

FINAL REPORT

Risk Assessment Critique of *Population Management Plan for New Zealand sea lion* (Pre Notification Consultation Document January 2006)

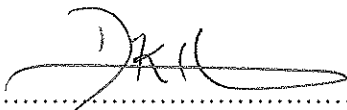
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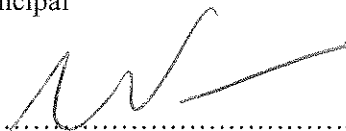
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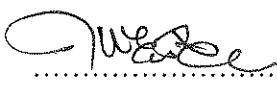
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Contents

1	Executive Summary -----	1-1
2	Introduction -----	2-1
	2.1 Objectives	2-1
	2.2 Exclusions	2-1
3	Risk Management Process -----	3-2
	3.1 Risk Management	3-2
4	Risk Management Critique -----	4-2
	4.1 Establish the Context	4-3
	4.1.1 Background	4-3
	4.1.2 Section 3E	4-4
	4.1.3 Section 3F	4-5
	4.1.4 Section 3G	4-6
	4.2 Developing Criteria	4-6
	4.2.1 Risk Criteria	4-6
	4.2.2 Comment	4-7
	4.3 Risk Assessment	4-7
	4.3.1 Comment	4-8
	4.4 Risk Treatment and Controls	4-9
	4.4.1 Comment	4-9
5	Conclusions -----	5-1
6	Limitations -----	6-1

URS has been engaged by the Deepwater Stakeholder Group Ltd to provide an independent critique of the risk assessment contained in the *Population Management Plan for New Zealand sea lion* (Department of Conservation, Pre Notification Consultation Document January 2006) (the draft PMP). The widely adopted Australian/New Zealand Standard Risk Management (AS/NZS 4360:2004) provides the risk management process against which the PMP has been critiqued.

The Marine Mammals Protection Act 1978 (the Act) is an Act to make provision for the protection, conservation, and management of marine mammals within New Zealand and within New Zealand fisheries waters. Sections 3E to 3H provide for the Minister of Conservation's approval of population Management Plans (PMPs) in respect of threatened species or other species of marine mammals. PMPs under the Act appear to focus on fishing-related mortality, with the primary mechanism to manage the species population being the establishment of a maximum allowable level of fishing-related mortality (MALFiRM) to allow certain criteria to be met.

The Marine Mammals Protection Act 1978 has been interpreted to provide the risk context for New Zealand Population Management Plan (PMP). PMPs are provided for in the Marine Mammals Protection Act 1978 and enable the Minister of Conservation to appropriately protect the population of threatened species until the species is no longer gazetted as threatened.

The risk assessment included in the *Population Management Plan for New Zealand sea lion* departs in a number of aspects from the guidelines of the Australian/New Zealand Standard Risk Management (AS/NZS 4360:2004), notably:

1. Unclear analysis of context and derivation of related risk criteria
2. Omission of a comprehensive risk identification, in terms of identifying events that will compromise meeting the risk criteria
3. Omission of a complete risk analysis, as there is no consideration of the likelihood or consequence (and therefore risk) of events on the New Zealand sea lion population
4. Omission of identifying and considering existing controls
5. Omission of evaluation of the resulting risk profile against the risk criteria in order to decide on appropriate risk mitigation measures (i.e. risk treatments), if any.

Given the above departures from best practise, any conclusions that are drawn from the risk assessment need to be carefully considered.

The risk assessment, as it currently stands, is not sufficiently complete to support the proposed management option (i.e. the establishment of a MALFiRM).

It is our recommendation that the departures in the risk assessment be remedied before conclusions are drawn on the appropriate control and treatments for meeting the goal of achieving non-threatened status for New Zealand sea lions within a 20 year timeframe.

URS has been engaged by Deepwater Stakeholder Group Ltd to provide an independent critique of the risk assessment contained in section 4 of the *Population Management Plan for New Zealand sea lion* (Department of Conservation, Pre Notification Consultation Document January 2006).

2.1 Objectives

1. Review how effectively the risk assessment process used in the draft Population Management Plan (PMP) addresses the intent of relevant legislation (Marine Mammals Protection Act 1978).
2. Review how the risk assessment in the draft PMP compares to recognised good practise in risk assessment, including adherence to Australian/New Zealand Standard Risk Management (AS/NZS 4360:2004).
3. Provide a concise and plain English report that critiques the relevance and appropriateness of the risk analysis in the draft PMP.

