Ministry for Primary Industries
Manatū Ahu Matua

Use of underwater breathing apparatus (UBA) in selected shellfish fisheries

MPI Discussion Paper No: 2013/08

ISBN No: 978-0-478-40560-6 (online)
ISSN No: 2253-3907 (online)

March 2013

New Zealand Government

Growing and Protecting New Zealand

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Contents

Page

1 Introduction

This discussion paper provides the Ministry for Primary Industries' (MPI's) initial views on proposals to amend the regulations governing the commercial use of underwater breathing apparatus (UBA). The views and recommendations outlined in the paper are preliminary and are provided for the purpose of consultation with tangata whenua, shellfish fisheries industry and other stakeholders.

The purpose of the review is to consider the commercial use of UBA to;

a) enable development of some underutilised shellfish fisheries. This includes the fisheries for sea cucumber, horse mussel and kina stocks; and
b) increase diver safety in the paua fishery off the Chatham Islands (i.e. Quota Management Area PAU 4).

The review was recommended by commercial stakeholders, and has been considered as part of MPI's annual planning process for shellfish fisheries. The proposals are specified as management actions in MPI's Annual Operational Plan for Inshore Shellfish Fisheries 2012/13. They are aimed at increasing the benefit obtained from the use of these shellfish fisheries while upholding stocks sustainability and ensuring diver safety.

Shellfish fisheries are managed under the Quota Management System (QMS) within the Fisheries Act 1996 (the Act). Management of shellfish fisheries is guided by the draft National Plan for Inshore Shellfish (the Plan), an MPI policy document which came into operation from July 2011. The Plan sets out management objectives for Inshore Shellfish fisheries. The goal of the Plan, as set out in the Fisheries 2030 strategy, is to maximise the benefits (economic, social and cultural) obtained from the use of fisheries within environmental limits. The proposed regulatory changes are considered within this context.

1.1 CONSULTATION

Tangata whenua, the industry and other stakeholders are encouraged to provide additional information of relevance to, and their views on, these proposals. Some initial discussions have been held with iwi and information had been gathered through recreational forums and commercial meetings. Further discussions will be had at the relevant forum meetings scheduled in March and April 2013. Submitters' points will be included in final advice to the Minister for Primary Industries on these issues.[1]

Written submissions can be sent in until Friday 19 April 2013 and should be directed to:

Inshore Fisheries Management
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PO Box 2526
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[1] All submissions are subject to the Official Information Act 1982 (OIA) and can be released, if requested under the OIA. If you have specific reasons for wanting to have your submissions withheld, please set out your reasons in the submission. MPI will consider those reasons when making any assessment for the release of submissions if requested under the OIA.

2 Proposals

The current restrictions on the use of underwater breathing apparatus are set out by regulation 76 of the of the Fisheries (Commercial Fishing) Regulations 2001. The proposals being considered in this document would involve the amendment to these regulations. The proposals are:

Option 1 ***(status quo)***	Maintain the current regulation, 76 of the Fisheries (Commercial Fishing) Regulations 2001, restricting the use of underwater breathing apparatus for the commercial harvest of shellfish species.
Option 2	Enable the use of underwater breathing apparatus in some or all of the following developing shellfish fisheries; a) kina (SUR) b) sea cucumber (SCC) c) horse mussel (HOR)
and/or Option 3	Enable the use of UBA in the PAU4 fishery to address safety concerns related to diver-shark interactions.

Section 5 outlines and considers the various regulatory/compliance tools that could be implemented in the event that Option 2 and/or 3 are supported (i.e. in the event that increased use of UBA is enabled). These tools range no additional regulatory controls, to requiring increased reporting and other compliance measures.

2.1 STATUS QUO

Under regulation 76 of the Fisheries (Commercial Fishing) Regulations 2001, commercial fishers are not permitted to possess or use UBA when harvesting fish or aquatic life. The only exception to this has been the deepwater clam (geoduck) fishery covered under regulation 76A of the Fisheries (Commercial Fishing) Regulations 2001.

The restriction on the use of UBA was originally established to reduce the risk of localised or serial depletion of shellfish stocks by commercial fishing. UBA restrictions limit the depth of shellfish collection and helps ensure populations cannot be completely fished out, e.g. kina remain unfished in areas below where free-divers can safely harvest. The restrictions on use of UBA do not apply to non-commercial shellfish fishers, with the exception of paua.

2.2 PROBLEM DEFINITION

MPI is committed to actively seeking opportunities to improve benefits and sustainable use opportunities as noted in the National Fisheries Plan for Inshore Shellfish and Fisheries 2030 strategy. MPI considers a review of the use of UBA is appropriate as this restriction pre-dates implementation of the QMS and the setting of total allowable catches (TACs) in these fisheries.

The specific issues that have prompted a review of the use of UBA in these fisheries include:

- Consistently low harvest levels in relation to the total allowable commercial catch (TACC).
- Difficulties in proving up the utilisation and economic potential of these fisheries, due to current fishing methods.

- Reduced harvesting efficiency based on species distribution and free-diving limitations (i.e. the species are at low densities or are located below safe free-diving depths).
- The vulnerability of these species to alternative fishing methods (e.g. dredging), which can cause damage to the product and/or increase by-catch and wastage.
- Diver safety and efficiency in areas where great white shark encounters occur and appear to be increasing.

MPI has received a number of requests from industry regarding the ability to use UBA in some shellfish fisheries as part of MPI's annual planning process for shellfish fisheries. The fisheries put forward by industry representatives for consideration include kina (SUR), sea cucumber (SCC), and horse mussel (HOR) (maps of fisheries quota management areas, QMAs, can be found in Appendix 1). The Paua Industry Council has also requested a review of the use of UBA in the Chatham Islands paua fishery (PAU 4)[2].

