

PROPOSAL TO LIST DEEPWATER CRABS ON SCHEDULE SIX OF THE FISHERIES ACT 1996

Executive Summary

- 1 The Ministry of Fisheries (MFish) received a request from the commercial fishing industry (industry) to add the following species to Schedule Six of the Fisheries Act 1996 (the Act) to enable their return to the sea following capture: deepwater red crab (CHC), giant spider crab (GSC) and king crab (KIC). Collectively these stocks are known as deepwater crabs.
- 2 Deepwater crabs were introduced into the quota management system (QMS) in 2004. Since then, commercial catch has been limited to bycatch in the squid and scampi trawl fisheries. Exploratory fishing is currently underway to determine the feasibility of a target deepwater crab fishery. Commercial catches have been well below the total allowable commercial catch (TACC) for the deepwater crab stocks since 2004 and limited information is available regarding the status of the stocks.
- 3 Section 72 of the Act requires all commercial catch of QMS fish stocks be landed and reported. However, the Act's Sixth Schedule provides harvesters of some QMS stocks with an exemption from the requirement to land and report all fish. Industry has requested that deepwater crab stocks be included on the Sixth Schedule to provide vessels with additional operational flexibility and enable quota holders to maximise the value of deepwater crab annual catch entitlement (ACE).
- 4 MFish considers the Sixth Schedule amendment is appropriate for deepwater crabs that are likely to survive and caught with potting gear since it will enable value maximisation for fishers with little risk of negative impacts on the sustainability of deepwater crab stocks.
- 5 MFish requests more information to determine whether trawl-caught deepwater crabs should be added to the Sixth Schedule. Stakeholders are invited to introduce information relevant to trawl-caught crab survivability or submit proposals for a collaborative data collection process if such information is not available. MFish welcomes stakeholder views on all options.

Summary of Options

Option 1: Retain the status quo – deepwater crabs are not included on the Sixth Schedule

- 6 Commercial fishers are not allowed to return deepwater crabs to sea and must land and report all CHC, GSC, and KIC (deepwater crabs) taken and balance the catch with ACE or pay the deemed value.

Option 2: Add deepwater crabs to the Sixth Schedule

- 7 Amend Schedule Six of the Act to enable fishers to legally return deepwater crabs to the sea if the crabs are likely to survive after release.

Option 3: Add deepwater crabs caught with potting gear to the Sixth Schedule

- 8 Amend Schedule Six of the Act to enable fishers to legally return deepwater crabs to the sea if the crabs were caught using potting gear and are likely to survive after release.

Rationale for Management Options

- 9 The CHC, GSC and KIC fisheries entered the QMS on 1 April 2004. Deepwater crab target fisheries are not yet developed but exploratory fishing is currently underway to determine the feasibility of a target fishery. The crabs are caught in pots and destined for a high-value overseas market.
- 10 GSC is caught incidentally in the squid and scampi trawl fisheries in areas GSC5 and GSC6A. CHC and KIC are minor bycatch species in the ORH2A, ORH2B and ORH3B trawl fisheries.
- 11 Based on reported catches, the TACC has not been fully harvested for any of the deepwater crab stocks. In the 2005-06 fishing year, commercial catch of GSC was approximately 74 tonnes for all areas, which is just over 17% of the total TACC. Reported catch of CHC has been less than 1% of the TACC, and reported harvest of KIC has been around 10% of the TACC since 2004.
- 12 Information on deepwater crab stocks is limited and there are currently no estimates of biomass for any of the deepwater crab species. It is not known whether these stocks are at, above, or below a level that can produce maximum sustainable yield (MSY).
- 13 Industry has requested the addition of deepwater crab stocks to the Sixth Schedule for two reasons:
- a) Some deepwater crabs caught in the exploratory target fishery will likely be too small to market and operators would prefer to return these small crabs to sea and maximise the value of targeted catch.
 - b) Incidentally caught deepwater crabs are generally unmarketable, and under the status quo operators must retain, land, and balance this low-value catch with ACE.
- 14 Regarding point (a), existing crab markets generally have a minimum marketable size, and deepwater crabs will likely be held to a similar standard. Adding deepwater crabs to the Sixth Schedule will permit operators to return to sea unmarketable crabs that are alive and likely to survive, thereby maximising the economic value of landed catch.
- 15 Regarding point (b), a target fishery does not yet exist for deepwater crabs and therefore markets are not generally available for these crabs when they are landed as bycatch in the trawl fisheries. In addition, these vessels are not equipped to appropriately store, handle or process the crab in order to attract a high market price.
- 16 To promote retention and reporting of all QMS stocks, section 72 of the Act prohibits dumping of commercially harvested QMS stocks. Schedule Six provides an exemption to the dumping prohibition for some fishery stocks and allows operators to return fish to sea in certain situations. Fish from most stocks listed on the Sixth

