Fisheries New Zealand
By email: FMsubmissions@mpi.govt.nz

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Review of rock lobster fishery management measures for urchin barrens in northeastern New Zealand

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Introduction

1. This is a submission on proposed management measures for the Northland (**CRA 1**) and Hauraki/Bay of Plenty (**CRA 2**) rock lobster fisheries as set out in the Fisheries New Zealand (**FNZ**) Discussion Paper No: 2025/26 (**Discussion Paper**).[1] The following management options are presented:

    (a) Area closure options for the east coast of CRA 1 and CRA 2; and
    (b) Changes to recreational daily limits for rock lobster.

2. The Environmental Defence Society (**EDS**) is an independent not-for-profit organisation conducting interdisciplinary policy research and litigation. It was established in 1971 with the purpose of improving environmental outcomes in Aotearoa New Zealand.

3. EDS submitted on proposed management measures for CRA 1 in December 2024. That submission is enclosed as **Attachment A** and the matters and concerns raised in Attachment A remain valid and must be read as forming part of this submission. EDS has also recently submitted on proposed management measures for CRA 2 in January and September 2025. Those previous submissions should be read alongside this submission.

4. EDS commends FNZ for proposing several of the measures we advocated for in our earlier submissions. In particular, EDS strongly supports the area closures proposed for CRA 1 and CRA 2, which build upon the closures already in place for the inner Hauraki Gulf. EDS also strongly supports reductions in recreational take to reduce any potential displacement of fishing effort, particularly for packhorse lobster.

[1] FNZ (2025) *Rock lobster fishery management measures for urchin barrens in north eastern New Zealand - Detail* (Fisheries New Zealand Discussion Paper No:2025/26, August 2025), [**Discussion Paper**], available here.

5. EDS also strongly supports the additional research work that FNZ has commissioned to better understand the prevalence of urchin barrens in north eastern New Zealand. The newly available evidence as to the spatial extent of urchin barrens provides strong support for the urgent implementation of fisheries management measures, including area closures. However, it also indicates that further measures need to be implemented to control urchin barren spread. These include:

    (a) Urgent monitoring of urchins barrens in deeper water to better understand their full spatial extent, including those caused by long-spined urchins;
    (b) Extending CRA 2 closures to include parts of the outer Hauraki Gulf, because urchin barrens are known to be extensive there and rock lobster abundance is likely low;
    (c) Developing an ecosystem monitoring plan to track the status of kelp forest habitat over time; and
    (d) Creating a network of Kelp Restoration Areas, through broader spatial fisheries closures, on the east coast of the North Island.

Context

Key characteristics of the CRA 1 fishery

6. CRA 1 extends north from Te Arai Point on the East Coast, around North Cape, to Kaipara Harbour on the West Coast. It also includes waters surrounding the Three Kings Islands.

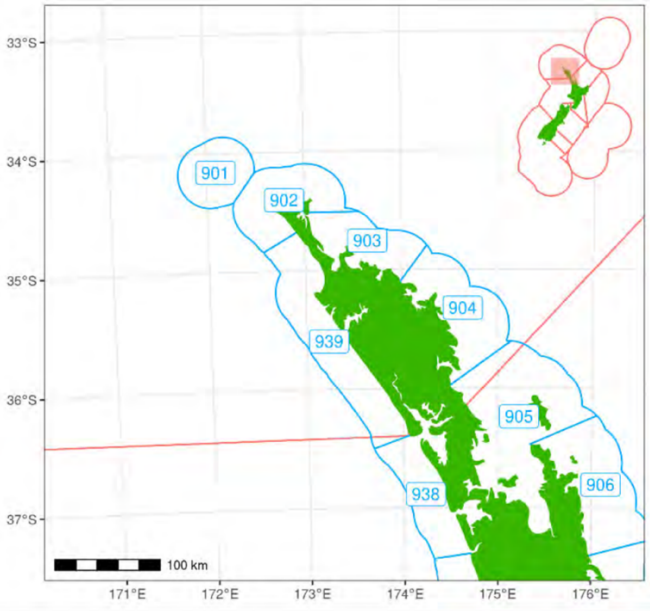

Figure 1. Map reproduced from the Fisheries Assessment Plenary (2024) showing the boundaries of the statistical reporting units within CRA 1 (i.e. everything north of the red lines).[2]

7. CRA 1 is characterised by very low stock abundance compared to historic levels, with current abundance only marginally higher than the lowest historic point. Commercial fishers have coincidingly shifted away from the east coast fishery, with fishing effort moving to the Three Kings Islands (statistical area 901), north coast (902) and west coast (939). Available catch and effort data suggests up to 20% of landings were caught from the East Coast until 2020-21 when

[2] FNZ (2024) *Fisheries Assessment Plenary: November 2024, Stock assessment and stock status Volume 1 Introductory sections and Albacore to Yellowfin Tuna* (Wellington, November 2024) [**Plenary Report**], available here, at 318.

there was a stark reduction.[3] In 2021-22 and 2022-23, landings dropped below 1% (~ 1 tonne) in the southeast (904) and below 5% (~ 5 tonnes) in the northeast of the fishery (903).[4]

8. EDS considers this trend is highly likely to reflect the localised depletion of rock lobster from reefs on the East Coast. For example, a recent review of reported catch and effort data states: "Statistical areas 903 and 904 have low CPUE and consequently carry proportionately more potlifts than catch".[5] In other words, it takes considerable effort to find legally harvestable rock lobster in these areas, indicating that the stock is critically depleted.

9. There is very limited understanding of recreational and customary harvest in CRA 1, with a heavy reliance on self-reported data.[6] The available data suggests there has been a decrease in recreational landings over the past decade from ~24 tonnes in 2011/12 to ~8 tonnes in 2022/23. Recreational catch is currently higher than commercial catch on the east coast.

10. There is limited information about settlement levels and recruitment in CRA 1.[7] Analysis of larval sources and sinks around the country suggests very low levels of recruitment in CRA 1. There is only a very small amount of local recruitment. Other recruitment is sourced from stocks on the west coast including the Taranaki Bight and South Island. There may also be some recruitment from Australia.

11. Unlike most other parts of the New Zealand coast, the oceanic currents along the west coast of the North Island are weak and variable. Offshore currents flow in a south-easterly direction (and away from CRA 1), with inshore currents flowing in a northwards direction, but only intermittently.[8] This means that only a very small proportion of larvae produced in the southern stocks (<5%) reaches CRA 1, with even less making it around North Cape to settle within the east coast portion of the stock.[9]

12. Overall, this means the stock is particularly vulnerable to poor settlement and overfishing. Compared to other stocks, CRA 1 has a reduced capacity to recover from fluctuations in environmental conditions or cumulative stressors.

13. The latest stock assessments for CRA 1 were undertaken in 2019 (last full assessment), 2021, 2022 and 2023 (rapid updates). Notwithstanding EDS's concerns about the reliability of the assessments (refer Attachment A), the results indicate there has been no substantive increase in

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[3] Starr P (2024) "*Rock lobster catch and effort data: 1979-80 to 2022-23*" (FNZ, New Zealand Fisheries Assessment Report 2024/10, March 2024), available here, at 12.
[4] Ibid.
[5] Ibid.
[6] Heinemann A and Gray A (2024) "*National Panel Survey of Marine Recreational Fishers 2022-23"* (FNZ, New Zealand Fisheries Assessment Report 2024/51, August 2024), available here, at 3.
[7] This influences model outputs. For example, no puerulus settlement series exists for CRA 1. See Roberts J and Webber D (2024) "*Review of red rock lobster (Jasus edwardsii) recruitment processes and the puerulus collector programme*" (FNZ, New Zealand Fisheries Assessment Report 2024/68, October 2024), available here, at 21.
[8] Sutton P J and M M Bowen, 2011, "Currents off the west coast of Northland, New Zealand", *New Zealand Journal of Marine and Freshwater Research*, 45:4, 609-624, at 623.
[9] Chiswell S M and J D Booth (2008) "Sources and sinks for larval settlement in *Jasus edwardsii* around New Zealand: Where do larvae come from and where do they go?", *Marine Ecology Progress Series*, 354, 201-217, at Figure 12 and Table 2.

stock abundance over the past five years. The 2023 rapid update found the vulnerable biomass was 15.5% (486 tonnes) and the spawning biomass was 37.1% (548 tonnes) of the unfished reference level (**URL**),[10] with the stock "*About as Likely as Not (40-60% probability) to be at our above the biomass management target*".[11]

Key characteristics of the CRA 2 fishery

14. CRA 2 encompasses coastal waters on the east coast of the North Island from Te Arai Point to East Cape in the Bay of Plenty as shown in Figure 2, and is divided into four statistical areas for reporting purposes.

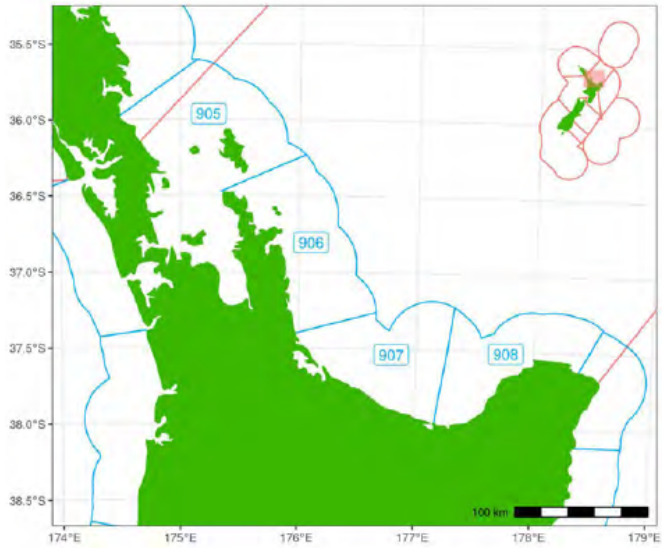

Figure 2. Map reproduced from the Fisheries Assessment Plenary (2024) showing the boundaries of the statistical reporting units within CRA 2.[12]

15. Rock lobster in CRA 2 have been heavily fished for many decades. While FNZ considers that CRA 2 is currently above its management target,[13] in EDS's view this does not paint an accurate picture of the stock's historical long-term decline, current status, or likely future trajectory.

16. In particular, EDS highlights that:

    (a) Stock abundance has declined significantly since the 1980s, and long-term studies indicate CRA 2 abundance had already experienced significant declines (~76%) by 1950.[14]

    (b) The number of operational commercial vessels operating within CRA 2 has decreased significantly alongside declines in commercial catch. Recreational landings in CRA 2 have

[10] FNZ (2023) "*Fisheries Assessment Plenary: November 2023, Stock Assessments and Stock Status Introduction Section to Yellowfin Tuna*" (FNZ, November 2023) at 308, available here, at 313.
[11] Ibid, at 311.
[12] Plenary Report, above n 2, at 318.
[13] FNZ (2025) *Management target fisheries plans for spiny rock lobster (CRA 2 and CRA 4)* (Fisheries New Zealand Discussion Paper No:2025/25, August 2025), available here, at [39]
[14] A B MacDiarmid et al (2016) *Taking Stock the changes to New Zealand marine ecosystems since first human settlement: synthesis of major findings, and policy and management implications* (NZAEBR No 170, MPI, June 2016), available here, at 27.

also decreased over the past decade,[15] with recreational fishers shifting away from the inner Hauraki Gulf (which has now been closed to harvest) due to localised depletion of rock lobster.[16]

(c) There is significant uncertainty about settlement and recruitment of larvae in CRA 2, given that the eastern portion of the northern stock (CRA 1), which is a major larvae source for CRA 2, has likely collapsed.[17]

17. Overall, the evidence confirms rock lobster populations are critically depleted in parts of the CRA 2 fishery, that key sources of larvae are likely depressed, and the stock is vulnerable to poor settlement and low recruitment. A cautious approach must be adopted to management of the CRA 2 fishery in light of this context.

18. EDS's submission on previous CRA 2 sustainability measures (refer Attachment A) discusses past management approaches that have resulted in CRA 2 depletion. In particular, EDS highlights the risk of relying on fisher-dependent catch-per-unit-effort (**CPUE**) data.[18] This was associated with significant depletion of rock lobster biomass over the span of several years, despite voluntary quota reductions.[19]

19. The latest stock assessments for CRA 2 were undertaken in 2022 (full assessment), 2023 (rapid assessment) and 2024 (rapid assessment). Again, we refer to Attachment A for a more comprehensive analysis of the data. However, it is important to highlight our concerns regarding the reliability of the latest stock assessments, which we think should be approached with caution:

(a) The model used by FNZ to assess the status of the CRA 2 stock is heavily reliant on fishery-dependent data as an indicator of stock abundance. CPUE data has known limitations because it can be influenced by a range of factors such as gear selectivity, changes in fishing location and practices, fleet efficiency and fleet dynamics.[20] Past reliance on CPUE-based management procedures led to rapid depletion of the CRA 2 stock. Recent scientific studies using fisheries-independent data in the Hauraki Gulf[21] suggest the latest FNZ stock assessments have significantly overestimated the biomass of rock lobster populations within the CRA 2 fishery.

(b) The Plenary Report acknowledges that there is no robust puerulus settlement series to inform the stock assessment model for CRA 2.[22] This means the assessment model is not responsive to changes in settlement levels, which can have significant implications for future recruitment into the fishery.