2.2.1 Developing shellfish fisheries

Low harvest levels

In the 2011-12 fishing year, only 2% of the TACC for horse mussel (HOR) was harvested, 90% of which was bycatch (non-target) in other trawl and dredge fisheries. Of the annual TACC of kina (SUR), only 74% was harvested, while only 57% of the TACC for sea cucumber (SCC) was harvested. The TACCs for these fishery stocks were set at nominal or low levels reflecting the limited information available when they entered the QMS. Allowing use of UBA would provide quota holders increased opportunity to 'prove-up' the TACCs and increase the value of these fisheries. Stocks such as SCC have a high unit value (in excess of $30 per kg) and could become valuable new fisheries for the New Zealand fisheries sector.

Harvest inefficiencies

The commercial harvest of all shellfish (except geoduck) must be by hand, free-diving, potting or by trawling methods such as dredging. These methods of collection limit the amount and efficiency of harvest when targeting species found in the sub-tidal environment. They were designed to help ensure sustainability, prior to the QMS and to reduce risks of localised depletion.

These methods may, however, be too restrictive for some developing fisheries given they are managed by TACCs within the QMS, preventing the economical harvest of valuable fisheries resources.

For example, free diving usually limits harvest depth to around 10 m, when some subtidal species can be found at depths in excess of 50 m. In the case of some fisheries, for example SCC, they are sometimes found at low densities and free-diving is an inefficient means of harvest.

Product quality and environmental issues

While dredging/trawling could allow access to deeper stocks of shellfish not accessible by free-diving, in practise these methods cause significant damage to SUR, HOR and SCC.
Safety in the Chatham Islands paua fishery (PAU 4)
Paua divers within the PAU4 fishery are concerned about the increased likelihood of great white shark attacks whilst free diving. Concentrations of sub-adult and mature great white

[2] The Paua Industry Council has requested no other commercial paua fisheries be considered for allowing the use of UBA. The paua fisheries are well utilised and their main concern is diver safety and providing a means for improving harvesting efficiency without undue risk to the fishers due to increasing anecdotal reports of great white shark presence.

sharks occur around the Chatham Islands and attacks on paua divers have occurred in historic and recent times. Divers are reporting that sharks are congregating closer inshore and are being more frequently encountered.

The Paua Industry Council considers that the use of UBA provides the best means of enabling paua divers to avoid or protect themselves from great white sharks.

The use of UBA, as a means of improving diver safety in PAU 4, has recently been trialled under a special permit. The results of those trials have been promising. Divers consider their safety and well-being was improved. Divers have also reported improved utilisation benefits such as:

- Increased catch-per-unit effort and overall efficiency.
- Less undersized fish taken to the surface.
- Reduction in damaged paua from harvesting.
- More selective harvesting to avoid localised overfishing.

Given the high crossover in terms of fishers participating in both the SUR 4 and PAU 4 fisheries on the Chatham Islands, the use of UBA in the SUR fishery should also be considered as similar risks are present.

2.2.2 Summary

Overall, MPI considers a review of the current restriction preventing the use of UBA in these fisheries appropriate. There is potential for the SUR, HOR and SCC fisheries to become economically valuable fisheries. Allowing the use of UBA may enable fishers to prove up these fisheries and develop market opportunities. The safety of fishers diving in the PAU 4 fishery is of concern as is the continued performance of the fishery. Trials of the use of UBA in the PAU 4 have shown positive outcomes for the fishery. A review of the regulations restricting the use UBA is supported by most industry representatives and quota holders.

2.3 OBJECTIVE

MPI is committed to maximising the economic benefits from the sustainable use of fisheries resources while reducing any unnecessary regulatory burden. The purpose of this review is to:

- Remove any unnecessary utilisation constraints
- Allow for commercial harvesting methods that may assist in realising the economic potential for SUR, SCC and HOR
- Ensure diver safety in PAU 4 and maintain the continued performance of this fishery.

3 Relevant Fishery Information

3.1 SUR FISHERY

Of the developing fisheries reviewed in this paper, SUR is the most developed. Currently product is targeted toward the Maori and Pacific Island populations both in NZ and Australia. Expansion opportunities exist in the Asian market.

Commercial dredging has previously been used for harvesting deeper-water stocks of SUR. However, this method has been largely discontinued due to high levels of product damage, low harvest yield, and increased environmental concerns compared to the more selective method of diving.

Specific quota management areas in the SUR fishery that may benefit from this proposal are SUR 2A and 2B. SUR 2A and 2B have had little harvest in relation to quota limits. The small amount that has been commercially harvested in SUR 2A in the past occurred just over the western border of SUR 1B. In SUR 2B no commercial landings have been recorded against the 30 tonne TACC for seven years.

3.2 SCC FISHERY

The SCC fishery is based on the harvest of one species, *Stichopus mollis*, which is found between 5 and 40 m depth. There is currently a combined national TACC of 35 tonnes across 13 QMAs. The largest harvest was 20 tonnes in the 2011-12 fishing year, with almost 50% of the catch coming from areas SCC 7A and 7B.

SCC is sold both locally and internationally, but the international market has the best potential for developing the SCC fishery. The biggest market for SCC is for dried product in the Asian market. Dried SCC is of high value fetching between $100 and $300 per kg (around $6.60 and $30.00 per kg green weight). Fresh local sales at around $20 per kg offer price stability, but are a relatively small market.

The SCC fishery is currently limited by free-diving due to depth limitation, as well as the low density of SCC beds. On average it takes up to 200 dives for one diver to gather 50 kg of unprocessed product, a low yield for any free-dive fishery. With the conversion to wet weight and the current low harvest efficiency by free-diving, this fishery is currently of marginal economic value.