Schedule may be returned to sea only if they are likely to survive¹. The Sixth Schedule exemption often provides operators the opportunity to maximise the efficiency of their operations or the value of their catch by returning some fish to sea, provided that only live fish likely to survive are returned and fish that are dead or unlikely to survive are landed and reported.

- 17 MFish notes that information is limited on the survivability of crabs discarded after capture in fishing gear. Available research suggests the survivability of crabs caught in pots may be good but survival rates for trawl-caught crab may be significantly lower. Based on this information MFish considers the addition of pot-caught deepwater crabs to the Sixth Schedule is reasonable to maximise value from utilisation.
- 18 Since it is unclear whether the majority of deepwater crabs caught in trawl nets are likely to survive MFish requires more information to determine whether it is appropriate to add trawl-caught deepwater crabs to the Sixth Schedule. Stakeholders are invited to present information regarding the likely survival rate of trawl-caught deepwater crabs or, if such information is not available, submit proposals to collect relevant data for survival rate estimation.

Assessment of Management Options

- 19 MFish presents the following three management options for consideration. MFish reminds submitters that this Initial Position Paper is not final advice for the Minister but provides stakeholders with the opportunity to comment on, and provide supplemental information to, the draft advice presented here.

Option 1: Retain the status quo – deepwater crabs are not included on the Sixth Schedule

- 20 The status quo is unlikely to constrain the harvest of deepwater crab stocks in the short term since the TACC has not been fully harvested in any year since the stocks were introduced to the QMS in 2004. Information on deepwater crab stocks is currently limited but the TACCs are set at levels considered sustainable. Stock sustainability issues should be examined in more depth if the target fishery develops and exploitation rates increase significantly.
- 21 From a management perspective, maintaining the status quo may be reasonable given MFish's concern over the survivability of deepwater crabs caught in the squid and scampi trawl fisheries, lack of a developed deepwater crab target fishery, and uncertainty regarding sustainability of the stocks.

Option 2: Add deepwater crabs to the Sixth Schedule

- 22 Option 2 results in an unknown level of risk to the sustainability of deepwater crab stocks but the risk is likely low given that current reported catch levels are well below the TACC for all stocks. The addition of deepwater crabs stocks to the Sixth Schedule will offer industry more flexibility and could enable more efficient vessel operations and utilisation of ACE.

¹ Of the 20 stocks listed on the Sixth Schedule, all but three (dredge oysters, spiny dogfish, and scallops) may only be returned to the sea if likely to survive.

