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Ministry of Agriculture and Forestry
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Attention: Kara McKelvey

MANAGEMENT MEASURES FOR THE 2011-12 SQUID (SQU6T) FISHING SEASON

The Environmental Defence Society (EDS) welcomes the opportunity to comment on the Ministry of Fisheries' initial position paper (position paper) on managing interactions between sea lions and trawl vessels in the SQU6T fishery in the 2011-2012 fishing season.

Given the threatened status of this endemic species, and the long-term decline in pup counts, EDS considers that a precautionary approach should be taken to the management of fisheries interactions with the New Zealand Sea Lion.

BACKGROUND TO EDS

EDS is a public interest environmental organisation, formed in 1971, with a membership consisting largely of resource management professionals. The focus of EDS's work is on achieving good environmental outcomes through improving the quality of New Zealand's legal and policy frameworks and statutory decision-making processes. EDS both litigates in favour of the environment and operates as an environmental think tank.

EDS has had a long interest in the management of New Zealand's coast and oceans and in marine conservation more generally.

- In 2005 EDS published a report on oceans governance titled *Looking out to sea: New Zealand as a model for ocean governance*.
- In 2007 EDS published a report investigating integrated coastal management titled *Beyond the tide: Integrating the management of New Zealand's coasts*. The report was reprinted in 2009 with support from the Hauraki Gulf Forum.
- In 2009, EDS released a policy paper on the establishment of an Environmental Protection Authority (EPA) titled *Improving environmental governance: the role of an Environmental Protection Authority*. This paper canvassed gaps in current marine management (amongst other things) and proposed a role for the EPA which would include oversight of coastal and marine management. It also proposed the establishment of a Coastal Commission.
- In 2009 EDS also launched a comprehensive book on coastal management titled *Castles in the Sand: What's happening to the New Zealand coast?*
- In April 2010 EDS launched a comprehensive guide to how the New Zealand's marine area is currently managed titled *Managing the Marine Environment*.
- In April 2011 EDS published a policy paper titled *Governing our Oceans: Environmental Reform for the Exclusive Economic Zone* which analysed the deficiencies in existing law and called for

urgent environmental effects legislation for the EEZ, given the growing interest in new commercial activities in the marine area.

- EDS is involved in ongoing work on coastal and marine conservation and management issues. In particular, EDS is currently undertaking research into the adequacy of the current legal and policy framework for managing human impacts on marine mammals.

SUMMARY OF EDS'S SUBMISSIONS

A summary of EDS's submissions is outlined below:

1. The proposed management approach does not allow the Minister to fulfil his obligation under the Fisheries Act 1996 (the Act) to *maintain associated or dependent species above a level that ensures their long-term viability*. The population is in decline, and removing controls on fisheries related mortality is very likely to speed up this decline.
2. The proposed management approach set out in the position paper is not consistent with the principle set out in section 10 of the Act that decisions should be based on the *best available information*, for the following reasons:
 - The Ministry of Fisheries (the Ministry) advice in the position paper is based on the assumption that the decrease in observed sea lion mortalities means that more sea lions are surviving sea lion exclusion devices (SLEDs), as a result of improvements in SLED design. However, there is no conclusive evidence provided to demonstrate this, and the position paper does not include information on other possible reasons for the decline in the observed mortality rate.
 - The Ministry proposes increasing the SLED discount rate to 82%, but this figure is based on a flawed and inaccurate analysis of the information on the likely mortality of sea lions which enter trawl nets.
 - The position paper does not consider a significant body of research which is relevant to the Minister's decision, including that recently undertaken by Robertson and Chilvers (2011) and published in a peer reviewed journal, which concluded that the SQU16 fishery is likely to be a key cause of the decline in the Auckland Islands sea lion population.
3. The proposal to review the "no FRML" management approach after five years is inconsistent with a precautionary approach. It also fails to avoid, remedy or mitigate the adverse effects of the SQU16 fishery on the aquatic environment (including sea lions) as required under section 8 of the Act.
4. The position paper sets out only one proposed management approach. The final advice provided to the Minister should set out a number of options, including a significantly more cautious approach, to enable the Minister to fully exercise his discretion on this matter. The current position paper does not provide sufficient information on options to enable the Minister to make a fully informed decision.
5. In the absence of conclusive evidence that the squid fishery is not the cause of the decline, at the very least the FRML should be maintained at the current level. Our preference is that the FRML is lowered.
6. In the longer term, the operational management plan should be replaced by a Population Management Plan. The Bayesian model used to calculate harvest control rules has been in use

since 2003 and in that time has failed to deliver the goals set out in the criteria against which the rules are measured. Instead, the sea lion population has continued to decline.