2.2 Exclusions

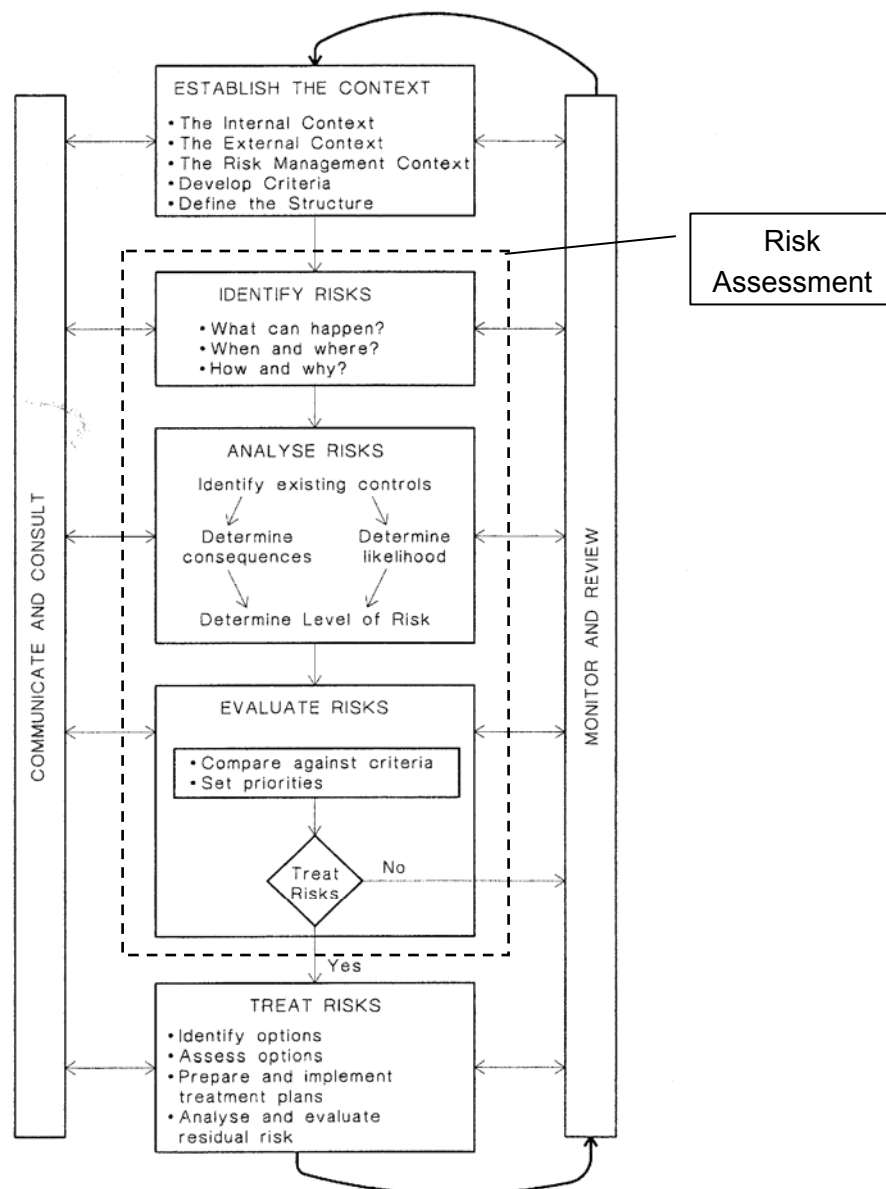
Our critique of the draft PMP excludes:

1. Detailed critique of the modelling or computational analysis, including error identification (e.g. transcription, scientific assumptions), and data presentation.
2. Detailed interpretation of legislative requirements or intentions that are not related to the risk assessment elements of the draft PMP.
3. Risk-based recommendations to either industry or the Crown for an appropriate PMP for New Zealand sea lions.

3.1 Risk Management

Most public and private entities in New Zealand are using the Australian/New Zealand Standard Risk Management (AS/NZS 4360:2004) as it provides a generic guide for managing risk. As is common practise, AS/NZS 4360 defines risk assessment as the overall process of risk identification, risk analysis and risk evaluation. The general processes outline in AS/NZS 4360:2004 are intentionally generic and are appropriate for application in the PMP. Figure 1 outlines the AS/NZS 4360:2004 risk management process against which the PMP has been critiqued.

