Supplementary Table 1. List of the questions given in the examined public consultations on MPAs (except the questions about submitter).

Questions of the public consultation of Proposal to designate a Deep Sea Marine Reserve in Scottish waters (Nature Conservation MPA) in the UK (2019)

1. Do you support the designation of the West of Scotland Deep Sea Marine Reserve?
2. Do you agree that the scientific evidence presented justifies the case for designation?
3. Do you have any comments on the conservation objectives and management advice?
4. Do you have any comments on the Business and Regulatory Impact Assessment?
5. Do you have any comments on the Sustainability Appraisal, including the Environmental Report and the Socio-Economic Impact Assessment?

Questions of the public consultation of Proposal for New Marine Protected Areas Act for its territorial sea in the UK (2016)

Q1. Do you agree there is a need for reform of New Zealand's approach to marine protection?
Q2. Are there any significant issues that haven't been identified?
Q3. Are there parts of the existing approach to marine protection that should be retained?
Q4. Do you support the outlined objectives of the new MPA Act?
Q5. Are there additional objectives that should be included in marine protection reform?
Q6. Are the four categories proposed for marine protection an appropriate way to achieve a representative and adaptable network of MPAs?
Q7. If the options outlined in table 1 were applied in an area of interest to you, what impact would that have on your existing or future activities?
Q8. Does the approach take account of the way the fishing sector operates?
Q9. Does the approach take account of the way the oil, gas and minerals sector operates?
Q10. Are there other economic interests that haven't been covered?
Q11. Is the new MPA Act likely to have the intended effect that decisions about environmental protection and economic growth are made in an integrated way (objective 2)?
Q12. What do you think would be the best process for initiating MPA proposals where multiple categories of protection may be needed? and
Q13. Are the proposed decision-making processes the best way of achieving the objectives?
Q14. What are the advantages and disadvantages of having two different decision-making processes?
Q15. Do you agree with the proposed review arrangements?
Q16. Are the proposed decision-making processes sufficient to ensure customary interests, rights and values are appropriately taken into account, Treaty of Waitangi principles are met and decisions are consistent with the Crown's historical Treaty settlement obligations?
Q17. Do you support the proposal for recreational fishing parks in the Hauraki Gulf and Marlborough Sounds?
Q18. What do you think should be the boundary lines for the recreational fishing parks?

Q19. Do you think commercial fishing should be allowed to continue for some species within recreational fishing parks? If so, what species would you allow and why?
Q20. What do you think about the proposed compensation scheme for commercial fishing affected by the creation of recreational fishing parks?
Q21. What do you think about who should manage recreational fishing parks? How could the park management work together with existing groups?
Q22. How should benefits and changes created through the proposed park be monitored?
Q23. Do you agree with the proposed arrangements for transitioning existing MPAs?
Q24. Do you agree that customary management areas should be able to be used alongside the proposed MPA Act to create integrated management packages?
Q25. What would be required to ensure the integrity of current protected areas is maintained while achieving the objectives of the new MPA Act?
Q26. Are the proposed approaches sufficient to ensure communities are involved in managing MPAs?
Q27. What role can iwi/Maori play in managing MPAs?
Q28. Do you agree with managing commercial tourism activities in MPAs in a similar way to how they are managed on public conservation land?

Questions of the public consultation of Marine Protected Area Standards by the National Advisory Panel in Canada (2018)

Question 1: What Practical Recommendations do you have for Creating Standards for Marine Protected Areas (MPAs)
Question 1a) on what do you base these suggestions? Best available science, indigenous knowledge, ecosystem approach or something else?
Question 2. What Role Do Indigenous Approaches Play in Shaping Your Suggestions?
Question 3: What Do You See As The Strengths and Weaknesses of the IUCN Guidelines?
Question 4: Do the Guidelines Developed by the IUCN Work Well in the Canadian Context?
Question 5: Specific circumstances unique to Canada that pose challenges for the use of the IUCN Guidelines?

Questions of the public consultation of Proposal for network of marine reserves and marine protected areas along the south-east coast of the South Island (Marine Reserves) in New Zealand (2020)*

2. Proposed marine protection measures
- I would like to make a submission on the establishment of the full network
3. The full network of marine protection measures
- Do you agree with our initial analysis of the costs/impacts of maintaining the status quo?
- Are there other costs/impacts that have not been described in our initial analysis?
- Do you agree with our initial analysis of the benefits of maintaining the status quo?

- Are there other benefits that have not been described in our initial analysis?
- What is your preferred option, the status quo, the network or another option?

4. Comments and supporting documents

- Please add any final comments to your submission

*, the questions were somewhat varied depending on proposed MPAs. Moreover, reasons for agreement/disagreement were asked by additional questions, once respondents chose agree/disagree.

Supplementary Table 2. Views by extractive marine users on the four questions of marine protected areas. The ideas in the column B were given based on text mining by ChatPDF, while the cited texts in the column C were manually extracted from original submissions as examples of what the stakeholders actually wrote.

A. Question	B. Views by extractive marine users according to the returned answers by ChatPDF in response to each question	C. Non-exhaustive list of some original texts related to each question in the cited submissions by extractive marine users
Q1: To what extents MPAs should target geographical scale (coverage area) and target time scale (duration)?	*Um*1: The proposal does not provide specific guidelines on the geographical or time scale for MPAs. However, it indicates a need for a balanced approach between marine health and the activities in these environments. [*Um*1] suggests that further discussions about the management measures are necessary to make informed decisions regarding MPAs without overly restricting activities such as oil and gas exploration. *Um*2: The geographical extent of MPAs should be sufficient to encompass key ecological features, ensuring protection of biodiversity and geodiversity. The proposal emphasizes that areas should be designated based on evidence of ecological significance rather than arbitrary boundaries. Coverage should align with the actual distribution of important habitats and species to maintain effective conservation. The time scale for MPAs should ideally be long-term to allow ecosystems to recover and adapt to changing environmental conditions. However, this should be flexible to reflect new scientific evidence or	○ Geographical scale "Species like Dungeness crab would be very difficult to protect unless very large MPAs were created and even then, the question is: Protect for what purpose? The same question needs to be asked for a majority of pelagic ocean species that are presently being fished sustainably through proven fisheries management methodologies." / "In conclusion, Integrated Marine Planning is very important to maintain the future health of Canada's marine area. MPAs are only one tool of many that may be needed to achieve these planning objectives. There is growing evidence that MPAs are being oversold for their benefits and it is well known in the field of Marine Planning that one of the major mistakes in this relatively new field is to treat Marine Plans as mirror images of terrestrial plans. Unlike Terrest[r]ial Areas, Marine areas are not static, they are highly variable and more mobile than the terrestrial environment and we need to take that into account when contemplating the possibility of locking out large areas of ocean

	ecological assessments, ensuring that management remains adaptive. *Um*3: Marine Protected Areas (MPAs) should ideally be designed to encompass significant habitats and ecosystems that warrant protection, ensuring that they cover enough geographical area to maintain ecological integrity. The geographical scale should consider the migration patterns of species, ecological connectivity, and the potential impact of human activities on marine environments. As for the time scale, MPAs should aim for long-term protection, allowing ecosystems to recover and thrive over extended periods. Temporary closures may also be employed in some cases to facilitate recovery from specific activities or events. *Uf*1: In terms of the geographical scale and the duration for which MPAs should target, it is essential that they cover sufficient areas that encompass key habitats and migratory pathways to ensure ecological sustainability. The design of the West of Scotland Deep Sea Marine Reserve suggests a broad geographical coverage to protect diverse marine features. As for the time scale, MPAs should have an indefinite duration to provide long-term protection, but they may require periodic reviews to adapt to new scientific data and changing environmental conditions.	space from human use. We see the need for a much more responsive and structured Terms of Reference for including the affected commercial industries into the MPA planning process. There is too much at stake for this industry to simply be part of a very loose consultative process that at the end of the day could very well see major negative economic consequences for our fishery." (*Cf*1) "In addition to this, after all the efforts from DFO, the 5% goal for 2017 was not easy to attain generating all kinds of conflicts like in crab fishing Area 19 in Cap[e] Breton. 10% level for 2020 is out of the radar for us and I would say, for all the fishing industry in Canada. In our case, this MPA file should stop at that 5% level." (*Cf*6) "With prospecting and exploration activities in the marine environment, the effects are generally minor, localised and temporary. During the development and production phase the effects are generally localised and minor, albeit over longer timeframes." (*Nm*1) "Prospecting is carried out over large areas; subsequent exploration is carried out over smaller areas, and mining is carried out over small and clearly defined areas;" / "Mining, if it

	*Uf*2: MPAs should target a geographical scale that reflects the ecological requirements of the species and habitats they aim to protect. The document indicates that there is recognition of existing regulations, such as the ban on bottom trawling below 800m, which suggests that a comprehensive approach to area designation should consider existing legal frameworks and scientific data on species distribution and habitat needs. The time scale for the designation of MPAs should also be strategic, allowing for long-term protection while being adaptable to new evidence and changing environmental conditions. This indicates a need for a balance between immediate and future conservation objectives. *Uf*3: MPAs should be designed to cover areas that are ecologically significant and represent diverse marine habitats. The geographical scale should encompass not only the targeted conservation features but also adjacent areas that support ecological processes, such as migration routes for fish species. As for the time scale, MPAs should be established for a duration that allows ecosystems to recover and thrive—ideally, long-term commitments that can adapt to new scientific findings and changing environmental conditions. *Cm*1: [*Cm*1] advocates for a flexible approach	occurs, is a temporary or short-lived use of space, with natural recovery of disturbed seafloor ecosystems an integral part of environmental management;" / "If the mining company is able to present the evidence to decision-makers on a marine consent application that mining would not unduly compromise the values being protected in an MPA, noting the activity will be a temporary one, and in consideration of the longer term future of the MPA and the values protected there, mining should proceed. New Zealand's obligations under UNCLOS will have been met." (*Nm*2) "Under the Government's proposals, any person, anywhere in the world, can apply for an MPA at any time. The proposals provide no process for planning and no structured approach to decision-making. In the absence of a planned, risk-based approach, New Zealand will end up protecting the wrong places for the wrong reasons (thereby failing to adequately protect marine biodiversity) and excluding more activities than necessary in order to protect biodiversity (thereby incurring unnecessary economic costs). The Government's stated objective of an appropriate balance between protecting the marine environment and maximising commercial, recreational and cultural opportunities will not be realised." / "For

	that aligns with existing Canadian National Frameworks for MPAs, referencing international practices from countries like Norway and the UK. This framework allows for regional flexibility and recognizes the need for targeted conservation efforts that can adapt over time. The focus on both geographical and time scales should reflect the varying ecological contexts and conservation targets needed to effectively manage and protect marine environments. *Cm*2: MPAs should target significant geographical scales to ensure a meaningful impact on biodiversity and ecosystem services. A coverage area of at least 10% is a common goal, as reflected in the MPA goal within the document, which mentions 100,000 sq km targeted area inside 200 nautical miles. The time scale for MPAs is crucial, ideally spanning several decades to allow ecosystems to recover, but specific durations would depend on the objectives and environmental factors influencing each MPA. *Cm*3: While the document emphasizes the importance of considering economic and environmental impacts, it does not provide explicit recommendations for the geographical scale and duration of MPAs. Generally, effective MPAs often require scientifically determined	instance the setting aside of 10% of a coastal area as an MPA may, in effect, remove 40 or 50% of particular inshore fisheries." / "Critical terms such as 'representative', 'adaptable' and (in the case of marine reserves, 'special' and 'unique') remain undefined, raising the spectre of an ever-increasing MPA network with no discernable end point. For example, in 2007 SeaFIC calculated that, under the policy approach proposed at that time for establishing a 'comprehensive and representative network of MPAs', up to 429 marine reserves would be required in inshore waters and 200 in deep water, along with an equal number of replicate ecosystems and habitats protected in other types of MPAs, and an unknown number of MPAs protecting special or unique ecosystems and habitats. Uncertainty on this scale introduces excessive scope for ad hoc MPA establishment and imposes significant costs on all marine users" / "Activities outside an MPA that may have adverse effects that are inconsistent with the objective of the MPA must: o in the case of existing activities, be reviewed in order to impose consent conditions to avoid, remedy or mitigate the identified adverse effects; or o in the case of new activities, be prohibited unless the identified adverse effects can be

