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**WWF-New Zealand Submission on:
2009-10 SQU6T Operational Plan: Initial Position Paper**

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Purpose

Background

The Ministry of Fisheries (MFish) is consulting on an Initial Position Paper relating to the Operational Plan for the squid fishery around the Auckland Islands (SQU6T). The Operational Plan outlines actions to mitigate the effects that fishing vessels, operating in the SQU6T fishery, have on the Auckland Islands sea lion population. After considering the submissions received¹, MFish will provide final advice to the Minister of Fisheries later this year (2009).

This document provides WWF-New Zealand's submission.

Key recommendations

1. The New Zealand sea lion is one of the rarest sea lion species and has recently been re-classified by the International Union for Conservation of Nature as being vulnerable due to population decline. The population exhibits several indicators of underlying stress.
2. A fishery-related morality limit (FRML) should be set to allow the species to achieve non-threatened status as soon as reasonably practicable, and in any event within 20 years.
3. The FRML must be set conservatively, recognising the ecological stress facing the sea lion population.
4. There may be inherent limitations in the model and hence model outputs should be treated with caution.
5. An international review of the model is needed.
6. FRMLs should be calculated extrapolating pup production from recent data using a linear regression.
7. This FRML should include all fisheries that kill sea lions, not just SQU6T.
8. The recommended FRMLs are subject to substantial and pervasive uncertainty.
9. The Minister must be advised on how to manage the pervasive uncertainty in the advice presented in the IPP and the potential consequences of non-precautionary decisions for the sea lions.
10. If an FRML is to be set, it should be no more than 50.
11. The efficacy of the SLEDs must be assessed and an updated strike rate determined.
12. A fisheries management plan should be developed that specifies timeframes with declining FRMLs that would encourage industry to actively avoid sea lion bycatch and reduce this to zero as soon as reasonably practicable.
13. Broader management interventions to protect the sea lions must be examined and implemented.

Although it is important for decision makers to strike a balance between protection and utilisation, it is critical that any measures implemented lead to real conservation benefits. Past management interventions do not appear to have addressed the decline in the numbers of New Zealand sea lions therefore WWF seeks to enhance the protection of these animals.

¹ All submissions must be received by Monday 2 November 2009.

Introduction

WWF-New Zealand

WWF-New Zealand (WWF) is part of a global network, using a science-based approach to encourage government, business and communities to conserve and manage our environment more sustainably. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- Conserving the world's biological diversity;
- Ensuring that the use of renewable natural resources is sustainable;
- Promoting the reduction of pollution and wasteful consumption.

The New Zealand sea lion

The Department of Conservation's Species Management Plan (SMP) for the NZ sea lion notes:

In 1997, the New Zealand sea lion was declared threatened under the Marine Mammals Protection Act 1978. The species has one of the lowest abundance estimates of all sea lion species (around 12,000 individuals)². The majority of breeding occurs within New Zealand's subantarctic islands, principally the Auckland Islands and Campbell Island/Motu Ihupuku. There is evidence of continued declines in pup production (around 50% since 1998) on the Auckland Islands.

During the late 1970s, a trawl fishery for squid was established around the Auckland Islands. The timing and location of the fishery coincides with the pupping and lactating season of New Zealand sea lions, resulting in significant numbers of animals being caught and killed in these fishing operations. New Zealand sea lions are also caught in the subantarctic scampi, southern blue whiting and other fisheries.

The New Zealand sea lion has recently been re-classified by the International Union for Conservation of Nature (IUCN) as being vulnerable due to population decline rather than the initial classification which stated that it was vulnerable due to a small or restricted population size.

The SMP also notes other human sources of mortality include:

- Indirect effects of fishing (including prey depletion and habitat degradation);
- Disturbance
- Climate change
- Pollution
- Marine debris

Non-human induced threats include:

- Disease: Three mass mortality events have resulted in the deaths of 53%, 32% and 21% of annual pup production for the 1998, 2002 and 2003 seasons.
- Predation

² Note that if pup production is an indicator of population size, the current population may be as low as 8,000 animals.

- Tsunami

WWF considers that the current population size, ongoing declines in pup production and the physiological stress on lactating females³ are indicative of a species in crisis. These factors bring into question the management of SQU6T, the fishery having the greatest impact on the sea lion.

Population management objectives

The SMP defines the sea lion management problem as follows:

The relatively small population size and restricted breeding range of the New Zealand sea lion makes the species vulnerable should a catastrophe, such as a tsunami or oil spill, occur at one or more of the breeding strongholds ...during the breeding season. This vulnerability will increase unless the current decline in population abundance at the Auckland Islands (79–86% of all breeding) is arrested.