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[15] Plenary Report, above n 2, at 274.
[16] FNZ (2024) *Review of sustainability measures for spiny rock lobster (CRA 2) for 2024/25* (Fisheries New Zealand Discussion Paper No:2024/33, December 2024), available here at [52].
[17] See Attachment A. Previous submissions by EDS on proposals applying to CRA 1 and CRA 2 are available here.
[18] D N Webber et al (2018) *The 2017 stock assessment and management procedure evaluation for rock lobsters (Jasus edwardsii) in CRA 2* (NZ Fisheries Assessment Report 2018/17, MPI, May 2018), available here, at 11-12.
[19] Ibid.
[20] Mark N Maunder et al (2006) "Interpreting catch per unit effort data to assess the status of individual stocks and communities" *ICES Journal of Marine Science*, 63(8) 1373-1385, available here.
[21] Nessia et al (2024) "Using marine protected areas to assess the status and recovery of the spiny lobster Jasus edwardsii fishery in the Hauraki Gulf, Aotearoa New Zealand" *Front Mar Sci* 11, available here. Benn J Hanns, Tim Haggitt and Nick T Shears (2022) "Marine protected areas provide unfished reference information to empirically assess fishery status" *Biol Conserv* 276, available here.
[22] Plenary Report, above n 2, at 326 and 336.

(c) Recent modelling has identified a potential negative correlation between sea surface temperature and annual recruitment in CRA 2.[23] Specifically, model results show that high temperatures may impair the survival of small rock lobster in CRA 2 around the size at recruitment.[24] This means it appears likely that ongoing ocean warming, and more frequent marine heatwaves, will likely negatively affect stock productivity in future years on the north-east coast. The stock assessment model does not account for this.

(d) Finally, recent evidence suggests FNZ's stock assessment approach lacks the nuance needed to ensure sustainability of the CRA 2 stock. MacDiarmid (2025) suggests a finer 'reef-scale' assessment approach is required to properly assess CRA 2 abundance which likely differs throughout the CRA2 area.

Key characteristics of the PHC 1 fishery

20. Two species of rock lobster are taken in New Zealand coastal waters: the red rock lobster (*Jasus edwardsii*), which supports nearly all the landings and is caught all around the North Island and South Island, Stewart Island, and the Chatham Islands; and the packhorse rock lobster (*Sagmariasus verreauxi*), which is taken mainly in the north of the North Island, including the Bay of Plenty. Packhorse lobsters grow to a much larger size than red rock lobsters and have a different shell colouration and shape. Packhorse lobster are managed as a single nation-wide stock (Figure 3).[25]

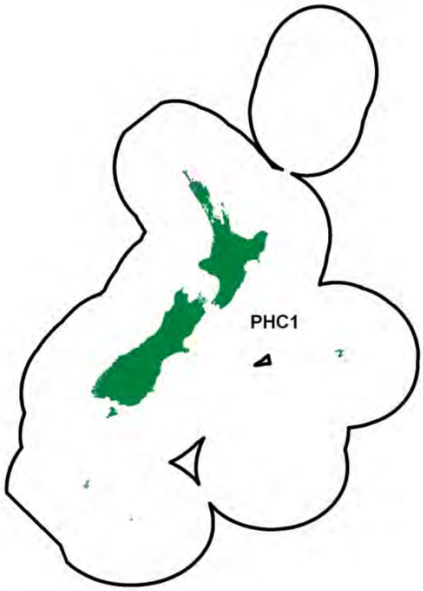

Figure 3. Map reproduced from the Fisheries Assessment Plenary (2024) showing PHC 1.

21. The New Zealand packhorse rock lobster fishery is small compared with the spiny rock lobster fishery. Catches of packhorse rock lobster are almost entirely taken along the north and east coasts of the North Island, overlapping with the spiny rock lobster fisheries in CRA 1 and CRA 2.[26]

22. Some fishers actively target packhorse rock lobster at their main New Zealand breeding grounds, centred at North Cape, in the Far North, but approximately half of the total reported catch since

[23] Plenary Report, above n 2, at 336.
[24] Ibid.
[25] Ibid, at 484
[26] Ibid, at 485

1990/91 was taken as bycatch by a much larger fleet targeting spiny rock lobsters. Nearly all the packhorse target catches are taken in statistical areas 901 and 902 (Figure 1).[27]

23. In terms of stock abundance, there is considerable uncertainty including because:[28]

    (a) The biomass dynamics model used in the stock assessment is a simple model that is unable to incorporate the detailed biological characteristics of the stock.
    (b) The only data used are historical catches and a CPUE time series, which are now 6 years out of date.
    (c) The recreational fishery is small and there are few participants from the fishery in surveys. In addition, Amateur Charter Vessel catch is likely underestimated because they are not required to report catch of packhorse rock lobster.

24. Additional areas of uncertainty include:[29]

    (a) The level of historical catches, including non-commercial catch
    (b) Very little information on growth
    (c) Very limited biological sampling of the fishery
    (d) Only moderate understanding of population dynamics
    (e) Limited understanding of migration extent, both in terms of distance and quantity
    (f) Likely change in fishing behaviour over time

25. Furthermore, like spiny rock lobster, there is uncertainty about recruitment and settlement of packhorse lobster. Genetic analysis indicates linkages between the New Zealand and Australian packhorse populations, due to the Tasman Front carrying larvae from Australia to New Zealand,[30] but only about 2% of larvae survive the crossing.[31] Under climate change, the Tasman Front's flow is projected to change, with a weakening of the eastward flow and a potential shift southward. This may impact larval transport between the two countries although there is uncertainty as to how the projected change to the Tasman Front would impact the packhorse stock in New Zealand.[32]

26. Overall, PHC 1 is categorised by significant uncertainty as to stock abundance, fishing levels, recruitment and survival, and stock distribution. EDS calls on FNZ to address these areas of uncertainty by allocating resources for improved research. In the meantime, very little weight can be placed on the stock assessment and a cautious management approach is required.

Urchin barrens in north eastern New Zealand

27. The effects of rock lobster fishing on shallow kelp forests and the proliferation of urchin barrens in CRA 1 and CRA 2 are well documented.[33] The evidence is discussed in detail in Attachment A.

28. Importantly, the best available information demonstrates that rock lobster fishing has contributed to a trophic cascade in CRA 1 and CRA 2, where the depletion of rock lobster (and

[27] Plenary Report, above n 2, at 485.
[28] Discussion Document, above n 1, at p 45.
[29] Ibid.
[30] Ibid, at [362].
[31] Plenary Report, above n 2, at 491.
[32] Ibid, at [193].
[33] Vince C Kerr, Roger V Grace and Nick T Shears (2024) "Estimating the extent of urchin barrens and kelp forest loss in northeastern Aotearoa, New Zealand" *Journal of Marine and Freshwater Research*, available here.

other key predators) has allowed kina numbers to significantly increase, leading to the overgrazing of kelp on shallow reefs.[34]

29. New research commissioned by FNZ provides a detailed illustration of the distribution of urchin barrens in shallow coastal waters from Cape Reinga to East Cape (Figure 4). The evidence demonstrates that urchin barrens are not isolated to the inner Hauraki Gulf, but in fact there are much larger areas of barren in the mid and outer Hauraki Gulf areas, along the Tutukaka coast and other parts of the CRA 1 and CRA 2 fisheries.[35] EDS finds the extent of barrens profoundly shocking and indicative of the need for a particularly strong management response.

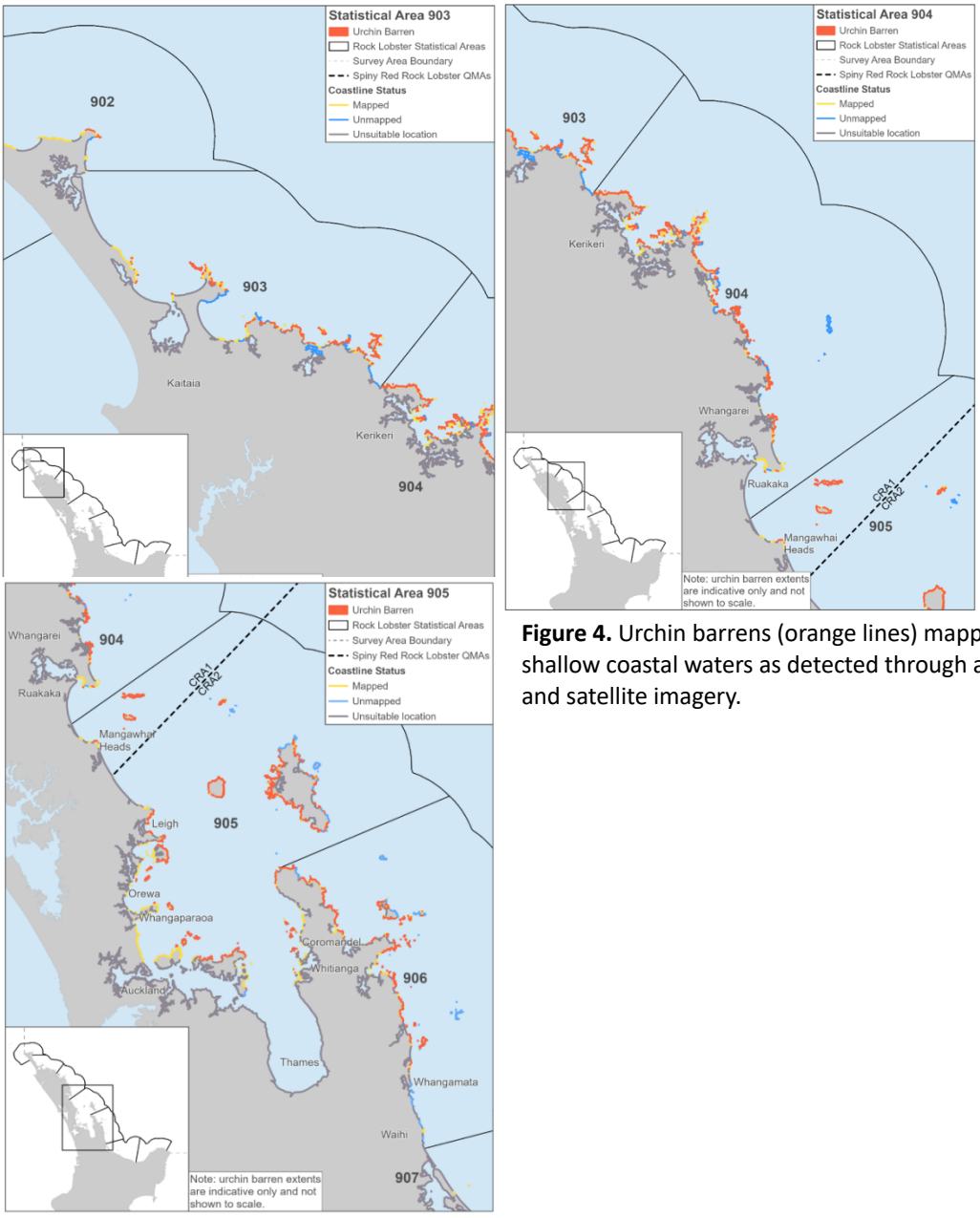

Figure 4. Urchin barrens (orange lines) mapped in shallow coastal waters as detected through aerial and satellite imagery.

[34] Nick T Shears and Russell C Babcock (2002) "Marine reserves demonstrate top-down control of community structure on temperate reefs" *Oecologia* 132 (131):142, available here; Nick T Shears and Russell C Babcock (2003) "Continuing trophic cascade effects after 25 years of no-take marine reserve protection" *Marine Ecological Progress Series* 246:1-16, available here.

[35] Kerr et al, above n 32, at 12.

30. In addition, Figure 5 demonstrates the stark difference in urchin barren extent in fished areas compared to marine reserves. This is strong evidence that removing fishing pressure leads to healthier kelp forests and ecosystems.

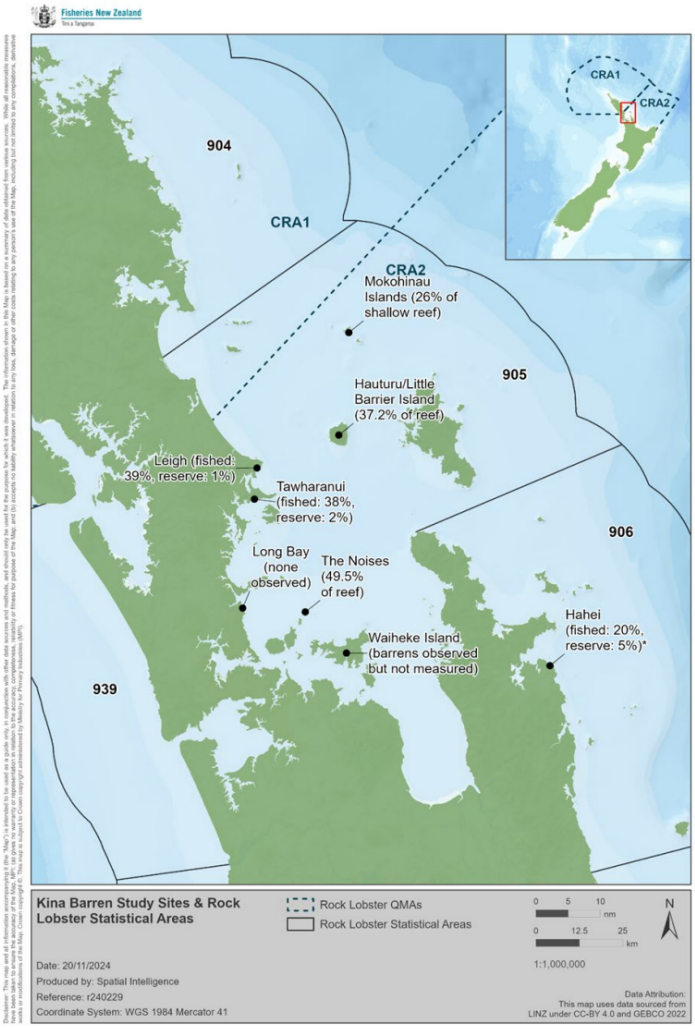

Figure 5. Map of coastal reef locations within the northern portion of CRA 2 where known urchin barrens occur, that have been compiled by an FNZ literature review

31. Long-spined urchin (*Centrostephanus rodgersii*) is an "emerging" and increasing threat for northern New Zealand having increased in abundance and spatial extent over the past two decades likely due to warming seawater.[36] Available information suggests long-spined urchin barrens are more challenging to manage than those caused by excess kina.[37] This is for two key reasons. First, long-spined urchins graze to much greater depths, and can therefore remove entire kelp forests, whereas kina leave kelp forests in deeper water intact. Secondly, the only known predator of long-spined urchins in New Zealand is rock lobster (spiny and packhorse) whereas kina (which have smaller spines) also has finfish predators.

