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Submission: Proposed recreational daily limits for kina and Centrostephanus: Fisheries Management Area 1

Recommendations

1. **We recommend the Minister supports an alternative option, Option 4 –** an increase to the FMA 1 recreational daily limit from 50 to 70 sea urchin, including kina and *Centrostephanus rodgersii*.

The Submitters

2. The New Zealand Sport Fishing Council (**NZSFC**) appreciates the opportunity to submit on the review of sustainability measures for sea urchins which includes kina (*Evechinus chloroticus*) and purple or long-spined urchins (*Centrostephanus rodgersii*) in Fisheries Management Area 1 (**FMA 1**). Fisheries New Zealand's (FNZ) Discussion paper was received on 26 March 2024, with submissions due by 20 May 2024.

3. The NZ Sport Fishing Council is a recognised national sports organisation of 50 affiliated clubs with over 36,700 members nationwide. The Council has initiated LegaSea to generate widespread awareness and support for the need to restore abundance in our inshore marine environment. Also, to broaden NZSFC involvement in marine management advocacy, research, education and alignment on behalf of our members and LegaSea supporters. legasea.co.nz.

4. The New Zealand Angling and Casting Association (**NZACA**) is the representative body for its 24 member clubs throughout the country. The Association promotes recreational fishing and the camaraderie of enjoying the activity with fellow fishers. The NZACA is committed to protecting fish stocks and representing its members' right to fish.

5. The New Zealand Underwater Association comprises three distinct user groups including Spearfishing NZ, affiliated scuba clubs throughout the country and Underwater Hockey NZ. Through our membership we are acutely aware that the depletion of inshore fish stocks has impacted on the marine environment and the wellbeing of many of our members.

6. Collectively we are '*the submitters*'. The joint submitters are committed to ensuring that sustainability measures and environmental management controls are designed and implemented to achieve the Purpose and Principles of the Fisheries Act 1996, including "maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations…" [s8(2)(a) Fisheries Act 1996].

7. Our representatives are available to discuss this submission in more detail if required. We look forward to positive outcomes from this review and would like to be kept informed of future developments. Our contact is Helen Pastor, secretary@nzsportfishing.org.nz.

Background

8. There are two main species of sea urchin on coastal rocky reefs in New Zealand. Kina (*Evechinus chloroticus*) is endemic to New Zealand and is a valued species for customary Māori, commercial and recreational fishers. Long-spined urchins (*Centrostephanus rodgersii*) have been known to occur in New Zealand since the 1920s or earlier. *Centrostephanus* are less common, however, with warming waters and changing ocean currents, their spatial distribution is expanding and abundance has been increasing.

9. Kina was introduced into the Quota Management System (**QMS**) in 2003. The Quota Management Areas (**QMA**) were created based on the Fisheries Management Areas (**FMA**). *Centrostephanus* is not managed under the QMS. For recreational interests, the combined daily limit for kina and *Centrostephanus* is 50, under the Fisheries (Amateur Fishing) Regulations 2013.

Figure 1: FMA 1 Kina management areas

10. Fisheries New Zealand (FNZ) is reviewing the recreational daily limit for kina and *Centrostephanus* in FMA 1. FMA 1 encompasses the inshore waters along the north-eastern coast from North Cape to Cape Runaway and consists of two kina QMAs: SUR 1A (East Northland) and SUR 1B (Hauraki Gulf/Bay of Plenty) (**Figure 1**).

11. There has been one increase to the Total Allowable Catch (**TAC**) settings for SUR 1A and SUR 1B since 2003 which included an increase to the Total Allowable Commercial Catch (**TACC**) and Customary Māori allowance. The recreational allowance and daily limit have remained the same.

12. There is currently no stock status estimate for SUR 1A and SUR 1B. However, reports from iwi, scientists and fishers have indicated the kina abundance across FMA 1 is high and catch estimates have remained within or below the limits and allowance.

13. Additionally, information from localised area surveys have highlighted that abundance of *Centrostephanus* and kina are high in many areas throughout the North Island, to an extent where kina are negatively impacting the wider marine ecosystem in the form of urchin barrens.

Sea urchin barrens

14. FNZ have defined a sea urchin barren as:

> *"sea urchin dominated areas of rocky reef that would normally support healthy kelp forest but have little or no kelp due to overgrazing by sea urchins,"*[1]

15. As a result of overgrazing and depleted food sources, urchins within barrens have a low gonad index value and are not deemed suitable or appealing for consumption. Also referred to as skinny kina.

