



Fisheries New Zealand

Tini a Tangaroa

Review of sustainability measures for pāua (PAU 3A) for 2024/25

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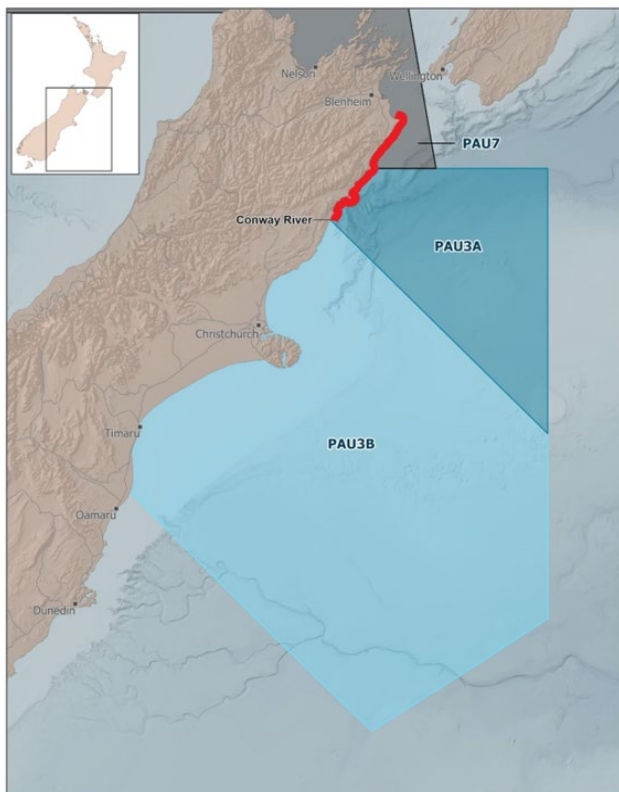


Figure 1: Map showing PAU 3A, PAU 3B, and PAU 7 Quota Management Area (QMA) boundaries for pāua (*Haliotis iris*), with PAU 3A highlighted and the wider Kaikōura pāua fishery (Marfell's Beach to Conway River) shown in red.

Why are we proposing a review?

1. Fisheries New Zealand (**FNZ**) is reviewing sustainability measures for pāua (*Haliotis iris*) in Quota Management Area PAU 3A for the 1 October 2024 fishing year (Figure 1).
2. When the fishery re-opened following the 2016 earthquakes the Total Allowable Catch (**TAC**), Total Allowable Commercial Catch (**TACC**) and allowances were set at around 50% of estimated pre-earthquake catch levels. A stock assessment conducted in 2024 shows a high abundance of pāua after several years of fishing at this level (see Supporting Information, Figure A1), with spawning stock biomass (**SSB**) at or above the management target (see the [Harvest Strategy Standard](#)). The SSB is projected to increase under current catch levels (Figure 2).
3. The stock assessment suggesting a utilisation opportunity, the approved Fisheries Plan for PAU 3 and initial feedback from iwi and stakeholders have been used as a basis for new TAC options for this stock (Table 1). Increases to the TACC, as well as allowances for recreational and other mortality are proposed.
4. Under Options 2 and 3, alternative allowances for recreational fishing are proposed, with options both to maintain proportionality with the TACC (as per industry's PAU 3 Fisheries Plan) as well as to set an allowance more reflective of recent interest from the recreational sector as indicated by recreational catch estimate surveys. The allowance would also influence recreational management settings such as season length. We invite submissions on these management settings as well as alternative combinations of allowances and TACCs within the range proposed.
5. Feedback is also sought on increasing the minimum legal size (**MLS**) from 125 to 130 mm to contribute to reducing localised depletion and maintaining spawning stock biomass as part of the proposed TAC increases.
6. Adjustment to the TAC would be made under [section 13\(2\)\(a\) of the Fisheries Act 1996 \(the Act\)](#) and apply from 1 October 2024 (the beginning of the next fishing year). Adjustment to the MLS would be progressed following any decisions. This would be given effect through the Fisheries (Recreational Management Controls) Notice for the recreational sector. The commercial sector already implements

a high minimum harvest size of 130 mm in this area, but a regulation change could be considered to give this statutory backing.

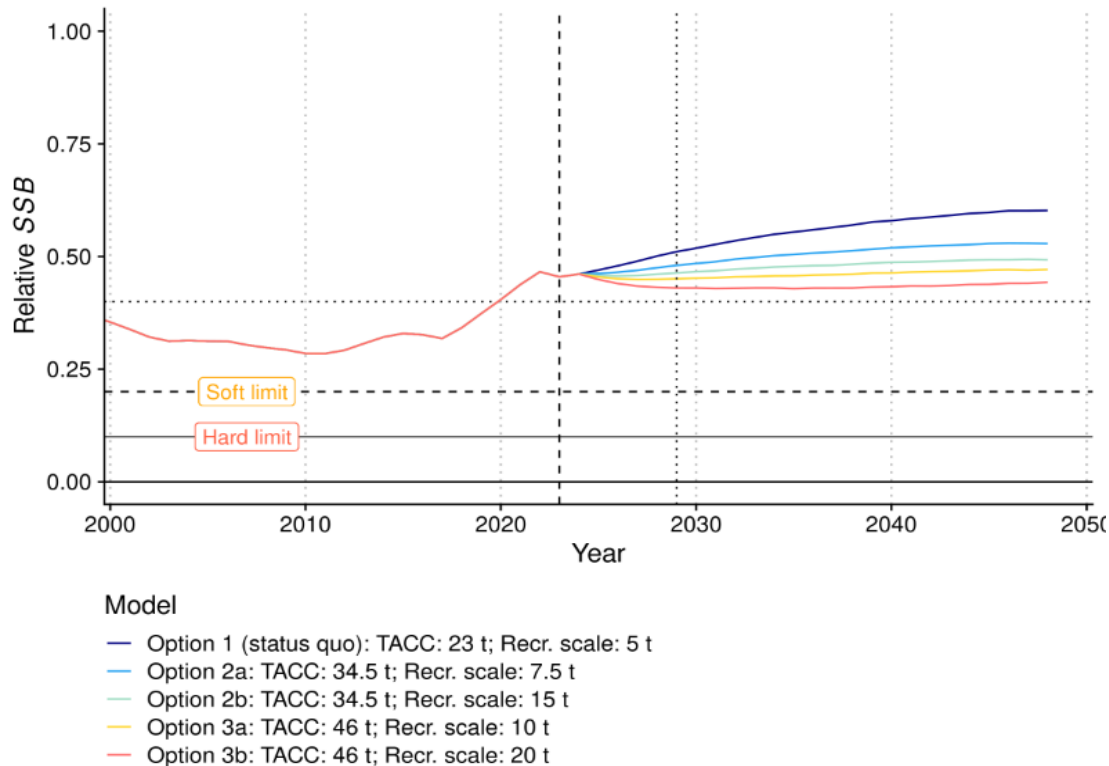


Figure 2: Simulated mean relative spawning stock biomass (SSB) trends for PAU 3A under each of the options proposed. The dashed vertical line shows the beginning of projections. The dotted vertical line shows the five-year projections (projections should be treated with caution due to uncertainties the further into the future they are). These assume that commercial catch will be adjusted according to relative pāua abundance using a ‘harvest control rule’,¹ and that recreational catch will also vary based on abundance. Customary catch is assumed to remain at or below 7.5 t. The dotted horizontal line shows the default management target which is 40% of the assumed unfished biomass and the soft and hard limits are 20% and 10% respectively (see Harvest Strategy Standard).