3.3 HOR FISHERY

The commercial harvest of HOR is taken mainly (90%) as bycatch in trawl fisheries, while the remainder is taken as bycatch in dredge and Danish seine fisheries. There has only been 85 kg of targeted commercial catch of HOR by free-diving in the last two fishing years

A targeted HOR fishery is largely restricted by limited market opportunities. However, there are potential markets for the use of HOR. Similar species harvested off the coast of California and Mexico are sold into the Japanese market and are prized for use as sashimi due to a sweet scallop-like taste and texture of the abductor mussel.

3.4 CHATHAM ISLAND PAUA FISHERY (PAU 4)

The Chatham Islands paua fishery is the largest paua fishery in New Zealand, with the TACC of 326.54 tonnes fully (or nearly) utilised each year. There are approximately 25 divers operating in the fishery, who free-dive in waters up to 15 m depth.

While paua divers' interactions with great white sharks are not frequent, they are high risk. Free-divers regularly swim up and down through the water column making them vulnerable to attacks should sharks enter into the area. The use of UBA in overseas paua fisheries (e.g. Australia) is common and allows divers to adopt defensive positions, seek refuge on the seabed, and allow for additional protective gear (e.g. heavy chain mesh suits, or shark shields and cages).

4 Analysis of management options

There is uncertainty around the costs and benefits of the *status quo* and alternative options in terms of people's social, cultural and economic well-being. MPI has undertaken an initial assessment of the economic opportunities associated with the alternative options and estimates an economic benefit of between $1.4 to $2.4 million per year from allowing of

UBA in developing fisheries, while also helping protect the $12.5 million annual value of the PAU 4 fishery. MPI is seeking further information to help quantify these opportunities; for example, to quantity the commercial potential of these fisheries.

In providing submissions, stakeholders should provide information on any use, economic, social and cultural factors that may be relevant in assessing the management options. In particular, fishers should provide information on how these proposals may impact on their fishing activities and on opportunities for increasing the value of the fisheries.

4.1 OPTION 1 – STATUS QUO

Options 1 would retain the existing regulation restricting the use of UBA for the commercial harvest of shellfish species.

4.1.1 Impacts

Under the *status quo* those most affected are the commercial fishers in the SUR, SCC, HOR and PAU 4 fisheries.

4.1.2 Costs

Sustainability/Environmental

Continued restriction means the shellfish beds currently targeted through free-diving would continue to be harvested. If harvesting pressure is high and focused on these shallower areas then the number of shellfish able to reproduce and provide recruitment stock to the local populations may be diminished.

Customary/Recreational

There will be continued overlap among customary, recreational and commercial sectors in some areas. This effort occasionally results in high fishing pressure and concerns about the availability of shellfish in easily accessible areas (for example, shallower waters).

Commercial

Commercial fishers would be unable to improve the efficiency, development opportunities and/or safety of their operations through the use of UBA under Option 1. They will be required to identify new ways of improving harvest levels or ensuring their safety.

4.1.3 Benefits

Sustainability/Environmental

Continued restriction would mean at least some portion of these shellfish stocks are left untouched. Those species in deeper waters would remain (unless targeted by other methods, e.g. dredge) to provide valuable recruitment stock.

Customary/Recreational

Customary and recreational fishers that use UBA to harvest their catch in the SUR, SCC and HOR fisheries are able to shift to deeper water without overlapping with commercial effort. This provides them opportunities to enter areas that are currently less or inaccessible to commercial fishers that rely on free-diving.

Commercial

There are no apparent benefits to the fishers in these fisheries under Option 1. There may be benefits to commercial fishers in other shellfish fisheries (e.g. scallops or rock lobster) that consider enabling the use of UBA would increase compliance risks or possible illegal harvest.

4.2 OPTION 2 – EXTENDING THE COMMERCIAL USE OF UBA TO DEVELOPING FISHERIES

Option 2 would amend regulation 76 of the Fisheries (Commercial Fishing) Regulations 2001to allow the use of UBA for the commercial harvest of SUR, SCC and/or HOR.

4.2.1 Impacts

Under this option those fishers, quota holders and licensed fish receivers (LFRs) involved in these fisheries would be most impacted. The allowance of UBA in these shellfish fisheries would affect approximately 46 fishing vessels, a majority of which target SUR (including 8 core vessels). There is a large crossover between SUR and SCC fisheries, with 61% of vessel that target SCC also target SUR throughout the fishing year.

4.2.2 Costs

Sustainability/Environmental

UBA is extensively used in similar overseas shellfish fisheries, usually by "hooka" (surface supplied air) rather than by self-contained underwater breathing apparatus (SCUBA). However, many of these overseas fisheries also highlight the sustainability risks that the introduction of UBA may pose (for example, recruitment failure in the stock due to overfishing).

However, unlike some overseas examples, the principal sustainability control in the SUR, SCC and HOR fisheries is the setting of a Total Allowable Catch (TAC) and subsequent allowances. This limits the amount of shellfish that can be removed from the fishery. Continuing to fish within these limits regardless of harvest methods will help mitigate the risk of stock collapse, but may fall short in addressing localised or serial depletion[3] in geographically restricted shellfish populations.

No other environmental impacts (e.g. bycatch issues, habitat destruction) are foreseen, given the highly selective and non-invasive method that fishing with UBA represents.

SUR Fishery

Anecdotal information from SUR fishers have highlighted that the use of UBA may pose high risk of localised depletion in specific areas of reduced productivity and steep topography. Parts of SUR 2A is thought by fishers to have low productivity and as such could be prone to localised depletion due to limited recruitment potential. Areas such as Marlborough sounds in SUR 7A could be easily depleted by divers using UBA due to the smaller area of suitable habitat as the ocean floor quickly falls below the habitable zone of kina.