It suggests the following solution:

Reducing the vulnerability of the New Zealand sea lion will require an increase in the population size and the species' breeding distribution. ... To achieve [this], a suite of management measures would need to be applied. This includes:

- *Avoidance or minimisation of the adverse impacts of human interactions⁴*
- *Promotion of protection provisions and compliance*
- *Promotion of community awareness, understanding and involvement in management of the species*

WWF supports the SMP's problem definition and the suggested solution. However, we are disappointed with the lack of definitive actions to implement the solution and, in particular, the Government's decision not to proceed with development of a Population Management Plan.

WWF believes that government actions should aim to meet the target as set out in the Marine Mammals Protection Act (MMPA). In particular, MFish should determine a fishing-related mortality limit (FRML) that should allow the species to achieve non-threatened status as soon as reasonably practicable, and in any event within a period not exceeding 20 years. This is consistent with the obligations on the Minister of Fisheries under s 15(2) of the Fisheries Act to avoid, remedy, or mitigate the effect of fishing-related mortality.

³ Females make an average return trip of over 400km to their feeding grounds and have been shown to dive at their physiological limits.

⁴ Emphasis added.

The SQU6T operational plan

Development of the FRML

The IPP is largely consistent with this submission to this point. In particular, MFish proposes to impose a FRML, as in recent years. In particular it intends that this FRML meets the following criteria:

1. Provide for an increase in the sea lion population to more than 90% of carrying capacity, or to within 10% of the proportion of carrying capacity 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.
2. Attain a mean number of mature mammals 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).

WWF submits that it is important that the fishery moves to zero sea lion mortality as soon as possible.

The model

The IPP uses the revised Breen-Kim model to assess harvest control rules and derive the FRML. WWF has a number of concerns about this model and how it has been used, and how the FRML is applied. The IPP recognises some key areas of uncertainty with the model, including:

- The maximum rate of population growth.
- How pup survival responds to population size.
- The maximum pupping rate.
- Extent of sea lion survivability following interaction with squid trawl gear that has SLED⁵ fitted.
- The model population stabilises at a level below K in the absence of fishing.

The model relies on factors dependent on population density to lead to population increases plateauing at or just below the carrying capacity. We understand that pup mortality is the key (or only) density dependent factor through which reduced population size is compensated by increased pup survival. While this may be appropriate for populations that are relatively close to carrying capacity, it is important that the model provides for “depensation”, where the ability of the population to increase may be reduced at low population sizes. The IPP also acknowledges that the recent declines in pup production may indicate that the population is no longer behaving as the model predicts – this may be due to an absence of depensation in the model. This suggests model outputs should be treated with caution.

⁵ Sea lion exclusion device.

Recommendation:

- There may be inherent limitations in the model and hence model outputs should be treated with caution.
- An international review of the model is needed.

Appropriate pup production

Pup production is an important input into the model. The Rule 3 series uses mean pup counts from the last two years. A critical management problem for sea lions is that pup counts are declining in what appears to be a statistically significant trend. The IPP acknowledges that the model cannot fit the large decline in pup counts between 2008 and 2009. Pup production in the year during which the FRML has effect is estimated by taking the mean pup production of the last two years. The IPP states that the recent pup count decrease is reflected in the FRMLs calculated for the 2009-10 season. This is not correct. Given the decline in pup production, production in 2009/10 would be better estimated using a linear regression. This would generate a figure closer to the pup production in 2008/09 (about 1500) than the average of the last two years (about 1840). This will have significant impacts on the model outputs.

Recommendation:

- FRMLs should be calculated extrapolating pup production from recent data using a linear regression.

Applicable fisheries

While the greatest fishing related sea lion mortality is through the SQU6T fishery, it is also caught in the subantarctic scampi and especially the southern blue whiting fishery. This mortality must be included within a FRML set for the species. We understand that some of these deaths are included, but this is not clearly specified in the IPP. It has been suggested that sea lions caught in the vicinity of Campbell Island were caught on the eastern side of the island and may not be part of the Auckland Islands population. However, this has not been substantiated and, in any case, any impact on the smaller Campbell island population probably represents a greater risk to the species.

Recommendation:

- Mortality from all fisheries killing sea lions must be included in the FRML.

Stress on sea lion population

The sea lion SMP notes that sea lions regularly dive beyond their aerobic dive limits and that reductions in prey availability may exacerbate this situation – indeed the SQ6T fishery is likely to deplete sea lion prey. The population is also subject to severe mortality events due to epidemics caused by bacterial infections. These factors indicate the stressed nature of this population.

The IPP notes that the Minister may take into account other possible impacts on the sea lion population when selecting a harvest control rule. While the FRML is related to direct fishing

mortality, it must be set conservatively, recognising the ecological stress facing the sea lion population.