Proposed options

Table 1: Proposed management options (in tonnes) for PAU 3A from 1 October 2024.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Option 1 <i>Status quo</i>	40.5	23	7.5	5	5
Option 2a	55.5 (↑ 15)	34.5 (↑ 11.5)	7.5	7.5 (↑ 2.5)	6 (↑ 1)
Option 2b	63 (↑ 22.5)	34.5 (↑ 11.5)	7.5	15 (↑ 10)	6 (↑ 1)
Option 3a	70.5 (↑ 30)	46 (↑ 23)	7.5	10 (↑ 5)	7 (↑ 2)
Option 3b	80.5 (↑ 40)	46 (↑ 23)	7.5	20 (↑ 15)	7 (↑ 2)

7. FNZ is satisfied that the current [deemed value rates](#) of PAU 3A provide sufficient incentives for fishers to balance their catch with ACE (consistent with [section 75\(2\)\(a\) of the Act](#) and the [Deemed Value Guidelines](#)). Therefore, no changes are proposed to the deemed value rates for this stock at this time. However, FNZ welcomes any feedback on these settings.

¹ See *Supporting information: Additional figures*, Figure A2 for a description of the harvest control rule.

8. For more information on the current management settings for PAU 3A, see the [PAU 3 Fisheries Plan](#) and the [Fisheries Infosite](#). For general information about fisheries management in New Zealand, see our [fisheries management webpage](#), and our [webpage about the Quota Management System \(QMS\)](#).

Option 1 – retain current settings (*status quo*)

Benefits	Under the <i>status quo</i> , the current TAC, TACC, and other allowances are retained with spawning stock biomass (SSB) projected to continue to increase (Figure 2) well above the default management target of 40% SSB as set out in the Harvest Strategy Standard. This option therefore represents a very cautious approach but takes into account the potential that pāua habitat at Kaikōura could be impacted by the earthquakes for some time as well as any potential/unknown effects of climate change on pāua recruitment and habitat loss.
Risks	Retaining the current TAC and TACC forgoes a potential utilisation opportunity for the commercial sector. In addition, the present recreational allowance of 5 t was set using uncertain information that likely underestimated recreational pāua catch (see recreational section under current settings within the TAC) and is unlikely to provide for recreational interest in this shared fishery. A low daily limit and a very short season in winter (see existing controls under section 11 considerations) would likely continue to be required to maintain catch at a level consistent with this allowance.

Options 2a and 2b – approximately 45% TAC increase (50% TACC increase)

Benefits	<p>TAC Increasing the TAC by approximately 45% (37-56% depending on the recreational allowance) represents a modest increase. Projections indicate that under this option the SSB will remain well above the management target (Figure 2). This approach allows for an increase in utilisation while recognising the potential for ongoing pāua habitat changes in Kaikōura. It is also consistent with the adaptive rebuild management approach set out in the approved PAU 3 Fisheries Plan developed by the pāua industry and approved by the Minister (see fisheries plans under section 11 considerations) and the precautionary approach taken when the fishery was first reopened. A small increase is proposed for the allowance for other mortality to reflect higher utilisation.</p> <p>TACC The 50% increase to the TACC under this option would bring commercial catch from the fishery to around 75% of pre-earthquake levels and provide economic benefits of around \$307,000 annually (based on 2023/24 port price), along with associated export earnings. It aligns with the adaptive rebuild strategy set out in the industry PAU 3 Fisheries Plan, with regular TACC reviews to be undertaken, informed by the harvest control rule. Modelled scenarios support this approach as they lead to a likely increase in catches under the control rules over a number of years (supporting information, Figures A3 and A4).</p> <p>Recreational Allowance 7.5 t (Option 2a) A recreational allowance under Option 2a of 7.5 t maintains proportionality between the TACC and the recreational allowance, which is the approach preferred under the industry’s PAU 3 Fisheries Plan. It would ensure that commercial catch (as guided by the harvest control rule) is not impacted by recreational fishing.</p> <p>Recreational Allowance 15t (Option 2b) A recreational allowance of 15 t is reflective of recreational catch estimated by surveys over the past two seasons (around 11 – 15 t). Under this option there may be some limited opportunity to consider a longer recreational season or alternative recreational management arrangements to those applied for the past two seasons. Modelling suggests little discernible impact on commercial catch (relative to Option 2a) from the additional 7.5 t recreational catch under this option (supporting information, Figures A3 and A4).</p>
Risks	<p>TAC and TACC The more modest increases proposed mean that the benefits associated with higher utilisation of the pāua fishery (i.e., under Option 3) are forgone in the short term. An increase is proposed for the allowance for other mortality to reflect higher utilisation.</p> <p>Recreational Allowance 7.5 t (Option 2a) An allowance of 7.5 t is less than the catch estimated to have been taken by recreational fishers during the past two seasons and (as for Option 1) is unlikely to provide for recreational interest in this shared fishery. A short (2-month or less) season in winter would likely be required to maintain catch at a level consistent with this allowance.</p> <p>Recreational Allowance 15 t (Option 2b)</p>

	An allowance of 15 t is higher than the 50% increase proposed to the TACC and would not maintain proportionality with the TACC (industry's preferred approach under the PAU 3 Fisheries Plan). Conversely, it is similar or only marginally higher than estimated recreational catch over the past two seasons, which may not be considered reflective of recreational fishing interest in the context of a 50% increase to the TACC.
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Options 3a and 3b – approximately 85% TAC increase (100% TACC increase)

Benefits	<p>TAC Increasing the TAC by approximately 85% (74-99% depending on the recreational allowance) represents a significant increase that would manage commercial catch at similar levels to those prior to the earthquakes. Projections indicate that relative SSB would remain above the management target (Figure 2) under both Options 3a and 3b but would decline slightly before stabilising around target levels under Option 3b.</p> <p>TACC A 100% increase to the TACC would provide economic benefits of around \$615,000 annually (based on 2023/24 port price), with associated export earnings. Implementation of a harvest control rule along with the high minimum harvest size of 130+ mm and catch spreading arrangements implemented by industry under the PAU 3 Fisheries Plan (see Supporting Information, section 11 considerations) would reduce risk of localised depletion under the higher level of catch.</p> <p>Recreational Allowance 10 t (Option 3a) A 100% increase to the recreational allowance from 5 to 10 t maintains proportionality between the TACC and the recreational allowance, which is the preferred approach as set out in the industry PAU 3 Fisheries Plan.</p> <p>Recreational Allowance 20t (Option 3b) Although pre-earthquake catch is largely unknown, 20 t is likely to be closer than the other options to the recreational catch that was occurring prior to the earthquakes (see recreational section under current settings within the TAC). It would provide scope for a longer season and less restrictive recreational management controls than in 2023 and 2024.</p>
Risks	<p>TAC and TACC The larger increases under this option are less consistent with the adaptive rebuild approach set out in the PAU 3 Fisheries Plan. Option 3b would move SSB slightly down towards the target (Figure 2) providing less of a margin for potential pāua habitat change. Under this option a higher level of monitoring and management would be required to ensure ongoing sustainability with associated costs.</p> <p>Recreational Allowance 10t (Option 3a) Recreational catch would remain difficult to manage at this allowance and would require retention of very restrictive management settings.</p> <p>Recreational Allowance 20t (Option 3b) An increase to the recreational allowance to 20 t would not be in proportion with a 100% increase to the TACC as set out in industry's PAU 3 Fisheries Plan. Modelling indicates (Figure 2) that this allowance (if fully caught) would move SSB down towards the target over time. In the longer term (i.e. beyond the next five years) it may also impact on commercial catch as higher recreational catch may trigger commercial catch reductions through operation of the harvest control rule (Figures A3 and A4). However, it is probably more reflective of actual recreational catch pre the earthquakes.</p>

