



Fisheries New Zealand

Tini a Tangaroa

Consultation on a proposal to reopen the Kaikōura coastline to pāua, and other shellfish and seaweed fishing for the 2022-23 fishing year



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Te Kāwanatanga o Aotearoa
New Zealand Government

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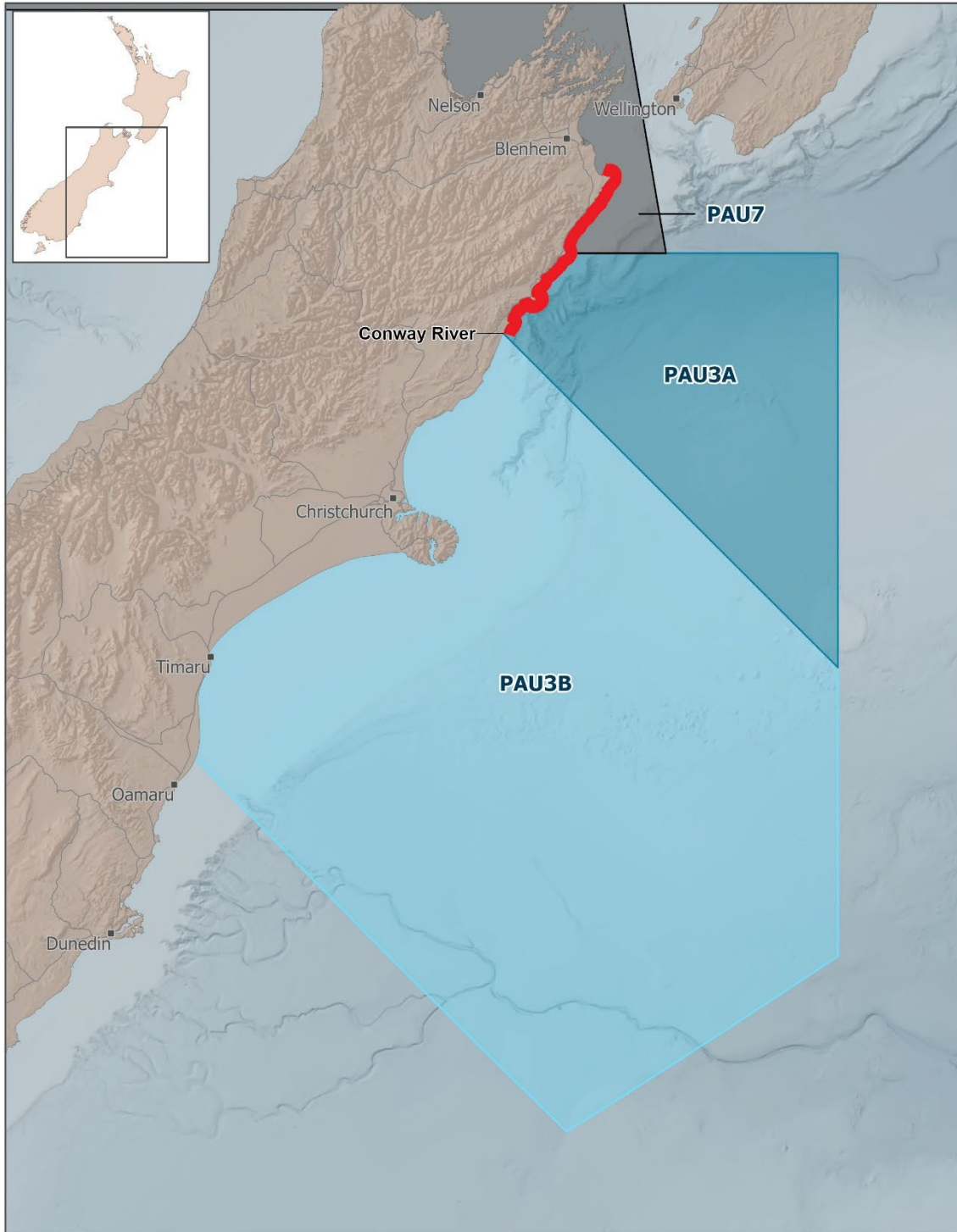
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| <p>PAU3A, PAU3B and PAU7 QMA Boundaries and Closed Area</p> <p>Date: 14/10/2022 Produced by: Spatial Intelligence Reference: r210075 Coordinate System: WGS 1984 Mercator 41</p> |  PAU3A QMA |  0 25 50 nm  0 50 100 km 1:3,200,000 |  N |
| |  PAU3B QMA | | |
| |  PAU7 QMA | <p>Seaweed and Shellfish Fishing Closed Area (Excluding Scampi, Rock Lobster, Octopus and Kina) Take Prohibited</p> | |
| |  | <p>Data Attribution: This map uses data sourced from LINZ and NIWA under CC-BY.</p> | |

SUBMISSION INFORMATION

Fisheries New Zealand invites written submissions on a new proposal to reopen the wider Kaikōura coastline to pāua fishing in the 2022-23 fishing year.

This coastline is currently closed to all commercial and recreational fishing of most shellfish and seaweed species following the 2016 Kaikōura earthquakes. Pāua fishing was permitted for a three-month period from 1 December 2021 to 28 February 2022.

This new proposal seeks feedback on providing a further opportunity for commercial and recreational fishers to gather pāua over the next 12 months.

Fisheries New Zealand also invites feedback on whether to extend this opening to include most other shellfish and seaweed species.

Make sure you tell us in your submission:

- the title of the consultation document
- your name and title
- your organisation's name (if you are submitting on behalf of an organisation)
- your contact details (such as phone number, address, and email).

To assist you in providing feedback, supporting information is available to view and download from the Ministry for Primary Industries' website - <https://www.mpi.govt.nz/2023-kaikoura-paua>.

All written submissions on this proposal must be received by Fisheries New Zealand no later than **5pm on Wednesday, 30th November 2022**.

Submissions can be emailed to: FMsubmissions@mpi.govt.nz with 'Kaikōura Pāua Fishery Consultation' in the subject.

While we prefer email, you can post your written submissions to:

Inshore Fisheries Management
Fisheries New Zealand
PO Box 2526
Wellington 6140
New Zealand

OFFICIAL INFORMATION ACT 1982

Note that any submission you make becomes public information. People can ask for copies of submissions under the Official Information Act 1982 (OIA). The OIA says we have to make submissions available unless we have a good reason for withholding it. That is explained in sections 6 and 9 of the OIA.

