Ministry for Primary Industries
Manatū Ahu Matua

Setting of Management Measures Related to the introduction of Common Hagfish into the QMS or the deferral of QMS Introduction

Final Advice Paper

MPI Information Paper No: 2014/22

ISBN No: 978-0-478-43733-1 (online)
ISSN No: 2253-394X (online)

July 2014

New Zealand Government

Growing and Protecting New Zealand

Disclaimer

The information in this publication is not government policy. While every effort has been made to ensure the information is accurate, the Ministry for Primary Industries does not accept any responsibility or liability for error of fact, omission, interpretation or opinion that may be present, nor for the consequences of any decisions based on this information. Any view or opinion expressed does not necessarily represent the view of the Ministry for Primary Industries.

Requests for further copies should be directed to:

Publications Logistics Officer
Ministry for Primary Industries
PO Box 2526
WELLINGTON 6140

Email: brand@mpi.govt.nz
Telephone: 0800 00 83 33
Facsimile: 04-894 0300

This publication is also available on the Ministry for Primary Industries website at http://www.mpi.govt.nz/news-resources/publications.aspx

Contents

Page

Executive Summary **1**

Key Considerations **3**
Need to act 3
Escape holes for Hagfish pots 4
Biological characteristics of Hagfish 4
Stock status 5

Relevant fishery information **5**
Commercial 5
Recreational and customary take 7
Other sources of fishing related mortality 7

Consultation **8**
Initial proposals 8

Summary of submissions **9**

Stakeholder views **10**

Final proposals **11**
TAC, TACC and allowances, or open access 11

Deemed value rates **13**

Analysis of Management Options **14**
TAC, TACC and allowances; or open access 14
Deemed value rates 18

Statutory Considerations **20**

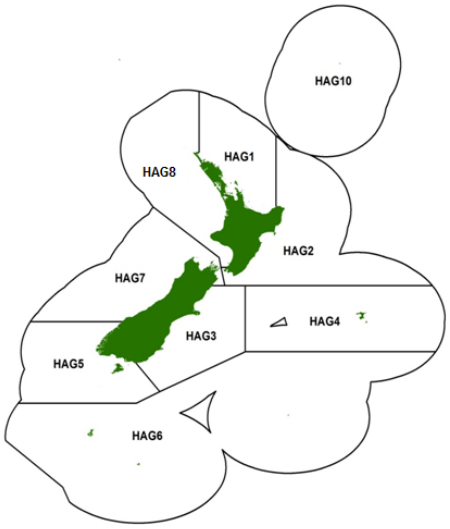
Conclusion **24**

Recommendations **25**
Option 1 25
Option 2 25
Option 3 26

Appendix One - Specific Concerns Raised in Submissions **29**

Setting of management measures related to the introduction of common hagfish into the QMS or the deferral of QMS introduction

Figure 1: Quota Management Areas for the common hagfish



Executive Summary

1. You agreed that the common hagfish (*Eptatretus cirrhatus;* also known as the slime-eel or Tuere) will enter the Quota Management System (QMS) on 1 October 2014, but have yet to implement this decision by signing a notice for the *Gazette*. Quota Management Areas for common hagfish stocks are shown in Figure 1.

2. If you agree to proceed with introduction of common hagfish into the QMS, you are required to set Total Allowable Catches (TACs), Total Allowable Commercial Catches (TACCs), associated allowances, deemed value rates, and make consequential amendments to the Fisheries (Reporting) Regulations 2001 to include hagfish stock codes. MPI also proposes that you decide to include hagfish on Schedule 6 of the Fisheries Act 1996 (the Act), if you consider hagfish can be released alive in certain circumstances.

3. An Initial Position Paper (IPP), released to stakeholders on 26 May 2014, contained proposals regarding the setting of TACs, TACCs, associated allowances, deemed value rates, and the possibility of including hagfish on Schedule 6 to the Fisheries Act 1996 (the Act) to allow for the live release of unwanted hagfish that are likely to survive back to the water.

4. MPI received 72 submissions.

5. The majority of submissions received (64) were from fishing permit holders, the crews of the fishing vessels involved with hagfish fishing, and their supporters. Of these, 48 were form submissions of different versions. ('Form submission' is a term used to describe identical submissions that are signed and submitted by different people.). These 64 submitters opposed both options for TACs presented in the IPP on the basis that they would not be economically viable

and would put their companies out of business. Many asked you to revisit your decision to introduce common hagfish into the QMS.

6. Eight submissions were received from the fishing industry, Te Ohu Kaimoana, iwi, and environmental groups. These submitters supported the decision to introduce common hagfish into the QMS, and supported one of the two options for setting TACs proposed in the IPP.

7. This Final Advice Paper (FAP) provides you with three options. Options 1 and 2 recommend that common hagfish is introduced into the QMS, and propose two separate options for setting TACs, TACCs, and associated allowances. Option 1 provides a more cautious approach to setting TACs than Option 2.

8. Option 3 is to delay introduction of common hagfish into the QMS. Your previous decision to introduce common hagfish has not yet been published in the *Gazette*, and therefore has not taken legal effect. Given strong concerns raised by submitters about the economic viability of the fishery once introduced into the QMS, MPI considers that there is merit in working with stakeholders to discuss the future management framework before introduction.

9. MPI notes that there are sustainability risks associated with the hagfish fishery and delaying QMS introduction. However, these risks can be managed over the short term by increased monitoring and the setting of section 11 catch limits, if required. Given opportunity for increased monitoring and the ability to introduce catch limits under section 11 of the Act, MPI considers that open access can better provide for utilisation, while ensuring sustainability over the short to medium term.

10. However, MPI considers that common hagfish remains a strong candidate for introduction into the QMS. The fishery for this species has strong development potential, and the species biology means there is a risk of overfishing. MPI will provide you with further advice following discussion with stakeholders

11. Additionally, you have previously made a decision to introduce a requirement for a minimum of 100 escape holes each with a minimum diameter of 18 mm for hagfish pots. To implement that decision, you need to sign the attached *Gazette* notice. Escape holes will help to ensure sustainability of common hagfish stocks regardless of any decision on TACs or introduction of the species into the QMS.

Key Considerations

NEED TO ACT

12. A target fishery for common hagfish has existed on and off in New Zealand waters since 2006. Recently, there has been renewed interest in the utilisation of this fishery. MPI expects fishing pressure to increase over the next year for a developing export market to Korea.

13. Currently, there are no estimates available for biomass, sustainable yield, or of stock status for any hagfish stock. Stocks were considered to be near virgin biomass prior to the development of a target fishery in 2006. Now some stocks, predominantly HAG1, HAG2, and HAG7 have been subject to a target fishery for the past seven years.

14. Hagfish fisheries around the world have historically been unsustainable. Some have a history of overexploitation followed by fishery collapse. Recommended best practice in overseas fisheries suggests management systems for hagfish that cap effort or catches, and protect juveniles.

15. The common hagfish is considered to be a slow growing, low productivity species with some experts assessing them less productive than sharks. It has no known migration or larval phase. Because of its biology, common hagfish in New Zealand waters is likely to be vulnerable to localised depletion whereby fishing effort targets areas of high initial density until low returns are reached, and then moves to the next area of abundance. Additionally, reported catch data indicates that a high proportion of catch is unwanted and returned to the water, with unknown consequences for survival.

16. You previously agreed to make common hagfish subject to the QMS on and from 1 October 2014, based on an analysis that concluded that open access outside the QMS could no longer provide for utilisation or ensure sustainability. You also decided to set nine Quota Management Areas for hagfish stocks (Figure 1).

17. If you continue with your decision to introduce common hagfish into the QMS, you are required to make consequential decisions on setting TACs, TACCs, and allowances for all hagfish stocks, prior to 1 October 2014. Additionally, you are required to set appropriate deemed value rates, and make a decision on whether or not to include common hagfish on Schedule 6 to the Act. Finally, the Fisheries (Reporting) Regulations 2001 must consequentially be amended to include common hagfish stock codes. MPI recently consulted on these management measures. This FAP outlines the submissions and factors for your consideration in making these decisions.

18. Alternatively, given concerns raised in submissions surrounding the economic viability of the fishery once QMS introduction occurs, you may wish to

reconsider the introduction of common hagfish into the QMS. MPI considers that sustainability risks associated with delaying introduction can be managed by increased monitoring and the ability to set catch limits under section 11 of the Act, if required. Given the strong concerns raised by submitters, the opportunity for increased monitoring, and the ability to set section 11 catch limits to ensure sustainability, MPI considers that the open access framework can better provide for utilisation, while ensuring sustainability over the short term to medium term.