32. While Figures 4 and 5 show shallow (<10 m) urchin barrens in north-eastern New Zealand, long-spined urchin barrens pose a greater threat to kelp forests across a wider depth range.

[36] Celia A Balemi and Nick T Shears (2023) "Emergence of the subtropical sea urchin Centrostephanus rodgersii as a threat to kelp forest ecosystems in northern New Zealand" *Frontiers in Marine Science* 10, available here, at 1.
[37] Scott Ling and John Keane (2021) "Decadal resurvey of long-term lobster experimental sites to inform Centrostephanus control" (Final contracted report for the Abalone Industry Reinvestment Fund, AIRF Project 2019_08), available here.

Therefore, it is essential that wider mapping is undertaken to identify incipient long-spined urchin barrens so measures can be deployed to avoid their expansion into more persistent networks which will be exceedingly difficult to reverse.

EDS's comments on proposals in the Discussion Paper

33. FNZ is consulting on the following management options to manage urchin barrens:[38]

    (a) Area closure options for the east coast of CRA 1 and CRA 2; and
    (b) Changes to recreational daily limits for rock lobster.

Proposal 1: Area closures for the east coast of CRA 1 and CRA 2

34. The Discussion Paper sets out three options for new area closures on the east coast of CRA 1 and an additional area closure for CRA 2 (Table 1). Figure 6 shows the spatial extent of the proposed closures.

35. The proposed closures would apply to spiny rock lobster and do not apply to packhorse rock lobster.

Table 1. Proposed closure options for CRA 1 and CRA 2

Area closures on the east coast of CRA 1		
Option A1 *Status quo*		Non-regulated commercial closure on the east coast of CRA 1 (Figure 2).
Option A2		Seasonal closure to recreational fishers from 1 October to 30 April and year-round closure to commercial fishers on the east coast of CRA 1 (Figure 3).
Option A3	*FNZ preferred*	Year-round closure to commercial and recreational fishers on the east coast of CRA 1 (Figure 4).
Area closure on the east coast of CRA 2		
Additional closure option	*FNZ preferred*	Year-round closure of to commercial and recreational fishers from Te Arai Point to Cape Rodney in CRA 2 (Figure 5).

36. As indicated in Table 1, the CRA 1 fishery is presently subject to a non-regulated commercial closure initiated by the Rock Lobster Industry Association (**CRA MAC 1**). This closure means the voluntary stopping of all commercial harvest of spiny rock lobster from the east coast statistical areas 903, 904 and part of 905 from 1 April 2025 for a minimum of five fishing years. Affected fishers who voluntarily stop harvest in these areas still have some access to packhorse rock lobster, but this is not expected to increase the amount of rock lobster landed because the PHC 1 total allowable commercial catch (**TACC**) is generally fully caught.

37. Notwithstanding these voluntary measures, FNZ considers regulated measures for both commercial and non-commercial sectors are necessary to meet the requirements of the Act. EDS strongly agrees. The best available evidence is that restricting both recreational and commercial harvest is urgently required to address urchin barrens.

[38] Discussion Paper, above n 1, at p 3.

38. EDS considers Option A3 will be significantly more effective in addressing urchin barrens because a temporary recreational closure (Option A2) is likely to divert fishing effort to winter months which is also the breeding and moulting period for rock lobster. FNZ considers the risk of diverted effort to be low but no evidence has been presented to support that position.[39] EDS considers the risk would be high based on the value recreational fishers place on harvesting rock lobster. We draw attention again to the relative dominance of recreational rock lobster fishing on the east coast of CRA 1 over recent years; recreational rock lobster fishing needs to be stringently managed. As such, EDS strongly supports a year-round closure for both commercial and recreational fishing (Option A3).

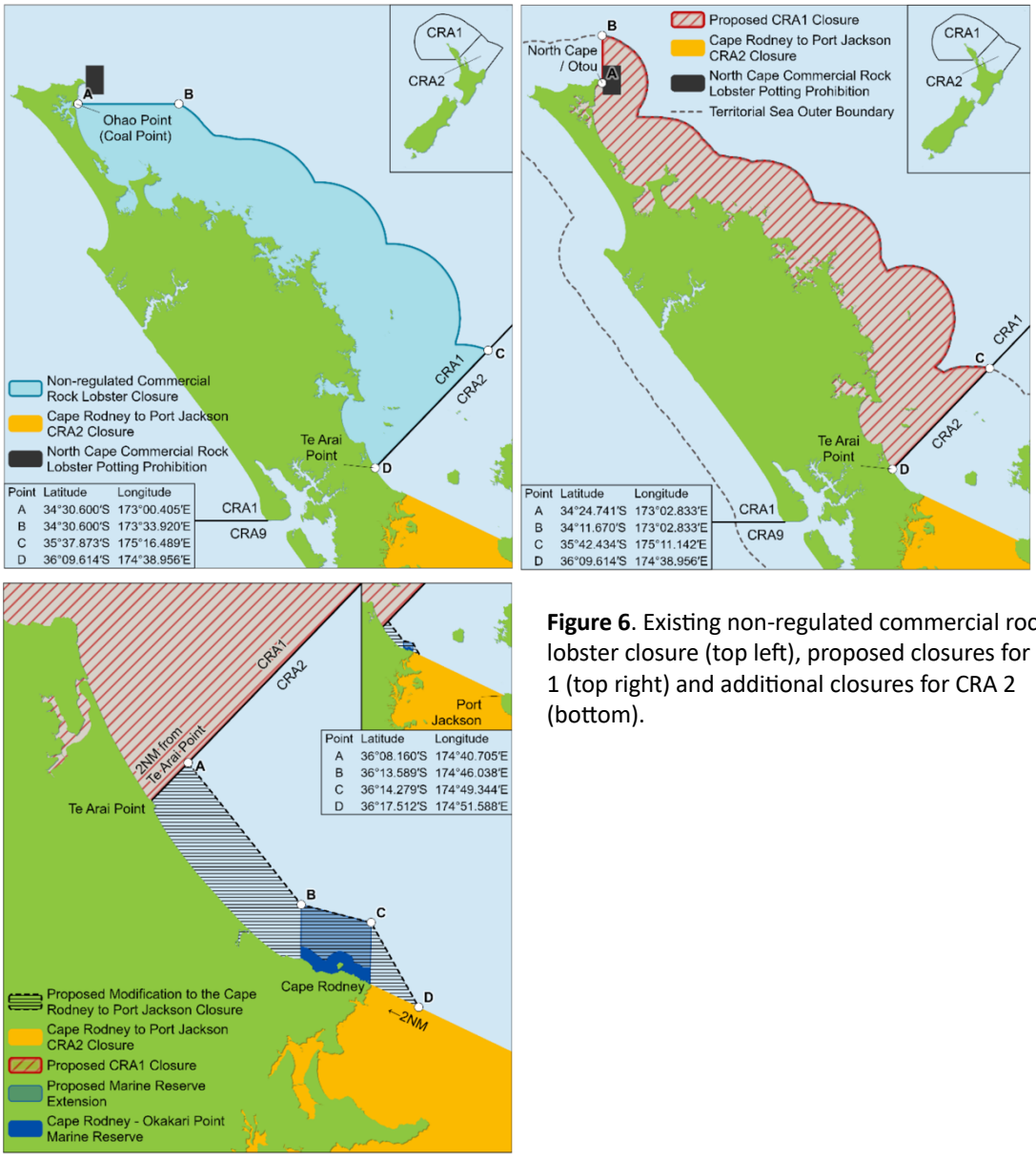

Figure 6. Existing non-regulated commercial rock lobster closure (top left), proposed closures for CRA 1 (top right) and additional closures for CRA 2 (bottom).

39. EDS also strongly supports the proposed addition to the CRA 2 rock lobster closure which will be supported by the expansion of the Cape Rodney-Okakari Point Marine Reserve under the Hauraki Gulf Tīkapa Moana Marine Protection Bill when it becomes law, which is expected imminently.

[39] Discussion Paper, above n 1, at [60].

40. Without these measures, both commercial and recreational fishing effort is highly likely to be displaced along this short stretch of coastline, consolidating displaced landings to a small area. This would likely have a significant impact on rock lobster populations in the area and almost certainly exacerbate the urchin problem. Displaced effort may also have significant impacts on the Cape Rodney-Okakari Marine Reserve through edge effects as rock lobster are known to migrate.

41. Conversely, extending the CRA 2 closure will remove the threat of displaced effort along this stretch of coastline, and with the extension of the marine reserve will support improved ecological outcomes for all species, including kelp forests. For these reasons, EDS considers the additional CRA 2 closure to be necessary to achieve the purpose of the Act.

Proposal 2: Changes to recreational daily take limits for rock lobster

42. The Discussion Paper sets out options to change the recreational daily take limits for rock lobster in CRA 1 and CRA 2 (in parts of the fisheries where the closures discussed above do not apply):

Table 2. Proposed options to reduce recreational daily limits for rock lobster

Recreational daily limits for rock lobster (east coast)		
Option B1 *Status quo*		• Combined recreational daily limit of six rock lobster (spiny rock lobster and packhorse rock lobster) per fisher nationally. • Spiny rock lobster recreational daily limit of three per fisher in CRA 1 (Northland), CRA 2 (Hauraki Gulf/Bay of Plenty) and CRA 3 (Gisborne/East Cape).[6,7] (Figure 6).
Option B2[8]	*FNZ preferred*	Set a recreational daily limit for packhorse rock lobster of three packhorse per fisher nationally (Figure 7)
Option B3[8]	*FNZ preferred*	In an area of northeast New Zealand including parts of CRA 1 and CRA 2 (two options for this area are given) (Figure 8): • reduce the combined recreational daily limit of rock lobster (spiny and packhorse rock lobster) to from six to three per fisher, • reduce the spiny rock lobster recreational daily limit from three to one per fisher, • set a packhorse rock lobster recreational daily limit of two per fisher.
Recreational daily limits for rock lobster (west coast)		
Option B4[8]		Reduce the spiny rock lobster recreational daily limit from three to two per fisher on the west coast of CRA 1 (Figure 9).

43. EDS supports a combination of Options B2, B3 and B4.

44. In respect of Option B2, EDS strongly supports measures to reduce recreational allowance for packhorse rock lobster. Packhorse lobster are larger than spiny rock lobster and are therefore able to predate on long-spined urchins which are known to be rapidly increasing in abundance in parts of northern New Zealand.[40] The reduced recreational allowance would not necessarily lead to a reduction in harvest levels, but it would help to prevent displacement of fishing effort which could lead to an increase in harvest under the existing allowance.

45. Similarly, EDS strongly supports Option B3 which would reduce the combined recreational daily limit and spiny rock and packhorse limits. This would help to reduce the effects of overfishing while softening the impact of displaced effort (as a result of area closures).

[40] Balemi and Shears, above n 35.

46. FNZ is proposing two options for the areas that Option 3B would apply to (Figure 7). EDS supports Area 2 because it includes the east coast of Coromandel Peninsula, where urchin barrens are extensive (see Figure 4).

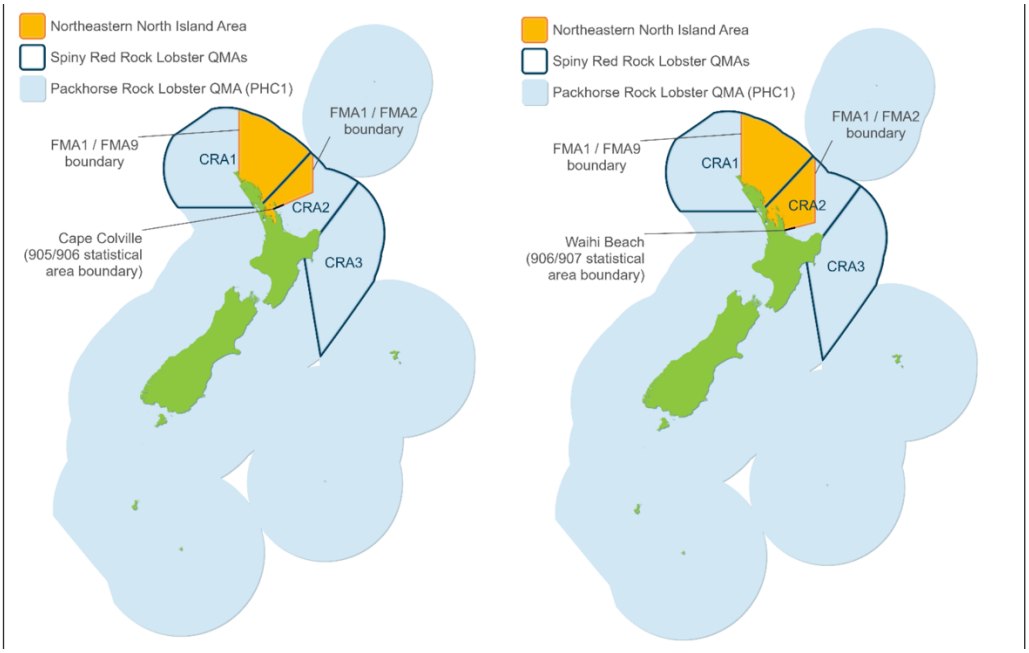

Figure 7. Map of Option B3 with the areas where lower recreational daily take limits for rock lobster would apply shown in orange. Two options are given: Area 1 (left) excludes the east coast of coromandel, and Area 2 (right) includes the east coast of coromandel.