Tell us if you think there are grounds to withhold specific information in your submission. Reasons might include that it's commercially sensitive or it's personal information. However, any decision Fisheries New Zealand makes to withhold information can be reviewed by the Ombudsman, who may tell us to release it.

Fisheries New Zealand may post all or parts of any written submission on its website. We will consider that you have consented to its publication, unless clearly stated otherwise in your submission.

SUMMARY OF PROPOSAL

1. Fisheries New Zealand seeks your feedback on a new proposal to reopen the wider Kaikōura coastline to pāua fishing in the 2022-23 fishing year. This area extends from Marfells Beach/Cape Campbell in the north to Conway River in the south and includes the Kaikōura Marine Area/Te Whata Kai o Rakihouia i Te Tai o Marokura (**Map 1**).
2. The area is closed to all commercial and recreational fishing of pāua and most other shellfish and seaweed species following the 2016 Kaikōura earthquakes. The closure rebuilt pāua biomass to a level that enabled limited fishing to resume between 1 December 2021 and 28 February 2022 (three-months only). Further consideration is being given to a second opening of the fishery over the next 12 months.
3. Fisheries New Zealand proposes the following options for the commercial and recreational pāua (blackfoot and yellowfoot) fishery for the 2022-23 fishing year.

| Sector | Management Tool | Approach |
|-----------------------------|---|---|
| Recreational fishing | Season | Fishery open from: Option 1: 1 March to 30 April 2023 (2 months), or Option 2: 1 May to 31 July 2023 (3 months) |
| | Daily limit <i>The existing accumulation limit of two daily limits will continue to apply</i> | Option 1: 5 pāua per person; or Option 2: 3 pāua per person, or Option 3: 2 pāua per person <i>Daily limit would now include both blackfoot and yellowfoot pāua combined.</i> |
| | Minimum legal-size limit (MLS) (Blackfoot only) | Option 1: ≥125mm MLS (<i>status quo</i>), or Option 2: ≥130mm MLS, or Option 3: ≥135mm MLS <i>The 80mm MLS for yellowfoot pāua will continue to apply.</i> |
| | Maximum vehicle and vessel daily limit (New measure) | Option 1: maximum of up to 2 daily limits, or Option 2: maximum of up to 4 daily limits |
| Commercial fishing | Fishery open year-round. PAU 3A and PAU 7 TACCs and commercial fishing rules and restrictions will continue to apply. Voluntary measures under two Fisheries Plans will implement fine scale catch spreading arrangements, avoiding popular recreational fishing areas, as well as a 135mm+ minimum harvest size. | |

4. Fisheries New Zealand will commission a new independent fishing survey that would allow the effectiveness of the recreational management measures to be monitored and, if appropriate, adjusted in-season.
5. Customary management areas would remain closed to commercial and recreational fishing (with exception of the Oaro-Haumuri Taiāpure). Fisheries New Zealand is engaging with the relevant management committees and Te Rūnanga o Kaikōura regarding ongoing management of these areas.
6. A temporary closure under section 186B of the Act is in place at Waiopuka (Wakatu Quay), Kaikōura Peninsula, which applies to all fish, shellfish, and seaweed species. This area is included within Te Taumanu o Te Waka a Māui Taiāpure. There is initial support for this temporary closure to be either extended or included in an ongoing closure of the taiāpure. Feedback is sought on this proposal.
7. The current closure also applies to commercial and recreational fishing for all shellfish and seaweed species except rock lobster, scampi, octopus, and kina. Fisheries New Zealand seeks your feedback on whether to reopen the closed area to all other shellfish and seaweed species (except bull kelp, *Durvillaea*) at the same time as the recreational pāua fishery is opened.

BACKGROUND INFORMATION

The Kaikōura coastline is closed to all commercial and recreational pāua fishing

8. Pāua has traditionally supported a significant and shared customary, recreational, and commercial fishery along the Kaikōura coastline.
9. In November 2016, the Kaikōura region experienced a series of significant earthquakes that caused coastal uplift of up to 6 metres along 110 kilometres of coastline. This led to extensive habitat modification and mortality of a wide range of species in the intertidal and subtidal zones. Pāua were particularly affected with very high mortality at all life stages and a significant loss of critical habitat.
10. To protect the remaining pāua populations and associated habitats, as well as other shellfish and seaweed resources, the coastline between Marfells Beach/Cape Campbell and the Conway River, including the Kaikōura Marine Area - Te Whata Kai o Rakihouia i Te Tai o Marokura¹ (**Map 1**) is closed to all commercial and recreational fishing under section 11² of the Fisheries Act 1996 (**the Act**). This closure does not apply to rock lobster, scampi, octopus, and kina fishing, or to customary fishing.
11. The closed area straddles two Quota Management Areas (QMAs) - the recently established PAU 3A (Kaikōura) QMA³ and the southern portion of the PAU 7 (Nelson/Marlborough) QMA. There are five customary management areas within the closed area – Mangamaunu, Oaro, and Te Waha o te Marangai Mātaitai, and Te Taumanu o Te Waka a Māui and Oaro-Haumuri Taiāpure (**Map 2**)
12. A broad research programme has been underway following the November 2016 earthquakes to better understand the impacts and monitor the recovery of fish, shellfish and seaweed. This research has provided Fisheries New Zealand with good information to measure how the recovery is progressing and help decide when the various fisheries could be reopened.
13. The closure has enabled the pāua fishery to rebuild to a level that allows for harvest opportunities. There was a significant increase in both juvenile and adult populations along the coastline, including an abundance of legal-size pāua in shallow intertidal habitats (which are typically highly vulnerable to continued shore-based fishing pressure). More Information about the Kaikōura research programme can be found here – <https://www.mpi.govt.nz/news/media-releases/kaikoura-earthquake-research-results-presented/>.

¹ Kaikōura Marine Area — Te Whata Kai o Rakihouia i Te Tai o Marokura was established under the Kaikōura (Te Tai o Marokura) Marine Management Act 2014 and extends between the Clarence River and Conway River, and out to the outer limit of the Territorial Sea (12 nautical miles).

