

# New Zealand sea lion/rāpoka Threat Management Plan

2017 – 2022



# **NEW ZEALAND SEA LION/RĀPOKA THREAT MANAGEMENT PLAN**

Joint paper of the Department of Conservation and the Ministry for Primary Industries

**July 2017**

## Disclaimer

While every effort has been made to ensure the information in this publication is accurate, the Department of Conservation and Ministry for Primary Industries do 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.

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](mailto:brand@mpi.govt.nz)  
Telephone: 0800 00 83 33  
Facsimile: 04-894 0300

Marine Species and Threats Team  
Department of Conservation  
PO Box 10420  
Wellington 6143  
Email: [marine@doc.govt.nz](mailto:marine@doc.govt.nz)  
Telephone: 04-471 0726  
Facsimile: 04-381 3057

This publication is also available on the Department of Conservation website at

<http://www.doc.govt.nz/nature/native-animals/marine-mammals/seals/new-zealand-sea-lion/docs-work/new-zealand-sea-lion-threat-management-plan/>

And the Ministry for Primary Industries website at

<http://www.mpi.govt.nz/news-and-resources/publications/>

Cover image: New Zealand sea lions and pup. *Photo: Sarah Michael*

© Crown Copyright – Department of Conservation and Ministry for Primary Industries

ISBN: 978-1-98-851427-7 (print)

ISBN: 978-1-98-851426-0 (online)

## Contents

<b>Executive summary</b>	<b>4</b>
<b>Treaty of Waitangi obligations</b>	<b>6</b>
<b>Status of New Zealand sea lions</b>	<b>6</b>
<b>Problem definition</b>	<b>10</b>
<b>Developing the NZSL TMP</b>	<b>10</b>
<b>NZSL TMP vision and objectives</b>	<b>11</b>
<b>The NZSL TMP</b>	<b>12</b>
<b>Description of work streams</b>	<b>15</b>
1. Engagement	15
2. Direct mitigation	15
3. Targeted research	16
4. Evaluation	16
<b>Review of the NZSL TMP</b>	<b>17</b>
<b>Acknowledgements</b>	<b>17</b>

## Executive summary

The New Zealand sea lion/rāpoka (*Phocarctos hookeri*), is a taonga species, treasured by tangata whenua. It is rare and endemic to New Zealand and currently classified as ‘Nationally Critical’<sup>1</sup>. The Treaty partnership within the Ngāi Tahu takiwā is one of the primary mechanisms enabling Ngāi Tahu whānui to exercise its inherent tribal rights and interests as rangatira and kaitiaki over conservation lands and taonga species. Rāpoka is a taonga species under the Ngāi Tahu Claims Settlement Act 1998, in which the Crown acknowledges the cultural, spiritual, historical and traditional association of Ngāi Tahu with rāpoka.

Annual sea lion pup counts at breeding sites are used to index trends in the total sea lion population. The Auckland Islands is the largest breeding site for sea lions: 68% of all sea lion pups are born there; 30% are born at Campbell Island/Motu Ihupuku, and the remaining 2% at Stewart Island/Rakiura and the South Island/Te Waipounamu (currently restricted to the Otago and Catlins coasts). Between 1998 and 2009 the number of sea lion pups born annually at the Auckland Islands declined by 50%. In 2014, the Minister of Conservation and the Minister for Primary Industries asked officials to develop this New Zealand sea lion/rāpoka Threat Management Plan (NZSL TMP).

The purpose of this document is to describe the first 5 years of a 20 year programme of work to manage the threats to sea lions and achieve the vision of the NZSL TMP, set out below. The scope of the plan includes all key threats to the sea lion population and all known breeding sites.

### The vision of the NZSL TMP is to:

*“promote the recovery and ensure the long-term viability of New Zealand sea lions, with the ultimate goal of achieving ‘Not Threatened’ status”<sup>2</sup>.*

### The objectives are to:

1. Halt the decline of the New Zealand sea lion population within 5 years
2. Ensure the New Zealand sea lion population is stable or increasing within 20 years, with the ultimate goal of achieving ‘Not Threatened’ status.

A major tool underpinning the NZSL TMP is a quantitative risk assessment of threats to sea lions<sup>3</sup>. The risk assessment focusses on the two regions with the most data available – the Auckland Islands breeding colony, and the Otago Coast breeding location. The risk assessment indicates that sea lions are exposed to different natural and man-made threats and that no single factor is solely responsible for the decline. For this reason, the NZSL TMP takes a holistic approach to mitigate key threats and promote recovery across the range of the sea lion population.

---

<sup>1</sup> Baker, C.S.; Chilvers, B.L.; Childerhouse, S.; Constantine, R.; Currey, R.; Mattlin, R.; Van Helden, A.; Hitchmough, R.; Rolfe, J. 2016: Conservation status of New Zealand marine mammals, 2013. *New Zealand Threat Classification Series 14*. 18 p.

<sup>2</sup> Threat classification considers the following criteria: number of mature individuals, predicted population trend, number of populations, number of mature individuals in the largest population, and area of occupancy of total population. To achieve Not Threatened status, the overall population trend would need to be stable to 10%, the number of mature individuals be over 20,000, and for more than the two current populations/breeding colonies (Auckland Islands and Campbell Island) to exist.

<sup>3</sup> Roberts et al. 2016. [Quantitative Risk Assessment of Threats to New Zealand Sea lions](#). NIWA, Wellington, New Zealand.