- 23 For the exploratory target fishery using potting gear, fishers would prefer to return undersize or otherwise unmarketable crab to the sea since they have a low market value. MFish is unable to estimate the additional gain in value for the exploratory target fishers if they are allowed to return unmarketable crab to sea since the market is currently undeveloped and export prices are not available.
- 24 For the squid and scampi trawl fisheries in which deepwater crabs are caught incidentally, operators propose to return live crabs to the sea since the vessels are not equipped to adequately store the crabs for processing into a high-value product. Storage and factory constraints generally restrict processing to crab meal or uncooked and frozen crabs, both of which are low-value products. In addition, the crab bycatch utilises valuable hold space on the vessel. The addition of deepwater crab stocks to the Sixth Schedule will provide these operators with flexibility to utilise their processing facilities and ACE for maximum economic benefit. No information is available to determine the approximate cost savings to operators if deepwater crabs caught incidentally on squid and scampi vessels were returned to sea instead of retained.
- 25 It is generally thought that deepwater crabs are hardy and the survival rate of released crabs caught in potting gear is fairly high, but no information has been collected for the deepwater species under consideration. A research study in South Africa found that the survival rate of crabs caught in pots varied from 78% to 89% if there was limited handling before discard. Expected survival rates declined to a range of 38% to 58% with rougher handling or if the crabs were injured.²
- 26 While the industry request arises from an economic concern, allowing operators to return unmarketable crab caught in a target pot fishery to the sea will not likely increase the sustainability risk to deepwater crabs when compared to the status quo since reported commercial catch has been well below the TACC since 2004. Adding deepwater crabs caught with potting gear to the Sixth Schedule is appropriate since sustainability will not likely be negatively impacted and the action does not appear to impact on any interconnected fisheries or the value derived by other fishery users. MFish notes the action is also consistent with the management objective to enable New Zealanders to achieve the maximum value from sustainable utilisation of fisheries.
- 27 Although one stakeholder indicated that a majority of the landed crab are alive when brought on deck and seem likely to survive if returned to the sea, research study results suggest trawl-caught crabs may have a lower survival rate than crabs caught with potting gear. A study to assess the short-term mortality of crab bycatch in the Nephrops (Norway lobster or scampi) fishery in Scotland found that on-deck survival rates ranged from 75% to 98%. However, 57% of the crab bycatch was considered damaged and these injured crabs had a significantly lower longer-term survival in further experiments, suggesting that overall post-trawling survival may range from 51% to 84%³. In Alaska, trawl-caught crabs are assumed to have just a 20% survival rate⁴.

² Purves, M.G., Agnew, D.J., Daw, T., Yau, C., Pilling, G. 2003. Distribution, demography, and discard mortality of crabs caught in an experimental pot fishery for toothfish (*Dissostichus eleginoides*) in the South Atlantic. *Fishery Bulletin*, 10(4): 874-888.

³ Bergmann, M., and Moore, P.G. 2001. Survival of decapod crustaceans discarded in the *Nephrops* fishery of the Clyde Sea area, Scotland. *ICES Journal of Marine Science*, 58(1): 163-171.

- 28 The rates of crab mortality and injury likely vary between the squid and scampi target fisheries. Scampi is a high-quality product so trawl tows and onboard handling are carried out to ensure that product standards are maintained. Like scampi, deepwater crabs have hard shells and it is possible that incidentally caught crabs could have a good survival rate in that fishery, depending on how the crabs are handled. Crab mortality and injury rates may be higher in the squid fishery if trawl tow times or speeds are greater.
- 29 Option 2 assumes fishers can identify deepwater crabs that are likely to survive upon release and would retain all other catch as required. MFish has no evidence to support the assumption that operators can effectively judge a crab's likelihood of survival and more information is requested from stakeholders on this issue.

Option 3: Add deepwater crabs caught with potting gear to the Sixth Schedule

- 30 Option 3 may reduce sustainability risk when compared to Option 2 since it restricts the Sixth Schedule addition to deepwater crabs caught with potting gear, a method for which the likelihood of crab survival may be good (as discussed in the Option 2 assessment). Option 3 recognises the uncertainty of trawl-caught crab survivability by excluding this deepwater crab capture method from inclusion on the Sixth Schedule. Based on current information, Option 3 is the preliminary preferred option.
- 31 In contrast with Option 2, which would add deepwater crabs caught by all methods to the Sixth Schedule, Option 3 excludes trawl-caught crab from inclusion on the Sixth Schedule at this time. MFish may consider trawl-caught crab for addition to the Sixth Schedule in the future if compelling evidence is presented to support a high likelihood of survival. MFish welcomes proposals from industry for a collaborative programme to collect data on the mortality and injury rates of deepwater crabs caught in trawl gear.
- 32 The addition of deepwater crab stocks harvested with potting gear to the Sixth Schedule will enable operators targeting deepwater crabs to maximise the value of their catch. MFish notes the lack of an established market for deepwater crabs prevents an estimation of the additional value gain for the exploratory target fishery operators if Option 3 is implemented.
- 33 Option 3 also assumes fishers can identify pot-caught deepwater crabs that are likely to survive after release. There is no evidence to support this assumption, but this is not likely to introduce a sustainability risk given the current level of targeted deepwater crab fishing. Stock sustainability issues should be examined in more depth if the target fishery develops further and exploitation rates increase significantly.