² Fisheries (Conway River to Marfells Beach Shellfish and Seaweed Harvest Closure) Notice 2021 (Notice No. MPI 1394) <https://gazette.govt.nz/notice/id/2021-go4676>

³ On 1 October 2021, the PAU 3 QMA was sub-divided into two smaller QMAs – PAU 3A (Kaikōura) and PAU 3B (Canterbury) to better reflect the nature of each fishery following the 2016 earthquakes.

A three-month opening of the pāua fishery resumed on 1 December 2021

14. The commercial and recreational pāua fishery (blackfoot only) was temporarily opened between 1 December 2021 and 28 February 2022. A three-month period was considered appropriate to allow limited harvest to occur, while enabling the fishery to continue to rebuild. The following measures were applied to limit harvest.
 - A recreational daily limit of five pāua per person (previously six), with an accumulation limit of two daily limits. These limits provided consistency with the adjoining PAU 3B (Canterbury) and PAU 7 (Nelson/Marlborough) fisheries.
 - A minimum legal-size limit (MLS) of 125mm (applies nationally⁴).
 - Continued closure of most customary management areas. Fishing was permitted within the southern Oaro-Haumuri Taiāpure.
 - Continued harvest prohibition on yellowfoot pāua.
15. Commercial harvest was constrained to a 23 tonne Total Allowable Commercial Catch (TACC)⁵ and in accordance with fine-scale management measures prescribed in an approved PAU 3 Fisheries Plan⁶.
16. Ongoing surveys were undertaken to monitor the effects of fishing on pāua biomass, as well as an independent recreational fishing survey (Blue Water Marine) during the three-month open period. The latter provided an opportunity to better understand and accurately estimate recreational catch (which previously had not been estimated for the Kaikōura region).

Pāua fishing was very popular after reopening

17. The results of the independent survey highlighted that recreational fishing for pāua was a popular activity over the three-month open period. Estimates of recreational catch were 42 tonnes from the Kaikōura Marine Area (PAU 3A) and three tonnes from Marfells Beach to Ward Beach (PAU 7). A report of the survey is found here - <https://www.mpi.govt.nz/dmsdocument/52552-FAR-202240-Harvest-estimates-from-landbased-amateur-fishers-Kaikoura-Marine-Area-to-Marfells-Beach>.
18. The increased abundance of pāua in shallow wade-able areas made it easier for people to harvest close to shore and near car parks. Less recreational fishing was observed away from these areas. Fishers were able to quickly collect the five pāua daily limit within the shallow 'wading' areas, with most pāua taken well above the 125mm MLS (average size was 138mm). About 80% of all fishers travelled from outside the Kaikōura region with most from Christchurch, Blenheim, and north Canterbury, particularly during the weekends and the peak summer period.
19. The level of recreational catch was far higher than anticipated and has led to a reduction in pāua abundance within the 'wading' areas. Catch far exceeded the

⁴ A lower 85mm MLS applies in Taranaki where pāua are typically smaller.

⁵ This decreased commercial catch to 50% of that taken prior to the 2016 earthquake.

⁶ A PAU 3 Fisheries Plan was approved on 9 April 2021 under section 11A of the Fisheries Act 1996.

five-tonne recreational allowance set for the PAU 3A stock⁷. However, at the time it was set, this allowance was noted to be indicative only given the absence of accurate historical estimates of pre-earthquake recreational take and be more reflective of the longer-term fishery once it responds to several years of fishing.

20. Commercial fishers typically harvest pāua from deeper beds further offshore and in areas along the wider Kaikōura coastline inaccessible to most recreational fishers. The commercial fishery caught the 23 tonne TACC with very high catch rates (average CPUE⁸ was about 70-80 kg/hr, where normally 50 kg/hr or lower is typical). Commercial fishers reported that new subtidal beds were created by the coastal uplift with high pāua abundance and new habitat for juvenile settlement. About 1-2 tonnes were caught each week to fulfil market demand, however, the three-month period caused problems as fishers had to harvest pāua in unfishable sea conditions to fulfil orders before the closure.
21. New stock assessment information (July 2022) indicates that the PAU 3A stock is safe for the next 2-3 years under all modelled catch assumptions, but there is considerable uncertainty beyond this timeframe. Scientific modelling suggests that a reduction in recreational catch towards 20 tonnes or less is likely to be required if the fishery is to remain sustainable long-term. **Appendix 1** shows model simulations of predicted future biomass under various recreational catch scenarios and this provides guidance on setting future management options.
22. Overall, scientific information suggests the Kaikōura pāua fishery is still rebuilding and uncertainty remains about its long-term performance in the absence of a time-series of post-earthquake fishing information. While biomass remains at a level to enable a second opening of the fishery, there is a consensus that a more cautious approach is required to limit the recreational take. This includes reducing the recreational catch towards 20 tonnes or less over the next two years and, where feasible, addressing localised overfishing to support a wading fishery in some areas.
23. As new information becomes available in the next 2-3 years on how the stock responds to all fishing, it will enable a review of the TAC and allowances. This will be undertaken through Fisheries New Zealand's stock assessment and sustainability review processes.

⁷ A new TAC of 40.5 tonnes was set for the fishery following the sub-division of the PAU 3 QMA on 1 October 2021. The TAC includes allowances of 7.5 tonnes for Maori customary non-commercial fishing interests, 5 tonnes for recreational fishing interests, 5 tonnes for all other sources of mortality to the stock caused by fishing, and a TACC of 23 tonnes. The TAC applies a 50% reduction across the commercial and recreational sectors based on previous commercial catch and a 2011-12 recreational harvest estimate of 10.3 tonnes.

⁸ Catch Per Unit Effort (CPUE) and is a primary tool to assess commercial pāua fisheries as indices of relative abundance.

THE PROPOSAL FOR A FURTHER OPENING OF THE KAIKOURA COASTLINE TO PĀUA FISHING

24. Fisheries New Zealand has met with Te Rūnanga o Kaikōura, the Kaikōura Marine Guardians, Te Waka a Māui me Ōna Toka Iwi Forum, and other fishery stakeholder groups including the pāua industry and the Kaikoura Boating and Fishing Club to discuss a further opening of the Kaikōura pāua fishery. The options presented below are based on these discussions. Where feasible, the options for recreational fishing have been modelled to assess the likelihood of decreasing catch (**Appendix 2**).
25. The previous opening of the fishery applied to blackfoot pāua only with harvest of the smaller, less abundant yellowfoot pāua remaining prohibited. It is proposed that yellowfoot pāua is included in any future opening and be managed as a combined limit along with blackfoot pāua in the recreational fishery.