Recreational and other management controls

9. The recreational allowance set will influence the controls imposed to manage recreational catch. Under Options 1, 2a, and 3a, more restrictive settings than those used over the past two seasons would likely be required such as low (e.g., 3 per person) daily and accumulation limits, as well as a short (two month or less) winter season. However, under Options 2b and 3b, longer seasons (3 months or more outside the summer season) and higher daily limits could be considered.
10. Alongside these controls, an increase to the recreational MLS of 125mm for the Kaikōura Marine Area is also being considered. Stock assessment modelling indicates a slightly larger 130 mm MLS would have little immediate impact on catch but would reduce risk of localised depletion. It would also allow pāua more time to contribute to reproduction before being available to the fishery (Schiel et al., 2023) and assist in maintaining the large aggregations of mature pāua that contribute to successful spawning.

11. The commercial industry currently operates at a voluntary minimum harvest size (**MHS**) above the MLS ranging from 130-135 mm. The MHS has been determined by the industry based on the growth characteristics of pāua populations over small spatial scales and analysis of survey data.
12. We welcome feedback on the recreational and other management controls that should be applied as part of this review.

Who is affected by the proposed changes?

13. The Kaikōura pāua fishery is an important shared fishery highly valued by Māori, recreational fishers, and the commercial fishing industry alike.
14. Based on the last three fishing years, in PAU 3A there have been on average 42 quota owners (of which 7.4% is Settlement quota), providing ACE to 11 permit holders (2% of all permit holders across all fisheries nationwide), landing pāua to 7 LFRs (4% of all LFRs nationwide).
15. On average over the last three fishing years, there were 12 vessels used by commercial divers operating in PAU 3A that were landing pāua to LFRs.
16. The proposal to review the PAU 3A TAC and indicative options has been discussed with the Kaikōura Marine Guardians which met mixed views based on the affiliation of members, with some preferring a recreational allowance reflective of the shared interest in the fishery, while others were concerned with about potential increased recreational catch.

Input and participation of tangata whenua

17. Te Waka a Māui me Ōna Toka is the Te Waipounamu Iwi Forum that represents iwi with an interest in PAU 3A. The proposal to review PAU 3A was provided to the forum in March 2024 and FNZ offered to provide more detailed information for any stocks upon request. To date no specific feedback on PAU 3A has been received from the forum, nor further information requested.
18. FNZ has discussed the options with Te Rūnanga o Kaikōura and will engage further with the iwi fisheries forums during consultation. We also welcome any input from tangata whenua outside of this planned engagement.

Fishery characteristics and current settings

Commercial (TACC)
<p>Prior to October 2021, PAU 3A was part of the PAU 3 QMA, which was introduced into the QMS on 1 October 1986 with a TACC of 57 t which later increased to 91.62 t in 1995. Commercial catches predominantly came from the Kaikōura coastline and Motunau/Banks Peninsula. Annual commercial catches were generally evenly distributed between these two fishing areas with about 45 tonnes being caught from each area on average despite variation between years. Black-foot pāua (<i>Haliotis iris</i>) make up most of the pāua catch, while yellow-foot pāua (<i>Haliotis australis</i>) are only caught in small numbers. All pāua is harvested by hand-gathering by free-diving from a boat or directly from shore. The use of underwater breathing apparatus (UBA) is prohibited in this fishery.</p> <p>Following the 2016 Kaikōura earthquakes, the Kaikōura coastline was closed to fishing to allow populations to recover from habitat impacts and the TACC for PAU 3 was lowered to 45.8 t. The closure caused fishing effort to move onto the unaffected open Canterbury coastline (now PAU 3B).</p> <p>On 1 October 2021, the PAU 3 QMA was subdivided into two smaller QMAs— PAU 3A (Kaikōura) and PAU 3B (Canterbury)—in response to the changed nature of the fishery. At that time, a new TAC, TACC, and allowances were set to reflect the QMA subdivision, pre-earthquake catch levels, and the need to adopt a precautionary approach to enable the fishery to rebuild to continue while providing for utilisation opportunities. This was set in accordance with fine-scale management measures prescribed in the approved PAU 3 and PAU 7 Fisheries Plans, with an adaptive rebuild management approach adopted.</p> <p>The commercial fishery was initially reopened for a limit three-month period in December 2021 at a TACC of 23 t, which equates to approximately half the estimated commercial catch from the area prior to the earthquake. It was then reopened on a permanent basis in January 2023. This has been fully caught each year since the reopening and catch per unit effort (CPUE) is at very high levels (supporting information, Figure A5).</p>

Customary Māori

A Māori customary allowance of 15 tonnes was set in 2017 under the PAU 3 TAC. Customary take in this fishery is managed under the Fisheries (South Island Customary Fishing) Regulations 1999. Estimates of customary take before the 2016 earthquakes ranged from seven to 13 tonnes (based on tāngata tiaki authorisations). Customary take after 2016 initially declined given the immediate loss of significant pāua abundance along the Kaikōura coastline. An increase in customary take during 2019-20 occurred in response to feeding local communities during the COVID-19 event. A customary allowance of 7.5 t was set under the PAU 3A TAC in 2021 and estimates of customary take have decreased to lower levels than this since then.

Recreational

A recreational allowance of 8.5 tonnes was set in 2017 under the PAU 3 TAC. The recreational daily limit within PAU 3 was 10 pāua per person prior to the Kaikōura (Te Tai ō Marokura) Marine Management Act 2014, at which time it was reduced to six in the Kaikōura Marine Area (remaining at 10 for the rest of PAU 3). The 2011-12 and 2017-2018 National Panel Surveys of Marine Recreational Fishers (NPS) which estimated recreational take of 17 tonnes and nine tonnes for 2011-12 and 2017-2018 respectively (the lower estimate reflecting the closure of the Kaikōura coastline to fishing) were used as the basis for the allowance (Wynne Jones et al., 2014 & 2019). The recreational allowance for PAU 3 was set at 50% of the 2011-12 estimate of recreational take to reflect the closed area and subsequent displacement of fishing effort into the unaffected Canterbury areas, with the daily limit also being reduced to 5.

A recreational allowance of five-tonne was set for PAU 3A in 2021 at approximately half of the 10.3 t estimated from the NPS for the Kaikōura Marine Area. However, this information is highly uncertain ([Fisheries Assessment Plenary, May 2024](#)), as there were inherent limitations with this survey for a predominantly shore-based fishery with multiple access points. The survey method also faced challenges when applied in small population centres like Kaikōura where no resident fishers were surveyed. As such, there is a strong likelihood that this estimate did not accurately reflect actual recreational catch at that time. Recent targeted surveys estimating recreational catch (Holdsworth, 2021 & 2022, and Holdsworth et al., 2023 & in prep) suggest recreational interest and catch prior to the earthquake may have been much higher than this (anecdotally as high as 40 t in some years with favourable conditions).