	scales that are contextual to local ecosystems and biodiversity needs. *Cf*1: [*Cf*1] emphasizes that MPAs should not be treated as a one-size-fits-all solution. He argues for a more nuanced approach, suggesting that the specific geographical and temporal scales should be carefully considered based on the dynamics of marine areas, which are highly variable. He implies that the area targeted for protection should consider existing fishing practices and the movement of marine species, rather than imposing blanket restrictions on large areas without adequate justification. *Cf*2: MPAs should be designed with sufficient geographical scale to effectively protect critical habitats and biodiversity. The MPA's coverage area needs to encompass entire ecosystems and migratory routes, particularly for species with wide ranges. A longer duration of protection is generally favored as ecological recovery can take time; however, MPAs should incorporate regular assessments and adjustments based on ecological research and changing conditions. This aligns with [*Cf*2]'s emphasis on adaptive management and ongoing monitoring. *Cf*3: The recommendation suggests taking a phased approach to establish MPAs in smaller	avoided, remedied or mitigated through the imposition of consent conditions." (*Nf*5) "The fishing industry emphasises that signing the CBD did not commit New Zealand to establishing MPAs over 10% of our coastal areas. Instead, the CBD – which does not mention marine biodiversity specifically – sets out a series of pragmatic, flexible, high-level obligations for parties with respect to biodiversity conservation. The Convention promotes the use of a variety of tools – including area-based and activity-based measures – to manage threats to biodiversity. Only one of the CBD's 42 Articles mentions protected areas, and nine of the thirteen measures in that Article apply to management of biodiversity outside protected areas. In relation to protected areas, the CBD provides parties with a choice of establishing either 'a system of protected areas' or 'other areas' where special measures are applied to conserve biodiversity." / "Numerical targets for marine biodiversity protection are set out in the Aichi targets, which are part of the CBD Strategic Plan adopted in 2010. The numerical target for marine conservation – 10% of coastal and marine areas by 2020 – is one of 20 targets alongside others focusing on effective management of particular threats to biodiversity. The CBD Strategic Plan makes it clear that the

	areas first, rather than large expanses. This allows for evaluation of results and adaptation based on what is learned, which implies that flexibility in geographical scale is important. Duration should similarly depend on outcomes and should remain fluid to accommodate the ongoing assessment of effectiveness. *Cf*4: The document emphasizes the need for MPAs to coordinate with existing planning regimes to effectively target geographical coverage. While it does not specify exact scales, it suggests that aligning MPAs with other management plans is critical for effective implementation and long-term success. *Cf*5: [*Cf*5] expresses concerns about the proposed 75% "no-take" zones, indicating that such restrictions could devastate local communities and the fishing economy. They argue for an approach that allows for managing the marine ecosystem comprehensively, rather than isolating specific areas. This suggests that the geographical scale of MPAs should consider the socio-economic dynamics of the local fishery, and time scale should accommodate the continuity and evolution of fishing practices over generations. *Cf*6: The scope and duration for Marine Protected Areas (MPAs) should be carefully considered to	targets are intended as 'a flexible framework for the establishment of national targets' and parties may set their own targets. Reflecting the Convention text, the Strategic Plan recognises that the 10% target can be met through 'systems of protected areas' and other effective area-based conservation measures." / "We do not know what the post-2020 biodiversity targets will be, but we do know that they will be implemented within the pragmatic, flexible framework of the CBD itself, which enables countries to set their own targets in a manner that suits their circumstances. As noted above, the revised NZBS has moved away from objectives based on arbitrary percentages of the marine environment being set aside using particular tools, and focuses instead on the effective protection and management of biodiversity. The fishing industry supports this progressive move, and has recommended that New Zealand should advocate a threat-based approach in negotiations at the CBD. From what we have seen to date on the post-2020 CBD targets, it appears that this is precisely the direction that the parties to the CBD are taking. 'Ambitious' and inflexible future CBD targets for marine reserves are therefore not something that can or should be held over New Zealand like a stick, as is threatened by DOC and FNZ in the SEMPA consultation document. " (*Nf*5*)

	balance ecological needs with fishing pressures. It raises the concern that the focus on MPAs might overshadow pressing questions about current fishing practices and resource availability. The text emphasizes the necessity for critical examination and broader discussions before implementation, suggesting that MPAs should not be arbitrarily applied without evaluating their geographical relevance and intended duration based on specific ecological contexts. *Cf*7: Marine Protected Areas should be designed with flexibility, considering the dynamic nature of marine ecosystems. The document emphasizes that MPAs must have clear purposes backed by demonstrable evidence, ensuring that the geographical scope and duration of closures are effective in achieving conservation goals. Seasonal or partial closures may be appropriate to protect key life stages and periods of increased vulnerability, suggesting that a well-considered temporal aspect is crucial. *Cf*8: While the document recommends that fishermen's groups be included in the selection and management of MPAs to incorporate their knowledge, it does not specify the ideal coverage area or duration for MPAs. Clear conservation objectives are suggested, but detailed guidelines on scale are absent.	"We cannot accept that government policy for the protection of marine biodiversity should be structured to achieve an arbitrary international benchmark of 10% or more of marine biodiversity in MPAs." (*Nf*8*) ○ Time scale "In conclusion, Integrated Marine Planning is very important to maintain the future health of Canada's marine area. MPAs are only one tool of many that may be needed to achieve these planning objectives. There is growing evidence that MPAs are being oversold for their benefits and it is well known in the field of Marine Planning that one of the major mistakes in this relatively new field is to treat Marine Plans as mirror images of terrestrial plans. Unlike Terrest[r]ial Areas, Marine areas are not static, they are highly variable and more mobile than the terrestrial environment and we need to take that into account when contemplating the possibility of locking out large areas of ocean space from human use. We see the need for a much more responsive and structured Terms of Reference for including the affected commercial industries into the MPA planning process. There is too much at stake for this industry to simply be part of a very loose consultative process that at the end of the day could very well see major

	*Cf*9: The geographical scale and duration of MPAs should aim for comprehensive coverage of sensitive ecosystems to ensure effective conservation. The establishment of a large area, like the Hatton Basin Conservation Area, indicates a targeted approach to conserve sensitive habitats and is crucial for maintaining ecological integrity. Thus, MPAs should ideally cover significant marine areas while allowing for flexibility in duration depending on ecological assessments and changes in environmental conditions.. *Cf*10: MPAs should ideally encompass a range of geographical scales to effectively protect diverse marine habitats and species. This includes establishing larger multiple-use MPAs with highly protected zones for critical ecological features, as mentioned by [*Cf*10], while also considering smaller, targeted areas based on conservation needs. Regarding time scale, MPAs should be designed with the flexibility to adapt over time, allowing for periodic assessments and adjustments based on monitoring outcomes, rather than relying on permanent closures that may not achieve desired conservation goals. *Nm*1: Marine protected areas (MPAs) should target both geographical scale and time scale	negative economic consequences for our fishery." (*Cf*1) "We must also ensure there is an element of flexibility in the MPA process. The marine ecosystem is dynamic. There must be a method of evaluation and room for adjustment as changes occur. We cannot draw lines that are rigid and permanent. We must be able to re-evaluate and leave room to improve" / "In Newfoundland & Labrador we are undergoing an ecosystem shift that is bringing a resurgence of species harvesters have not relied on for decades. We must ensure these traditional, historic fisheries patterns and knowledge are taken into account so that we do not limit future opportunities." (*Cf*7) "We agree that providing for adaptability over time is important to ensuring individual MPAs and the overall network are achieving their intended purposes. Knowledge will naturally increase over time and environments, and the threats facing them, will also evolve. Responding to this effectively will likely require changes to MPAs to be made (e.g. changes in boundaries, changes to MPA rules, new MPAs etc.). Experience has also shown that a prevailing view that an MPA boundary will be fixed forever, regardless of changes in

	strategically. The submission suggests that while it is important to adapt MPAs with time to ensure they meet their conservation objectives, they should also encompass significant geographical areas that represent various marine ecosystems. The need for a science-based approach is crucial to determine both the coverage area and duration of MPAs, ensuring they can effectively protect biodiversity over time. *Nm*2: [*Nm*2] supports limiting the application of the new MPA Act initially to the Territorial Sea. They suggest observing how it works in practice. The implication is that the geographical scale should be well-defined and manageable before considering expansion to the Exclusive Economic Zone and Continental Shelf. The duration of MPAs should be flexible to allow for periodic reviews and adjustments based on new scientific information and stakeholder input. *Nf*1*: The extent of geographical coverage should be carefully considered to ensure it does not exceed what is necessary for scientific studies and biodiversity protection. As emphasized in the submission, the boundaries of a marine reserve should be drawn to promote the intended scientific outcomes without unduly interfering with existing user rights or industries, such as commercial fishing. Regarding temporal	knowledge or circumstance, makes it more difficult to garner support for their establishment in the first place. Equally current MPAs should not be precluded from review and a clear basis and process for this should be provided within the new framework. The risk of not providing this adaptability is that the resulting lack of flexibility could act counter to the wider objectives for MPAs (e.g. more valuable MPAs aren't established due to an inability to review and potentially alter existing ones) and preclude new opportunities from being explored." / "There needs to be a potential time (as well as spatial) element for species-specific sanctuaries as many marine animals are migratory. An area may only be important for a species during a certain part of the year." (*Nm*1) "Mining, if it occurs, is a temporary or short-lived use of space, with natural recovery of disturbed seafloor ecosystems an integral part of environmental management;" / "If the mining company is able to present the evidence to decision-makers on a marine consent application that mining would not unduly compromise the values being protected in an MPA, noting the activity will be a temporary one, and in consideration of the longer term future of the MPA and the values protected there, mining should proceed. New Zealand's obligations

	duration, the time scale of MPAs should allow for sufficient study and recovery of marine ecosystems but should also be flexible to adapt based on new scientific evidence or changing ecological conditions. *Nf2**: The submission suggests that MPAs should consider a fuller range of protection measures rather than focusing solely on Type 1 MPAs that prohibit all fishing. It implies a preference for more flexible approaches that can adapt over time based on sound biological criteria rather than fixed designs. This indicates a possible belief in a geographical scale that is context-specific and a time scale that is responsive to ecological needs rather than predefined durations. *Nf3**: The geographical scale and time scale for MPAs should be carefully evaluated based on ecological requirements and the specific ecological integrity being preserved. The submission highlights that the management regime for MPAs must align with sustaining or recovering biodiversity: "the tool(s) must enable the maintenance or recovery of the site's biological diversity at the habitat and ecosystem level". Thus, the extent of coverage should be sufficient to protect critical habitats and species while also considering the spatial dynamics of the ecosystems involved. Duration should also reflect	under UNCLOS will have been met." (*Nm2*) "We also consider the cumulative effects of spatial displacement, particularly from the proposals in the TMP and other initiatives may restrict the flexibility of some fishers to respond to additional displacement." (*Nf4**) "Under the Government's proposals, any person, anywhere in the world, can apply for an MPA at any time. The proposals provide no process for planning and no structured approach to decision-making. In the absence of a planned, risk-based approach, New Zealand will end up protecting the wrong places for the wrong reasons (thereby failing to adequately protect marine biodiversity) and excluding more activities than necessary in order to protect biodiversity (thereby incurring unnecessary economic costs). The Government's stated objective of an appropriate balance between protecting the marine environment and maximising commercial, recreational and cultural opportunities will not be realised." / "We therefore recommend the following prioritisation process should be set out in the Act. MFE commissions a national gap analysis every 5 years using: o the best available marine environment classification system; and