Recreational fishing

26. The following options are proposed.

| Management Measure | Approach | Proposed Implementation |
|---|---|--|
| Season | Fishery open from: Option 1: 1 March to 30 April 2023 (2 months), or Option 2: 1 May to 31 July 2023 (3 months) | A new section 11 closure notice under the Fisheries Act 1996 and published within the <i>New Zealand Gazette</i> . |
| Daily limit | Option 1: 5 pāua per person, or Option 2: 3 pāua per person, or Option 3: 2 pāua per person A daily limit of five blackfoot pāua currently applies. The proposed daily limit would now include both blackfoot and yellowfoot pāua (combined total). The existing <i>accumulation limit</i> of two daily limits will continue to apply. | Amendments to the <i>Fisheries (Amateur Fishing) Regulations 2013</i> (Part 6) to require all recreational pāua fishers comply with the proposed measures. |
| Minimum legal-size limit (MLS) (Blackfoot only) | Option 1: ≥ 125 mm MLS (<i>status quo</i>), or Option 2: ≥ 130 mm MLS, or Option 3: ≥ 135 mm MLS The 80mm MLS for yellowfoot pāua would remain | |
| New vehicle and vessel limits (New measure) | Option 1: maximum of up to 2 daily limits, or Option 2: maximum of up to 4 daily bag limits | |

Commencement date and duration of season

27. The timing and duration of a further recreational fishing season will be a key tool to reduce take from last season's level. Both options delay the start of fishing until after the peak summer period where recreational activity and visitor numbers to the region are highest (around 80% of catch last season was taken by non-resident fishers who travelled into the region to gather pāua).
28. Option 1 delays fishing to the autumn months, while Option 2 further delays fishing to avoid the majority of holiday breaks and periods of high visitor numbers. Further consideration can be given to an alternative option once feedback is received through consultation.
29. In response to concerns that have been raised about controlling recreational take when effort is high, Fisheries New Zealand will look to implement a system to monitor catch throughout the season. A further independent recreational fishing survey will be commissioned to provide a rolling weekly catch total. This will be reviewed by Fisheries New Zealand and a reference group comprising of Te Rūnanga o Kaikōura, the Kaikōura Marine Guardians, and stakeholder representatives with the potential to adjust recreational controls should catch exceed expectations.
30. The proposed season would apply across the wider Kaikōura coastline (Marfells Beach to Conway River, including the Kaikōura Marine Area). The opening of the smaller Marfells Beach/Cape Campbell area permanently at this time could create a sustainability risk if fishers shift effort into this area during the period the Kaikōura Marine Area is closed.

Daily limit

31. A daily limit of five blackfoot pāua currently applies. The proposal seeks feedback to retain this limit or introduce a lower limit of either two or three pāua.
32. A lower limit would likely decrease recreational take and reduce incentives for fishers to travel to the region to gather pāua (given time and fuel costs). Based on modelling using last year's catch (**Appendix 2**), reducing the daily limit to two or three pāua per person may potentially result in a reduction in catch of up to 55% or 40%, respectively.
33. The proposed daily limit would include both blackfoot and yellowfoot pāua (combined total). Under each option, the current accumulation limit of two daily limits would continue to apply.

Minimum legal-size limit (MLS)

34. Feedback is sought on retaining the current 125mm MLS for blackfoot pāua or introducing a larger MLS of either 130mm or 135mm.
35. A larger size may further decrease recreational take and provide greater protection to the spawning biomass (an approach used in the commercial fishery). An MLS of 130mm or 135mm may lead to a 10% or 30% reduction in catch, respectively (**Appendix 2**).

However, this must be balanced against associated handling mortality from a likely higher proportion of sub-MLS pāua returned to the sea.

36. The current MLS of 80mm for yellowfoot pāua would continue to apply.

New maximum vehicle and vessel limit

37. Concerns have been raised about localised overfishing by large groups of fishers gathering pāua. Most fishing over last summer was undertaken in groups of 2-4 fishers; however, larger groups were observed in the more easily accessible areas, particularly during weekends and the holiday period.
38. To help avoid localised overfishing, feedback is sought on a new fisheries restriction – *maximum vehicle and vessel limit* - where a maximum pāua limit of up to two or four daily limits would apply. This new limit would apply regardless of the number of fishers within the vehicle or vessel. Under this approach, the requirement for each fisher to comply with the daily limit would apply.

Commercial fishing

39. The following options are proposed.

| Management Measure | Management Measure | Proposed Implementation |
|--------------------|---|--|
| Season | Open the fishery year-round. Retain current TACC of 23 tonnes. Fishing in accordance with the PAU 3 Fisheries Plan. | A new section 11 closure notice under the Fisheries Act 1996 and published within the <i>New Zealand Gazette</i> . |

40. The proposal is for the commercial fishery to be opened year-round as soon as practical. This will enable the industry to align catches with peak market price and avoid a potential race to catch the TACC as experienced last season. This approach acknowledges that fishing will continue to be managed by a TACC and in accordance with the approved PAU 3 Fisheries Plan.
41. This Plan prescribes an ‘*adaptive rebuild*’ approach that focuses on a conservative level of utilisation, together with management based on the collection of comprehensive fine-scale information and catch reporting, with responsive adjustments each year, where appropriate.
42. The main measures for managing commercial harvesting under the Plan are:
- A minimum pāua harvest size in the range of 135mm to 140mm shell length to protect spawning biomass;
 - catch spreading across the fishery using sub-area limits to avoid localised depletion and recognised patchy recovery;
 - the collection of comprehensive, fine-scale catch and location data to inform future management decisions;
 - a harvest control rule to inform recommendations on commercial harvest levels;
 - contingency measures to address unanticipated sustainability risks; and