Figure 1. Risk Management Process (adapted from Figure 3.1 AS/NZS 4360:2004)



It is our observation that the draft PMP risk assessment process has not been structured along lines consistent with AS/NZS 4360:2004. This would not compromise the process provided the principles and key steps recommended by the Standard have been completed. We have been able to interpret from the PMP that some of the key steps have been completed to a greater or lesser degree. This section will address each of the required steps in the risk management process, and critique how satisfactory the draft PMP addresses each of these steps.

4.1 Establish the Context

In order to undertake a risk assessment it is necessary to clearly state the context for the assessment and the risk criteria by which the significance of the risk is assessed. This section will outline the context for the risk assessment contained in section 4 of the *Population Management Plan for New Zealand sea lion*, and state the apparent risk criteria used in the assessment.

4.1.1 Background

The Marine Mammals Protection Act 1978 (the Act) is an Act to make provision for the protection, conservation, and management of marine mammals within New Zealand and within New Zealand fisheries waters. Sections 3E to 3H provide for the Minister of Conservation's approval of Population Management Plans (PMPs) in respect of threatened species or other species of marine mammals. With respect to threatened species, the desired outcome appears to be that the species is no longer gazetted as threatened. PMPs under the Act appear to focus on fishing-related mortality, with the primary control¹ to manage the species population being the establishment of a maximum allowable level of fishing-related mortality (MALFiRM) to allow certain criteria to be met.

The Marine Mammals Protection Act 1978 defines the context for a PMP – particularly sections 3E, 3F and 3G. Although the sections are focussed on the need and criteria for a MALFiRM, we believe the requirements provide an adequate contextual assessment for risk management purposes. The contextual assessment in the sea lion PMP is compared to the requirements below²:

¹ An existing process, policy, device, practice or other action that acts to minimize negative risk or enhance positive opportunities (source: AS/NZS 4360: 2004).

² Sections 3E and 3F of the Marine Mammals Protection Act 1978

4.1.2 Section 3E

(a) An assessment of the biology and status of the species

The Draft New Zealand sea lion Species Management Plan (draft SMP) is cited as the source of an assessment of the biology of the species. While the authors do not have a copy of the draft SMP, it is assumed that the draft SMP provides sufficient biological context for the analysis.

The draft PMP provides an adequate assessment of the status of the species, and states that sea lions have been gazetted as threatened “on the basis of limited geographic distribution, i.e. rather than because of any limitation on the absolute numbers of individuals in the population as a whole” (para. 21). However, the PMP does not show how the proposed control (i.e. MALFiRM) reduces risk to geographic distribution.

(b) An assessment of any known fisheries interaction with the species

The draft PMP provides an assessment of known fisheries interaction with the species, although it should be noted that the data and assessment provided appears to include a number of assumptions which have not been validated. Validation of all assumptions is required in a risk assessment so that the uncertainties in the assumptions can be taken into account.

(c) An assessment of the degree of risk caused by fishing-related mortality and other human-induced sources of mortality to the species, whether within New Zealand fisheries waters or elsewhere within the range of the species

To assess the degree of risk requires an understanding of what introduces risk to the population (essentially risks of reduction, or impediments to expansion, of the geographical distribution). Analysis of this context establishes risk management criteria with respect to these threats.

The inclusion of 1996 IUCN findings on the listed threats to New Zealand sea lions (para. 43) and the DOC perspective (para. 44) are helpful, but additional context in terms of attempting to present the quantum of effects of human-induced sources of mortality on the sea lion population is required.

Section 4 of the PMP is dedicated to describing the degree of risk caused by fishing-related mortality and other human-induced sources of mortality. However, there is an assumption that fishing-related mortality is a threat to the geographical distribution of sea lions, whereas this relationship has not been established in the PMP. Fishing-related hazards need to be described to support the assumed relationship, and allow risk management criteria to be established for these hazards (and subsequent treatments³ should the criteria not be met).

³ Process of section and implementation of measures to modify risk (AS/NZS 4360:2004)

(d) An estimate of the range of human-induced mortality for the species which would allow the criteria specified in section 3F of this Act to be met

Refer to comments to (c) directly above.

(e) An estimate of the range of fishing-related mortality for the species which would allow the criteria specified in section 3F of this Act to be met

Refer to comments to (c) directly above.

(f) The maximum allowable level of fishing-related mortality for the species, in New Zealand fisheries waters, which would allow the criteria specified in section 3F of this Act to be met

The proposals for a MALFiRM under section 3F have not been related to risk criteria or the relevance to of MALFiRM in achieving non-threatened status for the New Zealand sea lion (refer to 4.1.2.a above).

