherwise affected by the taking of any harvested species.

120. The removal of predators (particularly large predators) through fishing, contributes to kina barren formation with negative impacts on biodiversity and ecosystem health (Taylor & Schiel, 2010; MacDiamid et al., 2013; Udy et al., 2019). The full extent of this impact is unknown (including on associated and dependent species), but it is expected that a shift from productive kelp forests to kina barrens will result in reduced primary production and biodiversity. In CRA 3, studies on kina barrens are limited but are known to occur (refer to heading 7.4.2 '*Biological diversity of the aquatic environment'* below).

Protected species interactions

121. In New Zealand waters, marine mammal entanglements with pot fishing gear have been documented since 1980. A recent study on cetacean interactions with potting fisheries (Pierre et al., 2022) found that from 1980 to the present, 1-2 entanglement events of cetaceans per year were reported on average. However more recently, from 2010-2020, an average of 4-5 entanglement events per year have been recorded.

122. Nationally, the most recorded entanglements over time have involved humpback whales, followed by orca. Within the CRA 3 fishery no mammal interactions have been reported with pot or trapping gear.

123. Methods to reduce impacts on cetaceans from interactions and entanglements with pot and trap fishing gear include modified fishing practices, spatial/temporal management, and active untangling of entrapped cetaceans. Actively untangling is the main documented response to addressing entanglements in New Zealand to date.

124. Guidance for commercial pot fishers has been distributed by the New Zealand Rock Lobster Industry Council (**NZRLIC**). This guidance includes proactive approaches to reduce the risk of cetacean entanglements with fishing gear, providing information on whale identification, best practice approaches to mitigation and reporting requirements.

125. Management of seabird interactions with New Zealand's commercial fisheries is guided by the National Plan of Action – Seabirds 2020 (**NPOA-Seabirds**). The NPOA-Seabirds sets out the New Zealand government's commitment to reducing fishing-related captures and associated mortality of seabirds. The vision of the NPOA-Seabirds is that New Zealanders work towards zero fishing-related seabird mortalities.

126. Management actions and research under the NPOA-Seabirds are guided and prioritised based on the seabird risk assessment that breaks down the risks to seabird population by fishery groups. The most recent seabird risk assessment was published in 2023.[27]

127. There have been no reported interactions with seabirds in CRA 3 fishery in the last 10 years. This is likely due to the primary method being potting, with pots usually set too deep for seabirds to enter.

Fish and invertebrate bycatch

128. When spiny rock lobster was targeted in CRA 3 from the 2013/14 to 2022/23 fishing years, the most frequently reported incidental species caught in the CRA 3 target fishery were octopus, carpet shark, conger eel, and blue cod. Many of these were released alive.

129. Blue cod in FMA 2 (BCO 2), that overlaps the CRA 3 QMA, is managed under the QMS and there are presently no sustainability concerns with this stock.

7.4.2 Biological diversity of the aquatic environment – section 9(b)

130. Any benthic impacts from fishing are an important consideration in relation to this principle, along with the impact fishing has on kelp distribution, given its critical role in coastal and marine environments.

Benthic impacts

131. Potting is the main method of targeting spiny rock lobster commercially and is assumed to have very little direct effect on non-target species. FNZ is not aware of any information that exists regarding the benthic effects of potting in New Zealand.

132. A study on the effects of lobster pots on the benthic environment was completed in a report on the South Australian rock lobster fisheries (Casement & Svane, 1999). This fishery is likely to be the most comparable to New Zealand because the lobster species is the same (*Jasus edwardsii*) and many of the same species are present, although pots and how they are fished may differ. The report concluded that the amount of algae removed by pots (due to entanglement) probably has no ecological significance.

133. Fishing for rock lobster can indirectly impact biological diversity of the aquatic environment because of the relationship between abundance and size distribution of rock lobster and the abundance of kina (which graze on kelp).

134. As outlined in the Aquatic Environment and Biodiversity Annual Review 2021 (**AEBAR**),[28] kelp provides a wide and diverse range of ecosystem services, including:

    a) Providing important settlement, nursery, shelter, and refuge habitats for a wide range of coastal and inshore shellfish and finfish species, including for spiny rock lobster;

    b) Providing food for invertebrates, shellfish, finfish, and seabird species, which in turn supports a variety of important commercial and non-commercial fisheries resources;

    c) Modifying wave and tidal action and influencing coastal physical processes such as erosion, sedimentation, and turbidity;

[27] Update to the risk assessment for New Zealand seabirds 2023.
[28] https://www.mpi.govt.nz/dmsdocument/51472-Aquatic-Environment-and-Biodiversity-Annual-Review-AEBAR-2021-Asummary-of-environmental-interactions-between-the-seafood-sector-and-the-aquatic-environment

d) Driving primary production and energy and nutrient recycling that contribute to other near-shore systems including sandy beaches and deepwater ecosystems.

135. It is important to note that kelp is indirectly affected by fishing for spiny rock lobster. Removal of spiny rock lobster reduces predation on kina, which graze on kelp, though the threshold of spiny rock lobster abundance that will result in the formation of kina barrens is unknown (also noting there are other reef-based predators that predate on kina). Under reduced predation, kina can increase in abundance and over graze kelp, resulting in reef habitat devoid of macroalgae, known as kina barrens.[29] Kelp forests are an important habitat and food source for many rocky reef dwelling species. Therefore, in making a decision, the Minister must give consideration to the indirect impacts of spiny rock lobster fishing on species that directly rely on kelp (this is also relevant to section 9(a) of the Act - associated or dependent species should be maintained above a level that ensures their long-term viability).

136. Kelp habitats are likely to be important for a range of harvested and non-harvested species, and any reduction in such habitats is therefore likely to be adverse to spiny rock lobster and other species that rely on kelp for shelter or food (Dayton, 1985).

137. Fishing-induced trophic cascades, kelp grazers (e.g., butterfish, Shears et al., 2008), and other impacts on the ecosystem due to fishing, sedimentation and climate change can have long term impacts on kelp abundance and distribution. In turn, this could potentially negatively impact the suitability of rocky reef habitat for juvenile and adult spiny rock lobsters as a refuge for settlement, as well as the availability of their prey species (Stanley et al., 2015).

138. There is no published literature on the role of fishing in the development or distribution of kina barrens in CRA 3. However, data from a modelling study of the Te Tapuwae o Rongokako Marine Reserve (16km north of Gisborne) indicates that kina barrens do occur. The areas in this study classified as kina barrens were areas of reef with only coralline turf or crustose coralline algae, and their occurrence was attributed to silt deposition or sand scour (Pinkerton et al., 2008). A Sustainable Seas project 'Huataukina o hapū e! Prosperous moana; prosperous people' also noted that kina barrens were increasingly problematic in the Gisborne Region.

7.4.3 Habitats of particular significance for fisheries management – section 9(c)

139. Specific habitats of particular significance for fisheries management for CRA 3 have not been identified, however certain features of rocky habitats important for spiny rock lobster are discussed in Table 5.

140. In 2022 FNZ consulted on guidance for defining, identifying, and managing habitats of particular significance for fisheries management and for how FNZ considers that these habitats should be protected when preparing fisheries management advice.[30] This part of the Act was also noted in the Prime Minister's Chief Science Advisor's report titled *The Future of Commercial Fishing in Aotearoa New Zealand* (March 2021).[31]

Table 5: Summary of information on potential habitats of particular significance for fisheries management for CRA 3.