SCC Fishery

SCC is at higher risk of localised or serial depletion than SUR or HOR as it is found in lower densities than other species. However the threat of serial depletion may be curtailed by market

[3] **Localised depletion** is the reduction in shellfish numbers in a small area (e.g. a shellfish bed) to a point where continued fishing will result in recruitment overfishing in that area. Recruitment overfishing is when the shellfish population no longer has the reproductive capacity to replenish itself, that is there are not enough adults to produce offspring
Serial depletion of fishery stocks occurs when a fishery moves from one stock to another as each one declines to levels at which it is no longer economically feasible to fish, or fisheries managers feel it is necessary to close the fishery.

forces. SCC found in deeper waters is generally lighter in colour, which is less favoured in the Asian market. Thus, market pressures may impose a depth restriction on harvest.

HOR Fishery

Given the limited information available on HOR it is difficult to predict any fisheries specific issues that may arise from allowing the use of UBA. MPI considers the broader issue of localised or serial depletion relevant however if sufficient monitoring tools are not in place.

Commercial

Enabling the use of UBA has several up front cost for any commercial fisher intending to participate. A switch from free-diving to UBA will incur costs associated with the outlay and maintenance of equipment. Additionally given the unique nature of utilising UBA, divers and vessels will need to comply with OSH safety regulations to ensure they have any required certifications. The approximate cost for divers to acquire a limited certificate of competency is $2,000, indicating a commitment to safer diving practices.

The type of regulatory framework put in place to allow the use of UBA may also result in additional monitoring or compliance costs (described below and in section 5). In some instances, these costs may be prohibitive where any increased harvest potential does not outweigh those costs. This would be the case for many smaller scale vessel operators or operations where SUR is a supplementary source of income when not targeting other species. Such operations may be put at a competitive disadvantage if the use of UBA is allowed in these fisheries.

Customary/Recreational

MPI is aware there are concerns that the ability of commercial fishers to utilise UBA in these fisheries will decrease non-commercial fishers' ability to harvest these species. Anecdotal evidence suggests that in some areas where SUR is commercially harvested, customary fishers find the need to dive below the reach of commercial fishers to find plentiful beds to harvest. There is concern that allowing commercial use of UBA in the SUR or HOR fishery will reduce customary and recreational fishers' ability to find and gather plentiful catches that were once below commercial divers reach.

Current information suggests there is little customary or recreational catch of SCC. However, Asian community usage may be underrepresented in recent recreational surveys of SCC catch as anecdotal information suggests there may be significant harvest by Asian communities.

Compliance

The monitoring of harvesting activity where the use of UBA is allowed may result in increased costs or challenges for compliance operations. For example, there are a high proportion of fishers and vessels in the kina fishery that also fish for paua. The Paua Industry Council has asked that the use of UBA not be considered for use on the mainland paua fishery because it does not consider the fishery is subject to the same harvesting constraints (as in the developing fisheries) or safety risks (as in the Chatham Islands fishery). Without adequate monitoring or regulatory controls in place it would be difficult and costly to monitor vessels that have collected both paua and kina in the same trip and definitively say the UBA was not used in the collection of paua.

Another potential compliance risk is the possibility of fishers entering restricted or closed areas underwater to fish illegally. Use of SCUBA in particular would make this easier to do. However, in developing fisheries the opening up of deeper fish stocks and increased harvest efficiency should allow quota to be more easily obtained without the need for illegal methods.

Also, this risk could already exist in the recreational fishery but is not believed to be significant.

MPI notes the possible regulatory or monitoring controls that could be put in place to mitigate this risk are discussed in section 5.

4.2.3 Benefits

Sustainability/Environmental

Allowing the commercial use of UBA would enable access to currently untapped or underutilised sources of shellfish and allow for existing catch to be spread over a broader area. This could potentially alleviate the pressure on populations and stocks that fall within the depth range of free divers and help ensure the long term sustainability of these stocks.

Customary/Recreational

Enabling commercial fishers to use UBA may reduce the cross-sector pressures on local populations. Commercial fishers could spread their effort to deeper waters, reducing their amount of take in the shallower areas where customary and recreational harvest is more accessible. The ability to spread catch may also reduce the risk of localised depletion, which often results in increased sector conflict.

Commercial

The ability to harvest from new sources of these shellfish species may also provide better knowledge on the prevalence on these stocks, which can inform subsequent TAC reviews. For stocks that have nominal TACCs, increased information may allow for increases in the TACC, potentially increasing the value of these stocks to New Zealand's fisheries sector.

The use of UBA may also help increase the quality and selectivity of shellfish harvested due to increased bottom time. Spending more time and care during harvest will reduce damage to product, less disturbance of undesirable product (for example, small size or poor condition etc.) as an assessment of the product can be made on the seabed without the time pressure associated with free-diving.

Additionally increased harvest efficiency resulting in decreased harvest times may reduce handling time and allow for fresher, less stressed shellfish to be supplied to the market; a potential key to developing premium markets.

SUR Fishery

The current un-harvested portion of SUR quota represents between $1.33 million and $1.95 million in annual product value. Although allowing the use of UBA may not help realise all of this harvest potential, it may help some QMAs. For example, in SUR 2A and 2B industry suggests kina are found at depths greater than they are currently able to be harvested. These stocks are likely to be brought into the commercial harvest if there is access to UBA. An increase in harvest in SUR 2A and 2B could represent an additional $350,000 and between $120,000 and $150,000 per year, respectively.

The use of UBA would also be beneficial in developing the SUR fishery in specific geographical areas that pose difficulty for free-diving operations, i.e. areas of high current/tidal flow. Fishers suggest areas such as Foveaux straight (SUR 5) and around the Three Kings Islands (SUR 1A) may be good candidates for development with UBA.