ESCAPE HOLES FOR HAGFISH POTS

19. MPI requests that you sign the attached *Gazette* notice to implement a requirement for escape holes in hagfish pots. You have previously made a decision to require a minimum of 100 escapes each with a diameter of at least 18 mm in each hagfish pot. The attached *Gazette* notice will implement this decision, and help to ensure sustainability of common hagfish stocks. This is independent of your decisions on this FAP, and MPI considers this action to be important regardless of your decision on this FAP.

BIOLOGICAL CHARACTERISTICS OF HAGFISH

20. The hagfish, *Eptatretus cirrhatus*, is a common bottom-dwelling marine fish found throughout New Zealand coastal shelf waters. Generically hagfish are sometimes known as slime-eel or snot-eel, due to their eel like shape and ability to produce copious amounts of slime as a defence mechanism when stressed. The common hagfish inhabits a depth range from as shallow as 1 m to a depth of 900 m, but is most common between 90 m and 700 m. Populations of hagfish can be highly abundant, but are often highly localised too; therefore, abundance is expected to be patchy.

21. The hagfish is a low productivity species, and it is thought to be very slow growing and have low resilience to fishing. One study showed that females spawned first at a length of between 412 mm and 534 mm, whereas males developed later than females. Many individuals were not considered to be maturing until a size of 585 mm.[1] It is not known where or when the hagfish reproduces, but there is no evidence to suggest that reproduction is seasonal.[1]

22. Evidence from species overseas indicates that hagfish can take up to 2 or 3 years after maturing to produce between 6 and 80 eggs, depending on the species, but frequency of reproduction is not known. Development of the embryo is also slow, taking up to 7 months for early stages of embryonic development in some species, though MPI has no information on embryonic development for the common hagfish in New Zealand.

1 Martini, F. H., Beulig, A. 2013. Morphometrics and gonadal development of the hagfish *Eptatretus cirrhatus* in New Zealand. *PLOS ONE*. Volume 8. Issue 11. E78740

23. Information collected from discussions with stakeholders suggests that the hagfish may have developed differing tolerances to environmental factors (for example, salinity or temperature) throughout its geographic range. As such, hagfish may respond to fishing pressure differently between the east coast and west coast of the North Island due to these potential differences in environmental tolerances. This has led fishers to suggest that there are multiple species similar to the hagfish throughout coastal New Zealand; however, MPI currently has no scientific evidence to test this suggestion.

STOCK STATUS

24. The stock structure of hagfish is unknown. There are no estimates of absolute or relative abundance of hagfish, and the level of natural mortality is unknown. There is insufficient scientific information available to calculate estimates of current biomass, maximum sustainable yield, or the biomass that can support the maximum sustainable yield.

25. The only available information on stock status for hagfish is trends in catch, limited catch per unit effort (CPUE) analyses, and the performance of hagfish fisheries overseas. Trends in catch are sometimes used as a proxy for biomass in the absence of better information; however, they offer no indication of the amount of effort that was made to achieve those levels of catch, or the level of catch that will be sustainable over the long-term, particularly for long-lived species.

26. CPUE analyses account for fishing effort, but preliminary analyses for the hagfish fishery have been largely inconclusive and highlight that there is high uncertainty as to whether or not past levels of catch are sustainable. This information will require further scrutiny and need to be re-analysed in greater detail.

Relevant fishery information

COMMERCIAL

27. Common hagfish has been targeted since 2006. Catch records indicate a sharp decrease in landings after 2009/10 (Figure 2); however, MPI is aware that this was primarily due to the withdrawal of a purpose built hagfish vessel from New Zealand waters after the company that was responsible for the vessel went out of business.

Figure 2: Total reported landed and discarded catch in tonnes greenweight for hagfish from the 2002/03 fishing year up to the 2012/13 fishing year

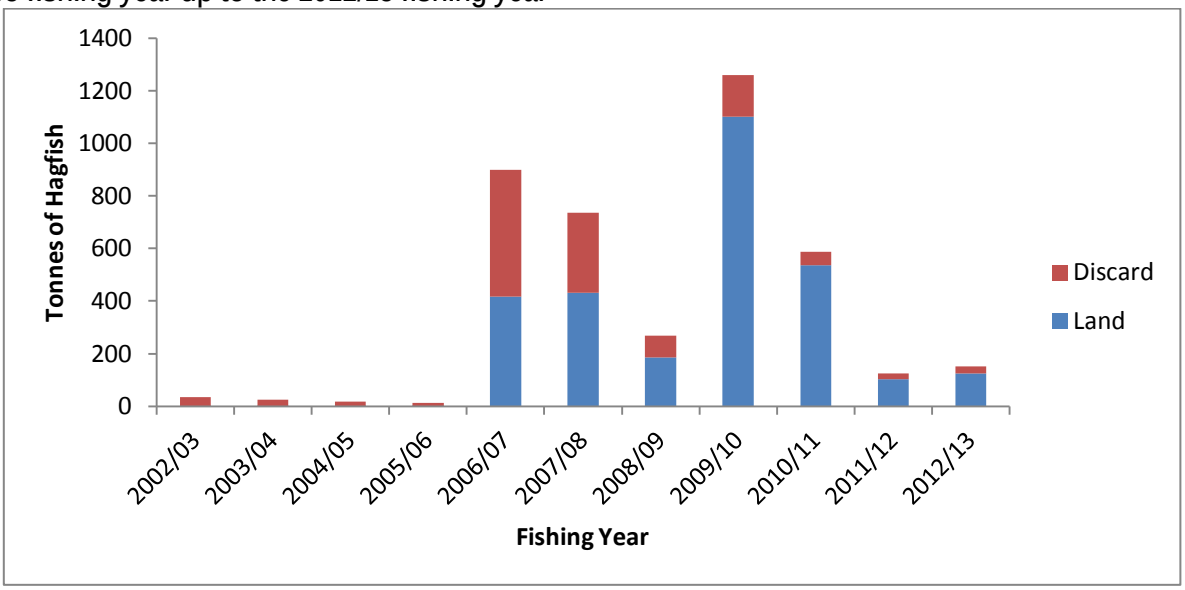
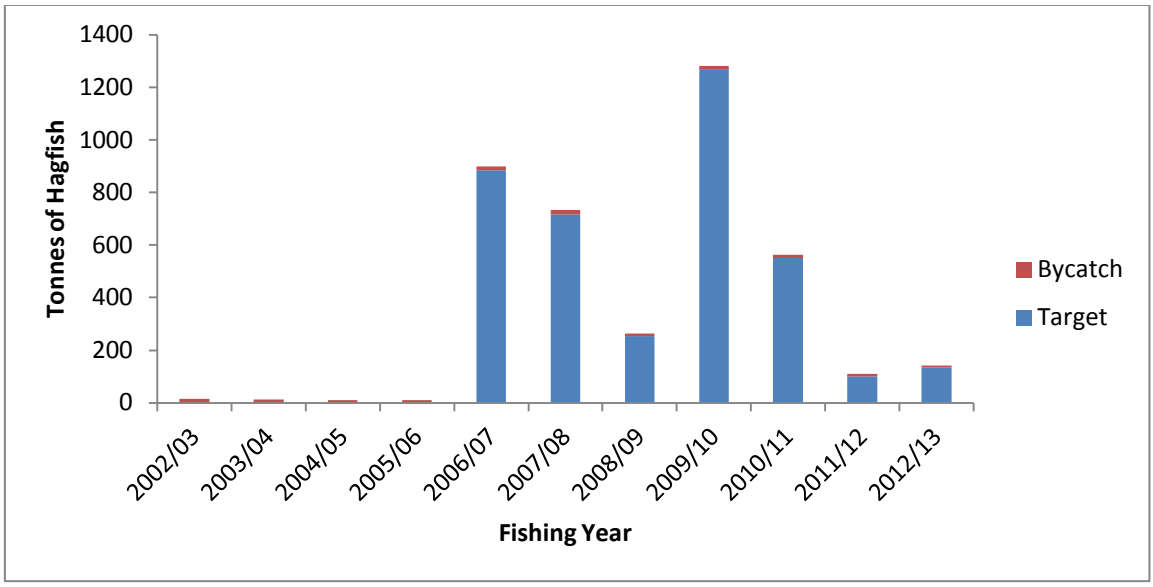


Figure 3: Total reported targeted catch for hagfish and bycatch of hagfish (including landings and discards) from the 2002/03 fishing year to the 2012/13 fishing year



28. The fishery is driven by an export market to Korea. The hagfish is sold as meat, which is considered a delicacy and believed to hold aphrodisiac properties. Hagfish is exported as either a frozen product with a port price of $3.00-3.50 per kg or as a live product with a port price of $12.00 per kg. The availability of flights currently restricts live exports of hagfish to those sourced only from the North Island.