The fishery was opened for a three-month period in December 2021 where a survey of recreational catch estimated catch at around 42 t (Holdsworth, 2022) reflecting the high interest from the sector in the fishery. In 2023 the fishery was opened for a two-month winter season from 15 April to 15 June with a reduced daily limit of 3 pāua in the Kaikōura Marine Area, and a daily limit of 2 with an MLS of 135 mm in the Oaro-Haumuri Taiāpure. A further survey of recreational catch estimated take at 11.6t (Holdsworth et al. 2023). A two-month winter season (22 April to 21 June) has again been implemented in 2024 with preliminary results from a recreational survey suggesting catch may be slightly higher, but within a similar range to 2023 (Holdsworth et al., in prep).

Other sources of mortality caused by fishing

An allowance of all other mortality caused by fishing of 10 tonnes was set in 2017 under the PAU 3 TAC, with the allowance set at 5 t for PAU 3A in 2021 to reflect the approximately 50% reduction in the fishery.

The 2014 stock assessment assumed an illegal take of about 15 tonnes for the PAU 3 fishery, but this was considered highly uncertain. Research suggests that incidental mortality associated with commercial fishing is low at about 0.3% of landed catch (Gerring et al., 2003). There is also some associated mortality in the recreational fishery, which is likely to occur at a higher rate than the estimate for the commercial fishery.

Additional supporting information and legal context

19. There are additional figures and more relevant information below on pages 9-13 below which supports the above analysis and proposed options.
20. On the following pages (page 14 onward) FNZ has provided a series of tables outlining key matters that support an initial assessment of the proposed changes against provisions of the Fisheries Act 1996. This includes matters relevant to sections 9, 10, 11, and 13 of the Act, as well as mātaimai reserves and other customary management tools which are relevant to the Minister's decision making under section 21(4).
21. For information on the relevance of sections 5 (Application of international obligations and Treaty of Waitangi (Fisheries Claims) Settlement Act 1992), and 8 (Purpose) of the Act, as well as detail on the

statutory considerations relevant to TAC decisions, please see the **Legal Appendix** (*‘Overview of legislative requirements and other considerations in relation to sustainability measures for the 2024 October round’*) on our [consultation webpage](#).

How to have your say

22. We welcome your views on these proposals. Please provide detailed information and sources to support your views where possible.
 - Which option do you support for revising the TAC and allowances? Why? Are there any alternative combinations of these settings within the range proposed that you would support?
 - If you do not support any of the options listed, what alternative(s) should be considered? Why?
 - Are the allowances for customary Māori, recreational and other sources of mortality appropriate? Why?
 - Do you think these options adequately provide for social, economic, and cultural wellbeing?
 - Do you have any concerns about potential impacts of the proposed options on the aquatic environment?
 - Do you support the recreational management measures including season length and daily limits to be applied to manage catch to the preferred allowance?
 - Do you support an increase in MLS to 130 mm for both the commercial and recreational sectors? Why/why not?
23. FNZ invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on **Monday 29 July 2024**.
24. Please see the FNZ sustainability [consultation webpage](#) for related information, a helpful submissions template, and information on how to submit your feedback. If you cannot access the webpage or require hard copies of documents or any other information, please email FMSubmissions@mpi.govt.nz

Supporting information

Additional figures

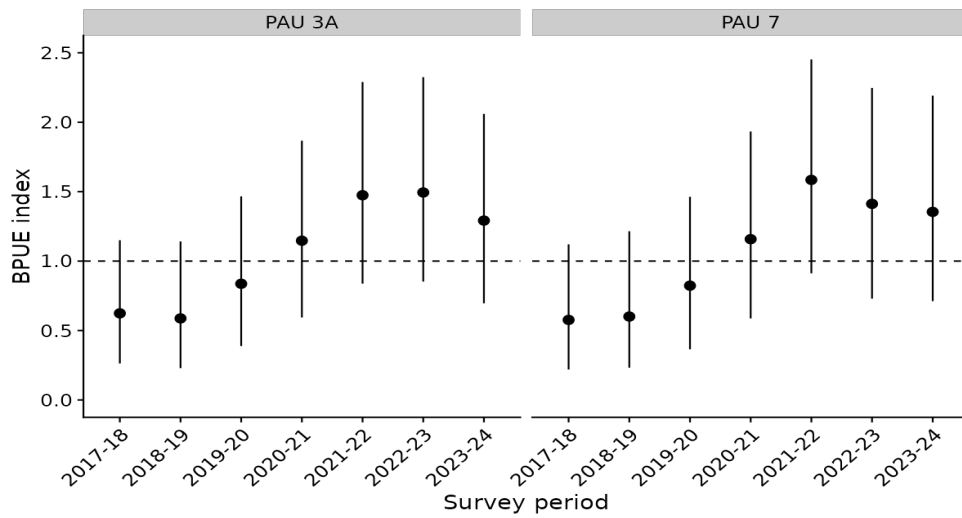


Figure A1: Trend (relative to a geometric mean of 1) in biomass per unit of effort (BPUE) across survey years for QMAs PAU 3A and PAU 7 from the BPUE model after accounting for confounding variables.

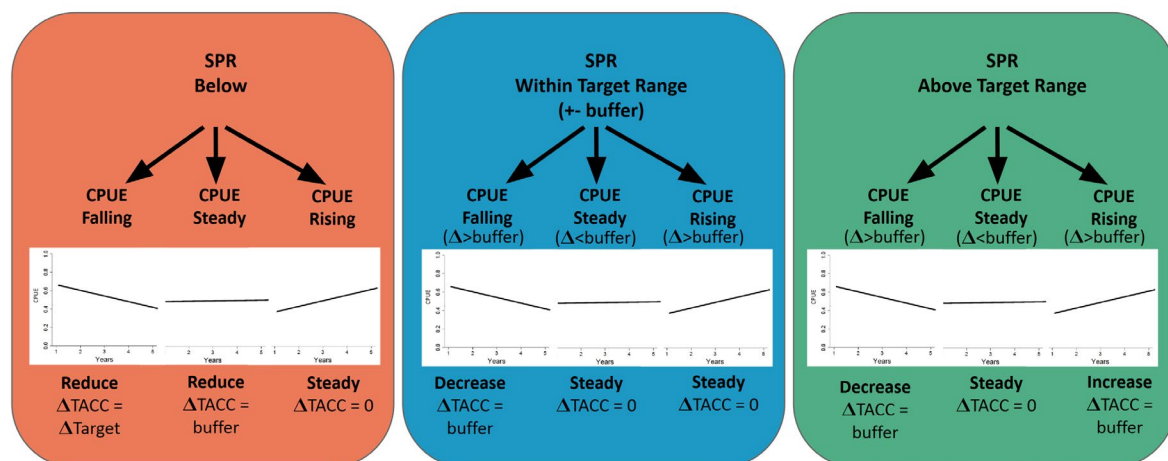


Figure A2: Spawning potential ratio (SPR) harvest control rule for pāua in PAU 3A. The SPR target is set and Total Allowable Commercial Catches (TACC) is adjusted to move catch per unit of effort (CPUE) in the direction of the target SPR. New management procedures were developed on the basis of length-based estimators SPR (Hordyk et al., 2016) and CPUE. These rules set a spawning potential target, and use CPUE or survey indices to indicate the “direction of travel”, adjusting catch to drive biomass towards the target SPR. The target SPR was set at 50% to reflect a precautionary target for pāua (Fisheries New Zealand, 2024).