	the time required to establish recovery goals and maintain ecological processes. *Nf*4*: Marine Protected Areas (MPAs) should be designed to target both geographical scale and time scale based on ecological needs, species conservation status, and socio-economic considerations. The coverage area should be sufficient to encompass critical habitats and migratory pathways for marine species. Duration of protection should ideally be long-term to allow ecosystems to recover and maintain resilience against environmental changes, but it could also include temporary closures to assess the efficacy of management measures or respond to specific environmental events. *Nf*5: The seafood industry advocates for a planned, risk-based approach that emphasizes the need for MPAs to be established with clear objectives and priorities based on the best available information. The scale (coverage area) should be determined through a national gap analysis and risk assessment to ensure that only critical areas for biodiversity protection are designated. Duration (time scale) should be flexible, allowing for adjustments based on ongoing assessments of marine biodiversity and the effectiveness of MPAs in achieving conservation goals. Therefore, MPAs should	o risk analysis to identify habitat/ecosystem types that are not adequately represented in MPA network and are at risk from threats that are not adequately managed by existing management regimes." / "We support the continuation of review provisions already in place for existing MPAs, including in the Fiordland and Kaikoura marine management areas. We also support the ability to revoke an MPA if a review identifies that revocation of the MPA would better deliver the identified outcomes" (*Nf*5) "Implementation of the proposed MPAs therefore represents an expropriation of these property rights. When not compensated for, property rights expropriations undermine incentives for future investment, which can have significant adverse effects on New Zealand's long-term welfare and economic growth prospects." / "Our approach to estimating the lost revenue is to do so on a forward-looking basis; that is, we estimate the effect on revenue arising from the proposed MPAs looking forward into the future. In determining the timeframe over which our analysis is conducted, we need to balance the use of a relatively long timeframe over which the proposed MPAs will be in place, against: a. The uncertainty of forecasting out into the distant future; and

	target specific areas that genuinely require protection rather than having arbitrary or excessive geographical coverage. *Nf*5*: The submission suggests that MPAs should be strategically designed to avoid harming sustainable fisheries management and should be justified based on specific site criteria. It implies geographical coverage should focus on areas where any threats posed by fishing can be effectively managed without displacing effort to other regions. For time scale, the councils argue that MPAs need ongoing evaluation to ensure that their establishment does not inadvertently create negative externalities, such as increased fishing pressure in adjacent areas. *Nf*6*: Marine protected areas should be designed with a clear understanding of ecosystem connectivity and the specific ecological goals intended. The document stresses that MPAs should not only focus on comprehensive spatial coverage but also account for temporal considerations, ensuring that the protections are effective over time. However, the authors caution that any proposed areas must be based on detailed scientific evidence related to local oceanographic conditions and habitats. The overall suggestion is for tailored assessments that include geographic and temporal scales that best serve the ecological	b. When dollar amounts are incurred far into the future, they have very little value when discounted back to present-day terms." / "We note also that the DOC/FNZ consultation refers to the requirement to undertake a 25-yearly generational review of the proposed MPAs. To reflect this, and balance the above factors, we assume a timeframe for our analysis of 25 years (although we also report our results on an annual basis). In particular, we assume the proposed MPAs are put in place in the 2021-22 fishing season (commencing 1 April 2021), and we analyse how they will affect the revenue of the fishery on an annual basis through to the 2045-46 fishing season. Our analysis is also expressed in 'real' terms i.e., after accounting for the effects of inflation." / "The evidence of ORLIA is that there are a number of distinct impacts on the kōura/rock lobster fishery which have not been properly evidenced in the SEMPA process to date, or have been badly underestimated. Taken together these cumulative effects are more than significant. The extent of change for this fishery will be difficult to absorb and create significant adverse effects, including economic impacts and displacement effects." (*Nf*6*)

	objectives while minimizing adverse impacts on local communities and fisheries. *Nf*7*: Marine Protected Areas (MPAs) should target geographical scale and coverage area in a way that reflects the ecological and recreational significance of the regions. The submission argues against the idea that MPAs are the only effective means of protecting marine biodiversity, suggesting that selecting areas based solely on a presumption of maximum protection can lead to unjustified restrictions on fishing activities, potentially displacing fishing pressure and harming surrounding environments. Thus, the extent of MPAs should be guided by a balance between conservation goals and the socio-economic impacts on existing user groups. *Nf*8*: The submission emphasizes that the selection of MPAs should be justified based on scientific value and should not be based on arbitrary coverage. It suggests that any proposed areas should consider the actual impacts and the ecological significance rather than simply meeting an international benchmark (such as the arbitrary 10% MPAs coverage). The duration of protection should correlate with the need for research and restoration of ecosystems, not as a blanket or indefinite measure without scientific rationale.	

	*Nf*9*: The document indicates that the [*Nf*9*] opposes all proposals for marine reserves or MPAs in estuarine habitats, suggesting that any decisions on geographical coverage should consider existing protections and potential adverse economic impacts on the fishery. They emphasized maximizing benefits while minimizing additional closures.	
Q2: To what extents MPAs should conserve objects and regulate activities based on limited evidence?	*Um*1: [*Um*1] expresses concern regarding the justification for MPA designations based on partial confidence in the scientific evidence. They argue that making broad decisions without reliable evidence may not serve the interests of affected stakeholders, highlighting the need for more concrete data. This implies that while some conservation efforts may be warranted, they should not be established on limited evidence alone. *Um*2: While conservation objectives should be informed by the best available evidence, the proposal suggests that relying solely on limited evidence may lead to overreach in protection measures. Effective conservation might require precautionary approaches, but there needs to be a balance to avoid excessive restrictions that are not warranted by the available data. This is particularly relevant when the confidence in the data is only partial, which may undermine the	○ Conservation targets "[*Um*1] and our members note a number of concerns with the scientific evidence including whereby the confidence assessment states "partial" confidence in much of the data. To make such wide-ranging decisions based on partial confidence does not seem to be in the best interest of any of the affected parties. It appears that assumptions are being made on a precautionary all-inclusive basis rather than reliable evidence. Therefore, at this time, we respectfully disagree that the scientific evidence represents a preponderance of justification for designation." (*Um*1) "In particular, there is only partial confidence in the use of the data to "support the understanding of the extent and distribution of the habitat within the pMPA". There is a reliance on modelled data, and much of the pMPA is lacking

	rationale for broad regulatory measures and could affect socio-economic factors. *Um*3: While it's important to base conservation efforts on the best available science, there are instances where MPAs may need to act on precautionary principles, particularly in the face of limited evidence. Regulations in MPAs should aim to protect critical habitats and biodiversity even when scientific data is incomplete. Adaptive management strategies can be implemented to modify regulations as more information becomes available, ensuring that conservation objectives are met while allowing for flexible responses to new challenges. *Uf*1: MPAs should still aim to protect significant ecological features, even when evidence is limited. In the case of [*Uf*1] response, they expressed concerns regarding the "partial confidence" in scientific data relative to the proposed conservation objectives. This suggests that while MPAs should proceed with conservation efforts, clear adaptive management strategies are necessary when evidence is insufficient, to allow for adjustments based on new findings or data. *Uf*2: The document references that the scientific evidence supporting the establishment of MPAs	any real baseline due to the scale of the pMPA and significant difficulty associated with acquiring adequate data across such an area. There is therefore an over-reliance on designation based on precaution rather than reliable evidence across the region as a whole. On that basis, we do not feel that there is sufficient evidence to justify the designation over the pMPA area as a whole." (*Um*2) "As explained above, [*Uf*1] are rather surprised that JNCC have indicated that they only have partial confidence in the underpinning data and its suitability to define extent of proposed protected features. With this in mind, we remain slightly confused as to how the Conservation Objectives can be set on the basis of evidence." (*Uf*1) "Data confidence appears to be rather lacking in relation to many of the features across such a vast area of designation (107,773 km2). Given that many of the features have the Conservation Objective set at "restore", it is surprising that JNCC indicate they only have partial confidence in the underpinning data and its suitability to define extent of proposed protected features (Section 4 of Data Confidence Assessment). In our opinion, this suggests that ongoing work would be required in order to monitor the effect

	can sometimes be characterized as partial, particularly concerning the presence and distribution of certain features. While there is acceptance of this level of confidence, it is suggested that such uncertainties should not justify an upper-level management scenario without sufficient evidence. Therefore, while MPAs can be established with limited evidence, there should be a proactive approach to gather more data to inform management decisions and adapt regulations accordingly to better understand interactions between marine biodiversity and fishing activities. *Uf*3: While there is a need to set conservation objectives based on existing data, [*Uf*3] proposal suggests that regulations should be cautious when based on limited evidence. It would be prudent for MPAs to implement a precautionary approach—establishing regulations that do not overly restrict activities, especially if the activities do not have a significant negative impact on conservation objectives. Continuous research should be encouraged to fill data gaps and refine management measures. *Cm*1: [*Cm*1] suggests that standards for MPAs should be developed based on the best available peer-reviewed science accompanied by Indigenous ecological knowledge. While	and impact of management measures in the future." (*Uf*3) "We know that amongst New Zealand's deeper oceans there are wide array of special wildlife and habitats. However, there is relatively little scientific knowledge of much of it, or the threats facing the individual species and ecosystems within it, and what measures would best protect these. Given this context an initial focus on the marine protection framework for our more coastal areas appears appropriate." / "The proposed approach outlined on page 20 of the consultation document would provide certainty to the holders of existing permits but would not be sufficient to identify potential future uses or values of an area as these might not be covered by existing permits. This perspective would need to be sought through the involvement of relevant parts of government, research institutions and the industry in an appropriate process." / "To mitigate against future uses and values being disregarded, government departments and industry representatives should be given an opportunity to participate in any processes." (*Nm*1) "It should be noted that when choosing potential sites for marine protection, information related to social and economic interests should be

	recognizing the importance of robust scientific evidence, they also acknowledge the necessity of adaptive management practices that allow for regulation even when evidence may be limited. This balance aims to protect ecologically sensitive areas while facilitating sustainable development. *Cm*2: MPAs should strive to conserve biodiversity according to the best available science, even if evidence is limited. It is often essential to take a precautionary approach where regulation is based on potential risks to ecosystems and species. Continuous monitoring and adaptive management, informed by ongoing research, can help refine conservation efforts over time. *Cm*3: The submission suggests that while the oil and gas industry can operate sustainably alongside conservation efforts, it advocates for a balance. According to the presentation, it is crucial that regulations be informed by rigorous scientific data to minimize impacts on marine habitats while allowing for economic activities. Limited evidence might hinder appropriate regulatory frameworks unless it's complemented with ongoing studies and adaptive management. *Cf*1: [*Cf*1] expresses skepticism about the utility	considered to minimise adverse impacts on existing users. Such information may include current and potential use for the purposes of extraction or exploration, or the contribution to economic or intrinsic value by virtue of its protection." (*Nf*3*) "We recommend the adoption of a planned, risk-based approach to marine biodiversity protection. A national gap analysis and risk assessment will help ensure that priorities for new MPAs are based on the best available information. A risk-based approach entails clear identification of biodiversity protection objectives and an analysis of threats that need to be managed, followed by the adoption of the least-cost mechanism for managing the identified threats and achieving the objectives. The least-cost mechanism may be an MPA (a marine reserve, species-specific sanctuary or seabed reserve) or it may be another tool such as measures under the Fisheries Act." / "[*Nf*5] recommend that: a planned approach to marine biodiversity protection is adopted, including the use of a national gap analysis and risk assessment to identify priority habitat/ecosystem types for protection;" / "We recommend that the following MPA assessment criteria should be taken into account by CGs, BOIs and Ministerial decision-makers.