SCC Fishery
The use of UBA will allow for the exploration of areas previously unavailable to the SCC fishery (for example, areas under mussel farms with high density of SCC). However, given the inherent dangers of free-diving under marine farms, they have not previously been utilised. This co-utilisation of an area may prove a more sustainable area of harvest then areas reliant on natural food supply. Full utilisation of current SCC quota could represent between $100,000 and $450,000 of additional annual product value.

HOR Fishery
HOR is still an unexplored fishery making it hard to determine how much this fishery may be worth in the long term. The use of UBA is unlikely to initially affect the harvest of HOR as little fishery or market currently exists for this species. However, MPI considers that the ability to utilise UBA will open up development opportunities within this fishery because it will ensure high produce quality.

4.3 OPTION 3 – ENABLE THE USE OF UBA IN THE CHATHAM ISLAND PAUA FISHERY (PAU 4) TO SUPPORT FISHER SAFETY

Option 3 would amend regulation 76 of the Fisheries (Commercial Fishing) Regulations 2001 to allow the use of UBA to harvest paua in the Chatham Islands fishery (PAU 4). This option could be progressed in conjunction with Option 2 or as a standalone initiative.

4.3.1 Impacts

There are approximately 25 paua divers in PAU 4 that would be impacted by enabling the use of UBA. There are an unknown number of customary and recreational paua fishers on the Island, but given the small size of the community and their interest in other fisheries, the interest in the proposed regulatory change would be broad.

4.3.2 Costs

Sustainability/Environmental

The use of UBA may increase the possibility of localised or serial depletion (resulting in poor performing areas) if monitoring tools are not in place to adequately manage that possibility.

Customary/Recreational

Allowing commercial access to the paua stock using UBA may affect local iwi who have a significant interest in customary and recreational take of this species. In such cases there may be increased sector conflict amongst commercial, customary and recreational fishers.

Commercial

Divers undertaking trials involving the use of underwater breathing apparatus (UBA) are required to have certificates of competency. Divers in this trial were required to hold the OSH qualification of "Limited certificate of competency". This qualification has an operational limit of 20 metres.

The approximate cost for divers to acquire a limited certificate of competency is $2,000, indicating a commitment to safer diving practices. The total number of divers who have obtained competency certificates over the two special permits trials is nine (~36% of PAU 4 divers).

4.3.3 Benefits

The use of UBA in PAU 4 is aimed at ensuring the current level utilisation can continue in the future given the increasing presence of great white sharks in the area. The use of UBA under the special permit trials has been found to decrease the likelihood of shark-diver interaction, significantly increasing diver safety in this fishery. The main observations in the trials were:

- UBA gave fishers the option to stay down, seek cover and if able to swim staying on the bottom to the shore so they could exit the water.
- Fishers were more relaxed in the water (as they felt safer and less stressed from free diving meant they were less likely to trigger shark aggression (i.e. not giving out distress cues).
- Use of UBA minimises the number of up and down trips in the water column and especially less time floating on the surface getting breath when they may appear as prey to a shark
- Allowed divers to float catch up from the seafloor to boat rather than swimming the catch up reducing the number of up and down passages.
- For the boat person, the use of UBA enables them to operate further out reduces the risk from waves braking and rocks.
- Improves diver ability to equalise properly and not be under any stress

Additional results beyond diver safety in the trials included some positive resource implications and minor economic benefits:

- Divers were more capable of measuring paua in the water rather than removing them and measuring at the surface, which can reduce fishing-related mortality or stress on the population
- Shorter harvest time (for the taking of the TACC) allows fishery to rest
- Shorter time to harvest means greater volume over short period through the LFRs
- More efficient harvesting means less time to take ACE (Annual Catch Entitlement) therefore may result in excess labour capacity in the fishery
- Use of UBA reduces barriers to entry (fitness) and may increase competition for ACE

Tangata whenua and stakeholders are encouraged to submit their views on these proposals and in particular information on:

- their perception of what are the current barriers to utilisation in the developing fisheries such as kina (SUR), sea cucumber (SCC) and horse mussel (HOR);
- the costs and benefits that the proposed changes would have on their fishing activities and business;
- the commercial potential of the respective fisheries and opportunities for increasing the value of the fisheries; and
- their assessment on the risks likely to be created under the proposed changes.

5 Proposed regulatory framework

Under Options 2 and 3, the main risks or issues identified from allowing the commercial use of UBA are:

- the sustainability of local populations of these shellfish due to the risk of serial or localised depletion
- increased sector conflict if areas are 'fished out'
- compliance implications:
  - harvesting of other species where UBA is not allowed and the ability to prove non-compliance, and
  - use of UBA to enter into closed areas undetected.

MPI proposes (in the event that Option 2 and/or 3 are supported) to mitigate potential impacts on the sustainability of the stocks or local population and potential compliance risks by implementing one or more of the following regulatory tools.

Option A	No regulatory controls.
Option B	Mandatory use of automatic location communicators (ALCs) when commercially fishing for any of those species where the use of UBA is allowed.
Option C	Prohibit the use of UBA if shore-diving (i.e. use of UBA requires a vessel equipped with an automatic location communicator).
Option D	Prohibit the use or possession of UBA when taking, or in the possession of, any other fish, aquatic life, or seaweed.
Option E	Increased reporting obligations, including; - the method of harvest to be reported as diving using UBA versus free-diving (new method code required), - finer spatial scale reporting (e.g. using the paua statistical reporting areas), - recording latitude and longitude of catch, - requiring the names of divers to be included on reporting forms

An initial analysis of the benefits and costs of these tools and practical issues relating to the implementation and enforcement of these measures is tabled below.