16. The proliferation of urchin barrens in FMA 1 is thought to be driven by a fishery induced trophic cascade, where fishing pressure has reduced or eliminated the functional role of top predators within an ecosystem.[2]

17. Large snapper (*Pagrus auratus*) and rock lobster (*Jasus edwardsii*) are accepted as the primary predators of kina in FMA 1. The management boundaries for FMA 1 match those of Snapper 1 (SNA 1) and Crayfish 1 (CRA 1). Both snapper (SNA 1) and rock lobster (CRA 1) populations have historically been fished down below their designated management targets. Additionally, there is anecdotal information from fishers and local communities that has highlighted localised depletion of snapper and rock lobster in areas of known urchin barrens.

18. Both rock lobster and packhorse lobsters (*Sagmariasus verreauxi*) have been reported as being predators of *Centrostephanus*, however, their long spines may make them a less favourable prey option, therefore, requiring alternative management interventions where predation does not limit spread.

19. Heavy grazing by urchins have turned previously diverse biogenic habitats into barren areas with low biodiversity and productivity. This ecosystem imbalance is a clear example of where the single-species based QMS with Maximum Sustainable Yield (**MSY**) targets has failed.

[1] Proposed recreational daily limits for kina and Centrostephanus: Fisheries Management Area 1. Fisheries NZ. At [50]

[2] Doheny B., Davis J.P., Miller B. (2023). Fishery-induced trophic cascades and sea urchin barrens in New Zealand: a review and discussion for management.

Proposed changes

20. FNZ has released a Discussion Document proposing a change to the recreational daily limit in FMA 1, encompassing quota management areas, SUR 1A and SUR 1B. There is no proposed change to the overall recreational allowance or Total Allowable Catch (**TAC**).

21. FNZ are proposing three options for FMA 1, as outlined in Table 1. Option 1 retains the status quo daily limit of 50 kina whereas, Options 2 and 3 provide for an increase to the daily limit to 100 or 150.

22. The submitters are proposing Option 4, an increase to the recreational daily limit to 70.

Table 1: Proposed options for the recreational daily limit for kina in FMA 1.

Option	Recreational Daily Limit
Option 1 (status quo)	50 per person
Option 2	100 per person
Option 3	150 per person
Option 4	70 per person

Urchin barren management

23. In March 2023, NZSFC representatives attended the National Workshop on kina barrens and kina management. This FNZ workshop was held to discuss scientific research and future research priorities for the management of kina barrens. NZSFC representatives have continued to attend community forums and stakeholder meetings in order to stay up to date with new relevant data and provide input into potential management options.

24. At the 2023 workshop, attendees agreed that while kina removal can support kelp regrowth and biodiversity in local areas, it does not address the underlying cause of elevated kina populations and is not a long-term solution for ecosystem recovery.

25. Work by FNZ, community groups and scientists has been ongoing to implement management, restorative and preventative measures that will be effective solutions long-term. However, it is evident that a suite of management measures will need be required for any meaningful progression toward a previous balanced state.

26. Direct urchin barren management discussed has included, targeted culling, kina translocations, changes to catch limits and a more in-depth understanding of climate change responses. Other indirect management that is being explored includes finer scale management of rock lobster (splitting CRA 1), rebuilding abundance of key predator species, reviewing the minimum legal size of crayfish, implementing a maximum legal size of crayfish and spatial and temporal closures.[3]

[3] Doheny B., Davis J.P., Miller B. (2023). Fishery-induced trophic cascades and sea urchin barrens in New Zealand: a review and discussion for management.

Discussion

27. FNZ are proposing an increase to the recreational daily limit of kina in FMA 1 which will include Centrostephanus (long-spined urchin). This increase is part of an effort to reduce the presence of kina barrens in the identified area and mitigate further spread.

28. There is no proposed change to the recreational allowance or TAC. The current recreational allowance for FMA 1 is 155 tonnes. The best available information on the current recreational catch is preliminary data from the 2022-23 National Panel Survey. The survey has estimated approximately 21 tonnes of kina was harvested from FMA 1.[4]

29. It is important to note that whilst an increase to the daily limit may increase the overall catch of kina, it is likely that recreational fishers will not use their daily limit to target kina in areas of barrens as these urchins have 'skinny' roe and are not suitable for consumption. Therefore, the appropriateness of a daily limit review as a solution to urchin barrens is questionable.