Fish stock	CRA 3
Potential habitat of particular significance	• No specific habitats of particular significance have been identified for CRA 3. <u>Larvae:</u> • Spiny rock lobsters have high fecundity and an extensive pelagic larval stage of up to two years, which results in larval dispersal over wide areas by ocean currents. • During this pelagic phase, larvae are dispersed in the open ocean and carried by currents. The open ocean environment (direction and temperature) is important during this stage of

[29] A kina barren is defined as a reef that has a high abundance of kina, area where kina densities is greater than two individual kina per one squared metre (Shears & Babcock, 2003; Leleu et al., 2012).
[30] The habitat of particular significance for fisheries management consultation material is available here: https://www.mpi.govt.nz/consultations/guidance-for-identifying-a-habitat-of-particular-significance-for-fisheries-management/
[31] Accessible at: https://www.pmcsa.ac.nz/topics/fish/.

Fish stock	CRA 3
	spiny rock lobster development (noting the importance of the Wairarapa Eddy on larval disbursement in CRA 3). <u>Juveniles</u> • After the pelagic larval phase, larvae metamorphose into the post larval puerulus stage and settle on coastal shelf rocky reefs. • Puerulus and juvenile spiny rock lobsters preferentially inhabit holes and crevices in hard substrates where light levels are low. • Evidence from Australia that kelp habitat is important for spiny rock lobster settlement. However, the relationship for New Zealand spiny rock lobster has not yet been scientifically tested. <u>Adults:</u> • Adult spiny rock lobsters are found in reef habitats up to depths of 200 m, where they inhabit crevices, caves, and rocky overhangs. • Macroalgae (kelp) provides food and shelter to adult spiny rock lobster and habitat for other prey sources. • Soft sediment habitats including sand flats near to rocky reefs support bivalves, a preferred food source for adult rock lobster. • Spiny rock lobsters are also known to forage for bivalves on sand flats surrounding reefs, usually nocturnally.
Attributes of habitat	• Coastal shelf, up to depths of 200m • Complex rocky habitats (crevices, caves, rocky overhangs). • Low light levels (juveniles). • Presence of macroalgae increases structural complexity. • Sand flats, horse mussel beds, and low-lying reef are important for short distance migration and for nocturnal feeding.
Reasons for particular significance	• Complex rocky habitats provide critical habitats for spiny rock lobsters, including: o Settlement substrata for juveniles. o Shelter and refuge from predation. o Feeding opportunities.
Risks/threats	• Land use can impact coastal reef habitats, including through sedimentation and eutrophication. • Climate change o In the long-term oceanographic circulation patterns (currents, gyres, eddies) could be impacted by climate change, and changes in seawater temperature and predation may affect survival and settlement of spiny rock lobster larvae (Garcia-Echauri et al., 2020). o Seawater temperature change is known to affect complex coastal reef habitat (such as kelp) of spiny rock lobster, which has the potential to inhibit larval settlement, and the survival of juvenile and adult spiny rock lobster (through loss of habitat and food source).
Existing protection measures	o Several mātaitai reserves and two section 186A temporary closures (discussed in *Mātaitai reserves and other customary management tools*). o The National Policy Statement on Freshwater Management and the National Environmental Standards for Freshwater, which came into effect on 3 September 2020, should lead to improved water quality in shallow harbours and estuaries and other shallower inshore waters. o The FNZ Coastal Planning Team engages with the RMA coastal planning processes to support marine management decisions to manage land-based impacts on habitat of particular significance for fisheries management.

Fish stock	CRA 3
Evidence	• García-Echauri, L., Liggins, G., Cetina-Heredia, P., Roughan, M., Coleman, M. A. & Jeffs, A. 2020. Future ocean temperature impacting the survival prospects of post-larval spiny lobsters. Marine Environment Research, 156, 104918. • Hinojosa, I. A., Gardner, C., Green, B. S., Jeffs, A., Leon, R. & Linnane, A. 2016. Differing environmental drivers of settlement across the range of southern rock lobster (*Jasus edwardsii*) suggest resilience of the fishery to climate change. Fisheries Oceanography, 26 (1): 49-64. • Shaffer, M.R. and Rovellini, A., 2020. A review of habitat use, home range and connectivity for selected New Zealand species. *Prepared for the Department of Conservation, Wellington, New Zealand*, p.43.

141. The extent to which there are specific areas within CRA 3 QMA that are habitats of particular significance for fisheries management in relation to life cycle stages of spiny rock lobsters has not yet been identified. However, kelp (macroalgae) is both indirectly impacted by spiny rock lobster fishing and a potential particular habitat of significance for fisheries management (in regard to spiny rock lobster), making it even more critical to consider when considering the impacts of catch settings on the spiny rock lobster habitat.

7.5 Considerations for setting sustainability measures under section 11 of the Act

142. Section 11 of the Act sets out various matters that the Minister must take into account or have regard to when setting or varying sustainability measures, such as setting the TAC. These include:

a) any effects of fishing on any stock and the aquatic environment; and

b) any existing controls under the Act that apply to the stock or area concerned; and

c) the natural variability of the stock concerned; and

d) any relevant planning instruments, strategies, or services.[32]

7.5.1 Effects of fishing on any stock and the aquatic environment – section 11(1)(a)

143. In setting or varying a sustainability measure the Minister must take into account any effects of fishing on any stock and the aquatic environment.

144. "Effect" is defined widely in the Act.[33] The broader effects of removing spiny rock lobster from the ecosystem as well as the more direct effects of potting need to be considered.

145. Information relevant to the effects of rock lobster potting on any stock and the aquatic environment is discussed under heading 7.4 '*Environmental Principles'* above and under heading 8 '*Setting a Total Allowable Catch - section 13 of the Act*' below.

7.5.2 Existing controls that apply to the stock or area – section 11(1)(b)

146. In setting or varying a sustainability measure the Minister must take into account any existing controls under the Act (including rules and regulations made under the Act (see section 2(1A)) that apply to the stock when setting or varying the TAC.

147. A range of existing management controls apply to CRA 3, including:

a) Gear restrictions: nationally, there is a prohibition on the use of spears for taking spiny rock lobsters by both recreational and commercial fishers.

[32] Sections 11 (2) and (2A).
[33] Section 2(1) of the Act defines "effect" to mean the direct or indirect effect of fishing, and includes any positive, adverse, temporary, permanent, past, present, or future effect. It also includes any cumulative effect, regardless of the scale, intensity, duration, or frequency of the effect, and includes potential effects.

b) Number of pots (recreational only): there is a maximum number of pots that may be used, set, or possessed in New Zealand fisheries waters on any day for recreational purposes. Recreational fishers are restricted to three pots per fisher. Two or more recreational fishers on a vessel are restricted to a combined total of six pots.

c) Escape apertures: a fisher must not use or possess on a vessel or vehicle a spiny rock lobster pot, unless the pot has at least two rectangular apertures (other than the mouth of the pot) through which undersize spiny rock lobsters are able to escape. This applies to both recreational and commercial fishers.

d) Size restrictions (see heading 3.3.2 '*Differential minimum legal size (MLS) in CRA 3*').

e) Prohibited states: nationally, it is illegal to take or possess spiny rock lobsters carrying external eggs (in berry), or spiny rock lobsters in the soft-shell stage (post moulting). This applies to both recreationally and commercially caught fish.

f) Daily limits: recreational fishing of spiny rock lobsters is managed through daily limits. In CRA 3 no person may take or possess more than six rock lobsters (both spiny and packhorse rock lobster combined) per day.

g) Area closures: area restrictions set under the Act can apply to both recreational and commercial fishers. Area closures may be put in place to ensure sustainable utilisation or to protect habitats of particular significance for fisheries management. Within CRA 3, Whakaki Lagoon (east of Wairoa) is prohibited from all commercial fishing harvest.[34] There are also four mātaitai reserves (three of which have restrictions specific to spiny rock lobster) and two section 186A temporary closures that fall within CRA 3 (see heading 6.3 '*Mātaitai reserves and other customary management tools*') as well as the Te Tapuwae o Rongokako marine reserve just north of Gisborne (note marine reserves are not fisheries management tools, but are included here as examples of area restrictions utilised within CRA 3).