- fishery enhancement to promote rebuild rate and local abundance.
43. In addition, an endorsed PAU 7 Fisheries Plan⁹ will adopt a similar approach for the coastline between Marfells Beach/Cape Campbell and Clarence River.
 44. Further details regarding the PAU 3 and PAU 7 Fisheries Plans and the proposed commercial management approach can be found here - <https://www.mpi.govt.nz/consultations/proposal-to-reopen-the-kaikoura-marine-area-to-paua-fishing>

The proposed management measures do not apply to customary pāua fishing

45. Customary fishing would continue to be managed under the Fisheries (South Island Customary Fishing) Regulations 1999.
46. The proposal does not include recommendations for changes within the five customary management areas (**Map 2**). Pāua fishing within these areas would continue to be managed by tangata whenua and the appropriate mātaihai and taiāpure management committees.
47. As occurred last year, it is proposed that these areas would remain closed to commercial and recreational fishing, except for the southern Oaro-Haumuri Taiāpure, which was relatively unaffected by the earthquakes. These areas are key to community aspirations to maintain a shallow wading fishery in some areas along the Kaikōura coast.
48. A temporary closure under section 186B of the Act is also in place at Waiopuka (Wakatu Quay), Kaikōura Peninsula, which applies to all fish, shellfish, and seaweed species (**Map 3**). This area is included within Te Taumanu o Te Waka a Māui Taiāpure. There is initial support for this temporary closure to be either extended or included in an ongoing closure of the taiāpure. Feedback is sought on this proposal.
49. Fisheries New Zealand is engaging with Te Rūnanga o Kaikōura and the relevant management committees regarding these proposals and ongoing management of these areas.

⁹ Developed by the PAU7 Management Advisory Committee (PauaMAC7) and endorsed on 14th March 2021.

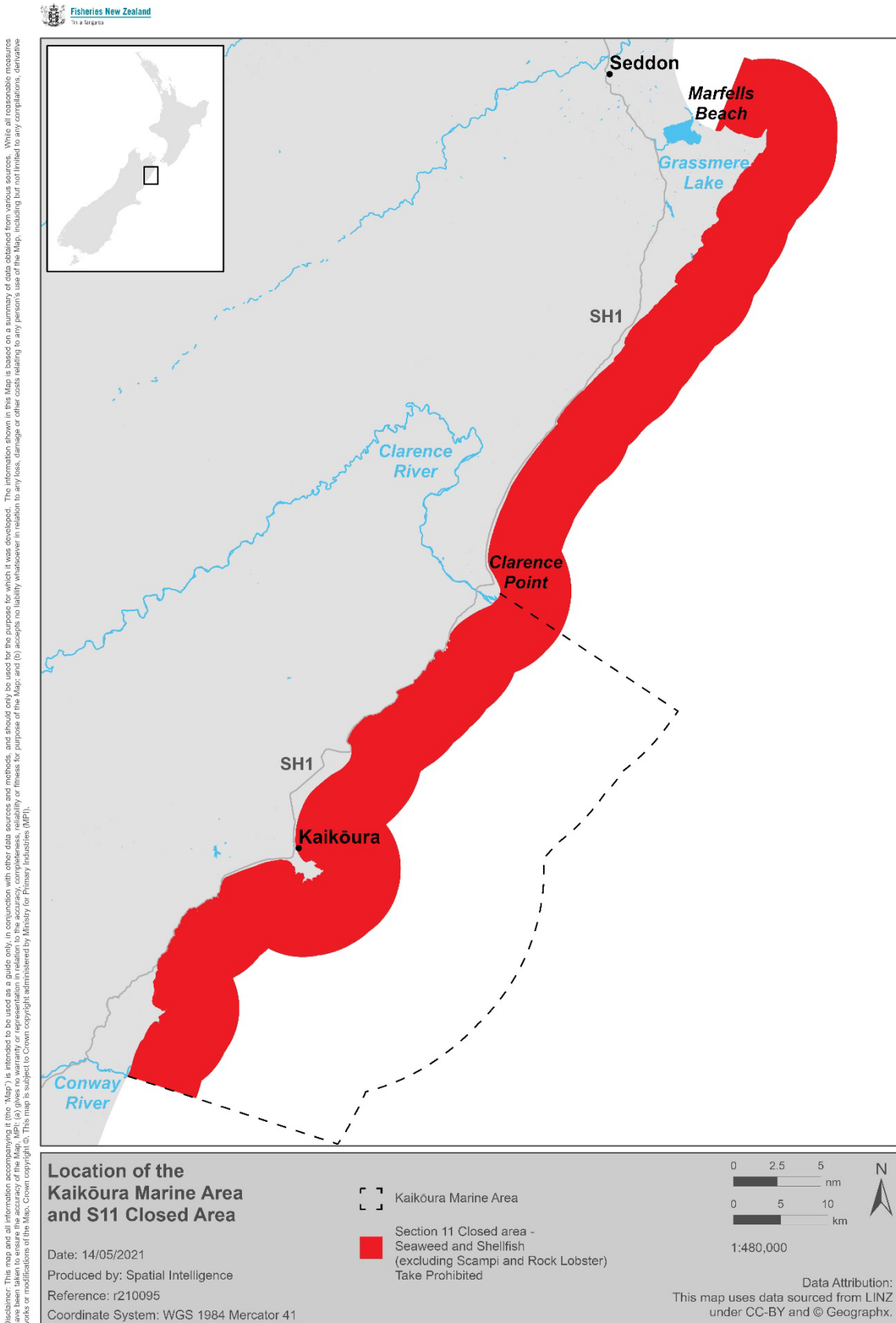
ALTERNATIVE APPROACHES

50. The closed area currently prohibits all commercial and recreational fishing for most other shellfish and seaweeds in response to the 2016 earthquakes. Only fishing for rock lobster, scampi, octopus, and kina is allowed at this time. Recent research demonstrates that the closure has likely allowed the biomass of other shellfish and seaweeds to recover to at least pre-earthquake levels enabling fishing to resume.
51. Concerns have been raised about the effectiveness of existing management tools under the Act to constrain recreational take of pāua at Kaikōura when fishing effort is high. There is interest in exploring alternative approaches, such as a requirement to use authorised tags, which is used overseas for some abalone fisheries. Introducing such a system in New Zealand would require extensive discussions with the recreational fishing sector, and it would not be possible to introduce a tagging (or similar) system for the Kaikōura pāua fishery in the upcoming year.
52. There is also community support for a recreational fisher self-reporting catch system for pāua at Kaikōura. Fish Mainland has recently launched a smartphone app (*Mainland Catch*) where fishers voluntarily record their fishing activities. This system promotes fisher self-reporting of catch and effort data collection to provide better information on recreational fishing. This will be rolled out for the South Island blue cod fisheries and could be expanded to include the Kaikōura pāua fishery. The development of a fisher self-reporting catch system could be an important step towards better describing recreational fisheries and can be used in combination with a set threshold for the fishery as discussed above.
53. Fisheries New Zealand seeks your views on the above potential approaches to manage the recreational take of pāua from the Kaikōura coastline. Implementing some of these measures would require further engagement and analysis and would be considered from 2023-24 onwards. Feedback is also welcome on alternative ideas you may have.