29. Hagfish are targeted with non-biodegradable plastic pots up to 230 litres in size. Typically up to 100 pots are set on a line with several lines deployed at a time. At the peak of hagfish fishing in the 2009/10 fishing year, gear conflicts were reported with other fishing methods. MPI is aware that there have been more recent gear conflicts.

30. Other than the potential for pots to become tangled with other fishers' gear, an additional negative consequence of losing hagfish pots is the potential for ghost fishing. Ghost fishing occurs when lost fishing gear continues to trap individuals, driving up levels of unobserved mortality.

31. Hagfish pots typically have up to five entrance holes, and hundreds of "escape" holes, which primarily function to help the pots sink. Reported commercial catches and observer information suggests that a large amount of hagfish is returned to the water from pots. This is driven by a market preference for fish larger than 400 g, or roughly 550 mm, and a high level of catch of smaller individuals.

32. Hagfish have primarily been reported taken in waters off the East Coast North Island and West Coast of the South Island (Fisheries Management Areas (FMAs) 1, 2, and 7). Low levels of catch have been reported for FMAs 3, 4, 5, 6, 8, and 9. However, MPI is also aware that there has been area misreporting in this fishery, with some fishers reporting the FMA that they are landing hagfish in, and not the FMA that the hagfish were caught in. As a result, MPI does not know whether or not the reported landings by FMA are reliable. MPI is aware of plans by industry to increase fishing effort off the east coast of the South Island (FMA3).

33. International fisheries for hagfish have typically followed a boom and bust pattern, and hagfish species appear vulnerable to overfishing and depletion. Many fisheries of a similar magnitude to the peak of the New Zealand hagfish fishery have collapsed or declined.

RECREATIONAL AND CUSTOMARY TAKE

34. MPI is aware that there is local customary take around the country for hagfish. Hagfish is not a reported catch in the NZ recreational marine fishing survey 2011-12, but anecdotal information from stakeholders suggests that there may be small levels of recreational take in some parts of the country. Hagfish is not subject to a recreational daily bag limit or a minimum legal size.

OTHER SOURCES OF FISHING RELATED MORTALITY

35. The reported level of hagfish taken as bycatch in target fisheries other than the hagfish fishery is relatively low at about 10% of the overall catch, but this number may be much higher. Information from fishers suggests that hagfish taken as bycatch in other target fisheries is unwanted and typically returned to the water. A high level of discarding has been reported to date; however, unreported fishing-related mortality of unwanted and unmarketable hagfish is also likely to be occurring. Likewise, a small amount of other sources of fishing related mortality of hagfish might be attributed to recreational fishers.

Consultation

36. Decisions on the proposed TACs, sector allowances, and deemed value rates for common hagfish stocks are made under sections 13, 20, and 75 of the Act. Therefore, the consultation requirements of sections 12 and 75A apply.

37. The Ministry followed its standard consultation process for IPPs; this involved posting all IPPs on the Ministry website and alerting stakeholders to this through a letter sent to approximately 200 companies, organisations and individuals. The IPP was released for 4 weeks of public consultation beginning on the 26th of May 2014. Stakeholders were told that hagfish would enter the QMS on 1 October 2014.

38. Feedback was sought from tangata whenua, stakeholders, the fishing industry, and other interested parties on TACs, TACCs, associated allowances, and deemed value rates for hagfish stocks. It also requested stakeholder views on the possibility of including hagfish on Schedule 6 to the Act.

INITIAL PROPOSALS

39. MPI consulted on the following options for TACs, TACCs, and allowances (Table 1), and deemed value rates (Table 2) in the IPP.

Table 1: Proposed TACs, TACCs, sector allowances, and other sources of fishing-related mortality for common hagfish stocks as proposed in the IPP

				Allowances		
Option	**Stock**	**TAC (t)**	**TACC (t)**	**Customary Māori (t)**	**Recreational (t)**	**Other sources of fishing related mortality (t)**
Option 1	HAG1	*112*	*100*	*1*	*1*	*10*
	HAG2	*112*	*100*	*1*	*1*	*10*
	HAG3	*112*	*100*	*1*	*1*	*10*
	HAG4	*112*	*100*	*1*	*1*	*10*
	HAG5	*112*	*100*	*1*	*1*	*10*
	HAG6	*13*	*10*	*1*	*1*	*1*
	HAG7	*167*	*150*	*1*	*1*	*15*
	HAG8	*112*	*100*	*1*	*1*	*10*
	HAG10	*13*	*10*	*1*	*1*	*1*
Option 2 (MPI preferred option)	HAG1	*112*	*100*	*1*	*1*	*10*
	HAG2	*57*	*50*	*1*	*1*	*5*
	HAG3	*57*	*50*	*1*	*1*	*5*
	HAG4	*57*	*50*	*1*	*1*	*5*
	HAG5	*57*	*50*	*1*	*1*	*5*
	HAG6	*13*	*10*	*1*	*1*	*1*
	HAG7	*112*	*100*	*1*	*1*	*10*
	HAG8	*57*	*50*	*1*	*1*	*5*
	HAG10	*13*	*10*	*1*	*1*	*1*

Table 2: Proposed deemed value rates for common hagfish stocks as outlined in the IPP

Option	Stock	Annual Price ($/kg)	Interim Price ($/kg)
Option 1	All stocks	3.00	2.70
Option 2	All stocks	12.00	10.80
Option 3 (MPI preferred option)	HAG 1, 2	12.00	10.80
	HAG 3, 4, 5, 6, 7, 8, 10	3.00	2.70

Summary of submissions

40. MPI received 72 submissions on the above TACs, TACCs, allowances and other management measures for hagfish. Submissions were received from the commercial fishing industry (4); Te Ohu Kaimoana; Chatham Islands Bluenose Project Team, environmental groups (2); fishing permit holders, skippers, and crew associated with hagfish fishing in New Zealand, as well as a number of their supporters (16), and a number of form submissions in two versions (48). ('Form submission' is a term used to describe submissions that are identical to one another but signed and submitted by different people.) A tabular summary of submission is provided in Table 3, and an analysis of the submissions is contained in the following sections. Copies of all submissions are attached in full for your reference.

Table 3: Summary of Submissions Received

Submitter	Introduction to QMS	Preferred Option for Catch Limits	Schedule 6	Comments
Environmental group submissions (n = 2)				
Our Seas Our Future	Yes	Not in this FAP (Option 2 from IPP)	Yes	
Environment and Conservation Organisation	Yes	Not in this FAP (Option 2 from IPP)	Yes	
Industry submissions in support (n =4)				
Deepwater Group	Yes	Option 1	Yes	
Fisheries Inshore New Zealand (FINZ)	Yes	Not specific	Yes	
Sanford Ltd	Yes	Option 1	Yes	
Southern Inshore Fisheries Management Ltd	Yes	Option 1	Yes	Set HAG5 as per IPP Option 2
Other submissions in support (n =2)				
Te Ohu Kaimoana	Yes	Option 1	Yes	
Chatham Islands BNS3 Project Team, representing Chatham Islands Enterprise Trust and others	Yes	Option 1	Yes	
Individual submissions (n =16)				
Chris Ludeke	No	No		
Jock McPhail	No	No		
Yakin Fisheries Co.	No	No		
Eureka Fishing	No	No		
Reg Stephens	No	No		
Kim Hyunae	No	No		
June Park	No	No		
J A & E M McLintock	No	No		
Eric Hikawai (submission identical to below)	No	No		
Craig Davidson (submission identical to above)	No	No		
Eric London	No	No		
Richard Clark	No	No		
Trevor Lynch	No	No		
Gary London	No	No		
Brian Currie	No	No		
Da Young Joon	No	No		
Form submissions (n=48)				
All versions	No	No		

Stakeholder views

41. Sanford Ltd., Fisheries Inshore New Zealand, Southern Inshore Fisheries, Te Ohu Kaimoana, Deepwater Group, Chatham Islands BNS3 Project Team, Environment and Conservation Organisation, and Our Seas Our Future, support the introduction of common hagfish into the QMS on the basis that hagfish is an emerging and growing fishery, and the setting of TACs will ensure stocks are

managed sustainably. These organisations expressed support for either Option 1 or Option 2 from the IPP (Table 1). Option 1 from the IPP matches Option 1 as it is presented in this FAP. Option 2 in the IPP proposed lower TACs than Option 1 (Table 1).