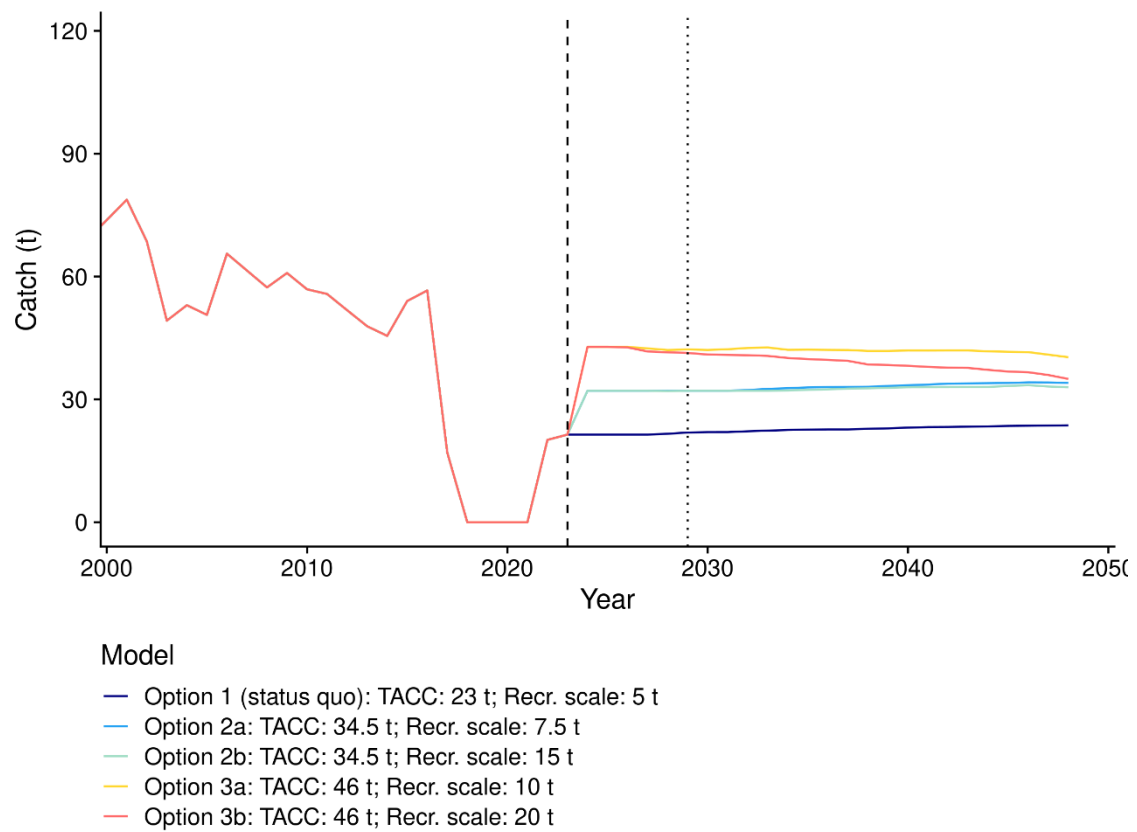


Figure A3: Simulated commercial catch in tonnes for PAU 3A under each proposed option of Total Allowable Commercial Catch (TACC) and Recreational Allowance. The dashed vertical line shows the beginning of projections. These assume that commercial catch will be adjusted according to relative pāua abundance using a harvest control rule, and that recreational catch will also vary based on abundance. Customary catch is assumed to remain at or below 7.5 t. The dotted vertical line shows the 5-year projections (projections should be treated with caution due to uncertainties the further into the future they are).

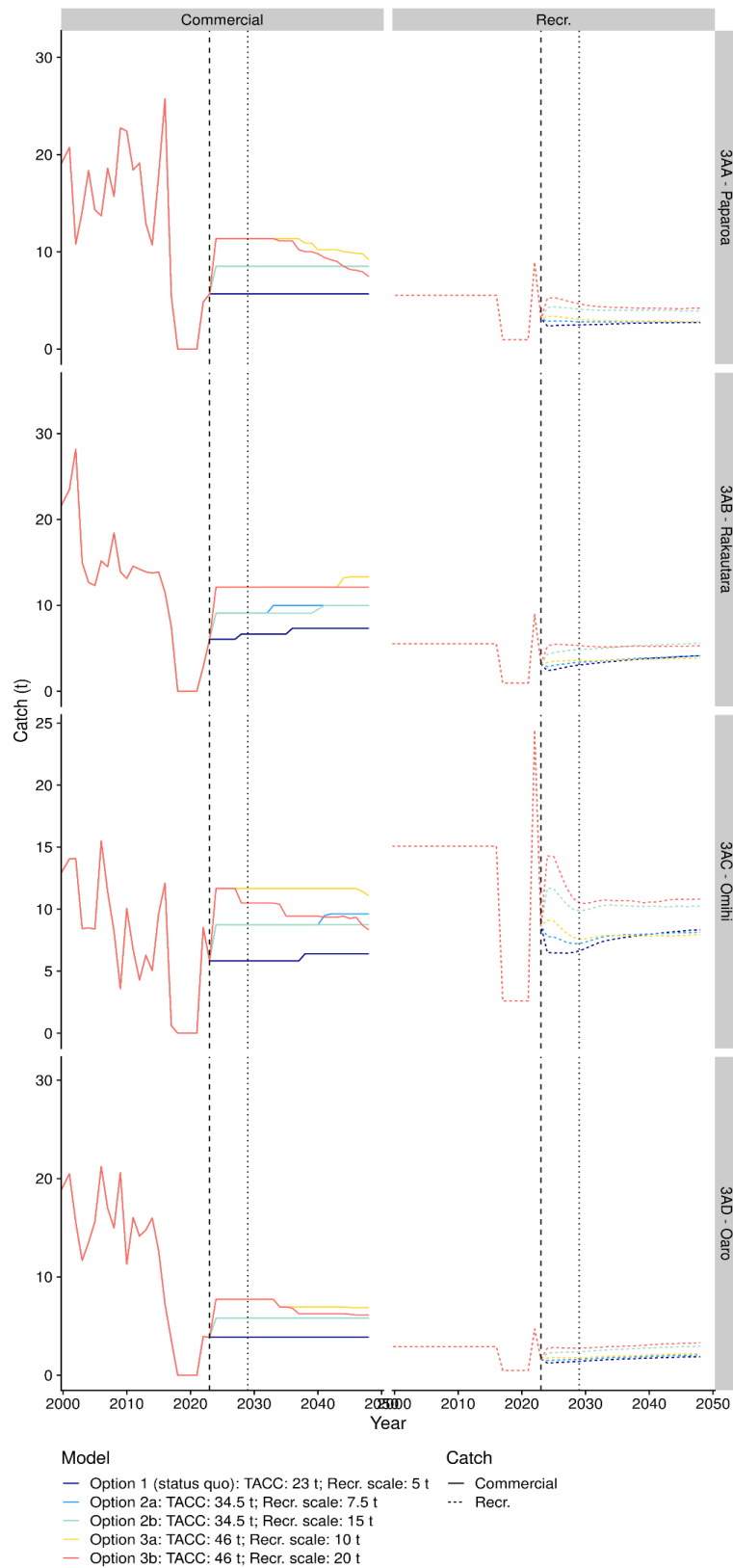


Figure A4: Simulated commercial and recreational catch in tonnes for sub areas of PAU 3A under each proposed option of Total Allowable Commercial Catch (TACC) and Recreational Allowance. The dashed vertical line shows the beginning of projections. These assume that commercial catch will be adjusted according to relative pāua abundance using a dynamic harvest control rule, and that recreational catch will also vary based on abundance. Customary catch is assumed to remain at or below 7.5 t. The dotted vertical line shows the 5-year projections (projections should be treated with caution).