47. For the same reasons, EDS supports Option B4 which would reduce the recreational daily limit for spiny rock lobster from three to two on the west coast of CRA 1. This is important because of the uncertainty as to urchin barren extent in the far north (e.g. Three Kings Islands) and because of the known risk posed by long-spined urchins there. Greater precaution is needed to ensure overfishing does not occur until further evidence as to urchin barren extent and rock lobster stock abundance in this part of the fishery becomes available.

Additional measures

Extend the CRA 2 closure

48. EDS considers the existing CRA 2 closures should be expanded to include barren areas in the outer Hauraki Gulf and eastern coastline of the Coromandel Peninsula. EDS strongly supported closures to the inner Hauraki Gulf rock lobster fishery, but new evidence demonstrates additional closures are needed to mitigate the effects of urchin barrens.

49. Specifically, Figure 4 demonstrates the greater prevalence of urchin barrens in the outer Gulf including Te Hauturu-o-Toi (Little Barrier) and Aotea (Great Barrier) islands, and the east coast of the Coromandel Peninsula. EDS considers this evidence likely underestimates the extent of urchin barrens in these areas because it only shows urchin barrens that exist in shallow water.

Urchin barrens are known to also exist in deeper water, particularly those formed by long-spined urchins which are more challenging to manage. In any case, urgent intervention is needed to avoid, remedy and mitigate their adverse effects.

50. The level of urchin predation in the outer Gulf is uncertain, although the best available information suggests it is significantly suppressed. Key predators such as snapper have been heavily overfished in the Gulf for many decades, while recent biomass samples at Little Barrier and Great Barrier islands indicate that, like other parts of the Gulf, rock lobster abundance is very low especially when compared to unfished areas.[41] There is a paucity of data on rock lobster abundance elsewhere in the outer Gulf, but we expect it to be similarly low given the extent of urchin barren coverage.

51. Overall, the best available information is that urchin barrens are extensive (and likely underestimated) in the outer Hauraki Gulf and eastern Coromandel, and that predation of urchins has reduced significantly. Based on this evidence, EDS considers wider closures within the CRA 2 fishery are justified and required in accordance with the sustainability principles of the Act. They should include all areas where kina barrens have formed. EDS considers such closures should be prioritised by FNZ for further investigation, consultation and urgent implementation.

Create a network of Kelp Restoration Areas

52. Although the proposed rock lobster closures will be critical in addressing kina barrens, they are unlikely to be sufficient on their own. This is due to the wide extent of barrens and the long time-frame required for rock lobster populations to re-establish sufficiently to reduce kina to low levels where kelp can regrow. For this reason, EDS considers further measures will be needed to avoid, remedy or mitigate the impacts of rock lobster harvest on rock reef ecosystems.

53. EDS suggests FNZ develop a network of 'Kelp Restoration Areas', through broader spatial fisheries closures on the east coast of the North Island, and in particular in CRA 1. The spatial extent of existing protected areas in CRA 1 is very limited and pales in comparison to the scale of vulnerable reef habitat in Northland.[42] Additional protected areas are necessary to rebuild keystone fisheries and address the cumulative effects of fishing on rocky reef systems in the area.

54. Studies have shown that protected areas are effective in restoring the functional role of rock lobster and snapper on rocky reef systems and promote long-term recovery of kelp forests in northeastern New Zealand.[43] No other measures have as yet been proven to be as effective at long-term reversal of urchin barrens.

55. We envisage that in the Kelp Restoration Areas, most harvest would be excluded, and there would be deployment of proactive restoration methods such as urchin removal and/or rock lobster translocation, with monitoring and appropriate conditions.

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[41] Nessia et al, above n 21, at Figure 2.
[42] Kerr et al, above n 32. Also see Peart R, 2025, *Caring for Te Pēwhairangi – Bay of Islands: An oceans reform case study*, Environmental Defence Society, Auckland
[43] For example, see: Babcock et al (1999) "Changes in community structure in temperate marine reserves". *Marine Ecology Progress Series* 189:125-134; Shears N and Babcock R (2002) "Marine reserves demonstrate top-down control of community structure on temperate reefs" *Oecologia*. 132(131):142.

56. EDS urges FNZ to commence work on designing such a network with urgency. Some of the considerations we consider particularly relevant are elaborated on in Attachment A.

Other measures

57. As noted in our previous submission (Attachment A), there are several other management measures that should be adopted to improve the sustainability of rock lobster fishing and reduce urchin barrens. These include:

    (a) A fisheries-independent stock assessment of CRA 1 and northern PHC 1. EDS finds it deeply concerning that the next CRA 1 full stock assessment might exclude the east coast stock because there is insufficient CPUE data to inform a reliable assessment.

    (b) Urgent research on the extent of urchin barrens at depths greater than including long-spined urchin barrens 10m (noting that kina can graze down to 20m and long-spined urchins down to 50m). EDS is concerned that there is significant uncertainty about urchin barrens in deeper waters.

    (c) Introducing new size restrictions, including a maximum legal size limit of 120 mm for commercial and recreational fishers to protect large rock lobster with the highest reproductive capacity and most important predatory influence. The minimum legal size limit should be increased by at least 10 mm for commercial and recreational fishers to support increased abundance in rock lobster (and large rock lobster) through time.

    (d) Developing an ecosystem monitoring plan to track the status of kelp forest habitat over time (including in and outside no-take areas), and requiring mandatory reporting of recreational catch of rock lobster (spiny and packhorse).

Conclusion

58. In light of the best available scientific evidence, urgent and precautionary action is required to address the severe depletion of rock lobster stocks and the associated spread of urchin barrens in CRA 1 and CRA 2.

59. EDS strongly supports the proposed area closures and reductions to recreational take, and recommends additional measures including fisheries-independent stock assessments, deeper-water urchin monitoring, and the establishment of Kelp Restoration Areas. These steps are necessary to rebuild predator populations, restore ecosystem balance, and ensure the long-term sustainability of New Zealand's coastal marine environment.

Attachment A: Previous submission on CRA 1

Fisheries management (CRA 1)
Fisheries New Zealand
By email: FMsubmissions@mpi.govt.nz

12 December 2024

Discussion of proposed measures for the Northland spiny rock lobster fishery (CRA 1)

SUBMITTER DETAILS

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Introduction

1. This is a submission on proposed measures being considered for the Northland spiny rock lobster fishery (**CRA 1**) as set out in Fisheries New Zealand (**FNZ**) Discussion Paper No: 2024/30 (**Discussion Paper**).[1]

2. The Environmental Defence Society (**EDS**) is an independent not-for-profit organisation conducting interdisciplinary policy research and litigation. It was established in 1971 with the purpose of improving environmental outcomes in Aotearoa New Zealand.

3. EDS has a special interest in the marine environment. In May 2022, EDS completed the first phase of a multiyear project looking at issues within the national oceans management system and options for future reform. This included, among other things, fisheries management.[2] EDS is undertaking phase two of the project which focuses on developing recommendations for oceans reform.

4. In 2018, EDS led an in-depth review of the national fisheries management system and published findings in a report entitled "*Voices from the Sea: Managing New Zealand's Fisheries*".[3] EDS has sought to improve fisheries decision-making by submitting on proposed measures for various wild stocks, including recent proposals for CRA 1.[4]

[1] FNZ (2024) "*Discussion of proposed measures for the Northland spiny rock lobster fishery (CRA 1)*" (FNZ Discussion Paper No: 2024/30, November 2024) **[Discussion Paper]**, available here.
[2] Severinsen G et al (2022) "*The Breaking Wave: Oceans Reform in Aotearoa New Zealand*" (EDS, May 2022), available here.
[3] Peart R (2018) "*Voices from the Sea: Managing New Zealand's fisheries*", (EDS, 2018), available here.
[4] EDS (2023) "*Submission on review of sustainability measures for spiny rock lobster (CRA 1) for 2023/24*", available here; and EDS (2022) "*Submission on FNZ Review of the Northland Rock Lobster Fishery (CRA 1)*" available here.

Summary of submission

5. EDS commends FNZ for taking steps to manage the negative impacts of rock lobster harvest on kelp forests in the CRA 1 fishery which is long overdue and now urgently needed.

6. EDS supports the collaborative approach being adopted by FNZ, particularly the proposed co-development of specific options with tangata whenua and stakeholders.[5] EDS has a strong interest in improving environmental outcomes in the Northland coastal area and requests involvement in that process.

7. EDS is very concerned about the depleted biomass levels of CRA 1, the significant implications for the health of rocky reef ecosystems, and the negative flow-on effects for the productivity of the broader marine environment. Available information suggests rock lobsters have been lost from most shallow reefs on the East Coast. This has been accompanied by an expansion of kina barrens. An urgent and careful management approach is required to support the recovery of the stock and kelp reef systems.

8. EDS supports a suite of measures that will provide for effective *long-term* ecosystem-based management of the stock. These include (as a minimum):

    (a) A fisheries-independent stock assessment of CRA 1.
    (b) A clear management goal and objectives that identify the need to "*remedy*" existing urchin barrens and "*avoid*" new barrens.
    (c) Appropriate Quota Management Area (**QMA**) subdivision to enable targeted measures in areas that are vulnerable to urchin barrens.
    (d) A maximum legal size limit of 120 mm for commercial and recreational fishers to protect large rock lobster with the highest reproductive capacity and most important predatory influence.
    (e) Increasing the minimum legal size limit by at least 10 mm for commercial and recreational fishers to support increased abundance in rock lobster (and large rock lobster) through time.
    (f) Establishing a permanent network of no-take "kelp restoration areas" on the East Coast. In these areas, deployment of proactive restoration tools should be enabled, such as urchin removal and/or rock lobster translocation, with appropriate conditions.
    (g) Developing an ecosystem monitoring plan to track the status of kelp forest habitat over time (including in and outside no-take areas).
    (h) Requiring mandatory reporting of recreational catch of rock lobster (spiny and packhorse).

9. However, the above suite of measures will not be sufficient to rebuild the CRA1 stock in a way that meets the desired management outcomes in a timely manner.

[5] Discussion Paper, above n 1, at [4]-[6].

10. EDS submits that a temporary closure of the entire East Coast rock lobster fishery to commercial and recreational harvest is needed to address cumulative effects of fishing, halt further declines in marine biodiversity, and achieve consistency with the purpose and principles of the Fisheries Act 1996 (**Act**).

11. This submission addresses: (1) relevant management context; (2) EDS's feedback on specific proposals in the Discussion Paper; and (3) legal framework for consideration of setting sustainability measures (**Appendix 1**). A table setting out EDS's feedback in relation to specific questions in the Discussion Paper is provided in **Appendix 2**.

Management of the Northland spiny rock lobster fishery (CRA 1)

Key characteristics of the CRA 1 fishery

12. CRA 1 extends north from Te Arai Point on the East Coast, around North Cape, to Kaipara Harbour on the West Coast. It also includes waters surrounding the Three Kings Islands.

13. The latest FNZ Assessment Plenary indicates that the abundance of legally harvestable rock lobster has declined by 84% since 1945,[6] while the spawning biomass has declined by 63%.[7] Model derived estimates of vulnerable biomass show the CRA 1 stock reached an initial low point in 1974, increased slightly until the 1980s, and decreased to a historic low in 1992. Since 1993, the vulnerable biomass has fluctuated around a level that is only marginally higher than the lowest historic point and well below the unfished biomass.[8]

14. In recent years, commercial fishers have shifted away from the core East Coast fishery (statistical areas 903 and 904). Available catch and effort data suggests up to 20% of landings were caught from the East Coast until 2020-21 when there was a stark reduction.[9] In 2021-22 and 2022-23, landings dropped below 1% (~ 1 tonne) in the southeast (which includes the Bay of Islands and to the south) and below 5% (~ 5 tonnes) in the northeast of the fishery (north of the Bay of Islands).[10] Commercial fishing effort has moved to the Three Kings Islands, North Coast and West Coast.

15. The Discussion Paper suggests the reasons for the shift in commercial effort may include:[11]

> "*a reduction in the size of the fishing fleet that coincided with commercial catch limit reductions, higher catch rates typically occurring in other statistical areas attracting a greater share of the reduced TACC, and the avoidance of conflict with the recreational fishery*".

[6] FNZ (2023) "*Fisheries Assessment Plenary: November 2023, Stock Assessments and Stock Status Introduction Section to Yellowfin Tuna*" (FNZ, November 2023) at 308, available here. The current vulnerable reference biomass was predicted to be at 16% of B_0 in 2019.
[7] The spawning stock biomass was predicted to be at 37% of SSB_0 in 2019.
[8] FNZ (2023), above n 6, at 306 (see Figure 5).
[9] Starr P (2024) "*Rock lobster catch and effort data: 1979-80 to 2022-23*" (FNZ, New Zealand Fisheries Assessment Report 2024/10, March 2024), available here, at 12.
[10] Starr P (2024), above n 9, at 12.
[11] Discussion Paper, above n 1, at [28].