Options	Costs	Benefits
A	No direct financial costs to fishers Difficult to monitor vessel activities and finer-spatial scale information on harvesting levels. Increased compliance effort	No changes needed to current fishing operations or recording
B	Set up cost of ALC equipment ~$5,000 Ongoing monitoring costs ~$50-$100 per month	Monitor vessel activities in relation to habitat type Identify and monitor participating vessels in real time Detailed information on harvesting locations
C	No direct financial costs to fishers Does not allow current fishers running shore diving operations to utilise UBA - Potential competitive disadvantage	Ensures that all use of UBA is carried out with the use of ALC that can be monitored - Reduces compliance risk
D	Limited direct financial cost- However, may reduce economic viability of fishing trips for fishers who utilise multiple fishing methods targeting different species in one trip	Minimises compliance risk of illegal take of other commercial species with the use of UBA
E	New reporting system to be developed and trailed Increased complexity in reporting system and fishing areas for fishers to navigate	Provides better information on commercial harvest across fish stocks Better information to inform catch-per-unit-effort (CPUE) analysis of commercial harvest Better assess impacts at local scales. Better information to inform stock monitoring and TAC assessments. Better information to inform compliance monitoring activities

MPI considers the following controls are likely to be required at a minimum to adequately manage the risks that have been identified:

- Option B - Mandatory use of automatic location communicators when commercially fishing using UBA.
- Option D - Prohibit the use or possession of UBA when taking, or in the possession of, any other fish, aquatic life, or seaweed.

Although not a viewed as a minimal requirement, increased reporting obligations will likely be considered for these fisheries as they develop. Better information on factors that might influence catch rates and harvesting pressure can be used to inform management decisions on TAC setting and other sustainability measures.

MPI is open to considering other regulatory controls or information requirements to inform the assessment of changes in how the fishery is used (e.g. areas of exploitation, changes in catch per unit effort).

6 Monitoring and Review

Through the annual fisheries planning process described above, MPI monitors and reviews the effectiveness of regulations in supporting management objectives. The performance of the fisheries and of the regulations proposed in this paper would be monitored and reviewed in discussion with tangata whenua, the industry and other stakeholders as part of this process.

For the SUR, SCC and HOR fisheries MPI currently monitors catch information to ensure that it is accurate and will consider changes in management measures if catch significantly increases or decreases over a three year period. For the PAU 4 fishery MPI monitors stock status to ensure the stock biomass is maintained at or above its maximum sustainable yield (or accepted proxy). Other performance measures (discussed in the National Fisheries Plan) are also used to determine whether the overall management objectives for these fisheries are being met and provide the basis for discussions with tangata whenua and stakeholders

Locations of commercial harvest are monitored through information provided on statutory reporting forms and general monitoring by MPI Compliance. This information is important in assessing if localised depletion issues could arise (for example, harvest is concentrated in only a few areas), and informing compliance monitoring and where they should target their activities. MPI is exploring the use of other technology to better monitoring commercial harvest activity that would build on any existing monitoring system.

7 Conclusions

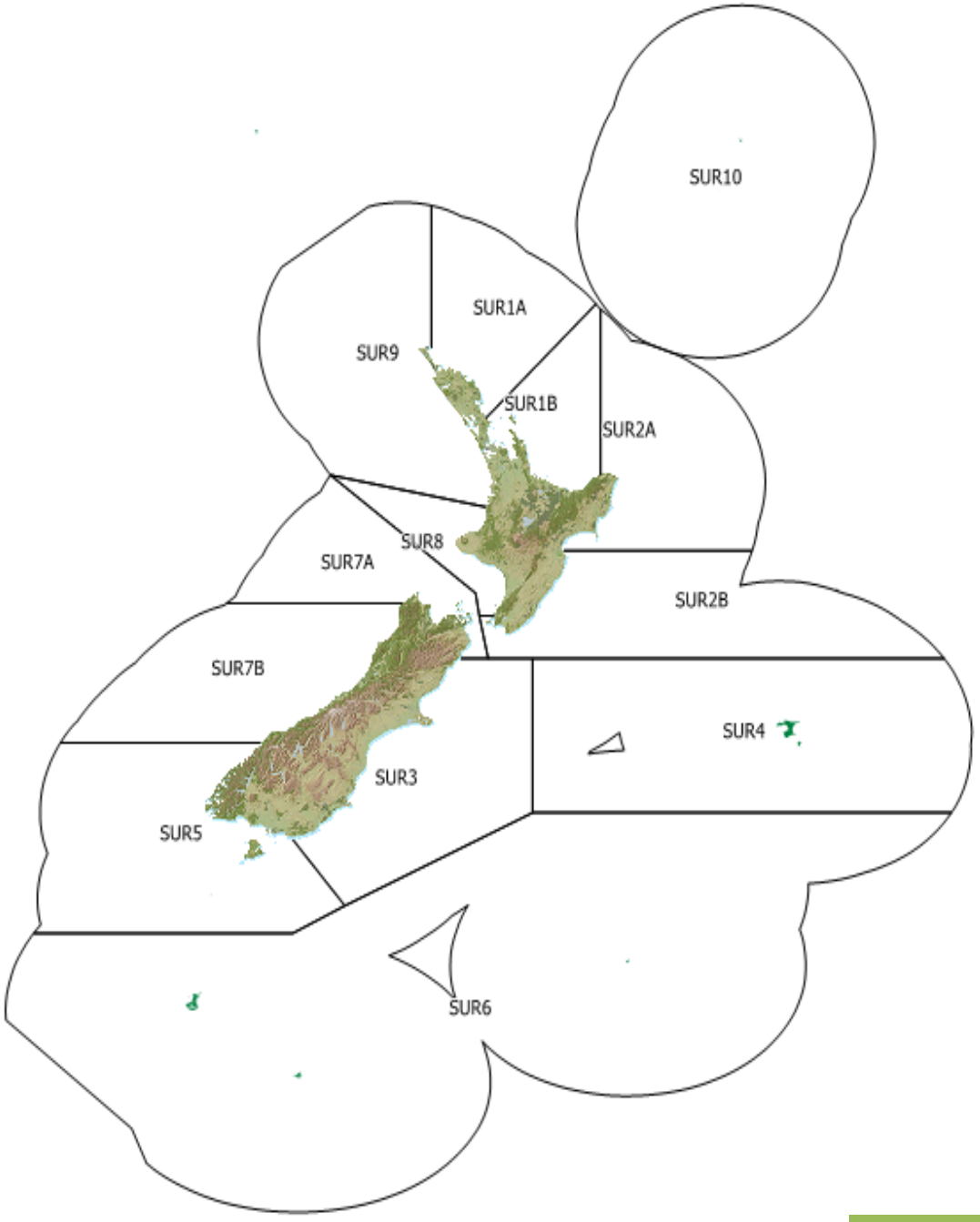
The proposals presented in this paper are intended to improve benefits from commercial fishing New Zealand and ensure the fishing regulation maintains the safety of fishers. MPI concludes that the proposed changes:

- are consistent with the government's statements on better and less regulation;
- furthers the Government's commitment to seek out and enable sustainable utilisation opportunities within the fishing sector
- will assist in maximising the benefits from the sustainable use of fishery resources
- are aimed at ensuring the safety of commercial fishers within the PAU 4 fishery
- ensure there is sufficient information and monitoring framework in place to allow for the management of risk.

MPI's preferred options based on the proposals put forward are Options 2 and 3, to allow the use of the UBA in the SUR, SCC, HOR and PAU 4 fishery. MPI considers that with the implementation of these options there are minimal regulatory controls that will need to be put in place to adequately manage the risks that have been identified.

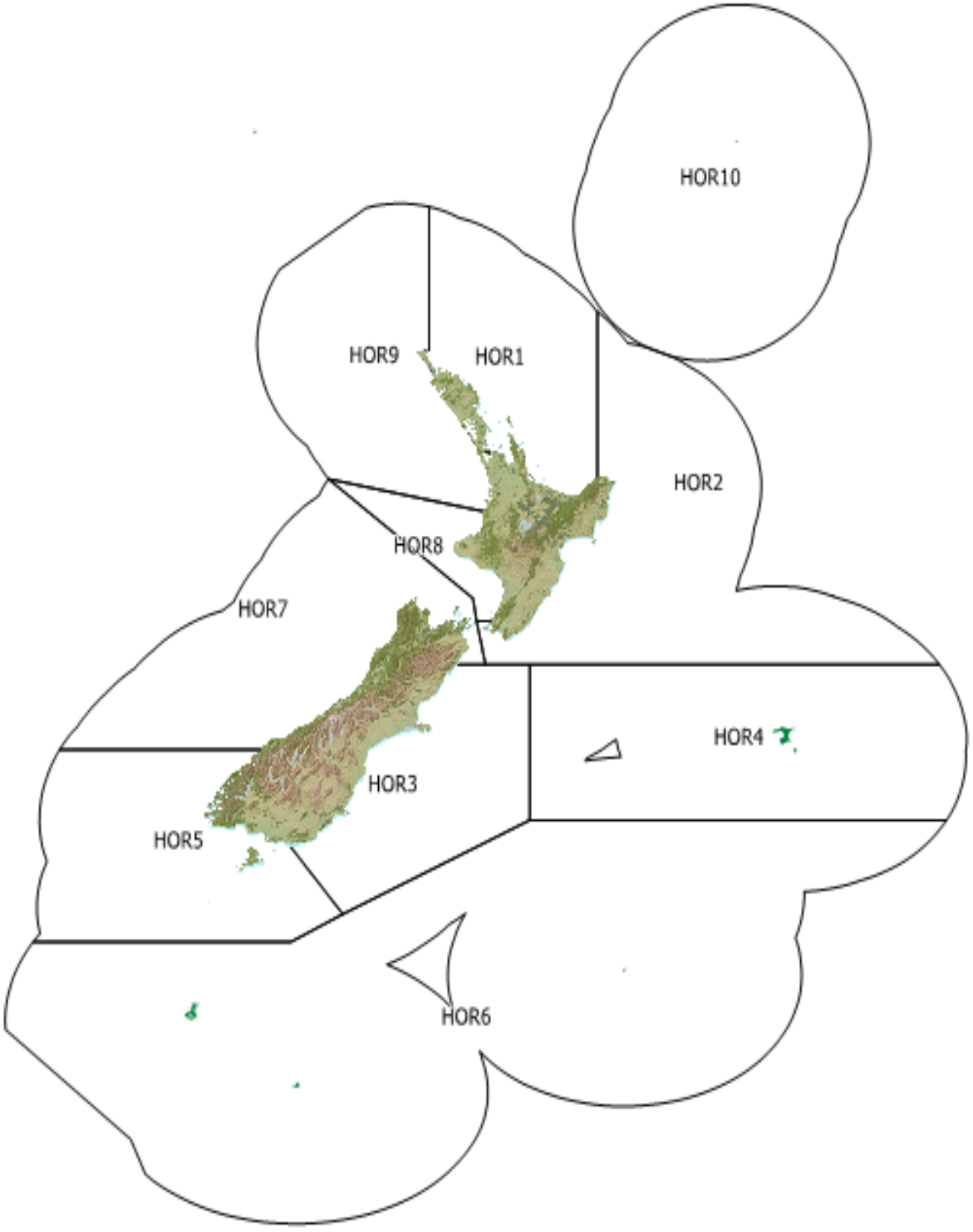
Tangata whenua, the paua industry and other stakeholders are encouraged to provide their views on, and additional information of relevance to, the proposals outlined in this paper. Submissions will be reflected in final advice to the Minister. Any changes resulting from the Minister's decisions would take effect following Cabinet's confirmation of the Minister's decisions, on 1 October 2013.