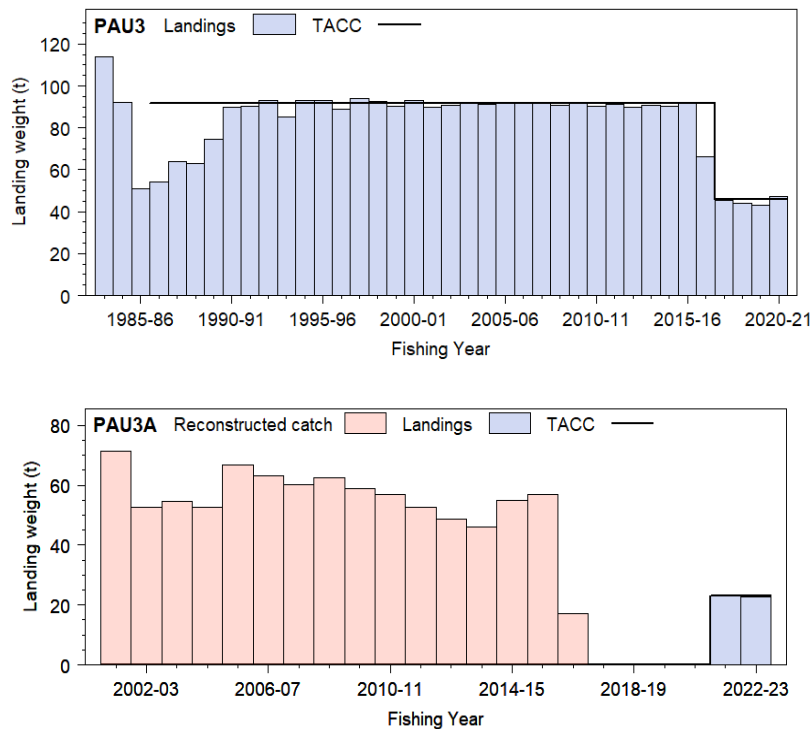


Figure A5: Reported commercial landings and TACC for PAU 3 (top) from 1983–84 to 2020–21 (last year before the QMA subdivision) and PAU 3A (bottom) from 2001–02 to 2021–22. The PAU 3A reconstructed landings between 2001–02 and 2020–21 correspond to the PAU 3 estimated catch for statistical areas 301 to 310 which correspond to PAU 3A QMA created in 2021–22. No catch from 2017–18 to 2020–21 reflects the fishery closure following the 2016 Kaikōura earthquake.

Information on biology, interdependence, and environmental factors

Interdependence of stocks

25. Pāua fishing by all sectors is restricted to hand-gathering only within the intertidal and shallow subtidal areas. Small pāua are eaten by a range of generalist predators, whereas larger pāua are more protected by their strong shells. There are no known predators that feed exclusively on pāua. Pāua play a key ecosystem role as grazers, preferentially feeding on drift algae, but can target attached algae at high densities where they may impact abundance. There is limited evidence that indicates some negative association between pāua and kina. However, there are no recognised interactions with pāua abundance and the distribution of other species.
26. Further information about potential impacts on other species is discussed under ‘Assessment of proposals against section 9 of the Act’.
27. For more information, see the pāua chapter of the [Fisheries Assessment Plenary, May 2024](#), and the [AEBAR](#).

Biological characteristics

28. Pāua inhabit reefs within intertidal and shallow subtidal coastal habitats. Recently settled juveniles are found in boulder and cobble habitats of 0-5 m depth, while adults are typically found in deeper waters of up to 7-10 m. This shellfish is relatively sedentary in nature and can form large, localised aggregations.
29. Pāua are broadcast spawners and spawning is understood to occur annually. Habitat-related factors such as wave exposure, habitat structure, availability of food, and population density all influence the settlement, growth, and recruitment of pāua.
30. Due to their sedentary nature, high levels of localised fishing pressure may make pāua susceptible to overfishing and depletion. Overfishing of a localised population can affect spawning success and may hinder overall productivity of the stock.
31. For a more detailed summary of biological characteristics, see the pāua chapter of the [Fisheries Assessment Plenary, May 2024](#).

Environmental conditions affecting the stock

32. In 2016, the Kaikōura earthquakes caused significant loss of pāua habitat resulting from coastal uplift along the coastline between the Clarence River and Conway River (Alestra et al., 2019 & 2020, and Schiel et al., 2021). This area was closed to commercial and recreational pāua fishing to protect the surviving pāua populations and associated habitats but has since been reopened to fishing following rebuilding biomass.
33. Pāua are considered to be highly vulnerable to climate change associated threats (Cummings et al., 2021) including marine heatwaves and ocean acidification, as well as other habitat impacts such as sedimentation.

Relevant provisions of the Act

Key matters for assessment of the proposals against section 13 of the Act

Matters for assessment under section 13(2)(a) of the Act	
Section 13(2)(a)	<p>The biomass of PAU 3A can be reliably estimated in relation to <i>MSY</i> using the 2024 stock assessment, which showed that pāua abundance is high, and that the <i>SSB</i> is above the management target and projected to increase.</p> <p>As biomass of the stock is above <i>MSY</i> and there is a desire to maintain the stock at or above this level, any change to the TAC of PAU 3A would be made under section 13(2)(a) of the Act, which requires the Minister to set a TAC that will maintain the stock at or above a level that can produce <i>MSY</i>, while having regard to the interdependence of stocks.</p> <p>FNZ's initial view is that all the TAC options proposed for PAU 3A would be consistent with the objective of maintaining the stock above <i>MSY</i>. This is supported by the forward projections of the assessment model, which predict biomass will remain above <i>MSY</i> under all options proposed (Figure 2). The options which set the TAC at a lower level would maintain the stock at a higher level relative to <i>MSY</i> (the management target of 40% B_0) for at least the next five years (Figure 2).</p>
Harvest Strategy Standard	<p>Under the Harvest Strategy Standard, the default management target is 40% B_0 (unfished biomass), the soft limit is 20% B_0, and the hard limit is 10% B_0. The default management target applies to PAU 3A. The current biomass (the spawning stock biomass, <i>SSB</i>) of PAU 3A is estimated to be above the target of 40% B_0. For PAU 3A this means that TAC increases would be sustainable.</p>
Section 13(2)(a) Interdependence of stocks	<p>There are no known interdependencies between pāua and other species in the same habitat. The harvesting method is highly selective, so FNZ considers any changes to fishing behaviour following the proposed TAC increases are unlikely to result in increased levels of bycatch of other species. There is a risk that a higher TAC increase may have negative effect on the ecosystem function that pāua serve through grazing on algae. However, the specific impacts of pāua harvest are uncertain, and their extent cannot be quantified based on the information available.</p>

Mātaaitai reserves and other customary management tools

34. When making TAC decisions, the Minister must allow for Māori customary non-commercial interests. In doing so, the Minister must take into account any gazetted mātaaitai reserve in PAU 3A, and any area closure, fishing method restriction, or prohibition imposed in PAU 3A under section 186A or 186B of the Act.
35. For more information on how mātaaitai reserves and other customary management tools are relevant for TAC decisions, see heading 2.7 in the Legal Appendix.