LEGISLATIVE FRAMEWORK FOR MINISTER’S DECISION

International Law

Section 5(a) of the Fisheries Act 1996 (the Act) requires that the Act should be interpreted in a manner consistent with New Zealand’s international obligations relating to fishing. Of relevance is the following provision under the United Nations Convention on the Law of the Sea of 10 December 1982:

Article 61 requires coastal states to ensure that, through proper conservation and management measures, that the maintenance of living resources in the EEZ is “*not endangered by over exploitation.*” In taking such measures “*the coastal State shall take into consideration the effects on species associated with or dependent upon harvested species with a view to maintaining or restoring populations of such associated or dependent species above levels at which their reproduction may be seriously threatened.*”

Fisheries Act 1996

The Minister’s decision is to be made pursuant to section 15(2) of the Act which provides that:

In the absence of a population management plan, the Minister may, after consultation with the Minister of Conservation, take such measures as he or she considers are necessary to avoid, remedy, or mitigate the effect of fishing-related mortality on any protected species, and such measures may include setting a limit on fishing-related mortality.

Also relevant to the Minister’s decision under section 15(2) is section 8 which sets out the Act’s purpose:

8 Purpose

(1) The purpose of this Act is to provide for the utilisation of fisheries resources while ensuring sustainability.

(2) In this Act—

“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:

“Utilisation” means conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural wellbeing.

The Minister must also take account of environmental principles in making his decision under section 15(2):

9 Environmental principles

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 environmental principles:

(a) Associated or dependent species should be maintained above a level that ensures their long-term viability:

- (b) *Biological diversity of the aquatic environment should be maintained:*
- (c) *Habitat of particular significance for fisheries management should be protected.*

“Associated and dependent species” are defined in the Act as “any non-harvested species taken or otherwise affected by the taking of any harvested species”. It is clear that the New Zealand Sea Lion is an associated and dependent species in the squid fishery around the Auckland Islands.

Best available information

Under section 10 of the Act the Minister is required to take into account the principles that decisions “should be based on the best available information” and that “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.”

The obligation to make decisions based on the best available information means that the Minister should be provided with all of the relevant information in order that he can determine what is the best available information. This concept is set out in *NZ Federation of Commercial Fishermen Inc & Ors v Ministry of Fisheries & Anor (2011) 24 NZULR 364* in which Mallon J states:

The obligation to take into account that decisions should be based on best available information requires the Minister to first be informed accurately as to what is best available information. If the information he is given is misleading or inaccurate then he cannot, and therefore does not, comply with s 10(a). That in turn can lead to a breach of s 15 because the Minister does not have the information to be able to determine if a measure is necessary. (para 22)

Necessarily, the obligation will require gaps in knowledge and shortcomings in the available data to be adequately explained to the Minister. In addition, if the Minister were to make his decision based on flawed reasoning set out in advice to him, he could not be said to have made the decision based on the best available information.

Precautionary approach

The Court of Appeal has confirmed that, in taking measures under section 15(2), a precautionary approach is available to the Minister (*Squid Fishery Management Ltd v Ministry of Fisheries & Anor CA (Squid (No. 2) 39/04 13 July 2004)*).

PROPOSED MANAGEMENT APPROACH

The Ministry’s position paper proposes that the SLED discount rate is increased from 35% to 82%. The Ministry has applied discount rates of 65%, 75% and 85% to the population model all of which indicate that a Fishing Related Mortality Limit (FRML) is not required. The proposal states: *‘the most recent research strongly suggests that the direct effect of fishing-related mortality on the New Zealand sea lion population is minimal and the results of the population model also demonstrate that no FRML is necessary to meet the established management criteria.’*

The Ministry thus proposes that an FRML no longer be set in the SQU6T fishery, conditional upon the following factors:

- All vessels operating in the SQU6T fishery continue to carry and deploy SLEDs that meet the specifications in the SQU6T Operational Plan;
- All vessels follow the reporting requirements specified in the SQU6T Operational Plan;
- No new information becomes available that suggests the risk to sea lions proposed by fishing in SQU6T is appreciably greater than current information suggests.