42. All other submissions opposed Options 1 and 2 in the IPP. Of these, 14 were original, 48 were signed form submissions (defined previously under 'Summary of Submissions') in different versions, and two were identical, but differed from other form submissions. These submissions assert that the TAC options proposed will render the fishery economically unviable, to the detriment of a valuable export based industry, and putting their companies out of business. They submit that there is inadequate information available to justify the proposed catch limits, and dispute the need to introduce hagfish stocks into the QMS, asking you to revisit your decision.

43. MPI proposes three options in this FAP. These options reflect concerns raised in the submissions received. Specific points raised in submissions and the MPI responses are outlined in Appendix One (Specific Concerns Raised in Submissions).

Final proposals

TAC, TACC AND ALLOWANCES, OR OPEN ACCESS

44. Some of the final proposals have changed from the IPP. This reflects a shift to options that provide greater weight to utilisation, as the previous options were seen to be potentially restrictive of utilisation. The revised options differ from one another in the balance they achieve between utilisation and sustainability. The final proposals are set out in Table 4.

45. Option 1 remains as proposed in the IPP. It is the most cautious option proposed in this FAP, and was the least cautious option proposed in the IPP. It proposes a combined TAC of 865 tonnes, and is based on average landings over the past seven years for only the key fishstocks (those that have been fished most heavily).

46. Option 2 in this FAP differs from Option 2 in the IPP that was released for consultation. It provides for slightly higher TACs than Option 1, with a combined TAC of 1285 tonnes. In the absence of a reliable estimate of sustainable yield, TACs proposed under Option 2 have been based on the average of the two years showing the highest reported landings out of the past seven years.

47. Option 3 is to not introduce the common hagfish into the QMS at this time. Under this option, no decisions are required on TACs, TACCs, or allowances. The *status quo* would still apply (the common hagfish fishery will remain an open access fishery).

48. If you decide to progress QMS introduction, section 13 of the Act represents the default management approach that applies when setting a TAC for a QMS stock. Section 13(2) requires an understanding of B_{MSY} (the biomass that can produce maximum sustainable yield). The current statuses of the common hagfish stocks in relation to B_{MSY} are not known and are unable to be reliably estimated using best available information. However, Section 13(2A) enables you to set a TAC under section 13 where the current biomass of a stock and the biomass that produce a maximum sustainable yield are not able to be estimated reliably.

49. Section 13(2A) says for the purposes of setting a total allowable catch under this section, if you consider that the current level of the stock that can produce the maximum sustainable yield is not able to be estimated reliably using the best available information, you must –
    a) not use the absence of, or any uncertainty in, that information as a reason for postponing or failing to set a total allowable catch for the stock; and
    b) have regard to the interdependence of stocks, the biological characteristics of the stock, and any environmental conditions affecting the stocks; and
    c) set a total allowable catch –
        (i) using the best available information; and
        (ii) that is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield.

50. In setting a TAC under this section, you must have regard to such social, cultural, and economic factors that you consider are relevant. Statutory obligations in respect of TAC setting and allocations are set out and discussed later in this paper under the section for “Statutory Considerations”.

51. The TAC must be apportioned between the relevant sectors and interests set out under the provisions of section 21 of the Act. Section 21 prescribes that in setting a TACC you shall allow for Maori customary non-commercial interests, recreational fishing interests, and for all other sources of fishing-related mortality.

52. The Act does not provide an explicit statutory mechanism to apportion available catch between sector groups either in terms of a quantitative measure or prioritisation of allocation. Accordingly, you have the discretion to make allowances for various sectors based on the best available information.

Table 4: Proposed TACs, TACCs, sector allowances, and other sources of fishing related mortality for common hagfish stocks

				Allowances		
Option	**Stock**	**TAC (t)**	**TACC (t)**	**Customary Māori (t)**	**Recreational (t)**	**Other sources of fishing related mortality (t)**
Option 1	HAG1	*112*	*100*	*1*	*1*	*10*
	HAG2	*112*	*100*	*1*	*1*	*10*
	HAG3	*112*	*100*	*1*	*1*	*10*
	HAG4	*112*	*100*	*1*	*1*	*10*
	HAG5	*112*	*100*	*1*	*1*	*10*
	HAG6	*13*	*10*	*1*	*1*	*1*
	HAG7	*167*	*150*	*1*	*1*	*15*
	HAG8	*112*	*100*	*1*	*1*	*10*
	HAG10	*13*	*10*	*1*	*1*	*1*
Option 2	HAG1	*167*	*150*	*1*	*1*	*15*
	HAG2	*167*	*150*	*1*	*1*	*15*
	HAG3	*167*	*150*	*1*	*1*	*15*
	HAG4	*167*	*150*	*1*	*1*	*15*
	HAG5	*167*	*150*	*1*	*1*	*15*
	HAG6	*13*	*10*	*1*	*1*	*1*
	HAG7	*257*	*225*	*1*	*1*	*30*
	HAG8	*167*	*150*	*1*	*1*	*15*
	HAG10	*13*	*10*	*1*	*1*	*2*
Option 3	Introduction into the QMS is deferred and open access to the fishery is retained. MPI will continue to closely monitor the fishery and any new information that becomes available to ensure that the management framework is able to provide for utilisation and ensure sustainability.					

Deemed value rates

53. Under Options 1 and 2 of this FAP, deemed value rates need to be set. MPI consulted on three proposals for the setting of deemed value rates in the IPP that was released for consultation. Two final proposals are included in this FAP (Table 5). MPI's preferred option is Option A. Under Option A, all landed hagfish are treated as being landed at the lower end of their value spectrum (landed frozen). Annual and interim deemed value rates would be uniform across all QMAs and provide the most minimal costs to fishers of each of the three options.

Table 5: Final proposals for deemed value rates for common hagfish stocks

Option	**Stock**	**Annual Price ($/kg)**	**Interim Price ($/kg)**
Option A (MPI preferred option)	All stocks	3.00	2.70
Option B	HAG 1, 2	12.00	10.80
	HAG 3, 4, 5, 6, 7, 8, 10	3.00	2.70

Schedule 6

54. MPI proposes that you agree to add common hagfish to Schedule 6 of the Act, should you choose Option 1 or 2 of this FAP. All submissions relating to Schedule 6 support the addition of hagfish to Schedule 6.

Analysis of Management Options

TAC, TACC AND ALLOWANCES; OR OPEN ACCESS

Option 1

55. Option 1 is to progress introduction of common hagfish into the QMS with a combined TAC of 865 tonnes. The primary benefit to utilisation of QMS introduction is the allocation of long term rights of access. This provides a solid basis for investment. However, rights have no value if the fishery is not sustainable. Therefore, Option 1 is the most cautious option for setting TACs presented in this FAP. In the context of uncertainty associated with sustainable harvest levels for hagfish, this option provides the least risk of overfishing as it allows the least yield. Conversely, it also provides the lowest level of utilisation.

56. Under section 13(2A) of the Act, you are required to set a TAC that is not inconsistent with the objective of maintaining a stock at or above, or moving a stock towards or above, a level that can produce the maximum sustainable yield.

57. Common hagfish has been targeted in FMAs 1, 2, and 7 since 2006. The statuses of these stocks relative to the level that can produce maximum sustainable yield are not known. The common hagfish fishery is thought to be in the ‘fishing down’ phase in HAG 3, 4, 5, 6, and 8. This means that the populations are expected to be near virgin biomass in these locations.

58. In the absence of estimates of the biomass that can produce maximum sustainable yield, and with the knowledge that hagfish are biologically vulnerable to overfishing due to slow growth and low productivity, there is risk in the ‘fishing down’ phase of fishing past the level that can produce maximum sustainable yield. This may have already occurred in some locations where there has been targeted fishing pressure since 2006.

59. This risk is heightened due to the fact that there is a delay between fishing effort, and when MPI officials receive catch information and are able to analyse this information for catch per unit effort, or other proxies that may used to monitor for overfishing.

60. Fishing the hagfish population down past the level that can produce maximum sustainable yield will lead to population depletion, and require even lower TACs coupled with a rebuild plan for the fishery. This reduces economic opportunities for fishers, and threatens sustainability of the fishery.