Recommendation:

- Any FRML set for the sea lion must be set conservatively, recognising the ecological stress facing the sea lion population.

Uncertainty

The IPP acknowledges uncertainty in the model around, some of which are described earlier in this submission. There is also uncertainty around the strike rate and the sea lion exclusion device (SLED) effectiveness and hence discount rate.

Uncertainty pervades the advice provided in the IPP, yet the IPP provides no guidance as to how this uncertainty should be managed. While the paper claims to balance utilisation with sustainability, it appears to favour utilisation. Indeed, the IPP assesses FRMLs that “just meet the MFish [sustainability] criteria”. The paper does not recognise the serious asymmetry in the consequences of wrong decisions. Should the FRML unnecessarily constrain fishing, this impact will be for a single year. On the other hand, FRMLs that fail to protect the sea lions have the potential consequence of an irreversible decline towards extinction.

WWF submits that this is inconsistent with one of the key Principles underpinning MFish’s *Fisheries 2030* strategy:

***Precautionary approach:** Particular care will be taken to ensure environmental sustainability where information is uncertain, unreliable, or inadequate.*

The IPP notes:

The Minister should form a view as to the extent to which (or perhaps the point at which) utilisation of the squid resource threatens the sustainability of the sea lion population and allow utilisation of squid up to that point. ... The Minister is not required to select a harvest control rule that removes all the potential risk to the sea lion population.

While this may be correct, Court decisions require the Minister to adopt a precautionary approach in balancing risk to the protected species against utilisation of the fishery⁶. The reclassification of the NZ sea lion by IUCN suggests precaution in the management of human impacts on this species.

With the ongoing decline in the sea lion population and the pervasive uncertainty in the IPP, WWF is uncomfortable with allowing any further sea lion deaths. The IPP recommends a range of FRMLs from 52 to 90. Given the significant uncertainties in the derivation of these numbers, WWF recommends that the FRML be no more than 50.

The efficacy of the SLEDs must be assessed and an updated strike rate determined.

Recommendations:

- The recommended FRMLs are subject to substantial and pervasive uncertainty.

⁶ Squid Fishery Management Company v Minister of Fisheries (7 April 2004) CA 39/04.

- The Minister must be advised how to manage the pervasive uncertainty in the advice presented in the IPP and the potential consequences of non-precautionary decisions for the sea lions.
- If an FRML is to be set, it should be no more than 50.
- The efficacy of the SLEDs must be assessed and an updated strike rate determined.

Incentive to reduce sea lion mortality

The definition of “ensuring sustainability” in the Fisheries Act includes “avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment.” The industry currently has very little incentive to develop and employ more selective fishing methods that avoid impacts on sea lions. The FRML should decline over time, enhancing the chance of population recovery and providing an incentive for the industry to develop technologies or fishing practices that avoid sea lion mortality.

Recommendation:

- A fisheries management plan should be developed that specifies timeframes with declining FRMLs that would encourage industry to actively avoid sea lion bycatch and reduce this to zero as soon as reasonably practicable.

Broader management actions needed

This submission has highlighted several indicators that show the parlous state of the sea lion population. This brings into question the effectiveness of past management of the species under both the Fisheries and Conservation Acts. WWF submits that broader actions are needed to stem the decline in this species. For example, the actions proposed by Chilvers (2008)⁷ should be examined in detail and conclusions published:

- Creating a larger no-fishing area around the Auckland Islands by extending the existing marine reserve or marine mammal sanctuary;
- Requiring vessels fishing around the Auckland Islands to use only jigging to catch squid;
- Transferring quota out of the SQU6T fishery into the SQU1T or SQU1J fisheries.

While MFish has sought comments only into the IPP and its powers under the Fisheries Act, WWF submits that broader actions are needed to address the adverse effects of human interactions with the sea lions and those in the SMP must be implemented:

- Develop effective fishing-related mortality mitigation devices and strategies;
- Develop and implement management tools as a means to avoid or minimise fishing-related mortalities
- Explore perceived indirect effects of fishing and develop relevant management outcomes based on research findings.

⁷ Chilvers, B.L. (2008) New Zealand sea lions *Phocarcetos hookeri* and squid trawl fisheries: bycatch problems and management options. *Endangered Species Research*: 5:193-204.

Note that pup production has declined further since this paper was published.

Recommendation:

- Broader management interventions (including those under the Conservation Act) must be examined and implemented.

Concluding comments

Although it is important for decision makers to strike a balance between protection and utilisation, it is critical that any measures implemented lead to real conservation benefits⁸. Past management interventions do not appear to have addressed the decline in the numbers of New Zealand sea lions therefore WWF seeks to enhance the protection of these animals.

⁸ Chilvers (2008).