Compliance

- 34 Options 2 and 3 introduce a compliance difficulty since MFish currently has no information to assess whether a damaged crab is likely to survive after return to sea. It

⁴ North Pacific Fishery Management Council, 2005. Salmon and crab bycatch measures for GOA groundfish fisheries. Anchorage, 41 pp.

is also unclear whether fishers can effectively determine crab survivability after capture. Additional information is needed for MFish to determine when damaged crabs are likely to survive. The likely to survive rule is difficult to enforce and it is expected operators would choose to discard crabs if there is an economic incentive to do so, regardless of the crab's condition. Option 3 creates additional compliance complexity when compared to the status quo and Option 2, since it creates different crab retention requirements for different types of fishing gear within the same QMS stocks.

- 35 MFish considers the status quo (Option 1) and Option 3 provide similar incentives for commercial fishers to dump deepwater crabs caught in the squid and scampi fisheries, since deepwater crabs caught incidentally have a low market value and operators must utilise hold space to store and land the crab in both options. Option 2 may reduce the incentive for squid and scampi harvesters to unlawfully dump deepwater crabs since Sixth Schedule inclusion would permit return to the sea if the crabs are likely to survive. However, there will still be an incentive for operators in the squid and scampi fisheries to dump crabs illegally if, as available research suggests, a significant portion of the crabs are dead or unlikely to survive.
- 36 MFish notes current annual deemed value rates were recently increased to relatively high levels and are set at a level designed to provide fishers with an incentive to report and balance catch with ACE. However, some fishers not holding ACE may choose to avoid payment of deemed value invoices by dumping deepwater crabs caught in the squid and scampi fisheries. Under the status quo and Option 3, dumping of trawl-caught deepwater crabs is an offence and, where detected, can lead to prosecution.
- 37 Ramped differential deemed value rates under the status quo are likely to have the greatest impact on those operators who do not hold ACE and choose to target deepwater crabs. Some of these operators may dump catch in an effort to avoid higher deemed value rates. Options 2 and 3 reduce the incentive to misreport targeted deepwater crab catch.

Statutory Considerations

- 38 **Section 8:** MFish considers Options 1 and 3 presented in this paper provide for utilisation in the deepwater crab fisheries while ensuring stock sustainability. The risks to sustainability under Option 2 are uncertain given the limited amount of available information on the survivability of trawl-caught crab.
- 39 Members of industry requested the addition of deepwater crabs to the Sixth Schedule to provide operational flexibility and the opportunity to maximise the value of targeted deepwater crab catch. In the case of pot-caught crabs, this management change would likely provide industry with economic benefits without raising sustainability concerns, provided commercial catch does not increase substantially. The risks to sustainability from including trawl-caught crab in the Sixth Schedule addition are highly uncertain. The Minister should consider whether enabling additional operational flexibility and ACE value maximisation is justified given the lack of knowledge about the survivability of deepwater crabs and the absence of a developed target fishery.