61. Cautious initial catch limits reduce the risk of fishing a population past the level that can produce maximum sustainable yield. Given past fishing pressure, it is not clear if the proposed TACs are cautious enough for HAG 1, 2, and 7 to ensure that the populations will not be fished past the level that can produce maximum sustainable yield. To mitigate potential sustainability concerns, MPI may require research be commissioned to support ongoing assessment of the sustainability of the TACs, especially if there is a desire to increase catch limits in the future.

62. MPI considers that a research program is most effectively implemented under the QMS as it provides a pool of quota owners with long term access rights to the fishery, and therefore a long term view to its utilisation and sustainability.

63. Many submissions assert that the TACs proposed under Option 1 are not economically viable for fishers, and will put hagfish fishing companies and vessels out of business. MPI notes that unsustainable harvesting poses an equally large risk to investment and long term viability. MPI has received conflicting information as to the economic viability of the common hagfish fishery. Other information from stakeholders suggests that it is unlikely the hagfish fishery will easily sustain multiple freezer vessels bulk fishing for the frozen trade, but that by developing live and frozen trade side by side, the fishery is likely to be both economically viable and biologically sustainable.

64. An additional point raised in submissions that is particularly relevant is the assertion that there are many more hagfish available to be taken than is allowed for under the proposed TACs. While the biomass may appear to be high, it is important to consider that the long term sustainable yield from a species with slow growth and low fecundity, like hagfish, is always a small proportion of the biomass present. Hagfish are also known to form highly abundant localised populations. These areas of high abundance can be expected to be patchy, a pattern that has been recognised and relayed to MPI by fishers involved in the fishery, and may lead to unrealistic perceptions of the overall biomass of hagfish.

65. Fishing individual patches and moving to the next means, not only that abundance can seem higher than it is, but also that there is a high risk of serial localised depletion, which can threaten sustainability of stocks. Fishing down highly abundant patches before moving to the next is unlikely to be noticed in catch records received by MPI as posing a risk to the sustainability of the fishery, until the last highly abundant patch is fished and catch records begin to decline. At this point, the population will already be depleted past the level that can produce maximum sustainable yield. Given that hagfish are slow growing, slow to reproduce, and low productivity – population rebuild could take a considerable time, which will have considerable economic implications for those who have invested in the fishery. Again, MPI considers that cautious initial

TACs reduce the risk of overfishing due to serial localised depletion of populations.

66. Under section 13(2A) of the Act, you must have regard to the interdependence of stocks, biological characteristics of the stock, and any environmental conditions affecting the stock. As scavengers, hagfish are considered to play an important role in the turnover of organic matter on the seafloor. They are thought to be important predators also. It is unclear what impact removing large numbers of hagfish will have on the benthic marine ecosystem. MPI considers that cautious initial TACs will minimise any negative impacts relative to Options 2 and 3 while further information can be collected.

Option 2

67. MPI recognises that by setting TACs too low, utilisation and development can be stifled completely. This is neither preferable nor does it achieve the purposes of the Act – to provide for utilisation while ensuring sustainability – if higher TACs can be sustainably harvested.

68. Based on submitters concerns that Option 1 does not provide for utilisation, Option 2 allows for additional catch under higher proposed TACs. You may consider that Option 2 achieves a more acceptable balance between utilisation and sustainability.

69. The proposed increase to the TAC as proposed by Option 2 reflects only commercial catch levels in the strongest fished FMAs over two years only. MPI notes that averaging landings across two years with the highest reported landings does not necessarily indicate a level that will be sustainable over the long term, and is not a proxy for estimating the level of catch that will achieve maximum sustainable yield.

70. MPI considers that there is a risk of overfishing populations past the level that can produce maximum sustainable yield under Option 2. We will undertake careful monitoring of the fishery to manage this risk. MPI may require that research be commissioned to support ongoing analyses of the sustainability of the TACs, or increases to TACs in the future.

71. Option 2 may permit quota owners to invest more in adding value to the fishery than Option 1, as it allows for greater overall returns for fishers in the short term. This option provides for an additional aggregated 420 tonnes on top of what is proposed in Option 1. Based on the port prices for frozen hagfish available to MPI, 375 tonnes is equivalent to an increase of roughly $1,125,000 from Option 1.

Option 3

72. Option 3 is to defer a formal decision on QMS introduction at this time, and to retain hagfish as an open access fishery pending further consultation. Some

submitters have expressed strong concerns about the economic viability of the fishery once introduced into the QMS. Given the extent of these concerns, MPI considers that there is merit in working with stakeholders to discuss the future management framework before a final decision on introduction.

73. In considering Option 3, it is relevant to consider any new information that has come to light since your previous agreement to make common hagfish subject to the QMS. Your assessment was made following consideration of the statutory tests for QMS introduction set out under section 17B of the Act.

74. Section 17B says that you must make a determination under subsection 2 (to make a stock or species subject to the QMS) if satisfied that the current management of a stock or species:

    a) is not ensuring sustainability of the stock or species; or
    b) is not providing for the utilisation of the stock or species.

75. The previous final advice you received regarding QMS introduction concluded that open access to the fishery outside the QMS did not provide adequately for utilisation, or ensure sustainability

76. Utilisation and ensuring sustainability are defined in section 8 to the Act. Utilisation means conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural well-being. Ensuring sustainability means:

    a) maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and
    b) avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment.

77. The final advice regarding introduction of common hagfish into the QMS noted that an open access regime for hagfish is unlikely to provide adequately for utilisation of common hagfish stocks. This is because fishers are not afforded the protection of long term access rights to the fishery, and have no security over their investment. Development of the common hagfish fishery has been sporadic so far, with multiple fishers entering and leaving the fishery, and MPI considers that this may be a reflection of the lack of access rights afforded under the open access regime. Furthermore, by retaining open access there are increased risks to the sustainability of common hagfish stocks, which in turn risks the long term utilisation of the fishery.

78. Since developing this advice, MPI has received multiple submissions suggesting that introduction into the QMS will make utilisation uneconomic. MPI considers that the primary benefit of QMS introduction to utilisation is the creation of long term access rights to the fishery. MPI considers, however, that open access may better provide for utilisation over the short to medium term, as it allows MPI time to engage in discussions with interested parties (although noting that those parties may not be ongoing rights holders in the fishery) about

the development of the fishery and the future management framework before QMS introduction occurs.

79. However, as detailed elsewhere, the biology of this species makes them vulnerable to overfishing. There is also anecdotal information to indicate that fishing effort targeting hagfish is likely to increase in the near future. Yakin Fisheries Co. (a submitter) note on their website that demand for the New Zealand product is dramatically increasing, while the majority of submitters noted that the New Zealand product is superior to other products. As with the US and Canadian fisheries, fishing effort is expected also to increase dramatically while the fishery is open access. The capabilities and efficiency of vessels are improving as fishers develop more effective means of sorting and storing hagfish at sea, enhance their awareness of localised aggregations of hagfish, and continue to develop vessels to target product for the frozen trade only. Additionally, perceptions that common hagfish may be introduced into the QMS in the near future may inspire higher catches either to extract maximum value from the fishery before it is necessary to acquire quota or Annual Catch Entitlements, or because of a mistaken belief that increasing catches now will impact on quota allocation. MPI can mitigate this risk by explaining to fishers that higher catches now will not affect quota allocation.

80. While these factors highlight that there are real sustainability concerns for this fishery, MPI considers that sustainability risks associated with increased fishing effort and overfishing can be managed over the short to medium term by increased monitoring, and the ability to set sustainability measures under section 11 of the Act, if required. You can implement section 11 measures by notice in the *Gazette* at any time during the fishing year. Such measures can relate to the catch limit; the size sex, or biological state of any fish, aquatic life, or seaweed of any stock that may be taken; fishing method; and fishing season.

81. MPI considers that common hagfish remains a strong candidate for QMS introduction over the short to medium term, given the strong development potential and sustainability risks noted above. Under this option, MPI will provide further advice to you following further consultation with fishers.

DEEMED VALUE RATES

82. MPI proposes that you choose to set deemed value rates as outlined under Option A or B in Table 6 of this FAP, should you choose Option 1 or 2 relating to TACs. Option A is to set deemed value rates uniformly across QMAs based on the lowest estimated port price for hagfish (i.e. frozen product). Option B is to set higher deemed value rates in QMAs where hagfish are known to be primarily landed live, and lower deemed value rates in QMAs where hagfish are known to be primarily landed frozen. MPI's preferred option is Option A.