16. EDS considers this trend is highly likely to reflect the localised depletion of rock lobster from reefs on the East Coast. For example, a recent review of reported catch and effort data (commissioned by FNZ) states: "*Statistical areas 903 and 904 have low CPUE and consequently carry proportionately more potlifts than catch*".[12] In other words, it takes more effort to find legally harvestable rock lobster in these areas. This indicates the stock is critically depleted.

17. There is limited understanding of recreational or customary harvest in CRA 1. Recreational catch is estimated through results of the National Panel Surveys of Marine Recreational Fishers (**NPS**) and reported landings from recreational charter vessels.[13] The NPS relies heavily on self-reported data.[14] It suggests there has been a decrease in recreational landings over the past decade from ~24 tonnes in 2011/12 to ~8 tonnes in 2022/23. From 2011-12 to 2022-23, most of the annual recreational catch (78% on average) has been taken from the East Coast.[15] This indicates that recreational catch is currently higher than commercial catch on the East Coast.

18. There is also limited information about settlement levels and recruitment in CRA 1.[16] In 2000, settlement monitoring frames were installed in Houhora Bay, Taupiri Bay (near the Bay of Islands), and Home Point (Whangarei Harbour), but settlement levels were too low to obtain reliable estimates for the fishery.[17]

19. A broader analysis of larval sources and sinks around the country indicates very low levels of recruitment in CRA1. There is only a very small amount of local recruitment in CRA1 (~1% of local production). Other recruitment is sourced from stocks much further to the south, on the West Coast of the South Island and in the Taranaki Bight. However, unlike other parts of the New Zealand coast, the oceanic currents along the west coast of the North Island are notably weak and variable. Offshore waters flow in a south-easterly direction (and away from CRA1), with inshore waters flowing in a northwards direction, but only intermittently.[18] This means that only a very small proportion of larvae produced in the southern stocks (<5%) reaches CRA1, with even fewer likely to make it around North Cape to settle on the East Coast.[19]

20. Overall, this means the stock is particularly vulnerable to variations in settlement levels and overfishing. Compared to other stocks, CRA1 has much reduced capacity to recover from fluctuations in environmental conditions or cumulative stressors.

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[12] Starr P (2024), above n 9, at 12.
[13] Discussion Paper, above n 1, at [30].
[14] Heinemann A and Gray A (2024) "*National Panel Survey of Marine Recreational Fishers 2022-23"* (FNZ, New Zealand Fisheries Assessment Report 2024/51, August 2024), available here, at 3.
[15] Discussion Paper, above n 1, at [30]-[32].
[16] This influences model outputs. For example, no puerulus settlement series exists for CRA 1. See Roberts J and Webber D (2024) "*Review of red rock lobster (Jasus edwardsii) recruitment processes and the puerulus collector programme*" (FNZ, New Zealand Fisheries Assessment Report 2024/68, October 2024), available here, at 21.
[17] Booth J et al (2001) "*Settlement indices for 1999, and 1999-2000 juvenile abundance of the red rock lobster, Jasus edwardsii*" (Ministry of Fisheries, New Zealand Fisheries Assessment Report 2001/28), available here, at 7.
[18] Sutton P J and M M Bowen, 2011, "Currents off the west coast of Northland, New Zealand", *New Zealand Journal of Marine and Freshwater Research*, 45:4, 609-624, at 623.
[19] Chiswell S M and J D Booth (2008) "Sources and sinks for larval settlement in *Jasus edwardsii* around New Zealand: Where do larvae come from and where do they go?", *Marine Ecology Progress Series*, 354, 201-217, at Figure 12 and Table 2.

Current status of the CRA 1 stock

21. The latest stock assessments for CRA 1 were undertaken in 2019 (last full assessment), 2021, 2022 and 2023 (rapid updates).

22. The 2023 rapid update found the vulnerable biomass was 15.5% (486 tonnes) and the spawning biomass was 37.1% (548 tonnes) of the unfished reference level (**URL**).[20] These estimates reflect a slight increase from the 2022 rapid update, where vulnerable biomass was 14.4% of URL (462 tonnes) and spawning biomass was 36.8% (543 tonnes).[21] However, they are about the same as the 2019 assessment (addressed above). The 2023 rapid update concluded that the stock is "*About as Likely as Not (40-60% probability) to be at our above the biomass management target*".[22] This suggests there has been no substantive increase in stock levels over the past five years.

23. EDS has concerns about the reliability of the 2023 rapid update. The stock assessment model is largely dependent on fishery-dependent catch per unit effort (**CPUE**) data.[23] This approach has known limitations because CPUE does not account for varying catchability of animals at different life stages, environmental interactions (e.g. predator-prey relationships) or changes in vessel/fisher behaviour. This means there is inherent uncertainty underlying the assessment results and strong measures should be developed to account for this. In the past, measures have not been sufficiently cautious to maintain sustainable stock levels or address cumulative effects of fishing on shallow reef ecosystems (this is addressed further below).

24. In the current CRA 1 context, the stock assessment approach is particularly problematic because:

    (a) The recent shift in commercial effort away from the East Coast means there is limited CPUE data available to inform the stock assessment model. The Discussion Paper states:

        (i) "*Since 2019, rapid assessment updates have not included new data for CPUE, the index of abundance used in rock lobster stock assessments*";[24] and
        (ii) "*Given the recent withdrawal and ongoing limited commercial fishing along most of the east coast of CRA 1 since the previous full assessment, it is unlikely that the 2025 assessment model will be able to estimate current biomass for the east coast region*".[25]

    (b) Recent modelling has identified a potential negative correlation between SST and annual recruitment in CRA 2 (the Hauraki Gulf fishery).[26] This means there is a *known risk* that ocean warming could affect stock productivity in future years on the northeast coast. The stock assessment model does not account for this.

[20] FNZ (2023), above n 6, at 313.
[21] EDS (2023), above n 4, at [20].
[22] FNZ (2023), above n 6, at 311.
[23] FNZ (2023), above n 6, at 301-304.
[24] Discussion Paper, above n 1, at [37].
[25] Discussion Paper, above n 1, at [39].
[26] Rudd et al (2023) "*The 2022 stock assessment of red rock lobsters (Jasus edwardsii) in CRA 2*" (FNZ, New Zealand Fisheries Assessment Report 2023/43, August 2023), available here, at 16.

(c) A study by Nessia et al (2024) compared fisheries-independent data of rock lobster populations from marine reserve and fished locations in CRA 2. They found biomass at fished locations was <10 % of that in reserves and stock assessments reliant on CPUE had "*severely overestimated the recovery and state of rock lobster populations*".[27]

25. EDS finds it deeply concerning that the next full stock assessment might exclude the East Coast stock because there is insufficient CPUE data to inform a reliable assessment. **An urgent fisheries-independent survey is needed to determine the status of the stock and inform future management settings in accordance with the Act.**

Extent and impact of urchin barrens in northeastern New Zealand

Characteristics of urchin barrens

26. Widespread shifts from kelp forests to urchin barrens have been observed across shallow reefs in northeastern New Zealand.[28] This is of concern because kelp forests support higher biodiversity, significantly contribute to fisheries productivity and support healthy ecosystem functioning when compared to urchin barrens.[29] The scientific literature describes urchin barrens as "*a collapsed kelp ecosystem*" and it is widely accepted that urchin barrens are an indicator of significant ecosystem degradation.[30] They indicate that a 'tipping point' has been passed where the ecosystem has 'tipped' into a stable depauperate state.

27. The loss of kelp forests from shallow reefs on the East Coast represents a significant threat to the CRA 1 stock as well as the wider ecosystem. Kelp forests are an important facilitator of rock lobster puerulus settlement onto rocky reefs after larval transition, with the physical structure and chemical cues emitted by them having a positive effect on settlement and recruitment levels.[31] Scientists have recorded higher survival rates of juvenile rock lobster (40%) in kelp habitat versus in urchin barren habitat (10%) in Tasmania and linked this to potential protective benefits of kelp forests (e.g. food and shelter).[32] This is particularly significant given the already naturally low numbers of puerulus reaching CRA1 (as described above).

28. Urchin barrens form when urchin densities exceed a critical threshold that drives destructive overgrazing of macroalgae.[33] Once barrens have formed, they are difficult to reverse because urchins are highly adaptive and can alter feeding behaviour to survive off less nutritious biota.[34]

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[27] Nessia et al (2024) "Using marine protected areas to assess the status and recovery of the spiny lobster *Jasus edwardsii* fishery in the Hauraki Gulf, Aotearoa New Zealand" *Front Mar Sci* doi: 10.3389/fmars.2024.1440350, available here.
[28] Discussion Paper, above n 1, at [7].
[29] Eger et al (2024) "Kelp forest versus urchin barrens: a comparison of ecosystem functions and services provided by two alternative stable marine habitats" *Proc R Soc B* 291: 20241539, here.
[30] Filbee-Dexter K and Schiebling R (2014) "Sea urchin barrens as alternative stable states of collapsed kelp ecosystems", *Mar Ecol Prog Ser*, 495:1-25, available here.
[31] Hinojosa et al (2015) "Settlement and early survival of southern rock lobster, *Jasus edwardsii*, under climate-driven of kelp habitats", *ICES Journal of Marine Science*, 72(Supplement 1), available here.
[32] Ibid.
[33] Ling et al (2015) "Global regime shift dynamics of catastrophic sea urchin overgrazing", *Phil Trans R Soc* B, available here.
[34] See review by Miller K, Blain C and Shears N (2022) "Sea Urchin Removal as a Tool for Macroalgal Restoration: A Review on Removing "the Spiny Enemies" *Frontiers in Marine Science*, available here, at 2.

Studies have shown it is necessary to reduce urchin numbers to very low levels (e.g. 1 kina per m^2) to enable kelp recovery.[35]

Urchin barrens in northeastern New Zealand

29. The best available information demonstrates that fishing of rock lobster has contributed to a trophic cascade in CRA 1, where the depletion of rock lobster (and other key predators) has allowed kina to flourish and overgraze kelp on shallow reefs.[36] This in turn, has driven the loss of kelp and formation of extensive kina barrens.[37]

30. The scientific evidence of the role of fishing in trophic cascades in Northland was accepted by the High Court in the recent CRA 1 case.[38] The Court found (footnotes omitted):[39]

> *"(a) rock lobsters have an important ecological role in coastal ecosystems;*
> *(b) their primary ecological role is as a predator in shallow water areas;*
> *(c) in New Zealand, rock lobsters prey upon sea urchins/kina;*
> *(d) kina are an important herbivore on rocky reefs in north-eastern New Zealand because they can consume entire kelp forests and other seaweeds;*
> *(e) generally, the ecological role of rock lobsters as a predator influences the ecological role of the species they prey on;*
> *(f) where there are fewer rock lobsters, there is an increased population of kina, thereby increasing the grazing activity of kina, and resulting in the loss of strands of seaweed, particularly kelp forests, in coastal areas, described as a "trophic cascade";*
> *(g) trophic cascade has been reported in New Zealand, and areas affected by it are described as 'kina barrens', which take decades to reverse;*
> *(h) loss of kelp forests is ecologically damaging for surrounding coastal systems, in fisheries production, biodiversity, and ocean carbon sequestration;*
> *(i) there is strong evidence that trophic cascade has significantly contributed to the presence of kina barrens in the north-east of New Zealand, within both CRA1 and CRA2;*
> *(j) there are other factors, such as water temperature, water depth, storm damage, sediment and kelp disease that may impact on the prevalence of kina barrens; and*
> *there is a lack of evidence as to this relationship around the remainder of New Zealand."*

31. In northeastern New Zealand, the majority of urchin barrens are dominated by *Evechinus chloroticus* (kina).[40] Studies have found that kina barrens predominately occur on shallow reefs (<10 m) but they can extend deeper (to ~20 m) at exposed offshore islands; they are most extensive on moderately wave-exposed reefs; and they are not observed in areas with high turbidity or wave action.[41]

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[35] See review by Miller K, Blain C and Shears N (2022) "Sea Urchin Removal as a Tool for Macroalgal Restoration: A Review on Removing "the Spiny Enemies" *Frontiers in Marine Science*, available here; and Miller K and Shears N (2023) "The efficiency and effectiveness of different sea urchin removal methods for kelp forest restoration" Restoration Ecology 31(1), available here.
[36] Shears N and Babcock R (2002) "Marine reserves demonstrate top-down control of community structure on temperate reefs" *Oecologia* 132 (131):142, available here; Shears N and Babcock R (2003) "Continuing trophic cascade effects after 25 years of no-take marine reserve protection" *Marine Ecological Progress Series* 246:1-16, available here.
[37] Ibid.
[38] *The Environmental Law Initiative v Minister for Oceans and Fisheries* [2022] NZHC 2969 at [69].
[39] *The Environmental Law Initiative v Minister for Oceans and Fisheries* [2022] NZHC 2969 at [69].
[40] Kerr V, Grace R and Shears N (2024) "Estimating the extent of urchin barrens and kelp forest loss in northeastern Aotearoa, New Zealand" *Journal of Marine and Freshwater Research*, available here.
[41] Shears N and Babcock R (2004) "*Community composition and structure of shallow subtidal reefs in northeastern New Zealand*" (DOC, Wellington, Science for Conservation 245, October 2004), available here, at 6-7.

32. A recent study by Kerr et al (2024) used survey data from seven sites on the northeast coast to estimate the spatial extent of kina barrens at the regional scale. In summary, they found existing kina barrens:[42]

    (a) Covered approximately 30% of shallow reefs in northeastern New Zealand, which equates to an area of 30 km^2;
    (b) Extended to depths of 12-16m at surveyed sites on the East Coast of CRA 1; and
    (c) Were less common in no-take marine reserves (<2% coverage of shallow reefs) than at fished locations (7-49% coverage of shallow reefs).