- 40 **Section 9 (a) and (b):** It is unlikely any of the management options proposed would materially affect associated or dependent species or the biological diversity of the aquatic environment.
- 41 **Section 9 (c):** None of the management options proposed would affect relevant habitats of particular significance. Deepwater crabs are currently caught with potting and bottom trawl gear and the methods and level of total commercial harvest would not change with this action.
- 42 **Section 10:** The information principles of the Act require that decisions be based on the best available information, taking into account any uncertainty in that information, and applying caution when information is uncertain, unreliable, or inadequate. The management options proposed have been developed based on the best available scientific information for deepwater crab stocks.
- 43 The Act also requires that the absence or uncertainty of information should not be used as a reason to postpone, or fail to take, any measure to achieve the purpose of the Act. Uncertainty regarding survivability of deepwater crab stocks following capture in fishing gear was considered and reflected in the management options presented. MFish invites stakeholders to provide additional information on the survivability of crabs caught in fishing gear or propose methods for collecting data to inform the estimation of survival rates.
- 44 **Section 11 (1) (a) and (b):** The effects of fishing on the deepwater crab stocks were considered and discussed. Commercial catch is currently well below the TACC for all stocks. The status quo, or Option 1, in which all deepwater crabs must be landed and balanced with ACE, was discussed and is the impetus for the request from industry to add deepwater crabs to the Sixth Schedule of the Act.
- 45 **Section 11 (1) (c):** The natural variability of deepwater crab stocks is largely due to the impact of changes in environmental conditions and does not directly affect this proposal.
- 46 **Section 11 (2) (a) and (b):** There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act of 1991, or any management strategy or plan under the Conservation Act 1987 that are relevant to the management options proposed.
- 47 **Section 11 (2) (c):** The options are discussed in a manner consistent with the Hauraki Gulf Marine Park Act 2000.
- 48 **Section 2A (a) and (c):** All relevant fisheries and conservation services were discussed and there are no relevant fisheries plans for these stocks. No decision has been made not to require a service in this fishery.
- 49 **Section 5 (a):** Decision-makers are required to act in a manner consistent with New Zealand's international obligations relating to fishing, including the Law of the Sea and the Fish Stocks agreement as well as regional fishery management agreements. Decision-makers must also act in a manner consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. MFish considers that the proposed options are consistent with both New Zealand's international obligations

relating to fishing and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.

REGULATORY IMPACT STATEMENT

Proposal to list Deepwater Crabs on Schedule six of the Fisheries Act 1996

Executive summary

The Ministry of Fisheries (MFish) received a request from the commercial fishing industry (industry) to add the following quota management system (QMS) species to Schedule Six of the Fisheries Act 1996 (the Act) to enable their return to the sea following capture: deepwater red crab (CHC), giant spider crab (GSC) and king crab (KIC). Collectively these species are known as the deepwater crabs. Fish stocks included on the Sixth Schedule are exempt from the dumping prohibition contained in Section 72 of the Act. Thus, operators must land and report all QMS fish that are commercially harvested unless the stocks are listed on Schedule Six.

Industry has requested the addition of deepwater crab stocks to the Sixth Schedule for two reasons:

- Some deepwater crabs caught in the exploratory target fishery will likely be too small to market and operators would prefer to return these small crabs to sea and maximise the value of targeted catch.
- Deepwater crabs caught incidentally in the squid and scampi fisheries are generally unmarketable, and under the status quo operators must retain, land, and balance this low value catch with annual catch entitlement (ACE).

MFish notes that information is limited on the survivability of crabs discarded after capture in fishing gear. Stocks currently listed on the Sixth Schedule, with the exception of dredge oysters, spiny dogfish and scallops, may be returned to sea only if they are likely to survive. Available research suggests the survivability of crabs caught in pots may be good but survival rates for trawl-caught crab may be significantly lower.

Based on this information MFish considers the addition of pot-caught deepwater crabs to the Sixth Schedule is reasonable to maximise value from utilisation. Since it is unclear whether the majority of deepwater crabs caught in trawl nets are likely to survive MFish requires more information to determine whether it is appropriate to add trawl-caught deepwater crabs to the Sixth Schedule.

Adequacy statement

This Regulatory Impact Statement has been reviewed by the Ministry of Fisheries' Regulatory Impact Analysis Review Committee and is considered adequate according to the criteria agreed by Cabinet.

Status quo and problem

Commercial fishers must currently land and report all CHC, GSC, and KIC (deepwater crabs) taken and balance the catch with ACE or pay the deemed value.

The status quo is unlikely to constrain the harvest of deepwater crab stocks in the short term since the total allowable commercial catch (TACC) has not been fully harvested in any year since the stocks were introduced to the QMS in 2004. Information on deepwater crab stocks

is currently limited but the TACCs are set at levels considered sustainable. Stock sustainability issues should be examined in more depth if the target fishery develops and exploitation rates increase significantly.

From a management perspective, maintaining the status quo may be reasonable given MFish's concern over the survivability of deepwater crabs caught in the squid and scampi trawl fisheries, lack of a developed deepwater crab target fishery, and uncertainty regarding sustainability of the stocks.