83. There is a considerable difference between estimated port price for different species state for common hagfish. The estimated port price for common hagfish landed frozen is $3.00 - $3.50 per kg, as opposed to $12.00 per kg for common

hagfish that is landed live. The Act provides for setting of deemed value rates by stock, and not species state.

Table 6: Final proposals for deemed value rates for common hagfish stocks

Option	Stock	Annual Price ($/kg)	Interim Price ($/kg)
Option A (MPI preferred option)	All stocks	3.00	2.70
Option B	HAG 1, 2	12.00	10.80
	HAG 3, 4, 5, 6, 7, 8, 10	3.00	2.70

84. Section 75(2)(a) of the Act says that you:

a) must take into account the need to provide an incentive for every commercial fisher to acquire or maintain sufficient annual catch entitlement in respect of each fishing year that is not less than the total catch of that stock taken by that commercial fisher;

b) may have regard to:
   (i) the desirability of commercial fishers landing catch for which they do not have annual catch entitlement; and
   (ii) the market value of the annual catch entitlement for the stock; and
   (iii) the market value of the stock; and
   (iv) the economic benefits obtained by the most efficient commercial fisher, licensed fish receiver, retailer, or any other person from the taking, processing, or sale of the fish, aquatic life, or seaweed, or of any other fish, aquatic life or seaweed that is commonly taken in association with the fish, aquatic life, or seaweed; and
   (v) the extent to which catch of that stock has exceeded or is likely to exceed the total allowable commercial catch for the stock in any year; and
   (vi) any other matters that the Minister considers relevant.

85. MPI considers that many fishers that take common hagfish take it as a bycatch, primarily in bottom trawl, bottom long line, and lobster potting fisheries (the target fishery is by potting only). Under the QMS, they will be required to land all bycatch of common hagfish (apart from individuals that may be released live under Schedule 6 to the Act, if you determine that hagfish should be included on Schedule 6). Setting high deemed values rates is unlikely to provide incentives for fishers to land undesirable take of common hagfish. Submitters raised concerns that setting high deemed values across all QMAs would be inappropriate considering the low value and low desirability of hagfish as a bycatch species.

86. Similarly, MPI considers that setting high deemed value rates based on the port price of live hagfish is not likely to provide incentives for fishers fishing for the frozen trade to land any hagfish they may catch in excess of their annual catch

entitlement. This may create a problem under Option B if fishers need to land frozen hagfish in QMAs 1 and 2 in excess of their annual catch entitlement.

87. There is a risk under Option A that fishers fishing for the live trade will have little incentive to fish within their annual catch entitlement, or to acquire annual catch entitlement rather than paying deemed values. This is because the market price for hagfish landed live is likely to be much higher than the deemed value rate, and will still provide economic benefits to the fisher regardless of paying deemed values. MPI considers this risk is low relative to the risk of fishers illegally discarding catch if deemed values are set too high, and further, that this risk can be managed by reviewing deemed value rates in the future if it is apparent that TACs are repeatedly overcaught. MPI expects the live trade to be a small portion of the overall fishery.

88. MPI considers that Option A will minimise overall costs to fishers, and may be most appropriate over the short term during the development stages of this fishery. This option is likely to be provide the best incentive to the majority of fishers to land their catch and balance it with annual catch entitlement.

Statutory Considerations

89. In evaluating the proposed management options for common hagfish stocks, the following statutory considerations have been taken into account:

a. **Section 5(a) and 5(b) –** Application of international obligations and Treaty of Waitangi (Fisheries Claims) Settlement Act 1992: There are a wide range of international obligations relating to fishing, including sustainability and utilisation of fishstocks and maintaining biodiversity. MPI considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options for common hagfish stocks. The options provide for customary take given information provided by stakeholders that there are nominal levels of take around the country. MPI welcomes and further information on customary take of hagfish.

b. **Section 8** sets out the purpose of the Act – to provide for utilisation of fisheries resources while ensuring sustainability. The proposed management options seek to ensure the sustainability of common hagfish stocks by setting TACs and other appropriate management measures, or by recommending catch limits and other pathways for ensuring sustainability given that catch records do not indicate an immediate concern. Utilisation is provided by way of setting allowances for commercial, customary Māori, and recreational interests, or by allowing development of the fishery and time for a management plan to be established. Section 8 requires that social, cultural, and economic effects be taken into account.

c. The development of commercial common hagfish fisheries within environmental limits will have positive economic implications throughout the country. The proposed management measures will provide a basis to develop long-term sustainable fisheries using the common hagfish resource. Under the proposed TACCs, rights holders will have an incentive to invest in and rationally develop these fisheries resources, along with opportunities for collective action to help identify and manage any adverse effects of fishing. Alternatively, Option 3 allows

for the further development of the fishery while management strategies are discussed with interested parties. As the fishery develops, the commercial sector will derive greater economic value over time.

d. The addition of common hagfish to Schedule 6 of the Act will reduce unnecessary waste within the fishery, allow management of bycatch to reduce industry costs, and enable the return of live hagfish to the water and their natural ecosystem.

e. **Section 9** requires the Minister to take into account the following environmental principles:
   i. **Section 9(a)** requires associated or dependent species to be maintained above a level that ensures their long-term viability;
   ii. **Section 9(b)** requires biological diversity of the aquatic environment to be maintained; and
   iii. **Section 9(c)** requires habitat of particular significance for fisheries management to be protected.

f. The common hagfish is thought to play an important role in the turn-over of organic matter on the seafloor, and potentially as an active predator also. It is unclear what impact removing hagfish will have on the benthic ecosystems of which they are a part. Setting catch limits at the proposed level will militate against any potential sustainability risks. MPI notes that the risk for localised depletion and associated impacts under each option could increase if the entire TAC is taken from a localised area, rather than spread out across the QMA. The development of a management strategy with stakeholders will reduce this sustainability risk. Option 3 holds higher environmental risks. These will be mitigated by setting of catch limits under section 11 of the Act.

g. **Section 10** says that all persons exercising or performing functions, duties, or powers under this Act, in relation to the utilisation of fisheries resources or ensuring sustainability, shall take into account the following information principles:
   i. decisions should be based on the best available information;
   ii. decision makers should consider any uncertainty in the information available in any case;
   iii. decision makes should be cautious when information is uncertain, unreliable, or inadequate;
   iv. the absence of or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of this Act.

h. In formulating the proposals in this IPP, MPI has relied on the best available information and outlined any uncertainties in the information in each case.

i. **Section 11** relates to the setting of sustainability measures.

j. **Section 11(1)** says that the Minister may, from time to time, set or vary any sustainability measure for 1 or more stocks or areas, after taking into account:
   i. Any effects of fishing on any stock and the aquatic environment. The proposals in this paper are not expected to impact negatively on any other stock.
   ii. Any existing controls under this Act that apply to the stock or area concerned. There are no existing controls for common hagfish stocks.
   iii. The natural variability of the stock concerned. MPI considers that the proposals in this paper account for natural variability of the stock

concerned over the short to medium-term. Under Option 1, low initial TACs will better safeguard against natural variability in the stock than Option 2.

k. **Section 11(2)** says that before setting or varying any sustainability measure under subsection (1), the Minister shall have regard to any provisions of:
    i. any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991;
    ii. and any management strategy or management plan under the Conservation Act 1987;
    iii. and sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 (for the Hauraki Gulf as defined in that Act) – that apply to the coastal marine area and are considered by the Minister to be relevant.