7.5.3 The natural variability of the stock – section 11(1)(c)

148. In setting or varying a sustainability measure the Minister must take into account the natural variability of the stock.

149. A variety of environmental factors are thought to influence the productivity of spiny rock lobster populations, including water temperature, ocean currents, shelter availability, and food availability (Linnane et al., 2010). Lobsters grow at different rates around New Zealand and female lobsters mature at different sizes (Annala, 1983).

150. Spiny rock lobster larvae spend a long time in a planktonic stage, swimming and drifting in the ocean for up to 24 months. This means that larvae hatched in one area may be retained in that area by local eddy systems, carried to other areas by currents, or lost to New Zealand entirely. For most areas, larvae may originate a considerable distance from the settlement site. The number of 'puerulus', the final planktonic developmental phase of spiny rock lobster, that settle to the sea floor varies among areas and from year to year.

151. Puerulus settlement may be affected by environmental factors such as the amount of suitable habitat available, the persistence of storms, prevailing ocean currents, sea temperature, food availability, and predation. Large numbers of puerulus larvae also die before reaching suitable habitat, which is due in part to predation, but may also be a result of unfavourable environmental conditions or reaching the end of their larval life before reaching shore.

152. Information on variability in growth, maturity, available abundance, mortality, and recruitment is incorporated into the stock assessments that inform spiny rock lobster management. FNZ considers the rapid assessment model may no longer have any predictive power about current or near future stock status in the short term, because the cyclones will have had a substantive impact on the productivity and dynamics of the CRA 3 stock. This uncertainty has underpinned the options proposed (discussed below under heading 8 '*Considerations for setting Total Allowable Catch – section 13 of the Act*').

[34] Section 3 (2) (b), Fisheries (Central Area Commercial Fishing) Regulations 1986 (SR 1986/217).

Climate change

153. The ocean around New Zealand is, in some regions, warming at a rate well in excess of the global average (Sutton & Bowen, 2019). While the extent to how this will impact the wider ecosystem is largely unknown, it can be expected that there will be an impact on spiny rock lobster, including their spatial variability. Current studies (see heading 7.4.3 '*Habitats of particular significance for fisheries management – section 9(c)*' above) suggest potentially negative relationship between sea surface temperature and spiny rock lobster recruitment in northern New Zealand.

154. Spiny rock lobsters are likely to be affected by climate change and ocean acidification (Cornwall & Eddy, 2015). Organisms such as rock lobsters are particularly susceptible to ocean acidification because it lessens their ability to lay down calcified body structures during each moult (Bell et al., 2013, Hepburn et al., 2011).

155. Changes spiny rock lobster productivity may have wider consequences in coastal ecosystems, because these species often have important ecosystem roles (Pinkerton et al., 2008; Pinkerton et al., 2015; Cornwall & Eddy, 2015) (see heading 7.4.2 *'Biological diversity of the aquatic environment – section 9(b)'* above).

156. Changes to ocean circulation patterns also have the potential to affect the recruitment of the spiny rock lobster, given the extended phyllosoma (larval) stage.

157. Recent work undertaken by the rock lobster stock assessment team (a FNZ-contracted research group) indicates a potentially negative relationship between sea surface temperature and spiny rock lobster recruitment in northern New Zealand. This work is preliminary and requires further scrutiny, however, this could be a significant development.

7.5.4 Relevant statements, plans, strategies, provisions, and documents - section 11(2)

158. In setting or varying the TAC of this stock, the Minister must have regard to relevant statements, plans, strategies, provisions, and planning documents under section 11(2) of the Act, that apply to the coastal marine area. The following plans and strategies apply to CRA 3.

Regional Plans

159. There is one regional council (Hawke's Bay Regional Council) and one unitary authority (Gisborne District Council) that have coastlines within the boundaries of CRA 3. Each of these authorities have policy statements and plans to manage the coastal and freshwater environments, including terrestrial and coastal linkages, ecosystems, and habitats.

160. The provisions of these various documents are, for the most part, of a general nature and focus mostly on land-based stressors on the marine environment. There are no provisions specific to spiny rock lobster.

161. FNZ has reviewed these documents and the provisions that might be considered relevant can be found in a separate document entitled 'Regional plan provisions and policy statements', which is accessible at https://www.mpi.govt.nz/dmsdocument/54625. FNZ considers that the proposed options in this paper are consistent with the objectives of these relevant regional plans.

162. The FNZ Coastal Planning Team engages with the RMA coastal planning processes (including regional authorities) to support marine management decisions to manage not only the fishing effects on the coastal environment but also land-based impacts on fisheries.

7.5.5 Relevant services or fisheries plans – section 11(2A)

163. Before setting or varying any sustainability measure (such as the TAC), the Minister must take into account any conservation or fisheries services, and any relevant fisheries plans approved under section 11(2A) of the Act.

164. There are no fisheries plans approved under section 11(2A) specific to CRA 3, or of specific relevance to this review of measures for the fishery.

165. Fisheries services of relevance to the options in this paper include the research used to monitor stock abundance, such as contracted projects for stock monitoring and stock assessment, tag deployment and recapture, and puerulus settlement monitoring. In addition, fisheries services include the tools used to enforce compliance with management controls in the fishery.

166. FNZ notes that the CRA 3 fishery has no observer or on-board camera coverage. However, Fisheries Compliance regularly monitors the CRA 3 areas to ensure that management controls are being adhered to.

7.5.6 Other plans and strategies

167. The following plans and strategies are not mandatory considerations under section 11 of the Act, but they may be considered relevant to this review.

Te Mana o te Taiao (Aotearoa New Zealand Biodiversity Strategy) example

168. Te Mana o te Taiao – the Aotearoa New Zealand Biodiversity Strategy sets a strategic direction for the protection, restoration and sustainable use of biodiversity, particularly indigenous biodiversity, in Aotearoa New Zealand.[35] The Strategy sets a number of objectives across three timeframes. The most relevant to setting sustainability measures for CRA 3 are Objectives 10 and 12:

Objective 10: Ecosystems and species are protected, restored, resilient and connected from mountain tops to ocean depths.
Objective 12: Natural resources are managed sustainably.

169. FNZ is working with the Department of Conservation and other agencies on implementation of the strategy. As part of that work we are progressing to a more integrated ecosystem-based approach to managing oceans and fisheries. In that context, this review contains information on biodiversity impacts, ecosystem function and habitat protection associated with adjustments to sustainability measures (as outlined above in this section).

8 Considerations for setting Total Allowable Catch – section 13 of the Act

170. As outlined above in *Status of the stock*, the best available information on the status of CRA 3 includes:

- The last full CRA 3 stock assessment conducted in 2019.
- The 2023 CRA rapid assessment update, that considers fisheries data up to March 2023.
- Post February 2023 NIWA surveys in response to Cyclone Gabrielle, which covered the CRA 3 QMA.