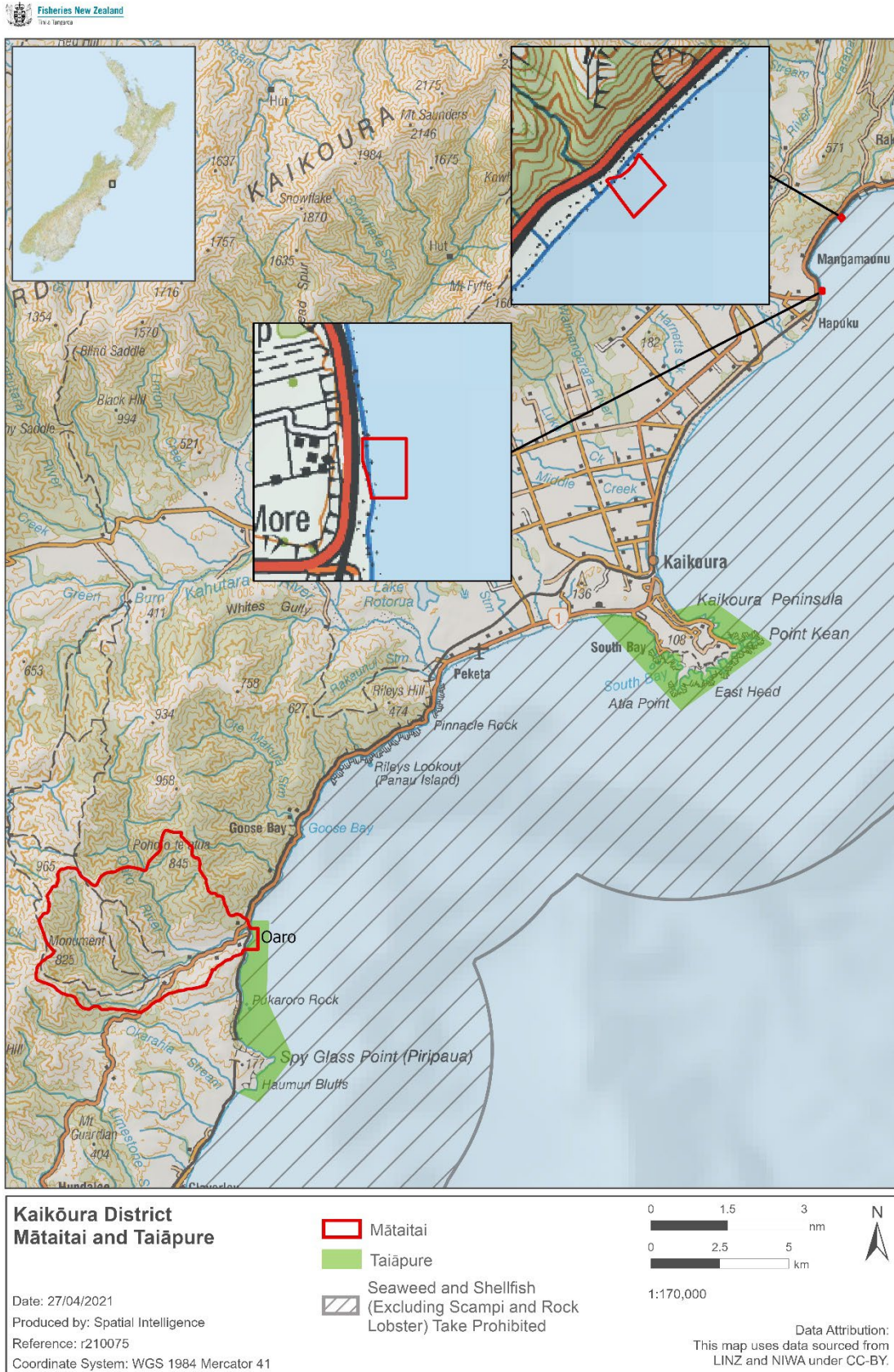
PROPOSAL TO OPEN THE CLOSED AREA TO OTHER SHELLFISH AND SEAWEEDS

54. The closed area currently prohibits all commercial and recreational fishing for most other shellfish and seaweeds in response to the 2016 earthquakes. Only fishing for rock lobster, scampi, octopus, and kina is allowed at this time. Recent research demonstrates that the closure has likely allowed the biomass of other shellfish and seaweeds to recover to at least pre-earthquake levels enabling fishing to resume.
55. Feedback is sought on allowing commercial and recreational fishing of most remaining shellfish and seaweeds species to resume. Reopening of these fisheries would be aligned with the proposed opening of the recreational pāua fishery to provide consistency and assist with fisheries compliance. All fishing would be controlled under relevant TACCs and commercial and recreational management controls on harvest areas, methods, etc.
56. The proposed opening of the closed area would not apply to the giant bull kelp seaweed (*Durvillaea*). Significant quantities of bull kelp were lost following the earthquakes due to extensive coastal uplift and recent research indicates that bull kelp recovery has been very slow. It is important to continue to protect existing biomass from fishing at this time.