	of MPAs where well-managed fisheries already exist. He points out that decisions regarding the conservation objects and regulatory activities should be founded on comprehensive scientific evidence, rather than assumptions. He highlights that in cases where existing fisheries management is effective, imposing MPAs may not provide significant conservation benefits and could negatively impact the fishing community. *Cf*2: MPAs should prioritize conservation goals based on the best available science, even if the evidence is limited. Initial measures can be implemented with a precautionary approach, where activities that pose a potential threat to biodiversity should be regulated. Ongoing research and monitoring can refine management practices over time. [*Cf*2] suggests that socio-economic impacts should not be overlooked, indicating that decisions should account for both ecological and community considerations, as hasty regulations without sufficient evidence may lead to conflicts. *Cf*3: The text indicates that an adaptive management approach is essential. This means MPAs should be developed with the best available evidence but remain responsive to new data and circumstances. If a breeding population of a species is insufficient, enhancement activities	o The effect of the proposal on: existing and future uses and values of the area, o Whether the proposal meets the biodiversity protection objectives at least cost to existing and future uses and values;" (*Nf*5) "A review by Huntington et al. (2010) highlighted that the rate of published empirical studies assessing marine reserve impacts globally lags behind the publication rate of theory and reviews, and suggest there is a danger of advocacy and model assumption not necessarily supported by science-based evidence (Huntington et al. 2010). For the numerous empirical studies they assessed as reporting an impact of reserve implementation, many did not fulfil good design criteria for comparative studies, including spatial and temporal replication and the non-random placement of reserves. The challenges in studying impacts were supported in a review by Halpern (2003), who also suggested replication of space and species is required for future assessments. Furthermore, Hilborn et al (2004) warned against implementation of marine reserves where fisheries are healthy and responsibly managed, as protection does not afford the same benefit as for over-exploited fisheries. Hilborn suggests that without case-by-case evaluation and appropriate monitoring of the reserves there

	might be necessary regardless of the current evidence level. *Cf*4: It implies that while the conservation of marine environments is essential, decisions should consider socio-economic factors alongside ecological ones. It cautions against the constraints that might arise from limited evidence unless socio-economic aspects are taken into account. *Cf*5: [*Cf*5] highlights the necessity of sound science and credible enforcement for effective resource management. They question the efficacy of MPAs, citing that many species may vacate areas based on environmental conditions rather than protection status. Therefore, they suggest that MPAs should be based on solid evidence regarding their effectiveness before implementing broad conservation measures that could disrupt existing fishing activities. *Cf*6: The implementation of MPAs should ideally be based on substantial evidence regarding ecological benefits. The text indicates a skepticism towards the hurried establishment of MPAs without thorough investigations into their necessity, as noted in the content discussing concerns over overfishing and resource depletion. There is an implicit suggestion that limited evidence should not be the sole basis for	is a risk of the marine reserves falling short of expectations and disenfranchising the community." / "The Forum and consultation documents regarding Network 1 do not contain any level of scientific analysis to demonstrate a particular basis for the Network 1 marine reserve network in full, nor for specific areas proposed as part of Network 1." / "There is no comprehensive review of the scientific literature relevant to the Otago region's oceanographic conditions, land-based influences, habitat health, fisheries management assessments, ecological connectivity, sourcing dynamics or environmental health requirements to underpin the Network 1 proposal." / "It is particularly difficult for any party to make a comment where there is such a deficiency of information. There is nothing of any substance to rebut, or disagree with. There is no clear scientific basis to discuss or argue, the Forum report predominantly contains only broad statements and assumptions which in places only serve to demonstrate the misunderstandings on which they are based." / "Because of this lack of scientific information, the process is even more difficult for the [*Nf*6*] fishers to understand and participate in. If there was a clear scientific rationale for imposing such a significant limit on the 'heartbeat' of their fishery then they would look to incorporate that information with their

	conservation decisions; instead, comprehensive assessments should precede the regulation of activities within MPAs. *Cf*7: The evidence presented must be thorough and robust before imposing restrictions. If there is insufficient data to demonstrate how specific closures will protect designated species or areas, there should be a commitment to targeted research to ascertain the most effective spatial conservation measures. The document advocates for evidence-based approaches rather than applying closures universally without clear justification. *Cf*8: [*Cf*8] suggests avoiding the exclusion of fishing activities with low ecological impacts unless there is clear scientific evidence of adverse effects. This implies a cautious approach to regulation based on the available evidence, though no specific extent is defined. *Cf*9: MPAs should strive to conserve a variety of objects, including specific species and habitats, even when limited data exists. [*Cf*9] raises concerns about the effectiveness of closures when other industrial activities (like oil and gas) continue, indicating a need for stringent protections, which suggests that regulations should be comprehensive despite the current	depth of knowledge of the fishery – but here – there is nothing of any substance for them to engage with." (*Nf*6*) ○ Regulation range "The oil and gas exploration industry is certainly in opposition to the Intermediate and Upper management scenarios that appear to arbitrarily discount the industry's ability to responsibly develop offshore energy resources in a complimentary manner to sustaining Scotland's marine environment." (*Um*1) "It is also noted that oil and gas activities may be subject to additional mitigation measures, which are to be required on a case-by case basis subject to environmental impact assessment and early engagement by the Operator with both OPRED and the JNCC. Of greater concern, are the Intermediate and Upper management scenarios, under which oil and gas activities are not permitted. Under these scenarios, geophysical surveying would be directly impacted by such a designation. Much of the survey effort across the region has been conducted on a non-exclusive basis. Termed 'multiclient' surveys, the data is made available to multiple operators who may have an interest in exploring in the region over a period of time that is typically 10 to 15 years. The Intermediate and Upper management

	understanding of the ecological impact. *Cf*10: MPAs should be informed by the best available scientific evidence, but recognizing that data gaps exist, they can still be established with provisional regulations that can adapt as new information becomes available. A balance must be struck between immediate protective measures and the acknowledgment of uncertainties, allowing for management that evolves with ongoing research and monitoring efforts. *Nm*1: MPAs can be established based on limited evidence, but this carries risks. The submission highlights the importance of understanding existing ecosystems and the threats they face before implementing protections. Without sufficient scientific understanding, there is a risk of merely displacing commercial activities rather than effectively conserving marine environments. Therefore, while limited evidence may inform initial decisions, the approach should prioritize continual knowledge gathering through research and monitoring. *Nm*2: The consultation document indicates the need for a planned and integrated approach to creating and reviewing MPAs, implying that while MPAs should aim to conserve biodiversity and ecological health, they should be based on	scenarios would nullify the investments made if increased restrictions or no further operations can proceed within these areas. This clearly overrides the management advice on activities which create underwater sound, and leads on to further points regarding the Business and Regulatory Impact Assessment (BRIA) and Sustainability Appraisal in the following sections." / "The recoverability of resources is evolving due to technology development. The OGA's own Technology Strategy is aimed at implementing technology which helps to locate new finds as well as prolong the life of field developments. Enhanced geophysical techniques including life of field seismic using ocean bottom nodes and '4D' methods are enhancing recovery in mature and challenging fields. Processing techniques are also helping to locate resources with greater success rates, reducing the chance of unsuccessful drilling activities, which helps to reduce environmental impact and interactions with benthic communities. Industry undertakes extensive environmental monitoring and modelling in association with extractive activities, with the footprint of development activities being small and unlikely to negatively impact the features of importance noted within the pMPA except on a very localised basis." / "We oppose application of the Intermediate or Upper management

	solid scientific evidence. [*Nm*2] notes concerns regarding the potential for regulations to be implemented without adequate evidence of environmental impact, suggesting a need for proactive engagement and scientific assessment before regulating activities. *Nf*1*: While MPAs can be valuable for conserving biodiversity, their establishment should be based on robust scientific evidence to assess impacts accurately. As noted by [*Nf*1*], the process should include economic modeling and full assessments of potential impacts on fisheries to determine if the regulations constitute undue interference in existing rights and activities. Limited evidence should not be the sole basis for establishing MPAs; instead, a precautionary approach may be warranted when substantial uncertainties exist, ensuring that decisions are made to protect marine biodiversity while considering stakeholder rights. *Nf*2*: [*Nf*2*] expresses concern about the inadequacy of current policies, which may lead to restrictions based on perceptions rather than empirical evidence. They advocate for regulations to be based on sound biological criteria and comprehensive assessments of all activities impacting the marine environment, not just fishing. This suggests that they believe MPAs	scenarios, in the event that the West of Scotland Deep Sea Marine Reserve is designated as an MPA." (*Um*2) "It is unclear why under the intermediate and upper management scenarios outlined in the proposal, all future oil and gas activity should be excluded from the site. It is recommended that the existing approach to licensed activities on the UKCS permitted following assessment of the potential effects through EIA and with agreed management measures in support of conservation objectives is used in the Deep Sea Marine Reserve." (*Um*3) "We feel that lack of full confidence in relation to data and extent of features suggest that it would be inappropriate to apply restrictions on mid-water fishing activity (on migratory stocks), particularly when this activity has no detrimental impact on the Conservation Objective for the proposed protected features, indeed, restrictions on pelagic activity would be unlikely to provide any additional benefits to the habitats and species proposed for designation within West of Scotland Deep-Sea Reserve." / "With regard to the impact on fishing, [*Uf*1] is supportive of the intermediate scenario which would result in no bottom fishing activity." (*Uf*1)

	should not hastily restrict activities without substantial and conclusive evidence of impact. *Nf*3*: The submission emphasizes the necessity for a robust evidentiary basis when making conservation decisions: "There are no information, data or references provided which back up this statement". This suggests that MPAs should ideally be established on sufficient scientific evidence that can demonstrate clear ecological benefits. However, in cases where evidence is limited, it may be prudent to apply precautionary principles, ensuring that any regulated activities account for potential impacts on ecosystems, allowing for adaptive management as new information becomes available. *Nf*4*: While it is important for MPAs to be based on the best available scientific evidence, practical conservation needs may necessitate precautionary measures. Limited evidence should not deter action, especially in cases where ecosystems show signs of degradation or where key species are at risk. However, management strategies should be adaptable, allowing for modifications as more data becomes available to ensure regulations are effective and equitable. *Nf*5: The industry suggests that MPAs should	"We acknowledge that for a lot of the features protected the confidence in the data on presence and distribution is defined by JNCC as partial. We accept this level of confidence considering the extent of the area and the fact that current legislation (banning bottom trawl fisheries over 800m) already applies for most of the extension of it. We suggest that this lack of confidence on both presence and status plus the prevalent demersal (or benthic) nature of the features considered for protection doesn't, in any instance, justify a consideration for the upper level management scenario considered for the West of Scotland Deep Sea MR in order to conduct the SEA and SEIA. Since the designation phase, [*Uf*2] strongly opposes any consideration of the upper level management scenario, considering the intermediate one more than appropriate to fully cover the scope of the Deep Sea Reserve and noting that this is the preferred scenario for Marine Scotland as well." "In is important to highlight that the exclusion of pelagic fisheries would not bring any additional benefit to the scope of protective the features focus of the Reserve." (*Uf*2) "We feel that lack of full confidence in relation to data and extent of features suggest that it would be inappropriate to apply restrictions on mid-water fishing activity (on migratory stocks),

	avoid being established solely based on limited evidence, emphasizing the need for a robust framework that accurately identifies biodiversity protection goals and the threats that need to be managed. While some regulation may be necessary based on existing knowledge, the approach should not be purely precautionary without sufficient supporting data. Adaptive management and periodic reviews should be employed to adjust regulations as more evidence becomes available. *Nf*5*: The fishing industry councils emphasize that any conservation measures, including MPAs, should be substantiated by robust scientific evidence demonstrating direct threats from fishing practices. They advocate for justification based on individual merits rather than broad assumptions or perceived needs that lack empirical support. Proposed conservation measures should not rely on hypothetical threats but rather on documented evidence of adverse effects. *Nf*6*: The establishment of MPAs should be backed by robust scientific evidence and thorough assessments of ecological requirements. The document argues that decisions made with limited evidence can lead to ineffective management and potential disenfranchisement of local	particularly when this activity has no detrimental impact on the Conservation Objective for the proposed protected features, indeed, restrictions on pelagic activity would be unlikely to provide any additional benefits to the habitats and species proposed for designation within West of Scotland Deep-Sea Reserve." (*Uf*3) "MPAs should permit recreational, harvesting, and industrial activities, depending on the potential risks of these activities to the ecological features being protected" / "The concept of developing provisions that permit flexibility in allowing or restricting recreational, harvesting, and economic activities, separately or jointly, depending on the potential risks of these activities to the ecological features being protected is not unique to Canada and such activities must be integrated as part of the National Advisory Panel recommendations." (*Cm*1) " · 95% of benthnic Populations damaged is caused by Bottom Trawling · 98% of Commercial Fishing occurs in waters less than 800 meters · Yet, 92% of the NE Slope Fisheries Exclusion Area is 800m or deeper" (*Cm*2)