EDS is concerned that this proposed management approach will not allow the Minister to fulfil his obligations under the Act, as it will not maintain the sea lion population above a level that ensures its long-term viability, as required under section 9(a) of the Act. It also fails to avoid, remedy or mitigate the adverse effects of the SQU16 fishery on the aquatic environment (including sea lions) as required under section 8. In addition a decision to adopt the proposed management approach would not be consistent with the obligation under section 10 to take into account that decisions should be based on the best available information, as the proposal is based on flawed logic and fails to take into account all the relevant information.

Decline in Observed Mortalities

The position paper notes that the observed mortality rate has declined over the last five years. The Ministry assumes that a decline in observed sea lion mortalities is due to increased efficacy of SLEDs: *“the number and rate of observed mortalities has declined markedly in recent years and the improvements to SLED design and use are likely to have contributed to this trend.”* (para 5)

In addition, in paragraph 28 the Ministry states *“the Minister considers that escape probability may have increased in recent years due to ongoing improvements in SLED design and the ubiquitous use of SLEDs.”* This supposition is not adequately explained. On the face of it, it does not follow that more frequent use of SLEDs will result in their becoming more efficient.

Whilst it is possible that SLED design and use have improved, it is by no means certain that the decrease in observed mortalities is not primarily due to a number of other factors, which are not considered in the Ministry’s position paper. For example:

- a. Dead sea lions fall out of the net as it is being hauled in;
- b. Sea lions pass through the SLED but later die;
- c. Decreasing population means fewer interactions;
- d. Changes in number of vessels active in the fishery;
- e. Inaccurate reporting by fishers and changes in observer coverage.

In particular, we note that the number of observed mortalities relies heavily on self-reporting by fishers, given the historic low levels of observer coverage (26% in 2009-10). We are not confident that this self-reporting has resulted in accurate records of the numbers of sea lions killed. We note that a large number of the vessels active in the fishery are foreign chartered vessels, which are currently the focus of a Ministerial Inquiry which is reviewing, amongst other issues, alleged breaches of fishing operation.

We also note that research by the Ministry itself has indicated that self-reporting of bycatch may not result in accurate reports: in Bremner et al *Unreported Bycatch in the New Zealand West Coast South Island Hoki Fishery* (2009) 33 Marine Policy 504, it is stated in respect of a study of bycatch reporting in the hoki fishery that:

“the results suggest that the reported catch of unobserved vessels is different to the observed catch of similar vessels in the same fishery. This may mean the catches and fishing patterns of the observed vessels are not representative of the fleet as a whole; or that the observers are better at identifying common fish in the catch than the vessels’ crews. An alternative explanation is that the catches reported by unobserved vessels contain large amounts of fiction.” Para 6.1.

In addition, we note that the position paper suggests increasing observer coverage to 50% as a condition of the proposed “no FRML” management approach. We question why the Ministry considers it necessary to improve observer coverage if the self-reported data that has been used to justify the removal of the FRML is thought to be accurate.

Proposed Changes to SLED discount rate

The proposed changes to the SLED discount rate appear to be driven by the assumption that the decline in observed mortalities is due to improvements in SLED design, together with the results of a biomechanical modelling study commissioned by the Ministry which indicates that the likelihood of sea lions sustaining fatal injuries before escaping from the SLED is much lower than previously thought.

We submit that the reasoning behind this proposal is flawed. The Ministry has produced no evidence that it is improvements in SLED design which have resulted in fewer mortalities. It is erroneous to refer to changes in the design of SLEDs as ‘improvements’ until the impact of each change has been scientifically tested, however no evidence is provided that such testing has been undertaken and the nature of the improvements is not detailed in the position paper. Without this testing, we can have very little understanding of what impact any changes to SLED design have had.

Prior to the introduction of SLEDs, it was believed that trawl nets killed 5.6 sea lions per 100 trawls. These sea lions were killed as a result of interactions with the net, in particular as a result of drowning. The Ministry has not produced any data which shows that interactions with the net no longer kill sea lions, in particular on the condition of sea lions that are ejected from the SLED. Indeed, in a report to the Aquatic Environment Working Group, Thompson et al (*Thompson, Abraham and Berkenbusch Marine Mammal Bycatch in New Zealand Trawl Fisheries 1995-6 to 2009-10, 2 December 2011*) state “*While SLEDs are designed to allow the escape of sea lion, some animals may still get captured. The number and fate of animals that escape the net vis (sic) SLEDs are unknown.*” (para 165) Nevertheless, the Ministry appears to assume that when SLEDs are used, the only significant potential cause of death is blunt force trauma from the SLED.