Mātaaitai reserves and other customary management tools in PAU 3A	
Customary area	Management type
Te Waha o te Marangai Mangamaunu Oaro	Mātaaitai reserve Commercial fishing is not permitted within mātaaitai reserves unless regulations state otherwise.
Te Taumanu o Te Waka a Māui Oaro-Haumuri	Taiāpure All types of fishing are permitted within a taiāpure. The management committee can recommend regulations to manage commercial, recreational, and customary fishing.

Key matters for assessment of the proposals against section 9 of the Act

36. When considering sustainability measures, the Minister must take into account the below environmental principles. For more information on how section 9 of the Act relates to TAC decisions, see heading 1.4. of the Legal Appendix.

37. While under the proposed options, a TAC increase will likely cause an increase in fishing effort, pāua are selectively hand gathered by free diving. Therefore, the proposed options are considered unlikely to have an adverse effect on associated or dependent species (under section 9(a) of the Act), biological diversity of the aquatic environment (section 9(b)), or any potential habitats of particular significance for fisheries management (section 9(c)). However, if significant (unsustainable) reductions in pāua biomass were to occur this could impact ecosystem function.

Associated or dependent species should be maintained above a level that ensures their long-term viability - Section 9 (a) of the Act	
Seabirds, mammals, fish and invertebrate bycatch	Pāua fishing by all sectors is restricted to hand-gathering only within the intertidal and shallow subtidal areas. This activity poses little to no risk to seabirds, mammals, and other protected species. There are no known captures of marine mammals, seabirds, or protected fish species in New Zealand pāua fisheries (Fisheries New Zealand, 2022). There is no known bycatch of threatened, endangered, or protected species associated with the hand gathering of pāua, incidental bycatch is limited to epibiota attached to or within the shell.
Biological diversity of the aquatic environment should be maintained - Section 9(b) of the Act	
<p>The environmental impact of pāua harvesting is thought to be minimal as pāua are selectively hand gathered by free divers. Habitat contact by divers at the time of harvest is minimal and limited to the area of pāua foot attachment (pāua are usually removed with a blunt tool to minimise damage to the flesh). While vessels anchoring have the potential to damage the reef, a large proportion of fishing along the Kaikōura coastline is directly from the beach, especially for recreational and customary sectors. Only small numbers of vessels operate in the fishery and they rarely anchor when diving is occurring.</p> <p>FNZ considers it unlikely that pāua fishing methods would have a demonstrable adverse effect on biodiversity along the Kaikōura coastline. However, if significant (unsustainable) reductions in pāua biomass were to occur this could impact ecosystem function.</p>	
Habitat of particular significance for fisheries management should be protected - Section 9(c) of the Act	
<p>While none have been formally identified for PAU 3A, emerging studies on pāua habitat after the 2016 earthquakes may contribute to the identification of potential habitats of particular significance such as subtidal rocky reefs (Alestra et al., 2021, Gerrity et al., 2020, and Schiel et al., 2019). Habitat that may be significant is discussed below. As discussed under section 9(b) considerations, the selective nature of pāua fishing means there is unlikely to be a large impact on associated habitat.</p>	
Potential habitat of particular significance	Adult pāua are found in deeper waters compared to juveniles with the onset of maturity where they become largely sedentary and live in aggregations in rocky crevice and boulder habitats associated with macroalgal reefs. These dense aggregations of mature pāua and appropriate water movement for larval dispersal may contribute to successful reproduction and is noted in subtidal rocky reefs in the area.
Attributes of habitat	<p>Pāua are found in shallow rocky reefs in coastal waters generally less than 10 m depth.</p> <p>Intertidal and subtidal rocky reefs typically consist of rocks and boulders, interspersed with cobble substrate and rock pools. Alongside these substrates, reefs typically include a high abundance and diversity of seaweeds.</p> <p>Crustose coralline algae attach to hard surfaces on intertidal and subtidal rocky reefs. This habitat is favoured by newly settled juveniles, is a cue for settlement, and provides a food source for adults and juveniles.</p> <p>Rocky crevices and boulders provide a cryptic habitat in the form of shade and cover for pāua. Cryptic habitats are important for pāua, particularly for juveniles before they emerge and recruit to the fishery.</p>
Reasons for particular significance	<p>Growth and recruitment success can be influenced by food availability, with rocky reef communities offering a food source in the form of coralline algae and seaweeds.</p> <p>Rocky reefs also provide shelter and shade, a source of refuge for pāua.</p> <p>Rocky crevices and boulders provide substrate for adults to aggregate and support localised recruitment. As pāua are broadcast spawners, fertilisation success depends on proximity and density of mature adults.</p>

Risks/Threats	<p>Land based impacts, particularly sediment deposition on habitats with benthic structure, are a threat to intertidal and subtidal rocky reefs. Sedimentation smothers coralline algae and seaweeds that provide adult and juvenile habitat.</p> <p>The Kaikōura earthquake caused significant uplift along the coastline and was estimated to have caused about 20% loss of pre-earthquake fished areas. The effects of subsequent land-based sedimentation and gravel deposition onto reefs caused further loss of habitats and will continue to be affected for many years to come. This means that pāua recovery will be variable across the fishery.</p> <p>The earthquake caused significant loss of intertidal and subtidal seaweed communities that continue to impact surviving pāua populations through loss of shade, cover, and food source.</p> <p>Ocean warming due to climate change contributes to higher sea surface temperatures and may influence the extent of productive pāua beds over time.</p> <p>Ocean acidification may influence the survival of crustose coralline algae, with New Zealand crustose coralline algae species found to exhibit a reduction in growth rates under lower pH. Reduced availability of crustose coralline algae could threaten habitat used for settlement and a source of food for juveniles.</p> <p>Overfishing, especially on small spatial scales can reduce the density of mature adults, which could impact spawning success if it occurs at unsustainable levels.</p>
Existing protection measures	<p>Pāua fishing has negligible effect on habitats. Steps have been taken to reduce the effects of land-based gravel deposition along the coastline with the placement of concrete barriers and walls where hillsides are close to the coastline.</p>
Evidence	<p>Alestra <i>et al.</i>, (2019) Alestra <i>et al.</i>, (2020) Cornwall <i>et al.</i>, (2014) Naylor <i>et al.</i>, (2006)</p>

Key matters for assessment of the proposals against [section 11 of the Act](#)

38. Section 11 of the Act sets out various matters that the Minister must take into account (sections 11(1) and 11(2A)) or have regard to (section 11(2)) when setting or varying sustainability measures such as the proposed TAC changes. The matters relevant to this review under section 11 are set out below. For more information on how section 11 is relevant for TAC decisions, see heading 2.2 in the Legal Appendix.