	communities, particularly when the need for conservation of specific species or habitats isn't clearly established. Thus, the extent to which MPAs conserve certain objects should correlate with solid empirical evidence demonstrating a need for protection and management of those resources. *Nf*7*: Regarding the conservation of objects and regulation of activities based on limited evidence, MPAs should be established only when there is concrete evidence of the need for protection and management measures. The submission indicates that certain proposed MPAs may not achieve their intended purposes and impose significant unnecessary costs on existing users without sufficient justification. This reflects a call for a more evidence-based approach, rather than one founded on speculative assertions about the benefits of MPAs. *Nf*8*: The submission argues against the idea that MPAs should be established with limited evidence of necessity, pointing out that ecosystems targeted for protection are not all unique or at risk. It asserts that regulation should have a clear justification based on demonstrable adverse effects to prevent unnecessary restrictions on fishing activities. [*Nf*8*] highlights the need for more robust scientific assessments before	"As outlined on May 8, 2018, [*Cm*3] is a strong advocate for the oil and gas industry and also strongly supports sustainable development, including the protection of marine habitat. [*Cm*3] firmly believes the offshore oil and gas industry is compatibable with marine conservation. This has been demonstrated over the past 20-plus years of activity that has been monitored by the Department of Fisheries and Oceans and the Canada-Newfoundland and Labrador Offshore Petroleum Board (CNLOPB) through stringent regulations and mitigation practices. There are no demonstrated signs of harmful effects to fish as a result of offshore oil and gas activities and the industry is committed to ensuring this remains so into the future." / "Oil and gas industry efforts to help protect marine habitat have included surveys of corals and other sensitive species and action has been taken to avoid such habitat, including the moving of planned anchors to avoid coral. All operators conduct Environmental Effects Monitoring and have indicated they will incorporate guidelines on cold water corals developed in Norway and the United Kingdom. Further, Suncor Energy conducted the first long-term study related to the environmental effects of offshore development and drilling. A 10-year study of the Terra Nova offshore project demonstrated that biological effects were limited. The study also provided

	designating areas for protection or imposing regulations. *Nf*9*: [*Nf*9*] critiques the Department of Conservation's (DoC) stance, arguing that their conclusions regarding the eel fishery's impacts lack understanding and unjustifiably assume knowledge about the fishing practices. They assert that decisions should be grounded in robust, peer-reviewed scientific research.	evidence of decreases in sediment contamination and recovery for benthos upon the reduction of drilling." (*Cm*3) "Did you know that most forms of shellfish farming are a net gain to the overall health of surrounding ecosystems? · Shellfish are filter feeders. They clean the water in which they live. · Shellfish are broadcast spawners. They send billions of larvae into the water column; these larvae form the base of the food chain for a variety of marine species. · Shellfish farmers do not add chemicals, foods or additives of any type to the ocean water. The infrastructure of deep water shellfish farms creates artificial reefs that have been proven to rejuvenate the immediate ecosystems. · The suspended trays become home to an abundance of species that provide food for juvenile fish. · They also provide a safe haven from predators. Recommendations – Standards for MPA activities 1. Include shellfish aquaculture as a permissible activity within the boundaries of an MPA. (Shellfish aquaculture does not threaten conservation objectives and may, in fact, enhance them.)" (*Cf*3)

		"Compared to all other animal protein sources, and by almost all measures (energy, water, space utilization, feed and use of medicines) farmed seafood is a very efficient food protein source. And the footprint of Canada's farmed seafood sector is considerably smaller than in other competing countries (e.g. Norway production is 157.8 tonnes/km of coastline, UK is 9.7 tonnes/km, Canada is 2.1 tonnes/km)." / "[*Cf*4] and its members believe that our sector can grow in a sustainable manner to more than twice our current size. With the right governance and policy framework in Canada, as well as a supportive development strategy, our industry is poised to increase output by as much as 120%, while limiting our physical footprint to an increase of only 38%. We estimate that these growth objectives can be achieved while occupying only 1.35% of the total area biophysically suitable for aquaculture in Canada – a much, much smaller footprint than in other countries." (*Cf*4) "Aboriginal Reconciliation: Another serious consideration of no take zones has to be the relationship between First Nations and Non Aboriginal license holders. Our Association supports the Reconciliation efforts of the DFO and the concept of a single inclusive fishery and have made all necessary

		accommodation to achieve that end. This effort has to date yielded considerable progress, with an aboriginal person speaking on behalf of an integrated fishery in some instances. While we can't apologize for the actions of others, the recognition of injustices and efforts to help with restitution and restoration of lost opportunity and place in the larger community has considerable value. Only time can sooth the residual emotion and permit mutual reconciliation and integration, but this process, for the benefit of all, has to continue to be supported by all those in a position to do so, While we can be optimistic about the future and recognize we have more to do, we must recognize that there is a degree of resistance to the present status, therefor any no take zone or exclusion zone or area of any kind that extends exclusive access for any purpose (especially after removal of historic occupants) which is already being anticipated would have a detrimental effect on the reconciliation process and set proponent's efforts back considerably." (*Cf*5) "For oil and gas exploration and development within MPAs, for several obvious and perceptual reasons, these activities should be removed completely from any MPA initiative." (*Cf*8)

		"Has all our extensive effort been wasted – if closed to fishing, areas should be closed to all industrial activity which causes negative impacts to conservation objective" (*Cf*9) "[*Cf*11 et al.] are currently involved in a very public campaign to stop the new construction of a 10 kilometer long, 1 meter diameter pipe that will discharge in the range of 65 to 90 million litres per day of pulp mill effluent into the Northumberland Strait. The area of discharge is currently designated as a marine refuge. We are actively seeking a Federal environmental review on this whole project and we see this as a prime example of how a land based pollution source will not be properly controlled and can have significant negative impacts to our surrounding fishery." / "We are also perplexed that we may have "no take" zones for fishing in the same area that oil and gas exploration and extraction are allowed under some of the current parameters." (*Cf*11) "Internationally it is common for the industry's activities to take place around MPAs, or if appropriate, within them." / "Seabed reserves: petroleum activities should be possible within these areas, which appears to be the intent, as the impacts of relevant activities are limited to small and discrete areas and so don't conflict with

		purpose of the protection, and any effects on the benthic environment would be considered and subject to control under relevant environmental legislation." (*Nm*1) "If the mining company is able to present the evidence to decision-makers on a marine consent application that mining would not unduly compromise the values being protected in an MPA, noting the activity will be a temporary one, and in consideration of the longer term future of the MPA and the values protected there, mining should proceed. New Zealand's obligations under UNCLOS will have been met." / "[*Nm*2] considers that prospecting and exploration should be allowed in MPAs or prospective MPAs. Mining proposals in such places would face higher scrutiny, and a higher bar to meeting environmental standards, analogous with mining proposals on land in areas where matters of national importance apply, under the RMA." (*Nm*2) "Compensation to affected parties is not discussed in the consultation document. We understand that this may be because officials consider that compensation is not payable where the Government is introducing regulation for biodiversity reasons. We understand that they see the current regulatory intervention as being

		similar to that under the Fisheries Act, whereby the Total Allowable Commercial Catch (TACC) can be adjusted to ensure the sustainability of the relevant fishery. As confidence in the fishery changes, quota shares either increase or decrease in value as a result. In usual circumstances, compensation would not be payable as a result of a change in the TACC. The difference here is that introducing a marine reserve is like a compulsory acquisition of land under the Public Works Act. It sits outside the Fisheries Act and is an expropriation of the property right in quota shares. The Marine Reserves Act is silent on the issue of compensation and as discussed above, this is likely because it was never envisaged that the Act would be used to turn such large areas into marine reserve networks." (*Nf*1*) "We also consider the cumulative effects of spatial displacement, particularly from the proposals in the TMP and other initiatives may restrict the flexibility of some fishers to respond to additional displacement." (*Nf*4*) "The ability of States to regulate 'seasons and areas of fishing' in the EEZ has been interpreted by most Coastal States as allowing the imposition of conservation and management measures which close certain areas to fishing for

		a period. However, there is nothing in Article 62 which can be seen as an authority for the permanent closure of large areas of the EEZ to fishing. Under UNCLOS, the international community has a clear right that any 'no take' permanently closed area should not impact unreasonably on the 'optimum utilisation' rule. This means that an MPA which closed off a whole stock or a significant portion of a stock that could not be fished elsewhere, and as a result was not able to be utilised to optimum levels, would be unlawful. Matters such as the size of the area, the fish populations in the area and their relationships with populations outside the area become very important determinants of lawfulness under UNCLOS." / "We further recommend that, if a regime were to be established in the EEZ, it should provide for just two categories of MPAs – i.e., seabed reserves and species-specific sanctuaries. We consider the use of no-take marine reserves to be unjustified in the EEZ for two reasons. First, the level of commercial activity in the EEZ is low (currently just fishing and petroleum activities) and the environmental risks of these activities are already managed under the Fisheries Act and the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012. A marine reserve could therefore not be justified under a risk-based approach to marine

		biodiversity protection in the EEZ. Secondly, as discussed above, no-take marine reserves may infringe New Zealand's obligations as a Coastal State under UNCLOS including the 'optimum utilisation' rule and the requirement for measures to be technically justified." / "As it is intended that marine reserves will be 'strictly protected' from all threats, we recommend that not only should there be no fishing or petroleum or minerals activity in marine reserves, activities authorised under the RMA that threaten the objective of the reserve (marine farming, discharges of contaminants etc) should also be prohibited. In the absence of such prohibitions, fishing will be the only existing activity that is able to be excluded from marine reserves (as petroleum and minerals permit holders can veto the establishment of an MPA within their permit area)." / "Any controls on fishing within a species-specific sanctuary or seabed reserve should be established under the Fisheries Act, not the MPA Act. This is appropriate because complex regulations such as those that currently apply to midwater trawling in BPAs are best established under the Fisheries Act by a lead agency with expertise in the design and implementation of fisheries regulations." / "[*Nf*5] recommend that: any controls on fishing within a species-specific sanctuary or seabed

		reserve are established under the Fisheries Act;" (*Nf*5) "Of this wide range of potential threats to New Zealand's marine habitats, the only potential threat to marine biodiversity that is typically prohibited by declaring a marine reserve is legal fishing. To the extent that illegal fishing activity occurs in an area, it is not prevented by the declaration of a marine reserve." / "No other significant threats to biodiversity are prohibited by establishing a marine reserve. In particular, the highest ranking threats, ocean acidification and climate change, cannot be controlled by establishing a marine reserve. Neither can the large number of highly ranked threats deriving from terrestrial activities. A review of land based impacts on coastal fisheries and marine biodiversity throughout New Zealand (including the SEMPA region) concluded that the most important land-based stressor in marine environments is sedimentation, including suspended sediment, deposition effects, and associated decreases in water clarity. Riverine sediments can have adverse effects on marine ecosystems by causing direct physiological and physical effects on marine organisms, as well as behavioural responses, and sublethal and lethal effects. Heavy nutrient loading from river sediment plumes reduces oxygen availability

		and adversely affects benthic communities. None of these impacts can be managed by declaring an area to be a marine reserve." / "The failure to take account of existing management measures when assessing the need for marine reserves is just one example of how the proposals impose unnecessarily high costs. An extensive network of fisheries restrictions is already in place in the south east region, including sustainable catch limits for all commercially-harvested stocks, widespread prohibitions on Danish seining, trolling and set netting along the entire coast of the region, as well as smaller but nevertheless significant restrictions on commercial shellfish harvesting, trawling and purse seining. The industry has voluntarily closed additional areas, including numerous closures to commercial pāua harvesting and trawl bans in the bryozoan beds off the Otago peninsula and an area south of Timaru. Additional existing measures are detailed in section 3.1.10." / "Although these regulated and voluntary fisheries restrictions are not classified as MPAs, they are nonetheless relevant when assessing whether particular types of marine habitat or ecosystem already have a level of protection or may be threatened by the use of particular fishing methods. However, the application does not demonstrate whether or how these existing protections have been taken