90. MPI considers that there are no regional policy statements, regional plans, or proposed regional plans under the Regional Management Act 1991 that MPI considers relevant to the hagfish fishery. Similarly, there are no management strategies or management plans under the Conservation Act 1987 that MPI considers relevant to the options presented in this paper. Hagfish are not relevant in sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000. There are no planning documents lodged by a customary marine title group under the Marine and Coastal (Takutai Moana) Act 2011 that involve hagfish. Therefore, MPI considers that there are no relevant provisions under section 11(2) that are relevant to the options presented in this paper.

a. **Section 11(2A)** says that before setting or varying any sustainability measure under this Part or making any decision or recommendation under this Act to regulate or control fishing, the Minister must take into account –
    i. Any conservation services or fisheries services, MPI considers that there are no conservation services or fisheries services in place for hagfish.
    ii. Any relevant fisheries plan approved under this Part. MPI intends to manage the target hagfish fishery as an inshore fisheries stock. In this case, it is included in the draft National Fisheries Plan for Inshore Finfish, which has not yet been approved under the Act.
    iii. Any decision not to require conservation services or fisheries services. No decisions not to require conservation services or fisheries services concern the hagfish fishery.

b. **Section 11(3)** says that without limiting the generality of subsection (1), sustainability measures may relate to – (a) the catch limit (including a commercial catch limit) for any stock, or in the case of a quota management stock that is subject to section 13 or section 14, any total allowable catch for that stock.

c. **Section 11(4)(a)** says that the Minister may:
    i. by notice in the *Gazette*, set or vary the catch limit (including the commercial catch limit) for any stock not within the quota management system;
    ii. implement any sustainability measures or the variation of any sustainability measures, as set or varied under subsection (1):
        i. by notice in the *Gazette*; or
        ii. by recommending the making of regulations under section 298

105. MPI will provide you further advice on setting a catch limit under this section should sustainability concerns arise while the species remains managed under the open access environment:

a) **Section 13** requires the Minister to set a TAC for every stock managed under the QMS. Section 13 requires the Minister to set a TAC that maintains the stock at, or above, a level that can produce the B_{MSY} having regard to the interdependence of stocks. Refer to the *Final Proposals* section of this paper for a discussion of section 13 considerations.

b) In respect to common hagfish stocks, the TAC for each stock will be set under section 13(2A). Section 13(2A) says that for the purposes of setting a total allowable catch under this section, if the Minister considers that the current level of the stock or the level of the stock that can produce the maximum sustainable yield is not able to be estimated reliably using the best available information, the Minister must –

    i. Not use the absence of, or any uncertainty in, that information as a reason for postponing or failing to set a total allowable catch for the stock. MPI considers that this has been taken into account in formulating the options in this paper.
    ii. Have regard to the interdependence of stocks, the biological characteristics of the stock, and any environmental condition affecting the stock. Consideration of these factors has been included throughout this initial paper (see *Environmental Impacts*).
    iii. Set a total allowable catch –
        i. using the best available information; and
        ii. that is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield.

106. Section 13(2A) requires you must set a TAC that is "not inconsistent" with the objective of maintaining the stock at or above, or moving the stock to a level at or above BMSY, in a way and rate considered appropriate for the stock. In doing so, you must have regard to the interdependence of stocks, the biological characteristics of the stock, and any environmental conditions affecting the stock, and set a TAC using the best available information. You must not use the absence of, or uncertainty in, the best available information as a reason for postponing or failing to take action necessary to achieve the purpose of the Act.

107. In considering the way in which and rate at which a stock is moved towards or above BMSY, you must have regard to such social, cultural, and economic factors that you consider relevant. There is no statutory guidance on what an appropriate 'way and rate' might be in any given case – it is a matter for you to determine having regard to social, cultural and economic factors. Relevant social, economic and cultural information is set out in the paper.

108. The TAC options presented in this FAP take into account the requirements of section 13, and offer differing approaches to managing the fishery that reflect the uncertainty in available information-see "Section 10-Information principles" below.

109. MPI considers that best available information regarding biological characteristics of the common hagfish, relevant fishery information, and all other information collected through past consultations has been used to formulate

proposals in this paper that are no inconsistent with the aforementioned objective.

a) **Section 21(1)(a and b)** and **section 21(4)(a and b)** require the Minister to allow for non-commercial fishing interests (customary Māori and recreational), and other sources of fishing-related mortality. These matters have been taken into account in the setting of the proposed TACCs.

b) **Section 21(4)** requires that when considering the proposed allowances for customary Māori interests, the Minister must take into account any mātaitai reserve or section 186A closure in the relevant QMA. MPI does not consider that the proposed allowances for customary harvest will detract from the intent of any existing or future mātaitai or section 186A closure, nor will these allowances be insufficient in terms of the customary use of common hagfish in these areas.

c) **Section 21(5)** requires that when considering the proposed allowances for recreational interests, the Minister must take into account any regulations that prohibit or restrict fishing under section 311 (area closures). MPI does not consider that the proposed allowances for recreational harvest will detract from the intent of any existing or future section 311 closures in the respective QMA.

d) **Section 75** provides for the Minister to set deemed values. Refer to the Analysis of Deemed Value Rates section in paragraphs 104 – 110 for a discussion of section 75 considerations.

Conclusion

110. This paper provides you with final advice on the proposed setting of Total Allowable Catch, Total Allowable Commercial Catch, associated allowances, deemed values, and the Schedule 6 rule for common hagfish stocks; and the alternative of deferring introduction of common hagfish into the Quota Management System.

111. On 16 May, you also made a decision to introduce a requirement for a minimum of 100 escape holes each with a minimum diameter of 18 mm for each hagfish pot. The decision followed a consultation process with fishers, and final advice from MPI. To implement that decision, you need to sign the attached *Gazette* notice. Implementing this decision will help ensure sustainability regardless of any decision on TACs or introduction of the species into the QMS.

Recommendations

112. MPI recommends that you sign the attached *Gazette* notice, and choose Option 1, Option 2, or Option 3 below. If you choose Option 1 or 2, also choose between Options A and B for deemed values, and choose whether or not to include common hagfish on Schedule 6 to the Act.

OPTION 1

a) **Agree** to set a TAC of 167 tonnes for HAG7 and within this set, for each stock:
   (i) A customary allowance of 1 tonne
   (ii) A recreational allowance of 1 tonne
   (iii) An allowance for other sources of fishing related mortality of 15 tonnes; and
   (iv) A TACC of 150 tonnes.

b) **Agree** to set a TAC of 112 tonnes for each of HAG1, 2, 3, 4, 5, and 8, and within this set, for each stock:
   (i) A customary allowance of 1 tonne
   (ii) A recreational allowance of 1 tonne
   (iii) An allowance for other sources of fishing related mortality of 10 tonnes; and
   (iv) A TACC of 100 tonnes.

c) **Agree** to set a TAC of 13 tonnes for HAG6 and 10, and within this set, for each stock:
   (i) A customary allowance of 1 tonne
   (ii) A recreational allowance of 1 tonne
   (iii) An allowance for other sources of fishing related mortality of 1 tonnes; and
   (iv) A TACC of 10 tonnes.

AGREED / NOT AGREED

OR

OPTION 2

a) **Agree** to set a TAC of 257 tonnes for HAG7 and within this set, for each stock:
   (i) A customary allowance of 1 tonne
   (ii) A recreational allowance of 1 tonne
   (iii) An allowance for other sources of fishing related mortality of 30 tonnes; and
   (iv) A TACC of 225 tonnes.

b) **Agree** to set a TAC of 167 tonnes for each of HAG1, 2, 3, 4, 5, and 8, and within this set, for each stock:

(i) A customary allowance of 1 tonne
(ii) A recreational allowance of 1 tonne
(iii) An allowance for other sources of fishing related mortality of 15 tonnes; and
(iv) A TACC of 150 tonnes.

c) **Agree** to set a TAC of 13 tonnes for HAG6 and 10, and within this set, for each stock:
(i) A customary allowance of 1 tonne
(ii) A recreational allowance of 1 tonne
(iii) An allowance for other sources of fishing related mortality of 1 tonnes; and
(iv) A TACC of 10 tonnes.

AGREED / NOT AGREED

OR

OPTION 3

a) **Agree** to defer making a decision on the introduction of common hagfish into the Quota Management System and direct MPI to undertake further consultation.

AGREED / NOT AGREED

and

If either options 1 or 2 are agreed

a) **Agree** to set the interim and annual deemed values for common hagfish using one of the two options outlined below:

i. Option A *(MPI preferred option)*
Annual deemed value of $3.00 per kg
AND
Interim deemed value of $2.70 per kg
Standard differential deemed value rates are used for common hagfish stocks, but no overfishing thresholds to be set at this time;

AGREED / NOT AGREED

OR

i. Option B

Annual deemed value of $12.00 per kg for HAG1 and 2, and $3.00 per kg for HAG3, 4, 5, 6, 7, and 8

AND

Interim deemed value of $10.80 per kg in HAG1 and 2, and $2.70 per kg for HAG3, 4, 5, 6, 7, and 8

Standard differential deemed value rates are used for common hagfish stocks, but no overfishing thresholds to be set at this time.