33. The authors tracked long-term changes in urchin barrens by comparing aerial imagery for two sites at Mimiwhangata and Maitai Bay.[43] Images from 1944 and 1950 showed the reefs were dominated by macroalgal forest but by 2003 and 2009 the same reefs were covered by urchin barrens (75-79%).[44] Similar trends have been reported in other parts of Northland. Available information shows that kina barrens have persisted at fished reefs for *at least* the last two decades.[45]

34. *Centrostephanus rodgersii* (long-spined urchin) have been described as an "*emerging threat*" for northern New Zealand.[46] Long-term monitoring data indicates that long-spined urchin have increased in abundance and spatial extent over the past two decades.[47] Balemi and Shears (2023) found long-spined urchins had formed barrens at protected and fished sites in Northland; and these barrens were generally deeper than kina barrens (i.e. > 10 m).[48] The authors suggest warmer sea temperatures may have contributed to the increases in long-spined urchin populations.[49]

35. Research on formation of long-spined urchin barrens in Tasmania suggests these develop differently to kina barrens.[50] Long-spined urchins have been observed to form discrete patches of barren habitat ("incipient barrens") which eventually expand and join with other barrens to create extensive barrens.[51] This provides an opportunity to identify incipient barrens and stop their expansion into more persistent networks through proactive management.

EDS's feedback on specific measures in the Discussion Paper

36. This section of the submission provides feedback on specific measures in the Discussion Paper (in the order addressed in that document).

[42] Kerr et al (2024), above n 40, at 12.
[43] Kerr et al (2024), above n 40, at 14.
[44] Kerr et al (2024), above n 40, at 14.
[45] Kerr et al (2024), above n 40, at 16.
[46] Balemi C and Shears N (2023) "Emergence of the subtropical sea urchin Centrostephanus rodgersii as a threat to kelp forest ecosystems in northern New Zealand" *Frontiers in Marine Science* 10, available here, at 1.
[47] Ibid.
[48] Ibid.
[49] Ibid at 9.
[50] Flukes E, Johnson C and Ling S (2012) "Forming Sea urchin barrens from the inside out: an alternative pattern of overgrazing" *Marine Ecology Progress Series* 464:179-194, available here.
[51] Ibid.

Draft goal and objectives

37. EDS supports the setting of a goal and objectives to guide rock lobster management responses to urchin barrens in CRA 1. However, it is important these provide for *effective* management of urchin barrens now and into the future. Some amendments are needed to clarify the scope and aims of management and achieve better consistency with the purpose of the Act.

38. First, the draft goal and objectives use the term "*mitigate*" to describe the desired outcome for management of existing urchin barrens. For example, the draft goal seeks "*to mitigate existing urchin barrens*"; and the draft objectives refer to "*mitigating existing urchin barrens*".[52]

39. Measures must avoid, remedy or mitigate urchin barrens (as an adverse effect of rock lobster fishing) to achieve consistency with the purpose of the Act. As the Supreme Court stated in the *King Salmon* case (in the similar context of the Resource Management Act 1991 (**RMA**)), "*avoiding*" has its ordinary meaning of "*not allowing*" or "*preventing*".[53] In the context of the Act it means preventing adverse effects of fishing on the aquatic environment from occurring. No judicial commentary of the term "*remedy*" was identified in the Act or RMA context. However, the ordinary meaning of "*remedy*" is "*to put right, reform (a state of things); to rectify, make good*".[54] In terms of mitigation, as stated by the High Court, "*The usual meaning of 'mitigate' is to alleviate, or to abate, or to moderate the severity of something*".[55]

40. EDS submits that the characteristics of existing kina barrens mean "*mitigation*" is not an appropriate end goal for their management. This is because:[56]

    (a) Kina barrens represent a phase shift where urchin overgrazing removes all kelp from an area – this is a radical change in ecosystem functioning with adverse consequences for the marine environment;
    (b) Kina barrens form when critical thresholds of urchin densities are exceeded (i.e. 'tipping points' are reached);
    (c) Kina barrens reflect a stable state – they are persistent and difficult to reverse unless virtually all kina are removed from an existing barren; and
    (d) Even where proactive measures are adopted (e.g. manual removal of kina), it can take considerable time for kelp recovery and it does not last unless wider ecosystem balance is restored (i.e. the abundance levels of large predators is rebuilt).

41. It is not possible to "*moderate the severity of*" an existing urchin barren because ecosystem functioning is not improved until kelp forest habitat is restored in the affected area (ie the system is tipped back to a healthy state). Therefore, the goal and objectives should identify the need to "*remedy*" existing urchin barrens.

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[52] Discussion Paper, above n 1, at [26].
[53] *Environmental Defence Society Incorporated v The New Zealand King Salmon Company Limited* [2014] NZSC 38 at [24(b)] and [93].
[54] Oxford English Dictionary (online edition) available here.
[55] *Royal Forest and Bird Protection Society of New Zealand Inc v Buller District Council* (No 2), [2013] NZHC 1346 at [72].
[56] See Filbee-Dexter K and Schiebling R (2014) "Sea urchin barrens as alternative stable states of collapsed kelp ecosystems", *Mar Ecol Prog Ser*, 495:1-25, available here; and Miller K et al (2024) "Large-scale one-off sea urchin removal promotes rapid kelp recovery in urchin barrens" *Restoration Ecology*, available here.

42. The goal and objectives seek to "*avoid*" new barrens. EDS supports this approach and considers it is consistent with the purpose of the Act.

43. Second, the draft objectives focus on increasing rock lobster abundance in "*areas with known urchin barrens*".[57] This is problematic because:

    (a) The draft objectives do not define the scope of "*known urchin barrens*". It is unclear if this would capture the entire East Coast of CRA 1; areas that are particularly susceptible to urchin barrens (e.g. shallow reefs < 10 m); or only *existing* urchin barrens.
    (b) The Discussion Paper suggests the West Coast, North Coast and Three Kings Islands will be excluded from the scope of management objectives.[58] This ignores the potential for urchin barrens to extend into new areas in the future. This risk should be captured in the objectives and would achieve better consistency with the draft goal, which applies to the entire QMA.

44. EDS seeks the following amendments to address the above matters:

    Draft Goal: Rock lobster stocks are managed to levels that enable them to meaningfully contribute as rocky reef predators, including ~~helping, at a minimum,~~ to ~~mitigate~~ remedy existing urchin barrens at both a QMA and local scale, while avoiding contributing to the formation of new barrens.

    Draft Objective 1: Increase rock lobster abundance in areas ~~with known~~ susceptible to urchin barrens to levels that ~~at a minimum, mitigating~~ remedy existing urchin barrens while avoiding contributing to the formation of new barrens; and

    Draft Objective 2: Increase abundance of large rock lobsters in areas ~~with known~~ susceptible to urchin barrens to levels that, at a minimum, ~~mitigating~~ remedy existing urchin barrens while avoiding contributing to the formation of new barrens.

    Areas susceptible to urchin barrens include areas where urchin barrens have been identified and areas where they are likely to occur.

    Draft Objective 3: Proactively monitor other areas and take appropriate management action if emerging urchin barrens are identified.

Voluntary measures

45. The Discussion Paper describes voluntary measures that industry have implemented to reduce pressure on the CRA 1 stock. These include:[59]

    (a) A combined harvest cap of 5 tonnes applying to the East Coast.

[57] Discussion Paper, above n 1, at [26].
[58] Discussion Paper, above n 1, at [7].
[59] Discussion Paper, above n 1, at [41].

(b) Seasonal closures over summer when incidental mortality of rock lobsters is thought to be highest.
(c) Area closures in parts of Tūtūkākā Harbour to Bay of Islands, Hokianga Harbour to Herekino Harbour and the Three Kings Islands.

46. The Discussion Paper indicates that additional measures are necessary to address urchin barrens in CRA 1.[60] EDS agrees.

47. EDS commends industry for taking steps to reduce pressure on the CRA 1 stock. However, these measures do not go far enough to rebuild the stock or address existing urchin barrens because:

(a) *Harvest cap:* the Discussion Paper suggests the annual catch for the 2023/24 fishing year was up to ~4 tonnes.[61] Applying a harvest cap of 5 tonnes for the 2024/25 year would *exceed* the maximum 2023/24 harvest of ~4 tonnes by 1 tonne. It also does not ensure pressure is taken off the southeast where harvest is currently less than 1 tonne. This means applying the current harvest cap may not in fact *reduce* the amount of rock lobster being taken from the East Coast.

(b) *Seasonal closures:* available CPUE data for the 2022/23 fishing year[62] suggests no fishing occurred in the southeast part of the fishery (i.e. statistical area 904) during December, January or February, which is when the current seasonal closure applies. Some fishing occurred in the northeast area (the specific amount is expected to be low given the total annual catch for the East Coast). Therefore, the seasonal closures are unlikely to significantly reduce fishing pressure on the East Coast.

(c) *Area closures* are a positive step. However, they do not prevent recreational or customary harvest. Experience from the Mimiwhangata Marine Park (now part of the larger Mimiwhangata Rahui Tapu no-take area under the RMA) demonstrates that partial closures, which allow ongoing recreational harvest, are not adequate to remedy existing urchin barrens.[63]

48. Stronger measures are necessary to rebuild the stock to sustainable levels and avoid, remedy or mitigate cumulative effects of fishing in accordance with the purpose of the Act.

QMA subdivision

49. The Discussion Paper seeks feedback on proposed subdivision of the CRA 1 QMA.[64] No specific boundaries were provided for consultation. However, the Discussion Paper suggests there is initial support from the New Zealand Sport Fishing Council for the QMA to be split at the boundary of statistical areas 902 and 903.[65] This would create two areas, with one area covering

[60] Discussion Paper, above n 1, at [43].
[61] Discussion Paper, above n 1, at 8 (see Figure 2, showing the total landed weight CRA 1).
[62] Starr P (2024), above n 9, at 35 (see Table 8).
[63] Discussion Paper, above n 1, at [32].
[64] Discussion Paper, above n 1, at [45]-[49].
[65] Discussion Paper, above n 1, at [49].

the East Coast; and the other area covering the West Coast, North Coast (including part of the northeast fishery), and Three Kings Islands.

50. **In principle, EDS supports QMA subdivision because this may make it easier to apply targeted measures to areas that are most susceptible to urchin barrens.** The Discussion Paper suggests FNZ have commissioned research to confirm the distribution of urchin barrens from Cape Reinga to East Cape.[66] The specific boundaries for any subdivision should be determined after results of this research are available (expected by May 2025) to ensure the full extent of current urchin barrens are captured in the new East Coast QMA.

51. QMA subdivision may provide for more effective management of rock lobster and urchin barrens. However, subdivision will not achieve this on its own. It is important that stronger measures are implemented to rebuild the rock lobster population; reverse existing urchin barrens; and enhance kelp forest resilience on the East Coast. Regular monitoring of urchin barrens in other areas should be undertaken and management settings reviewed if urchin barrens are identified.

Size restrictions

Introducing a maximum size limit

52. The Discussion Paper seeks feedback on applying a maximum size limit to recreational fishers. It does not recommend applying a maximum size limit to commercial fishers because (in summary): [67]

    (a) Modelling results suggest commercial fishers would have to land more smaller rock lobster to achieve the same weight of annual catch when attempting to catch their quota. This would result in increased fishing pressure on smaller lobster, fewer lobster would reach the protected size range, and the abundance of large rock lobster would reduce over time.
    (b) Recreational fishers are limited by the number of rock lobster a person can take per day (i.e. daily bag limit) rather than an annual catch weight. Therefore, the same outcome would not occur if a maximum size limit applied to recreational fishers.

53. EDS supports a maximum size limit for rock lobsters because:

    (a) Large rock lobsters have greater reproductive potential.[68]
    (b) Large rock lobsters (with a carapace length >130 mm) fulfil an important predatory role because they have an ability to consume large numbers of kina of all sizes and particularly larger kina. [69]

[66] Discussion Paper, above n 1, at 35.
[67] Discussion Paper, above n 1, at [52]-[54]
[68] See review by MacDiarmid A et al (2013) "Rock Lobster biology and ecology: contributions to understanding through the Leigh Marine Laboratory 1962-2012", *New Zealand Journal of Marine and Freshwater Research*, 47:3, 313-333, available here, at 319.
[69] Andrew N and MacDiarmid A (1991) "Interrelations between sea urchins and spiny lobsters in northeastern New Zealand". *Marine Ecology Progress Series*, 70, 211-222 at 216.

(c) Large rock lobsters can consume long-spined urchins whereas snapper are not known to predate these urchins.[70] This means large rock lobsters may play a critical role in regulating long-spined urchin numbers and preventing the expansion of urchin barrens into deeper kelp habitat in Northland.
(d) Larger urchins eat more kelp than smaller urchins.[71] Therefore, large predators play an important role in regulating the most destructive kina and preventing barrens.

54. The modelling results provided in the Discussion Paper do not justify excluding the commercial fishery from a maximum size restriction. This is because they fail to assess how a reduction in catch would influence stock abundance. For every modelled scenario, the Total Allowable Commercial Catch (**TACC**) was assumed to remain constant at 105 tonnes (i.e. the 2022 TACC).[72] No modelling results were provided for other possible options, including a combined reduction in TACC with a maximum size restriction; or FNZ's recommended measure (i.e. a maximum size limit applying only to recreational fishers).

55. Consequently, there is no evidence that an appropriate reduction in TACC would not offset the decrease in abundance that the modelling predicted, particularly on the East Coast where the annual catch is already low.