171. The status of CRA 3 in relation to BMSY is unable to be reliably estimated using the best available information outlined above. This means section 13(2A) is the relevant provision when setting the TAC. FNZ is proposing a precautionary approach to setting the TAC under section 13(2A) given the high uncertainty in the stock's status, absence of firm quantitative data, and concerns for potential localised depletion. The rapid assessment model may no longer have any predictive power about current or near future stock status in the short term. This is because the recent cyclones are expected to have had a substantive impact on the productivity and dynamics of the CRA 3 stock. This notion has been reinforced through consultation with local commercial fishers, whose feedback suggests that the CRA 3 fishery was heavily impacted by cyclones in January and February 2023 (though the extent of the impact cannot be quantified at this time).

[35] Accessible at: https://www.doc.govt.nz/nature/biodiversity/aotearoa-new-zealand-biodiversity-strategy/.

172. In deciding to set or vary the TAC under section 13 (2A) of the Act, the Minister must:

(a) not use the absence of, or any uncertainty in, that information as a reason for postponing or failing to set a total allowable catch for the stock; and

(b) have regard to the interdependence of stocks, the biological characteristics of the stock, and any environmental conditions affecting the stock; and

(c) set a total allowable catch:

i. using the best available information; and

ii. that is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield.

173. While the current level of CRA 3 in relation to B_{MSY} is unknown, based on the information available FNZ has concerns the stock may be below the level that can produce *MSY.* Therefore in addition to the status quo, FNZ is proposing three options to reduce the TAC of CRA 3 from the 2024/25 fishing year, and considers that all three of these options should help to move the stock towards or above a level that can produce MSY, consistent with section 13(2A). The different options provide different levels of precaution toward recovery and future sustainability of the stock. Some options propose larger decreases in TACC and are therefore more precautionary towards ensuring the sustainability of the stock. However, larger reductions will provide for lower levels of utilisation, which in the short term will have more significant negative socio-economic impacts.

174. Section 13(3) requires the Minister to have regard to relevant social, cultural, and economic factors when considering the way in which and rate at which a stock is moved towards or above a level that can produce the *MSY*. FNZ has provided analysis of relevant social, cultural, and economic factors under heading 8.5 '*Way and rate at which a stock is moved towards a level that can produce the MSY*' below, and further under heading 10 '*Options and analysis*'.

8.1 Biological characteristics

175. Biological characteristics of spiny rock lobster that the Minister must have regard to when setting a TAC under section 13(2A) of the Act are discussed under '*About the stock*'. The biological characteristics of spiny rock lobster (high site fidelity and low mobility, therefore considered susceptible to recent extreme weather events) mean that spiny rock lobster populations in CRA 3 could be less resilient under current fishing pressure as it is expected that supporting habitat has been impacted. This indicates that a conservative TAC setting could be warranted. It should be noted that the options under which greater TAC reductions are proposed, the Minister will have greater regard to the biological characteristics of CRA 3.

8.2 Interdependence of stocks

176. Evidence suggests predation upon spiny rock lobsters by octopus, rig, blue cod, grouper, southern dogfish, seals, and other spiny rock lobsters. These species have relatively broad diets and it is unlikely that any of them are dependent on spiny rock lobster as a food source.

177. Spiny rock lobsters are ecologically important predators in New Zealand's rocky reef ecosystems, feeding on a wide range of prey such as molluscs, crustaceans, annelid worms, macroalgae, echinoderms, sponges, bryozoans, fish, foraminifera, and brachiopods. There is evidence to suggest that predators, including spiny rock lobsters, when at sufficient abundance and size structure can have a significant role in mitigating sea urchin (kina) barrens, which are less biologically diverse environments than the kelp forest habitats they replace.

178. Much of the available information describing the relationship between fishing and kina barrens comes from CRA 2 (Hauraki Gulf/Bay of Plenty). However, kina barrens in CRA 3 are recorded (Pinkerton et al., 2008). Due to the similarity of the habitat and the role of spiny rock lobsters, as

predators that influence the abundance of prey species (and hence their ecological role), it is reasonable to assume that the findings from this area is also broadly relevant to CRA 3.

179. The majority of literature on the causes of kina barrens focuses on reefs in northern New Zealand where fishing effects on top predators of kina are considered a primary factor. The occurrence of kina barrens may also be influenced by a range of other environmental factors, such as environmental and climatic influences, species' demographics, and catchment-derived sedimentation. The extent of kina barrens and relative importance of contributing factors varies regionally across New Zealand (Schiel, 2013, Wing et al., 2022).

180. It would be reasonable to assume that options that reduce the TAC will not result in worse adverse effects on interdependent species. However, there is limited understanding in how the proposed options will contribute to reducing or reversing the existence of any kina barrens, by spiny rock lobster, within CRA 3. Furthermore, there is limited understanding in how the cyclones have affected both predators of spiny rock lobster, and other predators of kina.

8.3 Environmental conditions affecting the stock

181. Environmental conditions affecting the stock are considered both under heading 4 '*Status of the stock*' and heading 7.4 '*Environmental principles – section 9 of the Act*'. While unable to quantify the immediate and long-term impacts of the 2023 cyclones, FNZ is concerned that both the CRA 3 biomass and dependent reef habitat are likely to have been severely impacted by these cyclones. Other concerns include climate change (particularly the occurrence and frequency of marine heat waves[36]) and sedimentation (that is expected to be further intensified by the recent cyclones). It should be noted that the options under which greater TAC reductions are proposed, the Minister will have greater regard to this concern.

8.4 Harvest Strategy Standard

182. Section 13 of the Act provides for the setting of a TAC, and guidance is provided by the Harvest Strategy Standard (**HSS**). The High Court has held that the HSS is an implied mandatory relevant consideration that the Minister must have regard to when setting a TAC under section 13 of the Act.[37]

183. The HSS is a policy statement of best practice in relation to the setting of fishery and stock targets and limits for fish stocks in New Zealand's QMS. It is intended to provide guidance on how fisheries law will be applied in practice, by establishing a consistent and transparent framework for decision-making to achieve the objective of providing for utilisation of New Zealand's QMS species while ensuring sustainability.

184. The HSS outlines FNZ's approach to relevant sections of the Act and forms a core input to FNZ's advice to the Minister on the management of fisheries. The HSS defines a hard limit as a biomass limit below which fisheries should be considered for closure and a soft limit as a biomass limit below which the requirement for a formal time-constrained rebuilding plan is triggered.

185. The recent cyclones mean the rapid assessment model will no longer have any predictive power about current or near future stock status in the short term. Therefore, there is limited relevance in the context of reference points specified under the HSS.

8.5 Way and rate at which CRA 3 is moved towards *MSY*

186. Section 13(3) of the Act states "In considering the way in which and rate at which a stock is moved towards or above a level that can produce maximum sustainable yield under subsection (2)(b) or (c), or (2A), the Minister shall have regard to such social, cultural, and economic factors as he or she considers relevant."

[36] Recent marine heatwaves in Aotearoa New Zealand. (Moana project).
[37] Fisheries Inshore New Zealand Ltd v Royal Forest and Bird Protection Society of New Zealand Incorporated [2023] NZCA 359.

187. FNZ views that a consideration of the way and rate at which the stock is moved towards or above a level that can produce the *MSY* is applicable in the Minister's decision to set the TAC for CRA 3 under section 13(2A) of the Act. Given the unknown stock status of CRA 3, FNZ does not have the available information to advise on an appropriate way and rate at this time. However, logically the options which propose reductions to the TAC are likely to help move the CRA 3 stock towards a level that can produce MSY (the 'way') at a faster rate than the options which propose lesser reductions.