Accordingly, the Ministry’s biomechanical model addresses only one specific potential cause of death. In the absence of evidence that interactions with the net no longer kill sea lions, the estimated number of sea lions killed by blunt force trauma in the SLED should not be *deducted* from the estimated strike rate, but *added* to it.

The data used in the Ministry’s biomechanical modelling project is derived from a study of fur seal seal exclusion device (SED) collisions in a mid-water trawl fishery off Tasmania (*Lyle, J. and Willcox, S. 2008. Dolphin and seal interactions with mid-water trawling in the commonwealth small pelagic fishery, including an assessment of bycatch mitigation, AFMA, Canberra*). The study recorded that of the 132 seals observed interacting with the trawls, 44.7% either did not collide with the SED on first observation or it was unclear if the individual had collided. Six seals died in the net but did not collide with the grid.

The study recorded that 37.9% of the seals were “ejected” out of the exclusion device, but no evaluation was provided on the condition of these individuals. 9.1% of individuals died in the trawl nets, but were never landed on deck as they fell out of the net when it was hauled in. Finally, in another 21.2% of cases, it was not known if the seal died, was ejected, or swam away from the exclusion device.

This data is not adequately explained in the position paper. The effect of this data, even excluding the 21.2% of cases in which the seal’s whereabouts was not known, is that nearly half the seals were ejected in unknown condition, whilst 12% of animals were killed whilst interacting with the net.

The position paper recognises the possibility that sea lions could drown as a result of interacting with the trawl, but states that there is no data available to estimate how often this might occur – for example noting at paragraph 32: “*the Ministry is not aware of any information that would inform an estimate for post-exit drowning*”). Rather than properly taking this into account in the proposal, the Ministry assumes a 10% reduction in the discount rate for the purpose of a sensitivity analysis. This

10% reduction is arbitrary, given that the Ministry has recognised that information is not available to inform an estimate of the number of sea lions which drown whilst interacting with the trawl.

We consider that the biomechanical modelling project, whilst a useful addition to the body of information available on the effects of the SQU16 fishery on the sea lion population, should not be considered to provide incontrovertible evidence that SLEDs are fully effective in preventing sea lion mortality in squid trawls. Some of the limitations of the study are recognised in the project report itself:

“There are several fundamental uncertainties associated with this work. Firstly, the scaling of HIC [head impact criterion] values from a test-bed situation to values experienced by sea lions is not well known. Secondly, estimation of the probability of MTBI [mild traumatic brain injury] from HIC values is reliant on data derived from humans, and there is no theory or data to guide its application to sea lions. Thirdly, the study is reliant in part on extrapolation of data from Australian fur seals in a different fishery.”

(ER Abraham, Probability of Mild Traumatic Brain Injury for Sea Lions Interacting with SLEDs, Final Research Report for Ministry of Fisheries Project SRP2011-03, unpublished, para 40.)

Given the critical state of the New Zealand sea lion population a decision to radically alter management measures should not be based on the evidence of one study, addressing one aspect of the interaction between the fishery and the sea lion population. This is particularly the case given that none of the data used in the study has been obtained from the fishery in question.

Absence of evidence that SQU16 not a key cause of population decline

Prey competition from the SQU6T fishery is another factor which may be contributing to the sea lion population decline. This factor is not considered at all in the position paper.

A recent study (*Robertson and Chilvers, The Population Decline of the New Zealand Sea Lion Phocarctos hookeri: A Review of Possible Causes (2011) 41 Mammal Review 253*) makes a convincing argument that the Auckland Islands squid fishery is likely to be responsible for the decline in the sea lion population on the Auckland Islands. Whilst the population resident on the Campbell Islands is growing, the Auckland Islands population is declining. There is no discernible difference between the threats faced by the two populations, except that the Campbell Islands population is not exposed to squid or scampi fishing, as is the case in the Auckland islands. The conclusions of this study are not brought to the attention of the Minister in the position paper.