(g) Subject to section 3G of this Act, if a level has been set under paragraph (f) of this subsection, the maximum allowable level of fishing-related mortality for the species, in specified areas within New Zealand fisheries waters

The proposals for an area-based MALFiRM under section 3G have not been related to risk criteria or the relevance of MALFiRM in achieving non-threatened status for the New Zealand sea lion (refer to 4.1.2.a above).

4.1.3 Section 3F

Section 3F of the Marine Mammals Protection Act 1978 relates to determining a maximum allowance level of fishing-related mortality for New Zealand fisheries waters . For threatened species, it provides that the Minister “*shall determine a level of fishing-related mortality which 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*”.

In the case of a threatened species, section 3F provides for a risk management control that can be used if the risk assessment determines that fishing-related mortality is negatively affecting its threatened status. – In the case of the New Zealand sea lion, this would involve fishing-related mortality negatively affecting its geographical distribution. Section 3F does not prescribe the use of a MALFiRM. The risk assessment process should determine whether a MALFiRM is an effective control to use to mitigate risk. Our reading of the draft PMP is that the use of a MALFiRM has been treated by the Department of Conservation as a forgone conclusion, rather than being a conclusion of the risk assessment.

4.1.4 Section 3G

Section 3G of the Marine Mammals Protection Act 1978 relates to determining area-based maximum levels of fishing-related mortality. Section 3G(1) sets out the eligibility criteria for an area-based MALFiRM, and section 3G(2) provides that the Minister “*shall determine a level of fishing-related mortality for a discrete population referred to in subsection (1) of this section which should neither cause a net reduction in the size of the population nor seriously threaten the reproductive capacity of that population*”.

Section 3G provides for a risk management control that can be used if the criteria in section 3G(1) are established and if the risk assessment determines that fishing-related mortality is negatively affecting the net size of the discrete population or seriously threaten the reproductive capacity of that population. Again, our reading of the draft PMP is that the use of an area-based MALFiRM has been treated by the Department of Conservation as a forgone conclusion, rather than being a conclusion of the risk assessment.

4.2 Developing Criteria

The PMP for the NZ sea lion states a number of goals and objectives that can act as risk criteria.

4.2.1 Risk Criteria

Long term (50 years plus)

6. Populations of New Zealand sea lions are occurring throughout their natural range – as indicated by being present at densities of at least one population of New Zealand sea lions on North Island, South Islands, Stewart Island, and any 2 of the 5 subantarctic island groups.
7. A population will be considered to be established when a group:
 - a) Has a number of mature female sea lions exhibiting breeding philopatry equal to or greater than 35 individuals and
 - b) Maintains a population age structure conducive to ongoing recruitment.

Medium Term (20 years)

8. Achieve non threatened status for the New Zealand sea lion.
9. Populations of New Zealand sea lion are occurring in five or more locations.

Interim Term (5 – 20 years)

10. For a New Zealand fisheries waters MALFiRM, the New Zealand sea lion population increases at a rate that is not reduced by more than 10% compared to the increase that would have been achieved with zero fishing related mortality.
11. For an area-based MALFiRM, fishing-related mortality should neither cause a net reduction in the size of the population nor seriously threaten the reproductive capacity of that population.

4.2.2 Comment

The draft PMP should make it clear how the above risk criteria are derived from the contextual assessment. Supporting evidence to substantiate the validity of these criteria is required.

The Interim Term Criteria do not relate to the principal risk, which appears to have been established as limited geographic distribution. There is not a clear progression between the Interim, Medium and Long term criteria.

There are no criteria that are directly related to fishing activity. Nor are there clear linkages between the criteria and the operation of the control (MALFiRM). An effective risk management process requires means to measure the effectiveness of a risk management control in assuring the desired outcome.

We would also expect to see a defined mechanism to review the criteria at a either a predetermined time or when a particular threshold value is reached.

4.3 Risk Assessment

As outlined in Section 3 of this report, a risk assessment consists of the following components:

Risk Identification

- What events can happen to compromise meeting the risk criteria?

Risk Analysis

- What is the likelihood⁴ (L), consequence⁵ (C), and risk (L x C) of the occurrence of an event?