188. In considering what level of TAC is most appropriate, there are important social and cultural factors to consider. For example, at least 10% of the CRA 3 quota is owned by tangata whenua, with income from this quota used to fund a range of social and cultural services, so a reduction in TAC will likely reduce the ability of tangata whenua to exercise rangatiratanga and kaitiakitanga. Also, a reduction to the recreational daily limit of spiny rock lobsters could adversely affect recreational fishers (including tangata whenua). However, the options that propose a TAC reduction have the potential to improve sustainability of the fishery, which will likely help ensure both long-term commercial activity, and economic and social development opportunities.

189. Relevant economic factors to consider include the potential loss in annual export earnings resulting from a reduction to the TAC setting, discussed in more detail below under '*Socio-economic considerations*.' The impact of a reduced TACC on employment (both directly in the fishery and indirectly related to the fishery) is not quantified but is likely to be negative. However, there could also be a longer-term economic benefit for the commercial sector if the stock returns to a higher abundance level more quickly, and a more cautious approach to setting the TAC may also provide greater assurance that the stock is being managed sustainably.

9 Information principles: Uncertainties and unknowns - section 10 of Act

190. Under section 10 of the Act, decision-makers are required to take into account four information principles:

    a) decisions should be based on the best available information;

    b) decision makers should consider any uncertainty in the information available in any case;

    c) decision makers should be cautious when information is uncertain, unreliable, or inadequate;

    d) the absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of this Act.

191. FNZ considers that the information presented in this paper represents the best available information.

192. Uncertainties in the information regarding the status of the stock are noted above under heading 8 '*Considerations for setting Total Allowable Catch – section 13 of the Act*', with the impacts of the cyclones representing a significant source of uncertainty in understanding the immediate and long-term implications on spiny rock lobster biomass. Also, there is uncertainty in how the cyclones may affect specific regions within CRA 3, that were known to have regionally unique biomass and fishing effort trends.

193. In addition, there are several areas where more research and analysis are required to understand the role that spiny rock lobster do and can have in their ecosystem (this includes controlling kina populations), which the Minister should take into consideration when making a decision. For example:

    - The biomass threshold and size frequency distribution of spiny rock lobster required to ensure their ecosystem role (such as preventing kina barrens from occurring or to reverse existing barrens that may exist in CRA 3).

- Due to environmental variability, the extent to which the relationship between kina barrens and fishing pressure is applicable across the whole of CRA 3. This has particular relevance in terms of cyclone effects and the difference in the number of fishing events between regions in CRA 3.
- The specific contribution that spiny rock lobsters make to healthy reef ecosystems in CRA 3 relative to other predatory species.
- The extent of the impact that climate change will have on spiny rock lobsters (as well as marine heat waves).
- The size composition of the CRA 3 stock required to support a healthy ecosystem.

194. However, it is important to note that (as emphasised by section 10(d)) uncertainty should not be used as a reason for the Minister to postpone or fail to take any measure to achieve the purpose of the Act.

195. A precautionary approach – to ensure sustainability of both the stock and the aquatic environment – would be consistent with both the purpose of the Act and New Zealand's international obligations.[38]

10 Options and analysis

10.1 Proposed TAC

196. The TAC reduction options proposed for CRA 3 have been guided by a precautionary approach as a consequence of the uncertainty of the impacts associated with Cyclones Hale and Gabrielle, specifically on CRA 3 biomass and supporting habitat.

197. All of the options proposed are considered not to be inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield as required by the Act. According to the recent rapid assessment update, the CRA 3 vulnerable biomass was above the reference target level that produces *MSY*, however, this assessment does not take the effects of the cyclones into consideration.

198. Consequently, as the rapid assessment update and its associated data do not account for the recent impact and long-term effect of these cyclones, the consequences of each option on CRA 3 cannot be projected. However, it is considered highly likely that the amount of available spiny rock lobster habitat may have declined significantly, which has implications for the environment's ability to support current and future biomass, recruitment, and therefore historic target levels. Furthermore, as highlighted under heading 4.4 'Current status of CRA 3 (post-Cyclone Gabrielle)', the pre-cyclone differences in Region 1 and Region 2 (both biomass trends and fishing effort trends, that may have been further compounded by the cyclones) could lead to regional specific depletion.

199. The options proposed below provide different levels of precaution and are intended as an immediate approach while the impacts of the cyclones are better understood. The intended 2024 CRA 3 stock assessment will also inform CRA 3 management in the near future. In the immediate future, in light of the impacts of the cyclones on CRA 3 (see heading 4 '*Status of the stock*'), FNZ considers a reduction in the TAC is warranted in order to increase the likelihood that any recovery of the CRA 3 stock is not compromised by allowing fishing at the current rate.

200. The *status quo* as well as a range of TAC adjustments are proposed, with increasing precaution and increased likelihood of greater levels of biomass increase from Options 1 through to 4.

201. All options have differing degrees of probability that they would help move the stock towards a level that can produce *MSY* as required under section 13(2A)(c)(ii) of the Act.

[38] In particular, the Contracting Parties to the Biodiversity Convention (including New Zealand) note that where there is a threat of significant reduction or loss of biodiversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat.

10.1.1 Option 1 – *Status quo*

TAC: 302	**TACC:** 195	**Customary:** 20	**Recreational:** 12	**Other mortality:** 75

202. This option maintains the TAC at 302 tonnes, the customary allowance at 20 tonnes, the recreational allowance at 12 tonnes, the other sources of fishing mortality allowance at 75 tonnes, and the TACC at 195 tonnes.

203. This option reflects the uncertainty in information on current and future stock status. As a preliminary view, FNZ consider that best available information indicates a reduction in the TAC is warranted to mitigate potential impacts on current biomass and future productivity of the stock.

Shelving

204. ACE shelving is a formal agreement among quota owners in a stock to voluntarily forgo ('shelve') harvesting a specified proportion of the TACC by each transferring an agreed proportion of their ACE to a separate account held by FishServe.

Industry proposal

205. The industry acknowledges there is a stock performance issue. The Tairawhiti Rock Lobster Industry Association (**TRLIA**) and NZRLIC have proposed a shelving arrangement as an alternative to a regulatory TACC reduction. Specifically, TRLIA and NZRLIC have offered to shelve 30% of CRA 3 ACE from April 2024, which would reduce commercial catch from 195 tonnes to 136.5 tonnes. This would be achieved by transferring the required amount of ACE to FishServe. They consider this is an interim step to prevent further decline in the fishery until the completion of the next CRA 3 full stock assessment that is scheduled for 2024 and to allow time for other data collected to be analysed to assess the impact of the cyclones (that can inform future management).

206. While acknowledging impacts in relation to the recent cyclones, NZRLIC have noted that there are mixed signals from the stock assessment and feedback from industry participants in CRA 3 has not been uniform, with some areas more impacted than others.

207. NZRLIC acknowledges under-catch in the CRA 3 TACC in the last three years, attributing this to factors including COVID and poor winter weather (drawing attention to La Niña, that is discussed under '*Recent extreme weather events*'). This poor weather has led to a change in operator behaviour (such as fishing in deeper water with poorer catch rates). In turn, NZRLIC consider this has negatively affected fishing efficiency within CRA 3.

FNZ view

208. FNZ notes that shelving arrangements can help promote industry collaboration and increases agility of the fisheries system (i.e., allowing within season or more rapid responses to changes in stock abundance that would otherwise not be possible).

209. FNZ considers that whether or not shelving is proposed, a TAC that meets the requirements of section 13 of the Act must be set. Shelving can be used to complement TAC setting, to increase the rate at which the stock rebuilds.

210. We are aware that there are different views on how and when shelving can be used, including a view that shelving can be used to achieve the purpose of the Act. Industry representatives have expressed a strong preference for it to operate alongside the status quo option in CRA3 as an interim step until 2024. Our preliminary view is that a TAC reduction is warranted. The consultation process provides the opportunity for stakeholders and iwi to submit views on the use of shelving in this situation.