Whilst uncertainties remain about the causes of the decline in population, there is very good evidence to indicate that the population is declining. In 2010 the New Zealand sea lion was reclassified as ‘nationally critical’ under the New Zealand Threat Classification System. Other species listed as nationally critical, such as the Maui’s dolphin, are the subject of concerted efforts to reverse the decline. It is clear that a decision to remove existing management measures, in the absence of clear evidence that the squid fishery has no impact on the population, would be foolhardy and unlawful.

Observer Coverage

EDS welcomes the proposal to increase the target for observer coverage on vessels in the SQU6T fishery from 30% to 50% to ensure compliance with the operational plan, but considers that the state of the sea lion population, and the likely under reporting taking place in the fishery, means that 100% observer coverage would be more appropriate.

Proposed Review triggers

EDS is concerned that it is the Ministry's proposal to implement the "no FRML" management approach with a review only after five years. We consider that the fragility of the population means that a more cautious approach should be adopted. We see no reason to depart from the approach used until this point, in which management measures are reviewed annually.

We note that of the proposed triggers for early review of the "no FRML" approach, four (triggers (a) to (d)) are reliant on adequate reporting by the industry. The approach creates an incentive for fishers to under report captures and to misrepresent compliance.

Trigger (e) requires a review of the "no FRML" approach in the event of a pup count of fewer than 1,501 pups, which is the smallest pup count ever recorded. We submit that this is ill conceived. It is not appropriate to set minimum targets for critically threatened species, particularly when the proposed figure represents the smallest pup count ever recorded. This proposal is inconsistent with s9 of the Act which requires that the Minister must take into account that *associated or dependent species should be maintained above a level that ensures their long-term viability*.

Trigger (f) requires a review of the "no FRML" approach if and when information not considered in the position paper arises which indicates that the risk to sea lions is appreciably greater than current information suggests. Evidence is available *now* which suggests that the risk may be considerably greater than that set out in the position paper.

Absence of Options presented to Minister

EDS is concerned that whilst a radical divergence from past practice (i.e. removal of the FRML) is being proposed to the Minister, the position paper does not set out any other options from which the Minister could choose, instead restricting his decision making ability to accepting or rejecting the proposal.

Given the significance of the issue, we submit that the Minister should be provided with a range of options together with supporting analysis in each case which will enable him to give full consideration to the relevant issues and provide him with a proper ability to exercise his discretion.

FRML should be maintained at current or lower level for next fishing year

EDS submits that until more research is undertaken, so that interactions between sea lions and squid fishers can be properly understood, the FRML should be maintained at least at current levels or preferably decreased to take account of the declining population.

Need for a Population Management Plan

The Bayesian model used to assess the impact of squid fishery bycatch on the sea lion population has been in use since 2003. The model attempts to assess harvest control rules against the following criteria:

- *A harvest control rule must provide for an increase in the sea lion population to more than 90% of carrying capacity, or to within 10% of the population size that would have been attained in the absence of fishing, and that these levels must be attained with 90% certainty over 20 year and 100 year projections.*
- *A harvest control rule must attain a mean number of mature animals that exceeded 90% of carrying capacity in the second 50 years of 100 year projection runs (to allow for build up of numbers in hypothetical depleted populations over time.*

In the time that the model has been in use, the criteria have manifestly not been met in practice, as the population has continued to decline. It is clear that the model has failed to achieve the aims to which it was directed, and accordingly its use should be reviewed.

Whilst EDS recognises that this is outside the scope of the Minister's powers at present, we contend that the development of a population management plan by the Department of Conservation would be more effective in reversing the decline in sea lion numbers than the current management approach.

We also note that if, as appears to be the case, the Ministry believes that there is no significant link between sea lion mortality and squid fishery bycatch, it would be appropriate for the Ministry to return responsibility for the management of the population to the Department of Conservation, in order for a population management plan to be developed.

CONCLUSION

If the Minister was to adopt the proposal set out in the position paper, EDS considers that:

- The decision would not be consistent with a precautionary approach to management, which we believe is necessary given the critically threatened nature of the population;
- The decision would fail to meet the requirements of sections 8, 9, 10 and 15 of the Fisheries Act;
- The decision would be made without sufficient and reliable information to place the Minister in a position to reach such a conclusion;
- The decision would fail to take into account relevant considerations; and
- In the absence of clear evidence that interactions with the squid fishery are not a significant cause of sea lion mortality, in full knowledge, however, that the population is in decline, the decision would be so irrational as to amount to a misuse of decision-making power.

EDS would welcome the opportunity to discuss our submission further with you.

Yours sincerely

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