56. **EDS submits that a maximum size limit for *both* commercial and recreational fisheries is necessary to rebuild the CRA 1 stock and effectively avoid, remedy or mitigate urchin barrens.** The maximum size limit should be set to protect large male and female rock lobsters with a carapace length > 120 mm as studies have shown that rock lobster >130 mm can eat kina of all sizes. Additional measures, including consideration of appropriate reductions in the TACC, should be progressed to support the effectiveness of the new maximum size limit.

<u>Increasing the minimum size limit</u>

57. The Discussion Paper seeks feedback on adjustments to the minimum size limits for both recreational and commercial fishers.[73]

58. The Discussion Paper includes modelling results for four scenarios: the status quo; a reduction of 5 mm (i.e. letting smaller rock lobster be caught); and increases of 5 mm or 10 mm.[74] With a 10 mm increase in the minimum size limits, spawning biomass and vulnerable biomass were predicted to increase by 47.7% and 82.3% respectively.[75] A 5 mm increase would result in proportionate increases.

59. **EDS supports increasing the minimum size limits by 10 mm because it would support increased abundance of rock lobster over time.** However, given the scale of urchin barrens in Northland,

[70] Balemi and Shears (2023), above n 46, at 9.
[71] Stevenson C, Demes K and Salomon A "Accounting for size-specific predation improves our ability to predict the strength of a trophic cascade" *Ecology and Evolution*, available here.
[72] Discussion Paper, above n 1, at 39 (see Table 8).
[73] Discussion Paper, above n 1, at [56]-[57]. The current limits are: 54 mm tail width (males); and 60 mm tail width (females).
[74] Discussion Paper, above n 1, at 39.
[75] Discussion Paper, above n 1, at [137]-[138].

adjusted size limits are not likely to halt further declines in marine biodiversity and ecosystem functioning. Particularly given there is considerable uncertainty about the status of the stock and no 'target' biomass has been identified that would ensure rock lobster fulfil their functional role as a key predator of urchins.

Area-based measures

60. The Discussion Paper seeks feedback on two potential area-based measures:[76]

    (a) No-take area closures where fishing is prohibited (except for controlled kina harvest and customary harvest); and
    (b) Partial area closures where rock lobster fishing is prohibited.

Establish a network of kelp restoration areas

61. No-take areas are recognised as one of the most effective ways to rebuild populations of key predators with flow on benefits for ecosystem functioning. Studies have shown that no-take protection can restore the functional role of rock lobster and snapper and promote long-term recovery of kelp forests in northeastern New Zealand.[77] No other measures have proven to be effective at long-term reversal of urchin barrens.

62. The spatial extent of existing no-take areas in CRA 1 is very limited. For example:

    (a) The Poor Knights Islands Marine Reserve was established in 1981 and is ~2,410 ha.[78] The reserve includes rocky reef and associated kelp habitat surrounding offshore islands.
    (b) The Whangārei Harbour Marine Reserve was established in 2006 and is ~254 ha. It includes an area of intertidal mudflat/mangroves at Waikaraka and a mix of sandy beach, rocky reef and high current outcrops at Motukaroro / Passage Island.[79]
    (c) Te Hā o Tangaroa Protection Areas were established under the Northland Regional Coastal Plan in 2023. These applied no-take controls to areas around Mimiwhangata peninsula and from Maunganui Bay – Oke Bay in the Bay of Islands. Both areas had been subject to partial protections and included reefs with high biodiversity values.[80]
    (d) Temporary closures apply to areas near Rehuotane Ki Tai, Marsden Bank and Mair Bank, and Maunganui Bay .[81]

[76] Discussion Paper, above n 1, [58]-[67].
[77] For example, see: Babcock et al (1999) "Changes in community structure in temperate marine reserves". *Marine Ecology Progress Series* 189:125-134; Shears N and Babcock R (2002) "Marine reserves demonstrate top-down control of community structure on temperate reefs" *Oecologia*. 132(131):142.
[78] Department of Conservation "Poor Knights Islands Marine Reserve" available here.
[79] Department of Conservation "Whangarei Harbour Marine Reserve" available here.
[80] *Bays of Islands Maritime Park Inc v The Royal Forest and Bird Protection Society of New Zealand Inc* [2021] NZEnvC 228.
[81] For example, in 2022, Ngati Takapari, Te Waiariki, Ngati Kororoa applied for a temporary fisheries closure of Whangai Mokopuna Rohe Moana (Tutukaka Harbour, Ngunguru Bay, Ngunguru River, Horahora River and surrounding areas (Rehuotane Ki Tai) under s 186 of the Act – the closure included rock lobster and packhorse rock lobster and was approved in January 2024 see here; in 2022, Te Kupenga o Ngati Kuta and Patukeha ki Te Rawhiti applied to roll-over an existing temporary closure in regards to Maunganui Bay (approved in October 2022) see here; and in 2022 The Patuharakeke Mana Moana Rōpū applied for a temporary closure in regards to Mair and Marsden Banks (Marsden Point) (approved in 2022, see here).

63. The extent of existing no-take areas pales in comparison to the scale of vulnerable reef habitat in Northland. For example, Kerr et al (2024) estimated there are ~10,122 ha of shallow reefs susceptible to urchin barrens; and 3,053 ha of existing urchin barrens in northeastern New Zealand.[82]

64. **EDS supports the need for a carefully designed no-take network as part of a long-term management strategy.** Additional no-take areas are necessary to rebuild sustainable rock lobster populations and address cumulative effects of fishing on the East Coast. Areas susceptible to urchin barrens should be prioritised to promote recovery and enhance resilience.

65. It is important that no-take areas are carefully designed to optimise their effectiveness. The size of no-take areas is particularly important for rock lobster because they can move considerable distances offshore. La Scala-Gruenwald et al (2020) found rock lobster abundance had declined at three small (4-8km^2) marine reserves in CRA 2 despite no-take protection.[83] After excluding other factors, the authors suggested the declines were likely caused by fishing on the offshore reserve boundary.[84]

66. EDS submits that additional no-take areas will not be sufficient (on their own) to address the scale of urchin barrens in Northland because:

    (a) It can take decades for kelp forests to recover following no-take protection.
    (b) Heavily depleted rock lobster populations have not recovered to sustainable levels despite long-term protection in some areas. For example, Balemi and Shears (2023) found very low numbers of rock lobster (spiny and packhorse) at the Poor Knights Islands Marine Reserve and suggested this could be linked to limited larval supply, limited settlement habitat, and a severely depleted spawning population.[85]
    (c) As previously indicated, long-spined urchins have increased in abundance and formed urchin barrens at depths below kina barrens in Northland.

67. Proactive tools should be enabled to boost kelp recovery and build resilience in areas susceptible to urchin barrens. **No-take areas could be established as "*kelp restoration areas*" with bespoke regulations to enable activities that have been proven to support effective recovery of rock lobster populations and kelp forests.** For example:

    (a) Kina removal – studies have shown that kina removal (to <1 kina per m^2) can promote rapid recovery of kelp forests over relatively short timeframes (i.e. two years).[86] However, the removal process is labour intensive and does not deliver long-term kelp

[82] Kerr et al (2024), above n 40.
[83] La Scala-Gruenwald et al (2022) "Small marine reserves do not provide a safeguard against overfishing" *Conservation Science and Practice*, available here.
[84] Ibid at 9.
[85] Balemi and Shears (2023), above n 46, at 9.
[86] Miller K et al (2024) "Large-scale one-off sea urchin removal promotes rapid kelp recovery in urchin barrens" *Restoration Ecology*, available here.

recovery.[87] Urchins return and form new barrens unless removal continues so it is essential that additional measures are adopted to rebuild predator populations.[88]

(b) Rock lobster translocation – in Tasmania a translocation program has been operating since 2014 to boost recovery and productivity of the spiny rock lobster fishery.[89] Small rock lobsters are moved from high density areas on the southwest coast to warmer waters on the east coast. The program is aimed at supporting fisheries productivity by speeding up rock lobster growth (as lobsters grow faster in warmer waters) and is jointly funded by the Tasmanian Government and industry.

68. Any restoration tools must have a strong evidence-basis. Greater investment in scientific research is needed with priority areas including:

(a) Spiny and packhorse rock lobster movement/feeding patterns in the wild.
(b) Effectiveness of rock lobster translocation for rebuilding depleted stocks.
(c) Fine-grain mapping of urchin barrens at a wider depth range. As previously indicated, studies have suggested that long-spined urchin barrens form via a staged process where small discrete barrens eventually merge to form extensive barrens. Identifying these areas early will be the most effective and efficient way to prevent expansion of barrens.
(d) No-take areas should be monitored against clear restoration criteria, such as urchin barren or kelp forest cover and primary productivity, and reviewed if the results of monitoring show restoration has been ineffective. For example, Vince Kerr (marine scientist) has previously recommended setting the following thresholds to guide long-term ecosystem management in Northland:[90]
    (i) Level 1: 5-10% urchin barren extent signals that careful monitoring of predator populations is needed and fishing restrictions should be considered;
    (ii) Level 2: >10% urchin barren extent supported by low fish diversity and predator abundance signals that long-term no-take protection is required to restore ecosystem balance. Areas could be reviewed for reopening only if urchin barren extent was reduced below 10%.

Implement an urgent closure of the East Coast rock lobster fishery

69. Even if proactive restoration tools are urgently deployed, it will take years to rebuild healthy rock lobster populations and reverse widespread urchin barrens. In this context, **EDS submits that a temporary closure of the East Coast rock lobster fishery to commercial and recreational harvest is needed to address cumulative effects of fishing, halt further declines in marine biodiversity and achieve consistency with the purpose and principles of the Act.**

[87] Ibid.
[88] Ibid.
[89] Tasmanian Government "Rock Lobster Translocation" available here.
[90] Statement of evidence of Vince Kerr on behalf of Te Uru o Hikihiki Hapu, dated 25 March 2021, available here.

70. The temporary closure should be accompanied by appropriate conditions, which include:

    (a) A review after two years.
    (b) Regular monitoring of key ecosystem metrics to track kelp forest recovery through time and the effects of fishing in areas that remain open to rock lobster harvest (e.g. the West Coast and Three Kings Islands).
    (c) The East Coast fishery must not reopen until appropriate ecosystem targets have been met (e.g. urchin barrens have declined to defined thresholds and rock lobster abundance and size distributions have recovered to defined levels that are proven to fulfil an effective predatory role in reef ecosystems); and strong measures (i.e. kelp restoration areas) have been implemented to ensure long-term sustainability of the stock.

71. EDS considers a temporary closure of the fishery is unlikely to have significant economic consequences for industry because they have already largely moved away from the East Coast to find legally harvestable rock lobster. The effects on recreational fishers are justified by the need for *urgent* measures to ensure sustainability of the fishery and reduce the risk of more radical long-term measures being required in the future (ie permanent closure).

Seasonal closures

72. The Discussion Paper sets out various options for seasonal closures that aim to reduce fishing pressure on rock lobster populations when they are most vulnerable. For example, closures could apply during peak recreational fishing effort (i.e. over summer) and/or rock lobster breeding periods (e.g. April to November).[91]

73. EDS supports further consideration of seasonal closures as part of a long-term management strategy to maintain healthy rock lobster populations in CRA 1. However, for the reasons previously indicated, EDS submits that seasonal closures are not sufficient to adequately rebuild the stock or address cumulative effects of fishing in areas vulnerable to urchin barrens on the East Coast.

Additional measures proposed by tangata whenua

74. The Discussion Paper seeks input on measures to reduce recreational fishing pressure on spiny and packhorse rock lobsters, which include:

    (a) Vessel and/or accumulation limits; and
    (b) A reduced daily bag limit for packhorse rock lobster.

75. EDS supports further consideration of these measures as part of a long-term management strategy to maintain healthy rock lobster populations in CRA 1.

[91] Discussion Paper, above n 1, at [68]-[71].

76. There is strong evidence to suggest recreational fishing has contributed to the formation and persistence of urchin barrens in CRA 1. For example, Kerr et al (2024) recorded the highest relative cover of urchin barrens at sites in the Mimiwhangata Marine Park (48.8%).[92] Commercial fishing has been excluded from this area for years but recreational fishing continued up until last year. Urchin barrens were less common (1.4% and 1.9%) in areas where both commercial and recreational fishing was prohibited.[93]

77. However, it is uncertain if these measures would effectively reduce pressure on the stock. This is partly due to gaps and limitations in available information about recreational catch. **EDS supports the need for mandatory catch reporting to improve understanding of recreational fishing pressures.** As a minimum, reporting requirements should include:

    (a) Electronic reporting of the fisher's name, date, location, size and number of rock lobster caught per trip (with daily reporting of catch required for multi-day trips); and
    (b) A timeframe for reporting (e.g. catch must be reported within 7 days of a trip).

78. If an accumulation limit is progressed, it should be accompanied by 'bag and tag' conditions (as applied in the CRA 5 fishery) so compliance with daily catch limits can be easily monitored and enforced. The daily bag limit for pack horse rock lobster should be reduced from 6 to 3, which is consistent with the current daily bag limit for spiny rock lobster.

79. **Overall, EDS considers an urgent closure of the CRA 1 fishery is required to effectively address cumulative effects of recreational fishing on reef ecosystems.**

Conclusion

80. Kina barrens are widespread across shallow reefs (<16m) in Northland and *long-spined urchins* are increasing in abundance and extent. Urgent action is required to rebuild sustainable levels of rock lobster and promote recovery of kelp forest habitat.

81. EDS supports the need for a temporary closure of the East Coast CRA 1 fishery to ensure sustainability of the stock and avoid, remedy or mitigate urchin barrens in accordance with the purpose of the Act.

82. EDS supports a suite of additional measures, including no-take areas, proactive restoration tools and adjusted size limits, that would provide for ecosystem-based management of CRA 1. EDS would like to be involved in further development of these measures alongside other stakeholders and FNZ.