10.1.2 Option 2

TAC: 248 (↓ 54)	**TACC:** 156 (↓ 39)	**Customary**: 20	**Recreational:** 12	**Other mortality:** 60 (↓ 15)

211. This option proposes to reduce the TAC to 248 tonnes, a reduction of 54 tonnes (18%).

212. This option is the smallest reduction proposed by assuming that any impacts associated with the cyclones may have been modest, and that the stock has had some resilience to these weather events.

213. This option assumes more precaution than Option 1, but less than Option 3 and Option 4. This option comes with some immediate socio-economic impacts, but lower than what would occur from a larger TAC reduction.

214. Under this option no changes would be made to the customary allowance of 20 tonnes.

215. Under this option no changes would be made to the recreational allowance of 12 tonnes. As discussed in '*Recreational*', the 2017/18 National Panel Survey estimate was 12.2 tonnes and the recent rapid assessment update modelled recreational catch at 11.80 tonnes, noting the uncertainty associated with the rapid assessment in light of the cyclones. As recreational harvest levels tend to be linked to availability (i.e., abundance) and it is expected this would have declined in response to the cyclones, then it is anticipated recreational harvest will decline in the short term. However, there is no other way to confirm this at the present time, so how recreational allowance changes will affect the stock is currently unable to be modelled. Therefore, FNZ proposes not to modify the recreational allowance for any options at the present time. Furthermore, the recently completed National Panel Survey will, once analysed, may provide updated recreational harvest estimates to inform future management.

216. With abundance expecting to have declined in response to the cyclones and to ensure recreational catch is appropriately managed within the CRA 3 allowance for the immediate future (i.e., addressing uncertainty until CRA 3 can be confidently assessed), FNZ is reviewing the daily limit (see heading 10.2 '*Proposed recreational controls*' below).

217. This option proposes to decrease the other sources of fishing mortality allowance to 60 tonnes, a reduction of 15 tonnes. While the 2023 CRA 3 rapid assessment update model suggests an allowance of 74 tonnes (discussed in '*Other sources of mortality caused by fishing*'), because of the cyclones there is increased uncertainty in the model and associated data. A reduction in biomass will coincide with a reduction in abundance, and therefore it would be expected this would lead to a reduction in both handling mortality and illegal fishing. FNZ proposes a reduction in this allowance that is proportional to the reduction being considered for the TACC for this option (20%).

218. This option proposes to decrease TACC to 156 tonnes, a reduction of 39 tonnes (20%). Over the last five years, the average under catch against the TACC for each year has been 25 tonnes, which is 13% of the current TACC. Landings for the 2022/23 fishing year were 157.6 tonnes, which is 19% below the current TACC, and 1.6 tonnes above this option's proposed TACC.

219. FNZ notes that the reduced TACC under this option would likely have some moderate socio-economic impacts in the short term that will have wider important social and cultural implications for the wider region that is supported by the CRA 3 fishery. Under this option, assuming the TACC is fully caught[39], the annual port price[40] revenue would be $350,000 below the 2022/23 fishing year, and $1.20 million below the 5-year average, based on annual port prices and landings. The 2023/24 port price is $93.47/kg. This is discussed in more detail below under '*Socio-economic considerations*'. The impact of the reduced TACC on employment (fishers, process workers etc) is not quantified, but is expected to be negative. However, this option considers the longer-term sustainability of the fishery, which will likely help ensure both long-term commercial activity, and wider economic and social development opportunities (discussed under '*Way and rate at which CRA 3 is moved towards MSY*').

10.1.3 Option 3

[39] Noting that the TACC has not been fully caught in recent years, as discussed in '*Commercial*'.

[40] Each year, MPI sends a voluntary survey to all licensed fish receivers (**LFR**s) to calculate the port price index for the year ahead. Port price represents the greenweight price per kg paid on a particular day and not an average for the whole year. The fishing method is not included in the survey even though a particular method may receive a higher landed price. Port prices represent what commercial fishers receive at port, not what the fish is worth at market (which is higher). Nor does it reflect the income for Licensed Fish Receivers (including, wholesalers and/or processors) and retailers.

TAC: 220 (↓ 82)	**TACC:** 136 (↓ 59)	**Customary**: 20	**Recreational:** 12	**Other mortality:** 52 (↓ 23)

220. This option proposes to reduce the TAC to 220 tonnes, a reduction of 82 tonnes (27%).

221. This option makes the assumption that any impacts associated with the cyclones may have been somewhat more than modest, and that the stock has had some limited resilience to these weather events.

222. This option assumes greater precaution, therefore lower level of sustainability risk, than Option 1 and Option 2 but with greater socio-economic impacts with a larger TAC reduction.

223. Under this option no changes would be made to the recreational allowance of 12 tonnes (as rationalised under '*Option 2*').

224. Under this option no changes would be made to the customary allowance of 20 tonnes.

225. This option proposes to decrease the other sources of fishing mortality allowance to 52 tonnes, a reduction of 23 tonnes. Following the same rationale discussed for '*Option 2*', FNZ proposes a reduction in this allowance that is proportional to the reduction being considered with the TACC for this option (30%).

226. This option proposes to decrease TACC to 136 tonnes, a reduction of 59 tonnes (30%).

227. FNZ notes that reported CRA 3 landings for the 2022/23 fishing year were 157.6 tonnes (see heading 5.1 '*Commercial*' above); 21.6 tonnes more than this option's proposed TACC.

228. Under this option, assuming the TACC is fully caught[41], the annual port price revenue would be $2.22 million below the 2022/23 fishing year, and $3.07 million below the 5-year average, based on annual port prices and landings. The 2023/24 port price is $93.47/kg. (discussed in more detail below under heading 11 '*Socio-economic considerations'*). The impact of the reduced TACC on employment (fishers, process workers etc) is not quantified, but is expected to be negative. Offsetting this forgone short-term revenue, the biological characteristics of spiny rock lobster mean that catch not taken in the short term would likely be available to catch when stock abundance increases sufficiently. In addition, the long-term economic benefits associated with a higher stock biomass include the ability to harvest at sustainable levels and assure stakeholders that the stock is being managed sustainably. This option considers, to a higher degree than Option 1 and Option 2, the longer-term sustainability of the fishery, which will likely help ensure both long-term commercial activity, and wider economic and social development opportunities (discussed above under heading 8.5 '*Way and rate at which CRA 3 is moved towards MSY*').

10.1.4 Option 4

TAC: 194 (↓ 108)	**TACC:** 117 (↓ 78)	**Customary:** 20	**Recreational:** 12	**Other mortality:** 45 (↓ 30)

229. This option proposes to reduce the TAC to 194 tonnes, a reduction of 108 tonnes (36%).

230. This approach takes into account, to a high degree, the uncertainty associated with the recent impacts of the cyclones on the local marine environment.

231. This option is the largest proposed reduction to the TAC, so has the highest probability (and places the greatest weight on uncertainty) of the four options consulted on, of helping to move the stock towards or above a level that can produce the *MSY*, but also the largest forgone economic opportunity in the short term.

232. Under this option no changes would be made to the recreational allowance of 12 tonnes (as rationalised under '*Option 2*').

233. Under this option no changes would be made to the customary allowance of 20 tonnes.

[41] Noting that the TACC has not been fully caught in recent years, as discussed in '*Commercial*'.