⁴ A general description of probability or frequency that can be expressed qualitatively or quantitatively (AS/NZS 4360:2004)

⁵ An outcome or impact of an event that can be expressed qualitatively or quantitatively and are considered in relation to the achievement of objectives (AS/NZS 4360:2004)

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- What is being done to decrease either the likelihood or the consequence, and subsequently the risk, of the occurrence of an event (i.e. existing controls)?
 - What is the residual likelihood (rL), consequence (rC), and subsequent residual risk (rL x rC) of the occurrence of an event after the existing controls have been taken into account?

Risk Evaluation

- Does the resulting risk profile meet the risk criteria?

If we are not satisfied that the results from the risk evaluation meet the risk criteria, then there is a need to consider what further management options (i.e. treatments) are necessary to implement in order for the risks to be suitably managed to achieve the desired outcome. The stage of considering further risk management actions is identified as the Treat Risk box in Figure 1.

In the case of the sea lion risk assessment, the introduction of a MALFiRM is the primary risk treatment (which results in establishing a risk control for the future). As discussed above, the risk assessment needs to clearly establish that the legislative risk criteria (i.e. achieving non threatened status for sea lions within a 20 year timeframe) will be achieved using this treatment. A clear relationship between the legislative risk criteria and the MALFiRM has not been established in the PMP.

4.3.1 Comment

Evidence that the accepted risk assessment process has been followed can not be identified in the draft PMP.

There appears to be a number of unstated assumptions made as to the nature and magnitude of risk to the sea lion population from fishing practises, especially as a result of fishing-induced mortality. However, the key steps in a risk assessment are absent, notably:

- Risk identification, in terms of identifying events that will compromise meeting the risk criteria
- Risk analysis, as there is no consideration of the likelihood or consequence (and therefore risk) of events on the national sea lion population
- Identification and consideration of existing controls
- Evaluation of the resulting risk profile against the risk criteria

Section 4 of the draft PMP presents mortality statistics rather than an assessment of the “degree of risk”. In order to assess risk, there need to be clear risk criteria and assessments of the likelihood and consequences of events that impact on achieving the desired outcome.

The Department of Conservation has stated its uncertainty around how the identified threats (including fishing-related mortality) impact on the species’ ability to establish breeding colonies in new locations

(para. 44), and this uncertainty should be reflected in the risk assessment either through best estimates of likelihood of the event, and consequence to the population; and/or through sensitivity analysis.

A sensitivity analysis has been undertaken as part of the risk assessment in the PMP. However, as the risk analysis suffers from some significant omissions, the results of the sensitivity analysis may not be meaningful.

4.4 Risk Treatment and Controls

Population Management Plans (and any MALFiRM(s) they may contain) are a mechanism (or control) to assist the Minister of Conservation in managing the population of threatened species..

According to the draft PMP, the desired outcome of fulfilling the long term goal is the increase in both the total number of sea lions, and the distribution and number of breeding aggregations throughout New Zealand, in order to reduce the vulnerability of sea lions and enhance the total population's ability to withstand the effects of human activities or stochastic events (para. 20).

4.4.1 Comment

The draft PMP does not establish the degree or nature of risk to the viability of the New Zealand sea lion population, nor does it provide an assessment of the criticality of implementing a MALFiRM as a control. The assessment does not consider other treatments that could reduce the risk to the New Zealand sea lion population, either in isolation or in conjunction with a MALFiRM-based control.

The risk management process undertaken as documented in the draft PMP:

- a) Relies on a number of unclear assumptions and unspecific risk criteria
- b) Omits a number of critical steps
- c) Does not appear to make a logical link between risk criteria, risk assessment findings, and proposed risk treatments

A risk assessment requires specific risk criteria that can be expected to be met through the implementation of management actions. From the information given, it is unclear of the nature and quantum of threat posed to the New Zealand sea lion population; and in light of this, it is not clear that management actions in the form of a MALFiRM will result in greatly improved chances of reaching the goal of New Zealand sea lions no longer being threatened.

For example, should controlling fishing-related mortality through a MALFiRM not be expected to contribute to the removal of its threatened status, then a MALFiRM should not be sought as a risk treatment.

The conclusion reached that “*the management of fishing related mortality at the (sic) New Zealand sea lion remains a priority*” (para. 96) cannot be supported by the risk assessment undertaken in the PMP; nor can the contention that the analysis highlights “*the degree of risk posed by fishing compared to other human induced sources of mortality for sea lions..*”(para. 98).

URS New Zealand Ltd (URS) has prepared this report for the use of Deepwater Stakeholder Group Limited in accordance with the usual care and thoroughness of the consulting profession. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 20 February 2006.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between 1 March and 15 March 2006 and is based on the conditions encountered and information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

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