8 Appendix 1 – Maps showing Quota Management Areas



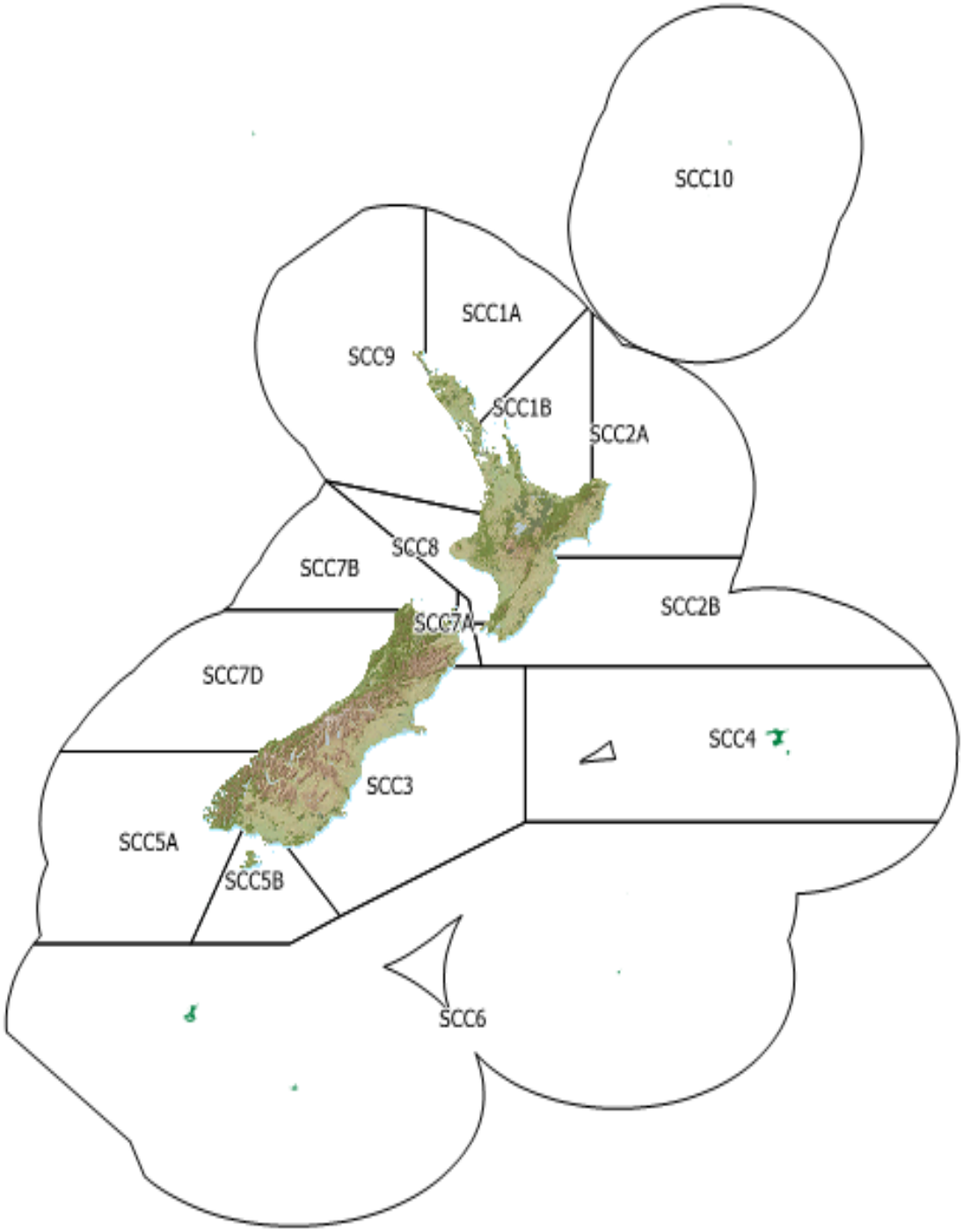
Map 1. Map of New Zealand showing the Quota Management Areas for kina (SUR) stocks.

Fish stock	TACC (kg)
SUR1A	40,000
SUR1B	140,000
SUR2A	80,000
SUR2B	30,000
SUR3	21,000
SUR4	225,000
SUR5	455,000
SUR7A	135,000
SUR7B	10,000
SUR8	1,000
SUR9	10,000



Map 2. Map of New Zealand showing the Quota Management Areas for horse mussel (HOR) stocks.

Fish stock	TACC (kg)
HOR1	4,000
HOR2	2,000
HOR3	2,000
HOR4	1,000
HOR5	1,000
HOR6	1,000
HOR7	16,000
HOR8	1,000
HOR9	1,000



Map 3. Map of New Zealand showing the Quota Management Areas for sea cucumber (SCC) stocks.

Fish stock	TACC (kg)
SCC1A	2,000
SCC1B	2,000
SCC2A	2,000
SCC2B	5,000
SCC3	2,000
SCC4	2,000
SCC5A	2,000
SCC5B	2,000
SCC7A	5,000
SCC7B	5,000
SCC7D	2,000
SCC8	2,000
SCC9	2,000

Map 4. Map of New Zealand showing the Quota Management Area for the Chatham Island paua stock (PAU 4).