		into account." / "The MRA requires that applications for marine reserves are assessed individually with no explicit consideration of cumulative impacts. The fishing industry considers that it is not in the public interest to implement individual marine reserves which, if implemented in totality, would have cumulative impacts that are both significant and undue. The cumulative impacts that are most contrary to the public interest include: a) Cumulative spatial displacement of all fishing – i.e., of commercial, customary and recreational harvest – from individual marine reserve sites; b) Cumulative spatial displacement from six proposed marine reserves of fishing for each affected stock, resulting in: [] c) Cumulative impacts of the proposed marine reserves and Type 2 MPAs for finfish and eel fisheries; d) Cumulative economic impact for quota owners and fishers who operate in more than one of the affected areas, or who operate in more than one fishery (e.g., rock lobster and set netting); and e) Impacts arising from the six proposed marine reserves that are cumulative with impacts arising from existing closures (i.e., areas from which fishing effort has already been displaced). These areas include: []" / "The maintenance of ecological systems, natural species composition

		and trophic linkages under the Fisheries Act is achieved through management measures that apply at a broad spatial scale applicable to the relevant fish stocks. If fisheries management settings are appropriate, the ecological systems, natural species composition and trophic linkages within a proposed MPA should not be at risk from commercial fishing. It follows, therefore, that if these ecosystem attributes are considered to be threatened by the level of fisheries removals, the most effective and appropriate management response is to adjust the fisheries management settings (e.g., by reducing allowable levels of catch) rather than to establish an MPA." (*Nf*5*) "There is no evidence that fished species are over-exploited, but there is an abundance of evidence that sedimentation, sea surface temperature, acidification, and invasive species need attention in the Otago region for the habitat and associated species. As highlighted by Morris et al. (2009) these underlying environmental changes continue to have lethal, sub-lethal, indirect, and direct impacts on fished species and are in urgent need of attention. Marine reserves do not address these underlying effects and may contribute to downplaying the importance of them." / "An additional consequence of sedimentation that has indirect effects on kelp-

		associated species is the invasion of non-native species. Fragmented patches or thinning of healthy native seaweed species allows the incursion and expansion of non-native seaweeds such as *Undaria pinnatifida*, as well as other invertebrate species." / "Morris et al. (2009) suggest that the focus on fished species in New Zealand continues to ignore the environmental impacts to changes on coastal habitats and ecosystems that are known to have occurred over the last 100 or more years. Ignoring these underlying habitat and directly lethal impacts on fisheries species inevitably impacts the underlying assumption of any population model, thereby reducing the efficacy of management tools. There is no scientific evidence to suggest marine reserves mitigate water quality issues." / "There are other tools, including under the Fisheries Act 1996, climate change legislation and the Resource Management Act 1991 to manage land uses affecting water quality, which will better achieve the aims that that proponents of network 1 believe it will achieve." / "The evidence of ORLIA is that there are a number of distinct impacts on the kōura/rock lobster fishery which have not been properly evidenced in the SEMPA process to date, or have been badly underestimated. Taken together these cumulative effects are more than significant. The extent of change for this fishery will be

		difficult to absorb and create significant adverse effects, including economic impacts and displacement effects. This is presently a settled and healthy industry, supporting stable and strong workplaces for fishers, their families and the community around them. The current number of boats in the fishery is sustainable and the fish are abundant. Given the demonstrated extent of cumulative effects on the ORLIA fishers it is difficult to understand why the Ministers would see value in closing off access to essential areas of reef when there is no evidence of ill effects to demonstrate any need for this to occur." (*Nf*6*) "The claim that when developed with fishing interests in mind, MPAs can contribute to fisheries management objectives (eg they may protect spawning and nursery habitat) – is also untrue. First, the SEMPA proposals were not developed "with fishing interests in mind" (other than with the aim of prohibiting fishing). Secondly, in the case of pāua, MPAs do not protect spawning and nursery habitat. The main risk to pāua juvenile habitat is sedimentation from terrestrial activities such as land clearance or coastal construction works. Marine reserves do not control any of these risks" / "Displaced catch will also exacerbate spatial conflict between fishing sectors." / "[*Nf*7*] emphasises

		that PAU 5D has already been badly impacted by loss of fishing grounds and displaced commercial catch from mātaitai reserves. A significant portion of PAU 5D is already closed to commercial fishing (see map below), including: []" (*Nf*7*) "[*Nf*9*] has been forced to oppose these mataitai reserves because of the cumulative closure effects with these three proposed estuarine marine reserves. There are already two mataitai reserves in estuaries in SFE15 - Waikoaiti estuary and Waikawa estuary." (*Nf*9*)
Q3: Who should bear the burden of proof with respect to the environmental impact of regulated activities?	*Um*1: Though not explicitly stated, it can be inferred that there is contention regarding this responsibility. The proposals imply that robust evidence and detailed analysis should inform decisions, suggesting that regulators might need to demonstrate the necessity of restrictions rather than onus falling on industry stakeholders to prove safety. *Um*2: The proposal indicates that the burden of proof should be on those advocating for new regulations or designations. In other words, proponents of environmental protections need to demonstrate that a proposed activity would significantly harm the ecosystem before imposing stringent regulations. This is crucial for maintaining regulatory certainty for industries	"Routine drilling activities should be permitted if the proponent can demonstrate that environmental effects are low in magnitude, geographic extent, frequency and duration, and are reversible based on environmental effects monitoring results to date from offshore east coast Canada and other well-regulated offshore jurisdictions internationally." (*Cm*1) "Do not exclude fishing activities with low ecological impacts (eg trap fishing for lobster and crab, longline fishing, supervised gill net fishing), unless there is clear scientific evidence that these activities may have a negative impact on MPA conservation targets." (*Cf*8)

	while still prioritizing environmental considerations. *Um*3: The burden of proof regarding the environmental impact of regulated activities should generally lie with the proponents of those activities. This means that industries wishing to conduct activities within or near MPAs should provide comprehensive environmental impact assessments (EIAs) demonstrating that their actions will not harm the conservation objectives of the area. This aligns with the precautionary principle, where the lack of scientific certainty should not preclude efforts to protect marine ecosystems. *Uf*1: The burden of proof regarding the environmental impact of regulated activities should ideally rest with the activities' proponents. This means that those wishing to engage in fishing or other activities within MPAs should demonstrate that their practices do not harm the conservation objectives set forth. Existing frameworks often place this burden on stakeholders proposing development, ensuring that protection measures consider potential ecological impacts. *Uf*2: The document implies that the fishing industry should be involved constructively in the	"If the mining company is able to present the evidence to decision-makers on a marine consent application that mining would not unduly compromise the values being protected in an MPA, noting the activity will be a temporary one, and in consideration of the longer term future of the MPA and the values protected there, mining should proceed. New Zealand's obligations under UNCLOS will have been met." (*Nm*2) "In order to legitimately prohibit these fishing methods under the Fisheries Act, decision-makers must be satisfied that each fishing method has actual or potential effects that are sufficiently 'adverse' that it is necessary to prohibit their use in each of the proposed sites in order to ensure sustainability." / "When prohibiting a fishing method because of its potential adverse effects, decision-makers must still act in a manner that is consistent with the purpose of the Fisheries Act, including the obligation to provide for utilisation, and with the requirements in section 10 relating to the use of the best available information. In summary, and as discussed further in section 4.2, we consider that the proposed Type 2 closures cannot rationally be justified on the basis of the potential adverse effects of fishing unless the

	discussion around management measures, highlighting the importance of minimizing negative impacts while considering the socio-economic aspects of fisheries. This suggests that both regulators and the fishing industry share responsibility in providing evidence and assessing the environmental impacts of their activities within MPAs. Ultimately, a collaborative approach should be encouraged where both parties contribute to the body of evidence regarding environmental impacts. *Uf*3: The burden of proof should ideally rest on those advocating for new restrictions on activities. In the context of the proposal, since [*Uf*3] expresses concern about the need for restrictions without full confidence in data, it would suggest that regulators need to demonstrate that proposed activities have a significant adverse impact before implementing restrictions. This approach prevents undue limitations on fishing operations, particularly in the absence of compelling evidence. *Cm*1: The document implies that the responsibility for demonstrating environmental impacts should primarily fall on the proponents of regulated activities (e.g., industry operators). They are expected to conduct thorough environmental assessments and provide evidence	potential adverse effect is of high probability or high potential impact." (*Nf*5*)

	regarding the safety and sustainability of their activities. This approach emphasizes accountability by requiring project developers to establish that their actions result in minimal environmental impact before proceeding. *Cm*2: The burden of proof regarding the environmental impact of regulated activities typically lies with the entities seeking to conduct those activities. This means that companies or agencies proposing offshore exploration or exploitation should demonstrate that their actions will not significantly harm the marine environment. Regulatory bodies need to ensure they adhere to strict environmental assessments before granting permissions for such activities. *Cm*3: The document implies that there should be a shared responsibility among industry operators and regulatory bodies to demonstrate that activities within MPAs do not adversely affect marine environments. This aligns with the notion that industries have a duty to adhere to stringent environmental assessments and regulations. *Cf*1: While the document does not explicitly address this question, [*Cf*1] implies that the burden of proof should lie with those advocating for the establishment of MPAs. He stresses that the rationale for designating protected areas needs	

	to be robustly justified by scientific evidence demonstrating how such protections would benefit conservation goals. This perspective suggests that those proposing restrictions should demonstrate the need for those restrictions based on their potential impacts on marine ecosystems. *Cf*2: The burden of proof should generally lie with those proposing regulated activities, such as industrial users or developers, to demonstrate that their activities will not harm the environment. This perspective promotes the principle of precautionary management, particularly in regions where ecosystems are vulnerable. Community and stakeholder involvement in this process is crucial to ensure transparency and accountability. *Cf*3: The write-up doesn't specify who should bear the burden of proof, but it implies that advocates for activities that may impact the environment should provide evidence of sustainability and minimal impact. Adaptive management suggests a shared responsibility in proving the efficacy of actions taken within MPAs. *Cf*4: The document suggests that it may be unfair to place the burden of proof solely on sectors being regulated, such as aquaculture. Instead, it implies a collaborative approach where	

	stakeholders work together to demonstrate compliance with environmental standards and impacts. *Cf*5: [*Cf*5] indicates that it is essential for the Department of Fisheries and Oceans (DFO) to prove how MPAs can protect local fishing interests effectively. They advocate for transparency and clarity in demonstrating the benefits of MPAs to local communities, suggesting that the burden of proof for environmental impact should lie with the authorities proposing the MPAs, to ensure that local fisheries are not adversely affected. *Cf*6: The burden of proof for the environmental impacts of regulated activities typically falls on those proposing the regulations. The text suggests that regulations should be well-founded, raising questions about the necessity of MPAs given the current state of fisheries. Therefore, it implies that regulators need robust evidence to prove that regulations, like MPAs, are needed, particularly in a landscape where fishing practices have adapted to changing ecological conditions. *Cf*7: The responsibility for proving the impact of regulated activities should lie with those advocating for the measures, particularly the Department of Fisheries and Oceans (DFO). If a	

	conservation closure is proposed to protect a species, then DFO must provide information indicating how such measures will achieve that protection, committing to further research if necessary. This underscores the importance of accountability from regulatory bodies. *Cf*8: [*Cf*8] highlights the importance of scientific evidence in decision-making but does not explicitly state who should bear the burden of proof regarding the environmental impact of regulated activities. *Cf*9: The burden of proof regarding the environmental impact of regulated activities may rest on both the industries involved and the regulatory bodies. [*Cf*9] emphasizes their concern about industrial activities potentially undermining conservation goals, highlighting the need for assessments from industries to prove their operations will not adversely affect conservation objectives . *Cf*10: The burden of proof should ideally lie with those advocating for regulatory changes or restrictions, which in this case would likely be the proponents of MPAs. They should demonstrate how specific activities negatively impact marine ecosystems. Conversely, those engaged in regulated activities, like fisheries, should also	