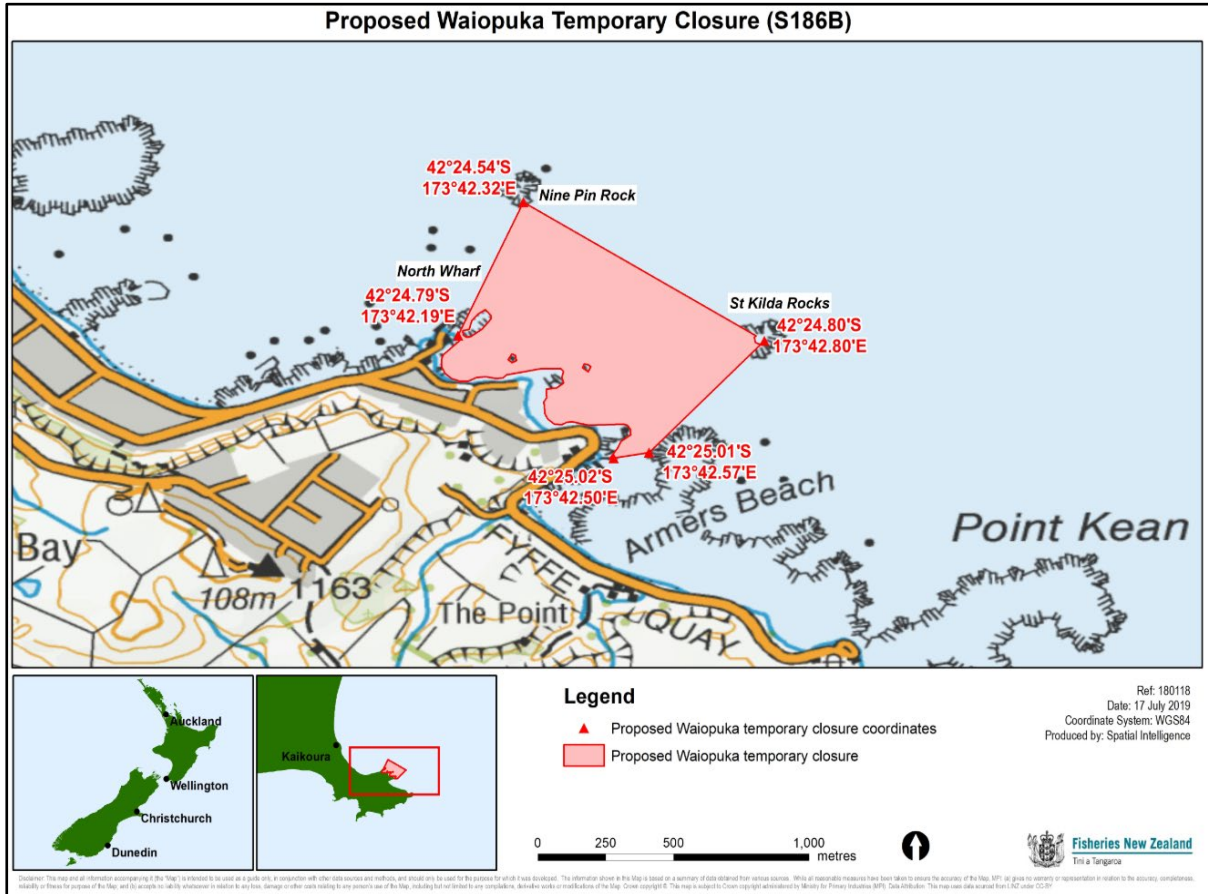
Map 1: Te Whata Kai o Rakihouia i Te Tai o Marokura — Kaikōura Marine Area & Section 11 Closed Area



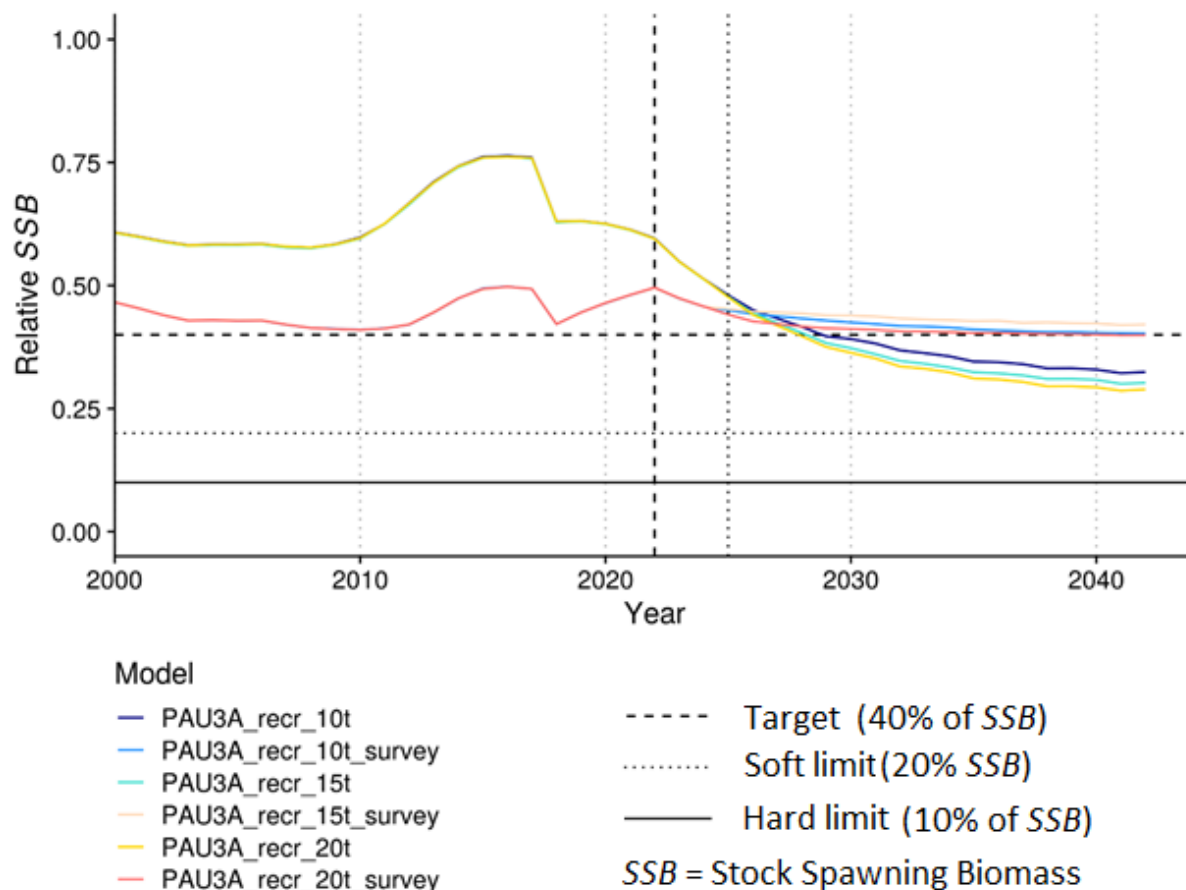
Map 2: Customary Management Areas along the Kaikōura coastline



Map 3: Waiopuka Temporary Closure (section 186B)



Appendix 1: Modelling of future PAU 3 biomass projections against recreational catch scenarios



The above graph models various catch scenarios for the PAU 3A stock over time with respect to current/projected spawning biomass against pre-fishing (virgin) spawning biomass (Relative SSB). Spawning biomass means total weight of mature pāua within the overall stock.