30. However, we note that although an increase in the daily limit may not improve the state of urchin barrens, it may assist in mitigating future expansion of kina barrens in fished areas. In addition, an increase in the recreational daily bag limit for the inclusion of *Centrostephanus* is warranted. This species is often found at deeper depths and is not as desirable as 'fat' kina.

31. The submitters have received anecdotal information from avid kina fishers in northern New Zealand, stating that the average divers catch bag can fit approximately 70 kina and if a diver has filled their bag then that is a successful day. **We submit in support of an Option 4. The Minister increases the recreational daily limit from 50 to 70 kina per day including *Centrostephanus***.

32. We are concerned that a significant increase to the recreational daily limit may drive localised depletion in the easily accessible areas. It would be counterintuitive to resolve an overfishing related issue with the potential to cause further localised depletion and remove an important food source. There is a particular concern for areas within the Bay of Islands that currently exclude commercial harvesting. If the bag limit for kina is increased, it is inevitable that recreational effort will concentrate on areas where kina are most prolific, that is, areas free of commercial harvest. The risk is that kina populations within Te Puna Mātaitai and Maunganui Bay will be targeted and depleted, undoing the good work that the kaitiaki of these areas have applied over many years.

33. If FNZ and the Minister want to make meaningful change to the current status of urchin barrens an integrative management approach must be applied, incorporating targeted removals, translocations, proactive management of key predators and active habitat restoration.

34. The submitters acknowledge FNZ's proposal for special permitted removals which is currently out for public consultation. We support this proposal as a means for large scale removals of kina and *Centrostephanus* and another tool for urchin barren management.

[4] Proposed recreational daily limits for kina and Centrostephanus: Fisheries Management Area 1. Fisheries NZ. At [46]

Trophic cascade

35. We cannot eat our way out of mismanagement.

36. If the Minister and Fisheries New Zealand are serious about addressing kina barrens then we must acknowledge the mismanagement of its prime predators, large crayfish and snapper. In *The Environmental Law Initiative v Minister of Oceans and Fisheries* ELI submitted the scientific evidence establishes that:

> Rock lobster are a key predator of sea urchins,…(kina). Through overfishing, rock lobsters are now functionally or ecologically extinct within CRA 1, meaning they no longer interact significantly with other species in the ecosystem, including in particular in their role as a predator of kina. Where kina populations are not controlled by predation, they can destructively graze down entire kelp forests, resulting in areas known as "kina barrens", which are areas of bare rocky reef. This chain of events is known as a 'trophic cascade". Once established, a kina barren can take decades to reverse, even when kina numbers are reduced. Kina barrens are already present within CRA 1, which is concerning given the significant ecological and economic value of kelp forests.

37. Trophic cascades are the signature of indirect effects of change in the abundance of individuals in one trophic level on other trophic levels (Pace et al. 1999). Trophic cascades can occur when the abundance of a top predator is decreased, releasing the trophic level below from predation. The released trophic level reacts by an increase in abundance, which imposes an increased predation pressure on the next lower trophic level, etc. In the case of marine systems, the outside perturbation typically stems from fishing, which can easily exceed the 'natural' predation mortality. Trophic cascades had not been thought to occur in marine systems but recently trophic cascades have been demonstrated in several large marine systems: the Black Sea (Daskalov et al. 2007), the Baltic Sea (Casini et al. 2008; Mōllmann et al. 2008) and parts of the Northwest Atlantic (Frank et al. 2005, 2006; Myers et al. 2007). These trophic cascades cover up to four trophic levels and reach all the way down to primary production[5].

38. Exploding urchin populations devouring kelp forests requires an integrated strategy to reverse the ecosystem disruption. MSY driven single species stock assessments are blind to any trophic cascades that result from prescribed catch levels. Such risks are not usually spelt out to the Minister in order for him/her to make a precautionary, ecosystem-based fisheries management decision.

39. The relationships within marine ecosystems are not well understood and the Minister has a statutory obligation to consider the management of kina within the complex ecosystem that it resides and make a precautionary decision. Changes to recreational daily bag limits for kina is only part of the response required and we urge the Minister to initiate a review of the management of CRA 1 and SNA 1 so that the predator population can rebuild and ultimately restore the biodiversity of the marine ecosystem on the northeast coast of the North Island.

[5] Andersen, Ken & Pedersen, Michael. (2009). Damped trophic cascades driven by fishing in marine ecosystems. Proceedings. Biological sciences / The Royal Society. 277. 795-802. 10.1098/rspb.2009.1512.