[92] Kerr et al (2024), above n 40, at 12.
[93] Kerr et al (2024), above n 40, at 12.

APPENDIX 1: LEGAL FRAMEWORK FOR DECISION-MAKING UNDER THE ACT

1. The Minister for Oceans and Fisheries (**Minister**) must comply with various requirements when considering the setting of sustainability measures under the Act.

Sustainability measures (s 11)

2. A "*sustainability measure*" is any measure set or varied "*for the purpose of ensuring sustainability*".[94] A range of options are available to the Minister including area closures, size limits and catch limits.[95]

3. The Minister must make decisions on sustainability measures:[96]
   (a) In a manner that is consistent with the purpose of the Act, as set out in s 8;
   (b) Taking into account the environmental principles in s 9;
   (c) Taking into account the information principles set out in s 10; and
   (d) After taking into account any effects of fishing on any stock and the aquatic environment in accordance with s 11.

Purpose (s 8)

4. The purpose of the Act is "*to provide for the utilisation of fisheries resources while ensuring sustainability*".[97]

5. The definition of "*ensuring sustainability*" includes "*avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment'*.[98] Certain terms are defined in s 2(1), as follows:

   (a) "*Effect*" means "*the direct or indirect effect of fishing*" including any positive, adverse, temporary, permanent, past, present, future and cumulative effects.
   (b) "*Aquatic environment*" is defined as "*the natural and biological resources comprising any aquatic ecosystem*" and to include "*all aquatic life*".
   (c) "*Aquatic life*" captures "*any species of plant or animal life that, at any stage of its life history, must inhabit water, whether living or dead*".

6. In *New Zealand Recreational Fishing Council Inc v Sanford Ltd*, the majority of the Supreme Court provided the following guidance on the purpose of the Act (footnotes omitted):[99]

   "Section 8(1) … expresses a single statutory purpose by reference to the two competing social policies reflected in the Act. Those competing policies are "utilisation of fisheries" and "ensuring sustainability". The meaning of each term in the Act is defined in s 8(2). The

[94] Fisheries Act 1996, s 2(1).
[95] Fisheries Act 1996, s 11(3).
[96] Fisheries Act 1996, s 11(1).
[97] Fisheries Act 1996, s 8(1).
[98] Fisheries Act 1996, s 8(2).
[99] *New Zealand Recreational Fishing Council Inc v Sanford Ltd* [2009] NZSC 54 at [39].

statutory purpose is that both policies are to be accommodated as far as is practicable in the administration of fisheries under the quota management system. But recognising the inherent unlikelihood of those making key regulatory decisions under the Act being able to accommodate both policies in full, s 8(1) requires that in the attribution of due weight to each policy [the weight] given to utilisation must not be such as to jeopardise sustainability. Fisheries are to be utilised, but sustainability is to be ensured."

7. The High Court has described the purpose of the Act as creating an "'*environmental bottom line' … complemented by a scheme that favours precaution*".[100]

8. EDS submits that this means any measures must effectively rebuild the CRA 1 stock to sustainable levels and avoid, remedy or mitigate adverse effects of fishing (e.g. urchin barrens) to achieve consistency with the purpose of the Act.

Environmental principles (s 9)

9. Section 9 of the Act sets out the environmental principles which the Minister must "*take into account*". The two most relevant to the CRA 1 stock are:

   (a) "*biological diversity of the aquatic environment should be maintained*" (s9(b)).
   (b) "*habitat of particular significance for fisheries management should be protected*" (s9(c)).

<u>Biodiversity should be maintained</u>

10. *"Biological diversity"* is defined in s 2(1) as *"the variability among living organisms, including diversity within species, between species, and of ecosystems".* The word "*maintained*" is not defined by the Act and no commentary on its meaning was identified in case-law. However, the online Oxford English Dictionary defines "*maintain*" as follows:[101]

    "To keep up, preserve, cause to continue in being (a state of things, a condition, an activity, etc.); to keep vigorous, effective, or unimpaired; to guard from loss or deterioration."

11. The approach adopted by the Discussion Paper to assessing whether s 9(b) has been achieved includes:[102]

    "The measures proposed in this document are designed to mitigate the impacts of fishing on biological diversity by increasing rock lobster abundance and, in particular, increasing the abundance of large lobster to levels where they can assist in mitigating existing urchin barrens"

    "FNZ's initial view is that relying on non-regulatory measures alone would not be consistent with the principle that biological diversity should be maintained. This is because these measures alone are unlikely to sufficiently mitigate existing urchin barrens or the formation of new urchin barrens. Similarly, implementing a maximum legal size in the commercial

[100] *The Environmental Law Initiative v Minister for Oceans and Fisheries* [2022] NZHC 2969 at [108].
[101] Oxford English Disctionary (online edition) available here.
[102] Discussion Paper, above n 1, at 28.

fishery has been shown to be counter productive in that it would reduce the abundance of large rock lobster (without additional TAC reductions) because fishers would have to take more small lobsters to catch their equivalent ACE tonnage. All other measures and combinations of measures have some potential of maintaining the biological diversity of the aquatic environment."

12. Kelp forests support higher levels of biodiversity than urchin barrens. Therefore, to "*maintain biodiversity*" it is necessary to avoid new urchin barrens. EDS submits that it is not appropriate to adopt measures that only "*have some potential of maintaining*" biodiversity. This is not consistent with the directive in section 9(c) that biodiversity "*should be maintained*".

13. There is insufficient evidence that "*increasing rock lobster abundance*" will effectively restore their role a key predator and prevent or reverse urchin barrens. Particularly in areas where rock lobster have been significantly depleted and recovery may be undermined by weak recruitment. It is important that proven measures, such as no-take area closures, are implemented to promote kelp recovery and restore biodiversity that has already been lost.

<u>Habitats of particular significance for the CRA 1 stock should be protected</u>

14. Section 9(c) states that "*habitat of particular significance for fisheries management should be protected*". The Discussion Paper identifies 10 habitats of particular significance for fisheries management (**HoPs**) within CRA 1.[103] However, no HoPs for rock lobster have been identified.

15. EDS finds this concerning because kelp forests are likely to be an important habitat for rock lobster in CRA 1. This is acknowledged by the Discussion Paper, which states:

    (a) "*While FNZ does not currently have evidence available to support the identification of specific (spatially defined) areas of kelp-dominated habitat as a habitat of particular significance for fisheries management, we recognise the likely importance of kelp-dominated habitat in supporting settlement, recruitment, and productivity of a number of species, including rock lobster*".[104]

    (b) "*Evidence from Australia suggests that kelp habitat may be critical to the settlement success of rock lobster (Jasus edwardsii) peuruli, providing important settlement cues, food and refuge. The same relationship has yet to be observed in New Zealand and further research is needed to test this. However, given the similarity between ecosystems in Tasmania and New Zealand these potential relationships are important to consider for the management of rock lobster. Kelp does support both food sources and shelter for later life stages of rock lobster in New Zealand, suggesting the health of coastal kelp forests is likely tightly linked to the health of the rock lobster population*".[105]

16. Given the widespread loss of kelp forests on the East Coast of CRA 1, it is important that remaining kelp forests are adequately protected to support productivity of the CRA 1 stock (and

[103] Discussion Paper, above n 1, at 47.
[104] Discussion Paper, above n 1, at 47.
[105] Discussion Paper, above n 1, at 31.

other fisheries). Identification of important kelp forest habitat should be prioritised with appropriate investment in scientific research to support this work.

Information principles (s 10)

17. The Minister must also take into account the information principles in s 10:

> *"(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."*

18. EDS submits that a cautious management approach requires the Minister to take action to ensure sustainability by avoiding, remedying or mitigating the adverse effects of rock lobster fishing on the aquatic environment. As area closures are the only *proven* measure for addressing urchin barrens, these should be prioritised for implementation. Additional measures should be progressed to increase the abundance of large rock lobster to sustainable levels in accordance with the purpose of the Act**.**

19. Uncertainty and gaps in available information have led to poor management outcomes for the CRA 1 fishery in the past. This in turn has been driven by a gross lack of investment in fisheries-independent surveys and scientific research of rock lobster populations and their role in the wider ecosystem. It is important that additional funding is made available to improve the knowledge base and monitor the effectiveness of management responses.

APPENDIX 2: SUMMARY OF EDS'S RESPONSES TO QUESTIONS IN DISCUSSION PAPER

FNZ Discussion Points		**EDS Response**
1	Do you consider that setting a goal and objectives for rock lobster management in response to urchin barrens in CRA 1 is useful?	EDS supports setting an appropriate goal and objectives.
2	Do you agree with the draft goal and objectives outlined above? If not, are there alternative objectives you think should be considered?	EDS supports the draft goal and objectives insofar as these seek to "*avoid*" formation of new barrens. EDS seeks amendments to the draft goal and objectives to appropriately: (a) Identify the need to "*remedy*" not "*mitigate*" existing urchin barrens; and (b) Recognise the potential for urchin barrens to form in new areas in the future. Suggested amendments are set out at [44] of the submission.
3	Do you agree with FNZ's initial view that the measures FNZ and the Minister have implemented to date, and the current non-regulated industry measures, will not sufficiently address barren issues? If so, what measures could be used in conjunction?	EDS agrees that current measures are insufficient to address urchin barrens. EDS seeks an urgent closure of the East Coast rock lobster fishery to recreational and commercial harvest with a two-year review and conditions on reopening the fishery. In addition, EDS seeks a suite of measures that will provide for effective long-term management of the stock. These include (as a minimum): (a) A fisheries-independent stock assessment of CRA 1; (b) Appropriate QMA subdivision to enable targeted measures in areas that are vulnerable to urchin barrens; (c) A maximum legal size limit of 120 mm applying to commercial and recreational harvest of rock lobster; (d) An increase to the minimum legal size limits of at least 10 mm for commercial and recreational harvest of rock lobster; (e) Establish a permanent network of no-take "*kelp restoration areas*" on the East Coast; (f) Develop an ecosystem monitoring plan to track the status of kelp forest habitat over time (including in and outside no-take areas); and (g) Require mandatory reporting of recreational rock lobster catch.

4	Do you support QMA subdivision as a management measure FNZ should pursue?	EDS supports QMA subdivision because this may make it easier to apply targeted measures to areas that are most susceptible to urchin barrens.
5	Do you consider QMA subdivision should be used in conjunction with another management measure? If so, which measure?	EDS supports additional measures. See above under '3'.
6	Do you have any views on where the CRA 1 QMA should be subdivided?	The specific boundaries for any subdivision should be determined after the results of FNZ commissioned research are available (expected by May 2025) to ensure the full extent of current urchin barrens are captured in the new East Coast QMA.
7	Do you have any views on how quota should be allocated in any new QMAs?	Allocation should be designed, to the extent possible, to support a reduction of commercial fishing pressure on the East Coast stock.
8	Do you support implementing a maximum legal size for commercial and/or recreational fishers?	EDS supports a maximum size limit for commercial and recreational fishers. The maximum size limit should be set to protect large male and female rock lobsters with a carapace length > 120 mm as studies have shown that rock lobster >130 mm can eat kina of all sizes.
9	Do you consider a maximum legal size should be used in conjunction with another management measure? If so, which measure(s)?	EDS supports additional measures. See above under '3'.
10	Do you support increasing the minimum legal size for commercial and/or recreational fishers?	EDS supports increasing the minimum legal size by at least 10 mm for commercial and recreational fishers because it will support increased abundance of rock lobster over time.
11	Do you consider increasing the minimum legal size should be used in conjunction with another management measure? If so, which measure(s)?	EDS supports additional measures. See above under '3'.
12	Do you support area closures for recreational and/or commercial fishers as a management measure FNZ should pursue?	EDS supports area closures applying to recreational and commercial fishers.
13	If yes, do you have any views on the location, scale, and type of closure (e.g. rock lobster fishing only or multi-species no-take areas) that should be implemented?	EDS supports: (a) An urgent closure of the East Coast rock lobster fishery to recreational and commercial harvest with a two-year review and conditions on reopening the fishery; and (b) A permanent network of no-take closure areas on the East Coast. These areas individually and collectively must be sufficiently large to protect rock lobster populations; appropriately sited to support recovery and enhance resilience

		of kelp forest habitat; and could be established as “kelp restoration areas” with bespoke regulations to enable activities that have been proven to support effective recovery of rock lobster populations and kelp forests.
14	Do you consider area closures should be used in conjunction with another management measure? If so, which measure(s)?	EDS supports additional measures. See above under ‘3’.
15	Do you support seasonal closures for recreational and/or commercial fishers as a management measure FNZ should pursue?	EDS supports further consideration of seasonal closures as part of a long-term management strategy to maintain healthy rock lobster populations in CRA 1.
16	Do you have any views on the time period, location, or scale of seasonal closures that should be implemented?	
17	Do you consider seasonal closures should be used in conjunction with another management measure? If so, which measure(s)?	EDS supports additional measures. See above under ‘3’.
18	FNZ is seeking feedback on vessel and accumulation limits for recreational fishers.	EDS supports further consideration of these measures as part of a long-term management strategy to maintain healthy rock lobster populations in CRA 1. EDS supports the need for mandatory catch reporting to improve understanding of recreational fishing pressures. If an accumulation limit is progressed, it should be accompanied by ‘bag and tag’ conditions (as applied in the CRA 5 fishery) so compliance with daily catch limits can be easily monitored and enforced.
19	FNZ is seeking feedback on whether tangata whenua and stakeholders consider additional measures for packhorse rock lobster are required.	As above under ‘18’. In addition, the daily bag limit for pack horse rock lobster should be reduced from 6 to 3, which is consistent with the current daily bag limit for spiny rock lobster.