Model projections are shown against hard (10%) and soft (20%) limits prescribed in the Harvest Strategy Standard for New Zealand Fisheries (2008). A default management target (40%) is also shown.

Two alternative models were tested to predict future biomass under various recreational catch scenarios (10 t, 15 t, 20 t). The models assume maximal impact from the earthquakes (short-term mortality and permanent recruitment reduction).

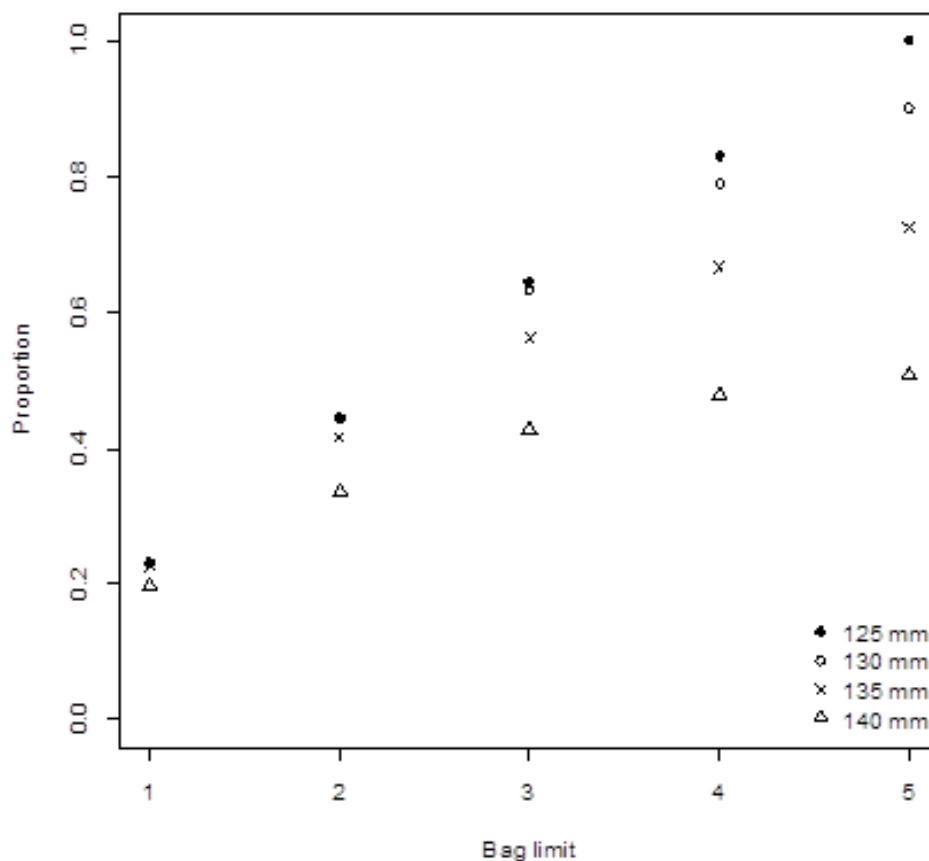
Because of the uncertainty around the real level of impact from the earthquakes, these models should be taken as trajectories measuring the risk level under high impact rather than showing most likely outcomes.

One of the two models explicitly includes the post-earthquake recreational survey (noted as ‘_survey’), and the other does not. *Note the lower 3 lines are the ones without the survey fit; lines that remain close to 40% are those fitting to surveys.*

Footnote: The model accounting for surveys of biomass trends since the earthquakes is *a priori* preferable as it includes more data, but it produced relatively poor fits to the survey trends in order to fit survey length frequency measures. Therefore, the Shellfish Working Group (July 2022) decided that no single trajectory could be chosen on the basis of available data at this point. Management options and risks were therefore tested using both models, with varying levels of recreational catch (10 t, 15 t, 20 t). A harvest control rule for commercial catch based on CPUE was included in the model.

Models ignoring fitting to survey data generally produced more pessimistic outcomes, with long term expected biomass below target levels (target being 40% of the spawning biomass before any fishing started) at all levels of recreational catch, while the alternative model was more optimistic, with expected biomass levels at or above target despite high impact assumptions. The models highlight considerable uncertainty about population trajectories, which largely outweighs differences in management scenarios.

Appendix 2: Relationship between recreational take and management tools (daily limit and MLS)



Explanation:

This figure shows the relationship between the proportion of recreational take (based on last year's three-month season) against various bag limit (1-5) and MLS (125-140mm) scenarios.

Under last year's approach (5 pāua bag limit and 125mm MLS), the proportion of catch is 1 (or 100%).

A lower daily limit of 3 pāua would be expected to lead to a 40% reduction in catch (0.6) and 2 pāua would lead to a 55% reduction in catch (0.45). A larger 130mm MLS would lead to a 10% reduction in catch (0.9) under a 5 pāua daily limit. Under a 3 pāua daily limit, a reduction in catch would be minimal if either a 125mm or 130mm MLS applied.

The above figure can be used as a guide to assess the effectiveness of different daily limits and MLS (singularly and in combination). For example, a 3 pāua daily limit effectively achieves the same 40% reduction in catch (0.60) regardless of a 125mm or 130mm MLS.

Note: The above catch scenarios are based on last season's catch (42 t) with all other variables being the same (ie, three-month open period, 5 pāua daily limit, 125mm MLS, etc.). In addition, a reduced daily limit per person may result in behaviours that increase catch in other ways, for example more people in a group participating in fishing. As such, the above should be treated as a guide only.