The problem is that the status quo may be constraining utilisation in the fishery. For the exploratory target fishery using potting gear, fishers would prefer to return undersize or otherwise unmarketable crab to the sea since they have a low market value, so the industry request arises from an economic concern. Allowing operators to return unmarketable pot-caught crab that are alive and likely to survive to sea is not expected to increase the sustainability risk to deepwater crabs when compared to the status quo since reported commercial catch has been well below the TACC since 2004. Adding deepwater crabs caught with potting gear to the Sixth Schedule is appropriate since sustainability is not likely to be negatively impacted and the action does not appear to impact on any interconnected fisheries or the value derived by other fishery users.

The addition of deepwater crab stocks to the Sixth Schedule will offer operators targeting deepwater crabs with potting gear (Option 3) more flexibility and could enable more efficient utilisation of ACE.

MFish notes information is lacking on the survivability of deepwater crabs caught incidentally in the squid and scampi fisheries and requests more information prior to the addition of trawl-caught deepwater crabs to the Sixth Schedule (Option 2).

Objectives

The National Fisheries Outcome is *“the value New Zealanders obtain through the sustainable use of fisheries resources and protection of the aquatic environment is maximised”*.

Alternative options

Option 2 amends Schedule Six of the Act to enable fishers to legally return deepwater crabs caught in all legal commercial fishing gear to the sea if the crabs are likely to survive after release. Option 2 results in an unknown level of risk to the sustainability of deepwater crab stocks but the risk is likely low given that current reported catch levels are well below the TACC for all stocks. The addition of deepwater crabs stocks to the Sixth Schedule will offer industry more flexibility and could enable more efficient vessel operations and utilisation of ACE.

The survivability of trawl-caught crab is unknown, but could be significantly lower, than pot-caught crab. Option 2 is not the preferred option because the percentage of trawl-caught crab likely to survive if returned to the sea may be low thus is it unclear if this poses a risk to the sustainability of deepwater crab stocks.

MFish is unable to quantify the benefits to operators from adding deepwater crabs to the Sixth Schedule since no export or market prices currently exist for these species and ACE

trading information is not available. With Option 2, however, all operators catching deepwater crabs will derive economic benefits from returning unmarketable crab to sea since they will be able to lower costs by discarding, rather than storing, unmarketable crabs and can maximise the value of the crabs that are landed.

Option 2 introduces a compliance difficulty since MFish currently has no information to assess whether a damaged crab is likely to survive after return to sea. It is also unclear whether fishers can effectively determine crab survivability after capture. Additional information is needed for MFish to determine when damaged crabs are likely to survive. The likely to survive rule is difficult to enforce and it is expected operators would choose to discard crabs if there is an economic incentive to do so, regardless of the crab's condition.

Preferred option

Option 3 is the preferred option. Option 3 amends Schedule Six of the Act to enable fisheries to legally return deepwater crabs to the sea if the crabs were caught using potting gear and are alive and likely to survive after release. As discussed previously, MFish considers allowing pot-caught crabs to be returned to the sea is reasonable since the survival rate of crabs caught in potting gear is believed to be fairly high.

Option 3 reduces the economic benefits to operators from adding deepwater crabs to the Sixth Schedule since it limits the return to sea exemption to fishers using potting gear. MFish notes that maximising the economic value from New Zealand's fisheries is an important management objective. MFish is unable to quantify the potential benefits to fishers since no export or market prices currently exist for these species and ACE trading information is not available.

Option 3 also assumes operators and fishery officers can identify crabs that are likely to survive upon release, which is subject to the same complications discussed for Option 2. Option 3 creates additional compliance complexity when compared to the status quo and Option 2, since it creates different crab retention requirements for different types of fishing gear within the same QMS stocks.

Implementation and review

It is proposed that Schedule Six of the Act be amended to include deepwater red crab (CHC), giant spider crab (GSC) and king crab (KIC) caught with potting gear that are likely to survive.

MFish will seek further information on the viability of adding trawl caught deepwater crabs to Schedule Six, through consultation.

Consultation

MFish carried out a consultation process in accordance with section 12 of the Act. That section requires the Minister to consult the persons and organisations considered by the Minister to be representative of those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned including Maori, recreational, commercial and environmental interests.

Once feedback from the above consultation has been reviewed and final advice drafted and considered by the Minister of Fisheries, MFish will also seek feedback from relevant government departments.