	contribute evidence showing sustainable practices and the effectiveness of existing management systems to inform decision-making. *Nm*1: The burden of proof regarding the environmental impact of regulated activities should ideally be shared among stakeholders, including the government, industry representatives, and researchers. [*Nm*1] notes that the existing regulatory framework already places significant scrutiny on petroleum activities, suggesting that permit holders should demonstrate the environmental effects of their operations. However, regulatory bodies must also provide clarity and guidance on expectations for assessment and management to ensure comprehensive evaluation. *Nm*2: [*Nm*2] implies that the burden of proof should potentially lie with the regulators and those proposing restrictions. They assert that existing minerals interests should be recognized and that significant changes to regulations should be backed by robust scientific evidence to identify their impact. Therefore, the onus should be on demonstrating the necessity of restrictions rather than on existing operators to prove no significant harm. *Nf*1*: The burden of proof should ideally lie with	

	those proposing the establishment of MPAs or the addition of regulations that significantly affect stakeholders. This means that those advocating for new marine reserves should provide substantial evidence demonstrating both the necessity and expected benefits of these measures relative to their impacts on existing fisheries and industries. This includes clear scientific evidence showing how proposed regulations contribute to biodiversity protection without creating undue economic harm. *Nf*2*: The submission does not directly state who should bear the burden of proof regarding environmental impacts; however, it implies that the current measures might not adequately consider diverse interests and the shared responsibility among stakeholders. It hints that perhaps the burden of proof should be on those proposing restrictions (e.g., the government or conservationists) to demonstrate significant negative impacts, rather than on fishers or other stakeholders to prove the absence of harm. *Nf*3*: The submission indicates that stakeholders involved in activities potentially impacting the environment should bear the burden of proof. [*Nf*3*] argues that "the advice the Ministers are relying upon is false," indicating a need for responsible parties to defend their practices with	

	sound scientific backing. Essentially, it falls upon the developers and regulators to demonstrate that their activities do not harm the marine ecosystems. *Nf*4*: The burden of proof regarding the environmental impacts of regulated activities typically rests with those proposing the activities. This follows the precautionary principle, particularly in vulnerable ecosystems where potential damage could be significant. It is essential to demonstrate that proposed activities will not significantly harm environmental values before they are permitted. *Nf*5: The submission implies that the burden of proof regarding the environmental impact of regulated activities should not fall solely on the fishing community or those operating in the affected areas. Instead, it should be a shared responsibility, where regulatory bodies and environmental advocates provide clear evidence of potential impacts before enforcing restrictions. This balance is crucial to ensuring that existing rights and livelihoods are taken into account when establishing MPAs. *Nf*5*: The submission suggests that the burden of proof should be on those advocating for the establishment of MPAs to demonstrate that	

	regulated activities have adverse environmental impacts. The councils argue that if there is no evidence of such impacts, then the justification for MPAs diminishes significantly. It seeks a case-by-case evaluation to ensure no undue restrictions are imposed without sufficient justification. *Nf*6*: The document suggests that regulatory bodies establishing MPAs should carry the burden of proof regarding the environmental impacts of regulated activities. It implies that those proposing restrictions or changes in use, such as the imposition of MPAs, need to demonstrate a clear justification and evidence-based rationale for such actions. This includes providing data on environmental conditions and potential benefits of the proposed management measures versus the socio-economic costs incurred by local stakeholders. *Nf*7*: The burden of proof concerning the environmental impact of regulated activities should lie with those advocating for restrictions. According to the submission, if the Minister seeks to close areas to certain fishing methods without clear evidence of their adverse effects on the marine environment, this would set a dangerous precedent for all fisheries users. Therefore, it is essential that robust evidence is required to justify	

	any claims on the negative impacts of regulated activities. *Nf*8*: According to the submission, the burden of proof should rest with those proposing the marine protected areas to demonstrate that the regulated activities (like fishing) do indeed have an adverse impact on the marine environment. The submission posits that current claims regarding the negative effects of trawling and set netting on ecosystems lack adequate justification and understanding. *Nf*9*: The document implies that the burden of proof regarding the sustainability and environmental impact of fishing activities should not solely rest on the fishermen or industry stakeholders. It suggests that DoC should provide more substantial evidence to support claims about the potential impacts on the eel fishery.	
Q4: Who and how monitoring and research on ecosystems should be done in MPAs?	*Um*1: The document does not specify who should conduct monitoring and research in MPAs. However, [*Um*1] shows interest in continuing dialogue with Scottish Authorities to achieve meaningful conservation objectives while involving subject matter experts. This suggests that collaborative efforts involving industry experts, government agencies, and scientific researchers might be essential for effective monitoring and ecosystem research.	"The stated conservation objectives are to ensure the maintenance of favourable condition of the proposed features, as well as improve the condition of those noted as being not in favourable condition. Based on the evidence, it is felt that the baseline is insufficient across the region as a whole in order to adequately assess the current condition of the features that the pMPA is designed to protect. Further, the needs in terms of monitoring in order to understand any

	*Um*2: Monitoring and research should ideally be conducted collaboratively between government bodies, scientific institutions, and industry stakeholders. An adaptive management framework may be beneficial, allowing for ongoing assessments of ecological health and the effectiveness of conservation measures. It's important that data collection is rigorous, transparent, and extensive enough to provide a true baseline for understanding ecological changes. This would include regular monitoring of key indicators of ecosystem health and the impacts of human activities, with flexibility to adjust strategies as new information emerges. *Um*3: Monitoring and research in MPAs should be a collaborative effort involving government agencies, NGOs, academic institutions, and local communities. A comprehensive monitoring program should be established to regularly assess the health of marine ecosystems, which can include biodiversity surveys, habitat assessments, and studies of human impacts. Data collection techniques may involve remote sensing, underwater surveys, and citizen science initiatives. Research should be aimed at understanding ecosystem responses to management interventions and informing	changes to benthic communities are significant." (*Um*2) "Data confidence appears to be rather lacking in relation to many of the features across such a vast area of designation (107,773 km^2). Given that many of the features have the Conservation Objective set at "restore", it is surprising that JNCC indicate they only have partial confidence in the underpinning data and its suitability to define extent of proposed protected features (Section 4 of Data Confidence Assessment). In our opinion, this suggests that ongoing work would be required in order to monitor the effect and impact of management measures in the future." (*Uf*1) "MPA Standards should include: - baseline data on the ecological, social, economic and governance dimensions, - ongoing monitoring of the ecological, social, economic and governance dimensions, and - regular review and adaptive management with all interests." (*Cf*2) "However, it remains incumbent on Canada to be able to monitor and assess the effectiveness of these MPAs. In order to properly monitor the success of MPAs on fish populations and the MPAs themselves, extractive research activities,

	adaptive management strategies to achieve conservation goals. *Uf*1: Monitoring and research in MPAs should be conducted collaboratively among scientists, regulatory agencies, and stakeholder groups such as local fishermen or conservation organizations. This collective approach ensures diverse inputs and greater data accuracy. Marine Scotland, as mentioned in the document, may play a vital role by leading these initiatives while incorporating findings from skippers and local operators to understand various ecosystem interactions and compliance with conservation measures. *Uf*2: The document mentions that monitoring efforts should focus on improving our understanding of deep-sea species and their life history characteristics, indicating that scientific organizations like JNCC (Joint Nature Conservation Committee) are likely to lead these efforts, perhaps in collaboration with marine researchers and fishing industry representatives. Research methodologies should encompass both scientific measurements and stakeholder input to ensure comprehensive ecosystem assessments. It is important that monitoring frameworks remain adaptive to new research findings and ecological data over time, allowing for adjustments to management practices as necessary.	such as the trawl survey where much of the information that this process has been collected from and long-line halibut surveys must be permitted, otherwise how can we tell if we are doing the 'right' approach?" (*Cf*10) "Under MPA research, monitoring and review we have the following concerns. - What if an MPA is not effective? - What are the measurement tools that will be used to assess MPA effectiveness? - What is the contingency plan if measures are not effective? - Can the MPA designation be removed or changed? - Who will be doing the area monitoring? - Where will the funding for proper scientific research coming from? We can appreciate that the concept of wide spread MPAs is relatively new to Canada and that decisions on these questions cannot be made in a vacuum or solely by one country. However these are important questions to the fishing industry that require detailed answers, the development of practical guidelines and solutions." (*Cf*11) "Activity and investment by the petroleum or mineral sectors will lead to greater understanding in specific areas through the

	*Uf*3: Monitoring and research in MPAs should involve collaboration between government agencies (like Marine Scotland), academic institutions, and stakeholder groups (including fishing organizations like [*Uf*3]). It is essential to employ a multi-disciplinary approach that incorporates both scientific research and local knowledge from stakeholders. Establishing a structured monitoring system can help track changes in ecosystems and assess the effectiveness of management measures. Engaging fishermen in data collection can also provide valuable insights while fostering a cooperative relationship between regulatory bodies and the fishing industry. *Cm*1: [*Cm*1] advocates for monitoring and research to be a collaborative effort that involves federal and provincial governments, Indigenous groups, and industry stakeholders. They emphasize the importance of ongoing environmental effects monitoring (EEM) to assess impacts during and after regulated activities. This can include the use of independent studies commissioned by government agencies to evaluate ecosystem health and changes, ensuring that all stakeholders are engaged and informed throughout the monitoring process.	regulatory requirements to undertake environmental impact assessments, the gathering of scientific information to inform these, and then to subsequently monitor any activities that are approved to be undertaken. However, given this research (and for similar reasons fishing related research) is inherently targeted on areas of commercial interest, broadly scoped research will also be required to build a more comprehensive understanding of New Zealand's marine environment." / "We therefore support the comments in the consultation document regarding the importance of improving our knowledge of our marine environment but are concerned there is no analysis of the current state of play in this area or new proposals outlining how this might be achieved. There appears to be wide agreement that there should be a science-based process for establishing and managing MPAs over time, individually and as a network, but this must be supported by both the appropriate regulatory frameworks and sufficient scientific understanding. The latter will require ongoing and potentially increased investment in research." (*Nm*1) "However, we recommend that all MPAs in the network, including MPAs that transition from the current Marine Reserves Act, should be

	*Cm*2: Monitoring and research should be a collaborative effort involving governments, local communities, NGOs, and scientific institutions. Regular assessments, data collection, and research studies should be conducted to evaluate the health of ecosystems within MPAs. Utilizing technological tools like remote sensing, underwater surveys, and community-based monitoring programs can enhance the understanding of ecosystem dynamics and inform management strategies. *Cm*3: It suggests that collaboration between industries, governmental bodies, and conservation organizations is essential for effective monitoring and research. This implies that Fisheries Liaison Officers and similar roles should facilitate information sharing and collaboration, ensuring the continuation of research on ecosystem impacts, ecological monitoring practices, and adherence to environmental monitoring standards. *Cf*1: [*Cf*1] advocates for the inclusion of affected commercial industries, including fishermen, in the monitoring and research processes. He suggests that a collaborative and structured approach is necessary, ensuring that local knowledge and expertise are integrated into the research framework. By doing so, monitoring	reviewed periodically in order to ensure that the MPA continues to meet its identified protection objective and continues to contribute effectively to the MPA network. This is even more important for existing marine reserves as historically they have been established in an ad hoc manner for the purposes of scientific study rather than for marine biodiversity protection. Such reserves may no longer be fit for purpose and there could now be better options for achieving the desired outcomes." / "The periodic review of all MPAs should be mandatory, not discretionary as proposed in the consultation document. The Act should provide that either a review period is identified at the time an MPA is established or, in the absence of a specified review period, a default review period applies. We consider that the use of a CG or BOI review model may be unnecessarily costly and time consuming for many MPA reviews, and that a more streamlined review option should be included (e.g., an appointed reviewer, with opportunity for public input via submissions)." (*Nf*5)

	efforts can be more effective and reflect the realities of the ecosystems being managed, promoting better outcomes for both conservation objectives and community livelihoods. *Cf*2: Monitoring and research in MPAs should ideally involve collaboration between government bodies, local communities, non-governmental organizations, and academic institutions. This collaborative approach ensures diverse expertise and stakeholder buy-in, crucial for effective management. Ongoing ecological, social, and economic assessments should be conducted to adapt management strategies as needed. [*Cf*2] underscores the importance of engaging local fishers and stakeholders in these efforts, as their knowledge can inform better monitoring practices. *Cf*3: The recommendations do not outline specific entities for monitoring and research, but effective monitoring is likely a collaborative effort involving scientists, local communities, and management bodies. A systematic approach to monitoring can help assess the health of ecosystems and the impacts of regulatory measures, implying that monitoring should be continuous and adaptable.	