Effects of fishing on any stock and the aquatic environment – section 11(1)(a)	<p>The broader effects of removing pāua from the Kaikōura pāua fishery on the ecosystem as well as the more direct effects of harvesting pāua need to be considered.</p> <p>Pāua fishing is highly localised in nature and restricted to the method of hand gathering only.</p>
Existing controls that apply to the stock or area – section 11(1)(b)	<p>Recreational daily limits: From Marfells Beach to Conway River no person may take or possess more than three ordinary (blackfoot) pāua and three yellowfoot pāua per day. Within the Oaro-Haumuri Taiāpure no person may take or possess more than two ordinary pāua and two yellowfoot pāua per day.</p> <p>Accumulation limit: refers to the number of pāua that can be accumulated over a period of more than one day. From Marfells Beach to Conway River no person may possess more than six pāua, and within the Oaro-Haumuri Taiāpure no person may possess more than four pāua.</p> <p>Size restrictions: blackfoot and yellowfoot pāua from Marfells Beach to Conway River have an MLS of 125 mm and 80 mm, respectively for both the commercial and recreational sectors. Within the Oaro-Haumuri Taiāpure blackfoot pāua has an MLS of 135 mm for recreational fishers.</p> <p>Prohibited states: nationally, it is illegal to possess seaward of the mean high-water mark any recreationally taken shellfish with a minimum size restriction in such a state that it cannot be measured. This means pāua cannot be possessed seaward of the mean highwater mark in a shucked state.</p>

	<p>Prohibited method: pāua are targeted by hand-gathering across the fishery and the use of UBA is strictly prohibited for both commercial and recreational fishers.</p> <p>Seasonal restrictions: Recreational pāua fishing has been restricted to a specified open season in 2021-22, 2023 and 2024 in the Kaikōura Marine Area.</p> <p>Spatial Closures: There are closed areas including the Hikurangi Marine Reserve and the Waiopuka (Wakatu Quay) Reef Area, as well as customary managed areas: taiāpure and mātaimai within PAU 3A that are closed to commercial and recreational pāua fishing other than the previously mentioned Oaro-Haumuri Taiāpure (See table on customary management tools).</p>
<p>The natural variability of the stock – section 11(1)(c)</p>	<p>A variety of environmental factors influence settlement, growth, and recruitment of pāua, including wave exposure, food availability, water temperature and population density (Fisheries New Zealand, 2023).</p> <p>Pāua generally grow faster in areas with lower mean monthly sea surface temperatures (Naylor et al., 2006). Growth rates and maximum size of pāua vary across the Kaikōura pāua fishery. Diver perceptions indicate that the northern region (Clarence River to Hapuku River) has more areas of faster pāua growth than the southern region (Hapuku River to Conway River).</p> <p>Biomass of pāua along the wider Kaikōura coastline was significantly decreased following the 2016 earthquake (Neubauer, 2017). As a direct result of the five-year fishery closure, this biomass has substantially rebuilt to a level that can support fishing opportunities for all sectors (Fisheries New Zealand, 2023).</p>
<p>Relevant statements, plans, strategies, provisions, and documents - section 11(2)</p>	<p>Regional plans:</p> <p>There are two regional councils that share unitary authority along the wider Kaikōura coastline – Marlborough District Council and Environment Canterbury Regional Council. These Councils have coastal-related environmental plans to manage the coastal and freshwater environments, including terrestrial and coastal linkages, ecosystems, and habitats.</p> <p>The provisions of these various documents are, for the most part, of a general nature and focus mostly on land-based stressors on the marine environment. FNZ considers that the proposed options in this paper are consistent with the objectives of these relevant regional plans.</p> <p>In addition, FNZ engages with the Resource Management Act coastal planning processes (including regional authorities) to support marine management decisions to manage not only the fishing effects on the coastal environment, but also land-based impacts on fisheries.</p> <p>Environment Canterbury has responsibilities for the coastline within the PAU 3A QMA boundaries. Its Regional Coastal Environmental Plan manages coastal and freshwater environments, including terrestrial and coastal linkages, ecosystems, and habitats.</p> <p>FNZ considers that the management options presented here are in keeping with the objectives of relevant regional plans, which generally relate to the maintenance of healthy and sustainable ecosystems to provide for the needs of current and future generations.</p>
<p>Relevant services or fisheries plans – section 11(2A)</p>	<p>PAU 3 Fisheries Plan:</p> <p>In April 2021 the PAU 3 Fisheries Plan for the commercial sector was approved by the Minister for Oceans and Fisheries under section 11A of the Act. The Plan was developed by <i>Pāua</i>MAC (Pāua management area council) 3, representing commercial interests within the PAU 3 fishery, to manage commercial fishing under an ‘adaptive rebuild programme’. This Plan recognises the distinct nature of the two sub-fisheries post-earthquakes. The Plan includes a commercial harvest strategy for the fishery under a range of measures, such as a conservative level of utilisation and catch spreading arrangements, larger minimum harvest size, harvest control rules, and fine scale catch reporting and monitoring. This approach is intended to enable responsive adjustments in commercial fishing during and between years. Section 11(2A) (b) of the Act states that before setting or varying any sustainability measure under this Part or making any decision or recommendation under</p>

	<p>this Act to regulate or control fishing, the Minister must take into account any relevant fisheries plan approved under this Part.</p> <p>The Minister may make a decision that is different to what is set out in this Plan, provided that in making the decision, its content is considered. The proposed management options presented here are consistent with the PAU 3 Fisheries Plan in adopting a cautious and adaptive approach to managing both stocks. While there are options presented that adopt the approach recommended by industry in the plan of maintaining proportional TACC increases with the base recreational allowance of 5 tonnes, some of the options presented do not. This is because FNZ does not consider the base recreational allowance of 5 tonnes that was set was based on accurate information regarding pre-earthquake recreational catch. The likelihood that recreational catch was underestimated was noted in the Minister’s decision at the time the recreational allowance was set, and that recreational surveys would be carried out to better establish the level of recreational interest. Based on these surveys and discussions with Kaikōura community it is likely that recreational catch was much higher.</p>
<p>Other plans and strategies</p>	<p>The Kaikōura (Te Tai o Marokura) Marine Management Act 2014</p> <p>The purpose of this Act includes recognising the local, national, and international importance of the coast and sea around Kaikōura as a consequence of its unique coastal and marine environment and distinctive biological diversity and cultural heritage. This Act aims to integrate and establish marine protection and fisheries measures in the Kaikōura marine environment. The options proposed in this paper have been tabled with the Kaikōura Marine Guardians and will be considered further by them during consultation.</p> <p>Te Mana o te Taiao (Aotearoa New Zealand Biodiversity Strategy)</p> <p>FNZ considers that the sustainability measures proposed for the Kaikōura pāua fishery are generally consistent with relevant objectives of Te Mana o te Taiao – the Aotearoa New Zealand Biodiversity Strategy. This includes Objective 10, which is to ensure that ecosystems are protected, restored, resilient and connected from mountain tops to ocean depths; and Objective 12, which is to manage natural resources sustainability. The proposed options are not thought to have risks of ecosystem or sustainability impacts.</p>

Information principles: [section 10 of the Act](#)

- 39. The best available information relevant to PAU 3A is presented throughout this paper, and in various sections FNZ has noted where information is uncertain.
- 40. As per section 10(c) of the Act, caution is required in decision making where information is uncertain, unreliable, or inadequate. However, as per section 10(d) of the Act, the absence of, or any uncertainty in, any information must also not be used as a reason for postponing or failing to make a decision.
- 41. Key uncertainties relevant to this review include uncertainty concerning the setting of the recreational allowance as a reflection of past and current fishing effort, and the difficulty in predicting recreational catch given its dependence on weather, sea conditions, and other factors. There is also uncertainty regarding the extent to which environmental factors may affect pāua in future, particularly climate change associated threats such as marine heatwaves and ocean acidification.
- 42. For more information on how section 10 is relevant for TAC decisions, see heading 1.5 in the Legal Appendix.

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