AGREED / NOT AGREED

b) **Agree** to add the common hagfish to the Sixth Schedule of the Fisheries Act 1996 (the Act);

AGREED / NOT AGREED

c) **Note** that the Fisheries (Reporting) Regulations 2001 will be amended to include common hagfish stock codes

NOTED

Scott Gallacher
Deputy Director-General
Regulation & Assurance
for Director-General

Hon Nathan Guy
Minister for Primary Industries

/ / 2014

Appendix One - Specific Concerns Raised in Submissions

1. June Park submits that commercial allocation to iwi will be in parcels too small to be viable and will remain forever uncaught.

2. In terms of allocation to Māori under the Treaty of Waitangi Settlement Act 1992, 20 percent of all new QMS species is allocated to iwi when hagfish is introduced into the system. These assets are used to the benefit of all Māori and are eventually allocated to individual iwi. Iwi will accommodate fishing for hagfish in accordance with fishing plans developed in consideration of all their fishing assets. This means the hagfish ACE will be managed on a commercial basis and used either to cover unavoidable bycatch or bought and sold to form more economic units. The submissions from Te Ohu Kaimoana and the Chatham Islands Enterprise Trust (that includes the views of the Hokotehi Moriori Trust and Ngati Mutunga o Wharekauri) are supportive of QMS introduction of Tuere (hagfish) on this basis.

3. Ludeke submits that fisheries science is inexact and that flawed information is used to derive proposed catch limits. He draws attention to the International Union of Conservation of Nature (IUCN) conservations status of hagfish noting it is listed on the IUCN Red list of Threatened Species in the least concern category.

4. Developing a comprehensive understanding of the hagfish fishery and resource will require new scientific and fishery-dependent research and data collection efforts. Data to address these gaps could involve an at-sea observer program, port sampling for estimating discard levels and collecting length/weight data, tagging studies to estimate growth rates and to examine movement of localized populations of hagfish, age and growth studies and investigation of spatial movement of the fishery through interviews with fishers. Some of this information is required in Canadian, and US fisheries as part of their investigative research program on hagfish with these costs borne by the fishers.

5. It is unlikely that conventional stock assessment approaches will provide significant information in the near future due to lack of data. Regardless the lack of information and uncertainty in information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Fisheries Act.

6. MPI does not consider that it is suitable to base proposals for TACs on the information contained in the IUCN given the generality of this information. MPI agrees with the ICUN status of NZ hagfish and notes that the intent of more active management is to maintain that status. The assessment notes that there are no conservation actions currently in place for the NZ hagfish and makes the observation that among other things more information is needed on fisheries impacts.

7. A number of submissions noted that hagfish is never sold or eaten within New Zealand, and has no commercial value on the domestic market. Since South Korea is the only market, demand is partially satisfied by imports from Canada, the US and Mexico the volume supplied by NZ fishers will be self regulating.

8. MPI acknowledges that there is a limited domestic market for hagfish. Anecdotal information from hagfish exporters suggests that the demand from Asia does appear to be met at current levels of supply from the various suppliers including New Zealand. New Zealand is said to be supplying off-season demand. There is no guarantee that the American suppliers will continue to meet current levels of supply hence a risk future demand could increase upsetting the current level of self-regulation.

9. Additionally, MPI notes that numerous submissions assert that the New Zealand common hagfish is a superior product to the hagfish provided by US, Canadian, and Mexican fisheries. On the Yakin Fisheries Co.'s website, they state that demand for the New Zealand product is dramatically increasing. This provides little support to the assertion that the market will be 'self-regulating'.

10. A number of submissions also state that other exporting countries do not have catch limits, and have developed sustainable fisheries. They claim that international fisheries have not collapsed, and the US and Canada are exporting at levels much greater than are proposed for New Zealand. In line with this, Chris Ludeke agrees that declining catches in Asian countries have caused concern, but asserts that for Japan at least this is due to perceptions arising from the Fukushima radioactive fallout.

11. MPI does not consider that a lack of management in other countries is a basis for failing to manage fisheries in New Zealand. MPI is aware that in the Canadian hagfish fishery, access to the fishery was initially limited to a restricted number of special permits required to collect a large amount of scientific information while fishing. This resulted in the cessation of fishing for a period of time as it was considered to be unsustainable.

12. Furthermore, the best information available to MPI indicates that catch per unit effort has decreased dramatically in the US fishery, resulting in a large increase in the number of vessels needed in order to catch the large quantities of hagfish that are currently being exported.

13. MPI acknowledge the possibility of Fukishima impacts at a local level, but there is no doubt internationally among scientists that overfishing has caused the collapse of the Korean hagfish fishery leading to their present and almost complete reliance on imports.

14. Fisheries Inshore New Zealand and Sanford request to see an option for setting of deemed values that considers setting different deemed value rates for different methods of fishing. This is to address complications for fishers landing common hagfish as a bycatch species when deemed values are set high. Neither submitter supported the options as outlined specifically in the IPP, and called for lower deemed value rates than were proposed to be set in the event that deemed values could not be set differentially for method type.

15. We note that deemed value rates exist to (i) provide an incentive for every commercial fisher to acquire and hold annual catch entitlement and (ii) be a disincentive to catch in excess of annual catch entitlement. In the common hagfish fishery, other than for the few fishers who target common hagfish, sufficient disincentives already exist such as its limited commercial value and slime contamination problems. By far the majority of fishers set out to avoid catching hagfish. However, MPI considers that there does not appear to be any scope in the Act for setting differential deemed value rates for method type, and incentives must still exist for fishers targeting common hagfish to land and balance catch with annual catch entitlement. As such, MPI considers that setting deemed value rates based on the port price for frozen product achieves the best balance in providing incentives for both target fishers, and those taking hagfish as a bycatch.

16. Sanford submit that Schedule 6 provisions should be changed so that common hagfish whether dead or alive may be returned to the sea and not balanced against annual catch entitlement. This ensures for the non-target bycatch there are no transaction costs as no annual catch entitlement is required.

17. MPI does not agree Schedule 6 provisions should be expanded to include dead releases. A policy that incentivises discards rather than utilisation runs counter to the purpose of the Act.

18. Sanford expresses concern at the discarding or loss of plastic pots at sea. They consider that pots made from non-biodegradable materials should be indelibly marked with a vessel's registration number and regulation should include penalties if it can be shown that vessels are willfully discarding pots or losing excessive numbers. Additionally, they question a regulatory requirement to insert a biodegradable panel in the pot as the only ecological safety measure.

19. MPI notes that plastic pots up to 230 litres in size are typically used with up to 100 pots deployed on a line. At the peak of hagfish fishing during the 2009/10 there were gear conflicts with other fishing methods. MPI considered that this risk had been mitigated by better communication between those using the different fishing methods; however, recent information suggests that hagfish pots are still fouling other fishing gear somewhat frequently. With regards to pot labeling, MPI notes that under section 56 of the Fisheries (Commercial Fishing) Regulations 2001, each pot and surface buoy or float must be clearly, permanently, and legibly marked with the registration number of the vessel from which it is set or transported.
20. Lost hagfish pots result in potential for ghost fishing. Ghost fishing occurs when lost fishing gear continues to trap individuals, driving up levels of mortality. This may increase other sources of fishing-related mortality. This is a matter for

stakeholders that could be mitigated by having pots with decomposable panels such as used in US fisheries.

21. SIF submits that a management strategy should be developed but that it should not be specific only to hagfish. SIF states that the development of decision rules is paramount and lists move-on rules as an example that can be incorporated dependent on the nature of the fishery and reporting level, the other stocks involved and the fishing method used. They assert that decision rules should also be linked to spatial management.

22. Sanford submits that it is unlikely that hagfish warrants the establishment of a dedicated Commercial Stakeholder Group. Hagfish quota owners could conceivably attach to Fisheries Inshore New Zealand given that it is an inshore species and managed by the MPI inshore team.

23. MPI agrees there are opportunities for development of industry-based research projects and further collaborative efforts among scientists, fishermen, administrators and policy analysts. Implementation of some of these recommendations may require adoption of a formal fishery management plan.

24. Sanford proposes all stocks (and SIF proposes that HAG 3, 5 &7 only) be moved from Group 7 to Group 6 of the Draft National Fisheries Plan for Inshore Finfish (the Finfish Plan). As more information through characterisation and analyses is completed movement further up the scale of the plan may be necessary, but not until then. Moving stocks to the upper limits of the plan will have cost implications because of the increased need for assessment.

25. MPI is not yet providing a proposal for which Group common hagfish should be moved to in the Finfish Plan, should you decide to progress with QMS introduction.