	*Cf*4: The document does not detail specific processes for monitoring and research in MPAs; however, it emphasizes the importance of stakeholder engagement throughout planning and implementation phases, suggesting that researchers and local communities might play a vital role in ongoing monitoring efforts. *Cf*5: [*Cf*5] suggests that monitoring and research should involve local fishers who have historically managed and stewarded the area. They express a willingness to participate in a transparent advisory process that includes the perspectives of local harvesters. This approach indicates that monitoring should be community-involved and based on continuous engagement with local fisher knowledge. *Cf*6: Monitoring and research within MPAs should involve a collaborative approach among government agencies, academia, and fishing communities. The text indicates the need for a Canadian Marine Research Network that promotes cooperative research and monitoring strategies. This integrated approach would enhance understanding of ecosystem dynamics and the effects of MPAs, fostering more informed and effective management strategies.	

	*Cf*7: Monitoring and research should involve collaboration between fish harvesters, academics, community groups, and scientists. The traditional and local ecological knowledge of fish harvesters is invaluable and should be integrated into the research efforts. Engaging fish harvesters in the process ensures that their experiences and insights inform the management strategies deployed within MPAs. *Cf*8: The document does suggest that fishermen's associations could play a role in the management and evaluation of MPA conservation objectives, indicating that local fishermen may be involved in monitoring efforts. However, it does not elaborate on the specific methodologies or frameworks for conducting monitoring and research on ecosystems within MPAs. *Cf*9: Monitoring and research in MPAs should be a collaborative effort involving local governments, industries, and non-governmental organizations (ENGOs). The document suggests that joint efforts and comprehensive stakeholder involvement, as seen in the formation of marine conservation working groups, are essential for successful monitoring and understanding of ecosystems. Moreover, engaging local communities could enhance data collection and monitoring practices.	

	*Cf*10: Monitoring and research should involve collaboration between governmental agencies, scientific institutions, and local stakeholders, including fishers who often have valuable experiential knowledge. This cooperation can help design robust monitoring programs that assess both the effectiveness of MPAs and the health of ecosystems. Employing various research methods, such as trawl surveys mentioned by [*Cf*10], should be permitted in certain MPAs, especially those with less stringent protections, to ensure comprehensive data collection and understanding of the ecosystem's status. *Nm*1: Monitoring and research on ecosystems within MPAs should be conducted collaboratively by relevant government agencies, academia, and industry stakeholders. The submission emphasizes the necessity for dedicated funding and clear linkages for research to support the management of MPAs. Ongoing engagement with stakeholders is critical for developing effective monitoring strategies and sharing responsibilities among those who utilize marine resources. *Nm*2: The submission highlights that monitoring and research should be collaborative, involving various stakeholders, including scientists, industry representatives, and government	

	agencies. [*Nm*2] suggests that research should be scientifically robust and led by those with expertise — typically marine scientists and environmental researchers — while also emphasizing the important role of minerals companies in conducting research as part of their operations. Information gathered should inform adaptive management strategies for MPAs. *Nf*1*: Monitoring and research within MPAs should be conducted collaboratively by government agencies, academic institutions, and industry stakeholders. Such collaboration can ensure that diverse perspectives and expertise are included in ecosystem assessments. [*Nf*1*] suggests that measures taken should be proactive and should involve ongoing scientific research to monitor the ecological outcomes effectively. Additionally, integrating stakeholder knowledge and experience within the industry could enhance understanding and reporting on ecological dynamics within these protected areas. *Nf*2*: The submission indicates a preference for community involvement and local knowledge. It highlights the Marine Guardians' approach, which successfully integrated community interests in decision-making. Therefore, it can be inferred that monitoring and research on ecosystems within MPAs should involve collaboration among the	

	community, fishers, Iwi (Māori), and governmental agencies, incorporating local knowledge and stakeholder engagement. *Nf*3*: Monitoring and research in MPAs should ideally be entrusted to bodies comprising both governmental and independent scientific entities, with stakeholder participation. The submission implies a call for transparency and independent validation of findings, suggesting that involvement from those who hold property rights in marine resources can provide valuable input and monitoring initiatives. There should be a systematic approach to collect data on ecological progress and the effectiveness of management strategies, allowing for necessary adjustments over time. Collaboration between government agencies, researchers, and local communities is vital to ensure comprehensive monitoring efforts. *Nf*4*: Monitoring and research within MPAs should be conducted by a combination of governmental agencies, research institutions, and local stakeholders. Methods may include regular assessments of biodiversity, habitat health, and fish populations using both field surveys and technology (e.g., remote sensing, underwater drones). Community involvement in monitoring can enhance local stewardship and compliance, while partnerships with universities can facilitate	

	rigorous scientific inquiry to inform management decisions. *Nf*5: Monitoring and research in MPAs should be conducted by a collaborative effort involving government agencies, environmental organizations, and the fishing industry. The seafood industry recommends establishing clear protocols and partnerships to ensure ongoing ecosystem assessments, compliance monitoring, and adaptive management strategies. This collaborative approach helps ensure that all stakeholders are engaged in the research process, fostering transparency and shared responsibility in the management of MPAs. *Nf*5*: The submission does not provide specific recommendations on monitoring and research but implies that responsible entities, likely government bodies (Department of Conservation and Fisheries New Zealand), should undertake these efforts. Research should focus on understanding the ecological and socio-economic outcomes of MPAs and should be transparent, involving stakeholders to ensure comprehensive assessments of both ecological health and impacts on local communities. It advocates for broad spatial management principles rather than isolated MPA management due to the interconnectedness of marine ecosystems.	

	*Nf*6*: Ecosystem monitoring and research within MPAs should ideally involve collaboration between government agencies, scientific organizations, and local stakeholders, including fishermen and community members. The document advocates for a participatory approach where local knowledge integrates with scientific research to develop effective monitoring strategies. Regular assessments should include ecological health indicators and socio-economic impacts to inform adaptive management practices. Transparency in monitoring processes is key to gaining community trust and ensuring that management objectives are met. *Nf*7*: Monitoring and research on ecosystems within MPAs should be conducted collaboratively by governmental agencies, scientific institutions, and input from local communities and user groups. The submission emphasizes the need for a balanced approach that respects the rights and interests of all parties involved. This may involve co-management frameworks that integrate scientific research with the traditional ecological knowledge of local users, ensuring that monitoring efforts are comprehensive and reflect the socio-economic dynamics of the region.	

	*Nf*8*: The submission does not provide specific details on the mechanisms for monitoring and research within MPAs; however, it advocates for a framework that integrates scientific assessments and is based on objective criteria. It suggests that monitoring should be done by relevant authorities alongside industry stakeholders, ensuring that research is targeted towards understanding the ecosystem's state in the context of any restrictions placed upon it. A robust collaborative approach is essential for effective monitoring and implementation of MPA regulations. *Nf*9*: [*Nf*9*] asserts that sustainability assessments should be conducted by Fisheries New Zealand, which convenes an open forum (the "Eel Science Working Group") for stakeholders to discuss sustainability issues. This indicates that monitoring should involve industry participation alongside scientific research bodies, ensuring a collaborative and informed approach to ecosystem monitoring.	

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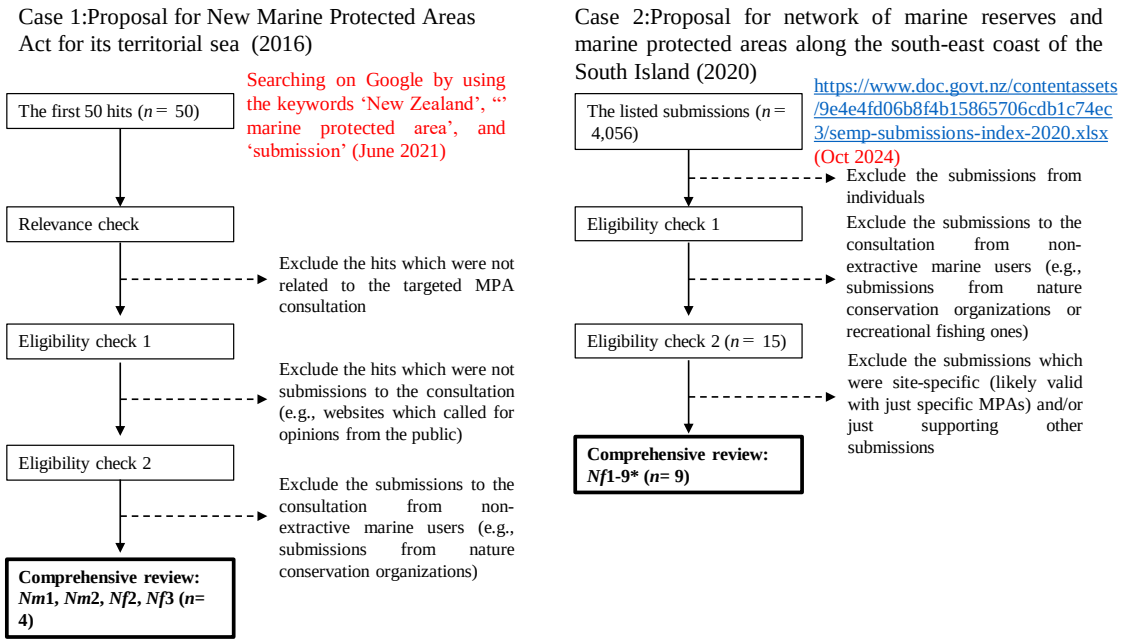
Supplementary Figure 1. Data collection process about the two consultation cases of marine protected areas in New Zealand.



In New Zealand, the Ministry for the Environment, Department of Conservation, and the Ministry for Primary Industries collected approximately 5,400 public submissions between January and March 2016 during the process of reforming the MPA system for New Zealand's territorial waters (Bamford, 2018). However, the government of New Zealand did not disclose the submissions on their website, although such submissions were uploaded by some submitters on their websites. I therefore collected them through keyword searches ('New Zealand', 'marine protected area', and 'submission') on the Internet (Suppl. Fig. 1). Specifically, I found and examined four submissions from the mining and fishery sectors, including the submission which represents many mining companies of NZ, the joint submission made on behalf of private sector companies of petroleum exploration and mining across New Zealand, and the joint submission of three fisheries organizations (*Nm*1-2 and *Nf*5). To supplement the limited data on New Zealand, public comments gathered in the consultation on the aforementioned establishment of the southeastern South Island marine protected areas in 2020, which disclosed information on submitter names and submitted texts, were also examined here. The Department of Conservation of New Zealand as well as Fisheries New Zealand conducted this consultation between February and August in 2020, and 4,056 submissions were made public (Department of Conservation and the Ministry of Fisheries of New Zealand, 2020). Again, only submissions from organizations representing (commercial) fishery interests were examined in this study (n = 9), and hereafter they were shown by comment number with asterisk (i.e., *Nf*1*-9*). In other words, I did not examine the submissions from recreational fishing or those from commercial fishing, which focused on site-specific issues (likely valid with just specific MPAs) and/or just supporting other submissions. There were no submissions from mining organizations in this consultation. Although there were four years between the two consultation cases, no other consultations about MPAs were identified during this period according to the consultation list by Department of Conservation of New Zealand (Department of Conservation of New Zealand, 2024).

Additional references

Department of Conservation and the Ministry of Fisheries of New Zealand. (2020). Consultation on south-eastern South Island marine protected areas. https://www.doc.govt.nz/get-involved/have-your-say/all-consultations/2020-consultations/consultation-on-south-eastern-south-island-marine-protected-areas/ [Accessed October 27, 2024].

Department of Conservation of New Zealand. (2024). All consultations. https://www.doc.govt.nz/get-involved/have-your-say/all-consultations/ [Accessed October 27, 2024].