234. This option proposes to decrease the other sources of fishing mortality allowance to 45 tonnes, a reduction of 30 tonnes. Following the same rationale as discussed for '*Option 2*' FNZ proposes a reduction in this allowance that is proportional to the reduction being considered with the TACC for this option (40%).

235. This option proposes to decrease the TACC to 117 tonnes, a reduction of 78 tonnes (40%).

236. FNZ notes that reported CRA 3 landings for the 2022/23 fishing year were 157.6 tonnes (see heading 5.1 '*Commercial*' above); 40.6 tonnes more than this option's proposed TACC.

237. Under this option, assuming the TACC is fully caught,[42] the annual port price revenue would be $3.99 million below the 2022/23 fishing year, and $4.85 million below the 5-year average, based on annual port prices and landings. The 2023/24 port price is $93.47/kg (discussed in more detail below under '*Socio-economic considerations*'). The impact of the reduced TACC on employment (fishers, process workers etc) is not quantified, but is expected to be negative. Offsetting this forgone short-term revenue, the biological characteristics of spiny rock lobster mean that catch not taken in the short term would likely be available to catch when stock abundance increases sufficiently. In addition, the long-term economic benefits associated with a higher stock biomass include the ability to harvest at sustainable levels and assure stakeholders that the stock is being managed sustainably. This option considers, to a higher degree than all the other options proposed, the longer-term sustainability of the fishery, which will likely help ensure both long-term commercial activity, and wider economic and social development opportunities (discussed under '*Way and rate at which CRA 3 is moved towards MSY*').

10.2 Proposed recreational controls

10.2.1 Current recreational controls

238. Within the CRA 3 area there is a recreational daily bag limit of six rock lobsters. Most fishing trips for spiny rock lobster (59%) result in three or fewer individuals being caught.

239. Recreational catch is managed within the allowance set, primarily through a combination of a daily limit and a minimum legal size. Table 6 provides a summary of the recreational regulations that are currently in place to manage spiny rock lobster fishing in CRA 3.

Table 6: Summary of the key Fisheries (Amateur Fishing) Regulations 2013 that currently apply in CRA 3.

Regulation	Details
Daily limit of six lobsters per person (regulation 13)	No person may take or possess more than 6 rock lobsters (spiny and packhorse rock lobsters combined) on any one day.
Minimum size limit for spiny lobster (regulation 30)	54 mm tail width for males; 60 mm tail width for females.
Protected spiny lobsters that cannot be taken and must be returned to the sea (regulation 31)	• Undersize lobsters below the minimum size limit; • 'berried' females carrying external eggs; • soft-shelled lobsters (both sexes); and • unmeasurable lobsters (both sexes).
Pot limits (spiny and packhorse) (regulation 43)	3 pots for one person, up to 6 pots for 2 or more persons from a vessel.
Pot escape gap requirements for spiny and packhorse lobster (regulation 45)	Pots must have at least two escape gaps 54 mm x 200 mm to allow undersized rock lobsters to escape.
The buoy or floats attached to the pot must be marked with the fisher's name (regulation 44)	
Spear guns, spring-loaded loops, and spring-loaded lassos may not be used to harvest rock lobster. Hand drawn loops may be used (regulation 46)	

[42] Noting that the TACC has not been fully caught in recent years, as discussed in '*Commercial*'.

10.2.2 Proposed CRA 3 daily limit options

240. The recreational catch was modelled in the recent rapid assessment update to be just within the allowance, with best information suggesting significant uncertainty in the rapid assessment update in light of the cyclones. If vulnerable biomass has declined this will coincide with a reduction in abundance, and therefore it would be expected this would lead to a reduction in recreational catch.

241. Given that best information suggests there has been a decline in CRA 3 biomass in response to the cyclones and to ensure recreational catch is appropriately managed within the CRA 3 allowance for the immediate future, FNZ is reviewing the daily limit.

242. As explained in '*Option 2*', specific modelling of the effects of modifying the recreational allowance cannot be done at this time. However, FNZ considers that a reduction in the CRA 3 recreational daily limit may complement the proposed TAC adjustments that seek to address uncertainty in the CRA 3 biomass.

243. FNZ is considering two options: to either maintain current settings or reduce the daily limit to three spiny rock lobsters (Table 7).

Table 7: Daily limit proposals for CRA 3.

Option	Description
A	**Current settings** Retain the current daily limit of six rock lobsters (spiny and packhorse combined) per recreational fisher in CRA 3.
B	**Reduce the daily limit for spiny rock lobster to three** Within the daily limit of six rock lobsters (spiny and packhorse combined), amend the Amateur Regulations so that a recreational fisher must not take or possess more than three spiny rock lobsters from CRA 3.

244. The options outlined would apply to all recreational fishers in CRA 3. A "recreational fisher" is a person fishing under the Amateur Regulations and includes those fishing on an amateur fishing charter vessel and commercial fishers taking fish for non-commercial purposes under section 111 of the Act.

245. No new offences would be introduced as a consequence of the daily limit proposals. The following infringement fees would continue to apply:

a) A $250 infringement fee for taking or possessing more than the daily limit for spiny rock lobster, but not more than 2 times that daily limit.

A $500 infringement fee for fee for taking or possessing more than the daily limit for spiny rock lobster, but not more than 3 times that daily limit.

246. FNZ welcomes feedback on proposed changes to the CRA 3 recreational daily limit to ensure the long-term sustainable utilisation of this important shared fishery is not compromised.

10.2.3 Options analysis

247. Under Option A (no change to the current spiny rock lobster daily limit), the utilisation opportunities for recreational fishers in the CRA 3 fishery would remain unchanged. However, as CRA 3 spiny rock lobster abundance increases there is the potential for recreational fishers to receive additional catch as the stock builds. If this goes unchecked, the aim of stock sustainability could be compromised and the overall objective of increasing CRA 3 abundance will be put at risk.

248. The proposed daily limit reduction (Option B) is unlikely to impact the majority of recreational fishers given most fishing trips (just under 60%) are estimated to catch three spiny rock lobsters or fewer. The proposed limit will support increasing the abundance of spiny rock lobsters in CRA 3 by providing some level of increased constraint on recreational take, therefore addressing current uncertainty in recreational harvest levels, as discussed in '*Option 2*'. It will

also ensure that as abundance increases that recreational catch does not undermine this increase as more spiny rock lobsters become available to recreational fishers.

249. The impact of a daily limit reduction on overall recreational harvest depends on the frequency at which the spiny rock lobster daily limit is fully caught by recreational fishers. The 2017/18 National Panel Survey results suggest that 40.5% of recreational fishing trips catch in excess of three spiny rock lobsters.

250. Given the low numbers of recreational boat ramp data in CRA 3, a reliable analysis of how a daily limit reduction will impact the CRA 3 fishery is not possible. This is further compounded by the uncertainty of how the cyclones have impacted CRA 3.

251. There is a risk under any proposal to reduce a daily limit that fishers could be incentivised to go fishing to take their daily limit more often. More frequent collection of a daily limit will counter the overall reduction in harvest that is intended by lowering the daily limit.

252. Overall, the risk of fishers fishing more often for CRA 3 spiny rock lobsters is considered to be low, as recreational catch is strongly influenced by abundance (generally lower when abundance is low, and higher when abundance is higher). Reducing the daily limit could change fisher behaviour, however recreational fishing effort is influenced by a range of factors, including weather, accessibility, and the availability of spiny rock lobsters.

11 Socio-economic considerations

11.1 Commercial

253. The CRA 3 fishery supports many people in the commercial sector, including quota holders, commercial fishers, licensed fish receivers (**LFR**s), and seafood processing facilities. To give a sense of scale and distribution, based on data from the last three years, there have been on average 52 quota owners, providing ACE to 24 Permit Holders, landing rock lobster to 12 LFRs, using 27 fishing vessels. This is a lower number of participants from the 10-year average for all parts of the value chain except LFRs.

254. Over the last three years in CRA 3, 50% of quota was owned by four entities, with the remaining 50% owned by 48 quota owners. Settlement quota makes up 10% of all CRA 3 quota. At the end of the April 2022/23 fishing year, 29% of ACE was held by four entities, and the remaining 71% of ACE was held by 26 entities. On average over the last three fishing years, 37% of the total greenweight was landed to LFRs by four permit holders, and 63% was landed by 20 permit holders. 95% of greenweight was received by four LFRs, and the remaining 5% was received by eight LFRs. Permit holders landed to 1-5 different LFRs, and LFRs received rock lobster from 1-12 permit holders.

255. As well as the expected economic impacts of reducing the CRA 3 TACC for local fishing industry participants, it is also important to note the impacts the cyclone has had on local fishery infrastructure.

256. In the immediate term, Cyclone Gabrielle primarily impacted rock lobster fishers north of Gisborne, with sea access issues for Tokomaru Bay caused by wooden debris and silt. Limited road access meant there were difficulties in obtaining bait and fuel.

257. Some CRA 3 rock lobster fishers were unable to catch or land their ACE in the remaining weeks of the 2022 April fishing year because of damage to the roading and power infrastructure, and difficulty accessing clean seawater for storing spiny rock lobster catch on land. There were also difficulties with getting their catch processed through Gisborne because of limited access to sufficient clean water.

258. Potential changes in revenue have been calculated from the proposed TACC changes and the respective port prices[43] within CRA 3 for the 2023/2024 fishing year. Over the last five years the average annual port price revenue has been $15.78 million, while over the same period the average Free on Board[44] export revenue was $23.18 million.

259. The estimated impacts on annual port price revenue of a reduction in the TACC from the 5-year average, assuming the new TACC is fully caught, range from a reduction of $1.20 million (Option 2) to a reduction of $4.85 million (Option 4).

260. The impact of a reduced TACC on employment (fishers, LFRs, local supporting businesses, etc.) is not quantified, but is expected to be negative. Offsetting this forgone short-term revenue, the biological characteristics of spiny rock lobsters mean that catch not taken in the short term would likely be available to catch when stock abundance increases sufficiently. In addition, the long-term economic benefits associated with a higher stock biomass include the ability to harvest at sustainable levels and assure consumers that the stock is being managed sustainably.

261. It is important to note that the indicative revenue impacts are a very basic analysis of potential economic impacts and do not take into account regional socio-economic or flow on impacts. Additionally, there is the possibility that financial and socio-economic impacts will reduce over time as fishers adapt their behaviour, respond to fishing technology and strive for greater fishing precision.

11.2 Social

262. There is no current non-market valuation of spiny rock lobster in CRA 3 to recreational or customary fishers, but anecdotal qualitative information indicates both groups value spiny rock lobster highly as food.

263. Being able to catch spiny rock lobster according to tikanga also provides opportunities to learn and share mātauranga about the fishery and the hapū history, which often is contextual to a location and can only be learned by doing.

264. Potential reductions to the daily recreational take of spiny rock lobster could adversely impact recreational fishers who harvest within CRA 3, including those who harvest as subsistence fishers.[45] However, as discussed in '*Recreational*' the majority of fishers in CRA 3 take three or fewer spiny rock lobsters in a day. Therefore, the proposed reduction will still provide for most recreational fishers, and there will be a long-term benefit for recreational and customary fishers from increased abundance in CRA 3 and associated improved catch rates and size ranges.

12 Deemed value rates

265. Deemed values are the price paid by fishers for each kilogram of unprocessed fish landed in excess of a fisher's ACE holdings. The purpose of the deemed values regime is to provide incentives for individual fishers to acquire or maintain sufficient ACE to cover catch taken over the course of the year, while allowing flexibility in the timing of balancing, promoting efficiency, and encouraging accurate catch reporting.

266. The Deemed Value Guidelines set out the operational policy FNZ uses to inform the development of advice to the Minister on the setting of deemed values.

267. The deemed value rates for CRA 3 are shown in Table 8.

[43] It is important to note that port price is an index calculation of what commercial fishers receive across a QMA, based on a voluntary survey sent each year to LFRs to calculate the port price for the year ahead. Port prices represent what commercial fishers receive at port, not what the fish is worth at market (which is higher). Nor does it reflect the income for Licensed Fish Receivers (including, wholesalers and/or processors) and retailers.

[44] Exports (including re-exports) are valued as free on board (**FOB**), which is the value of goods at New Zealand ports before export, and are shown in New Zealand dollars.

[45] Subsistence fishers refer to those who fish primarily to feed family and relatives, relying on the resource as a source of food.

Table 8: Deemed value rates ($/kg) for all spiny rock lobster stocks.

Interim rate ($/kg)	Annual differential rates ($/kg) for excess catch (% of ACE)					
	100-120%	120-140%	140-160%	160-180%	180-200%	>200%
99.00	110.00	132.00	154.00	176.00	198.00	220.00

268. The average price paid by fishers during the 2022/23 fishing year for one kilogram of CRA 3 ACE was $41.24 The most recent (2023/24) port price for rock lobster is $93.47/kg. This port price is below the basic annual deemed value rate, which is set at $110/kg (Table 8). Note the average export price ($/kg) for all rock lobster exported in the 2022 calendar year was $136.26.

269. The commercial CRA 3 fishery is a high value and selective target fishery. Having the annual deemed value rate set above port price recognises the need of strong incentives for rock lobster fishers to avoid catching in excess of ACE.

270. FNZ is satisfied that the current deemed values for CRA 3 are consistent with section 75(2)(a) of the Fisheries Act in that they provide sufficient incentives for fishers to balance their catch with ACE. FNZ is therefore not recommending any changes to deemed value rates at this time. FNZ acknowledges, however, that if the TACC is decreased, subsequent changes in fishing behaviour and the ACE market may result in the need for the deemed value to be re-evaluated in the future.

271. FNZ welcomes any feedback on these deemed value settings.

13 Questions for submitters

- Which option do you support for revising the TAC and allowances? Why?
- If you do not support any of the options listed, what alternative(s) should be considered? Why?
- Are the allowances for customary Māori, recreational and other sources of mortality appropriate? Why?
- Do you think these options adequately provide for social, economic, and cultural wellbeing?
- Do you have any concerns about potential impacts of the proposed options on the aquatic environment?
- Is there any literature or research that is relevant and has been omitted in this paper?
- What are your thoughts on the ecological importance of spiny rock lobster in CRA 3?
- Which of the proposed daily limits of spiny rock lobsters do you support? Why?
- Are there any other benefits and impacts of the proposed daily limit reduction in addition to those discussed here?
- Do you have any feedback on the current deemed values settings?

272. We welcome your views on these proposals. Please provide detailed information and sources to support your views where possible.

14 How to get more information and have your say

273. Fisheries New Zealand invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on 2 February 2024.

274. Please see the Fisheries New Zealand sustainability consultation webpage https://www.mpi.govt.nz/consultations/review-of-sustainability-measures-2024-april-round) for related information, a helpful submissions template, and information on how to submit your feedback. If you cannot access to the webpage or require hard copies of documents or any other information, please email FMSubmissions@mpi.govt.nz.

15 Legal basis for managing fisheries in New Zealand

275. The Fisheries Act 1996 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* at https://www.mpi.govt.nz/dmsdocument/60415 for more information.

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