The NZSL TMP is an overarching 5 year strategic programme of work agreed to by the Ministers of Conservation and Primary Industries. It includes a vision and objectives and identifies four workstreams: Engagement, Direct Mitigation, Targeted Research and Evaluation. The programme includes both population level initiatives and site-specific actions for mitigating threats at each of the four current breeding sites:

- South Island/Te Waipounamu
- Stewart Island/Rakiura
- Auckland Islands (Motu Maha or Maungahuka)
- Campbell Island/Motu Ihupuku.

The principles of mātauranga Māori will be incorporated into the four workstreams to achieve the vision of the NZSL TMP. Working in partnership on issues relating to sea lions, the Department of Conservation and the Ministry for Primary Industries will enable whānau, hapū, and iwi to fulfil their kaitiakitanga responsibilities towards sea lions.

## Treaty of Waitangi obligations

Sea lions are very important to all Māori. In te reo, the female sea lion is kake and the male is whakahao -rāpoka is used more generically for all sea lions.

Section 4 of the Conservation Act 1987 requires that the Act (and the Acts in the First Schedule) must be interpreted and administered as to give effect to the principles of Te Tiriti o Waitangi (the Treaty). It provides one of the highest levels of recognition and requires the Crown to work in partnership with iwi. The Treaty partnership within the Ngāi Tahu takiwā is the primary mechanism to enable Ngāi Tahu whānui to exercise their tribal rights and interests as rangatira and kaitiaki over conservation lands and taonga species.

In addition to Section 4 responsibilities, rāpoka are a taonga species under the Ngāi Tahu Claims Settlement Act 1998, in which the Crown acknowledges the cultural, spiritual, historical, and traditional association of Ngāi Tahu with rāpoka. This commits the Crown to consult with and have particular regard to the views of Ngāi Tahu when the Minister of Conservation makes policy decisions concerning the protection, management, or conservation of rāpoka.

Ngāi Tahu relationships to taonga species are not passive, they reflect the long history of interaction, management and use. It is through working in partnership with the Department that Ngāi Tahu are able to maintain these relationships with the lands, waters, flora and fauna within the Ngāi Tahu takiwā. By exercising rangatiratanga across these ancestral lands and waters, and as active tangata tiaki, the traditions that support the central values that define Ngāi Tahu can be maintained. Under the NZSL TMP Ngāi Tahu will be active in the management and decision making in relation to the enhancement of the species, to ensure the flax-roots knowledge and the Ngāi Tahu voice is heard. Officials will work with whānau, hapū and iwi to develop the appropriate mechanisms to ensure kaitiakitanga responsibilities for rāpoka are met. These mechanisms for ensuring iwi engagement will be further developed at the local level, with the associated rūnanga, ensuring the structure and function of the relationship matches the Treaty partnership needs.

## Status of New Zealand sea lions

Before humans reached New Zealand, sea lions were found around the entire New Zealand coast and on the Chatham Islands. Sea lions were hunted for food, bone and other products by Māori and for pelts, meat and oil by commercial sealers. This significantly reduced the population and distribution so that by the 20th century, sea lions were only found on Campbell Island/Motu Ihupuku and the Auckland Islands in the subantarctic region. In the 1990s, sea lion population growth led to a small number of sea lions breeding on Stewart Island/Rakiura and the Otago coast. Sea lions also began breeding in the Catlins area in Southland in 2006; however most sea lion pups (98%) are born either on Campbell Island/Motu Ihupuku (30%) or the Auckland Islands (68%) (**Figure 1**).

The marine environment around the Auckland Islands was protected for marine mammals in 1993 when the area out to 12 nautical miles became a marine mammal sanctuary. In 2003, the value of the wider marine ecosystem was recognised with the area covered by the marine mammal sanctuary also becoming a marine reserve. In 1997, [the New Zealand sea lion was gazetted as a threatened species](#) under the Marine Mammals Protection Act 1978.

New Zealand sea lions have been assessed under two threat classification systems: the New Zealand Threat Classification System<sup>4</sup> and the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species. In 2010, the New Zealand Threat Classification System listed the New Zealand sea lion as ‘Nationally Critical’ based on the rate of decline prior to 2010 and the restricted range of the population. This status was confirmed in the most recent review of the threat status of marine mammals in 2013<sup>5</sup>. In 2015, the IUCN updated the Red List status of New Zealand sea lions, listing them as ‘Endangered’ (they were previously listed as ‘Vulnerable’) – based on the projected ongoing decline in pup production of 4% per year at the largest breeding colonies on the Auckland Islands, and because all individuals are in one population<sup>6</sup>.

Annual sea lion pup counts at the four main sea lion breeding colonies on the Auckland Islands since 1995, and are used to index trends in the total sea lion population<sup>7</sup>. The number of sea lion pups born at the Auckland Islands in the 11 years between 1998 and 2009 declined by 50% (**Figure 2**).

During the 2014 monitoring survey, 1,575 sea lion pups were estimated to have been born at the Auckland Islands. This was the third lowest pup count since 1995. In response to concern at this low pup count and the declining trend, the then Ministers of Conservation and for Primary Industries requested that the Department of Conservation (DOC) and the Ministry for Primary Industries (MPI) work together to develop a joint New Zealand sea lion/rāpoka Threat Management Plan (NZSL TMP).

---

<sup>4</sup> Townsend, A.J.; de Lange, P.J.; Duffy, C.A.J.; Miskelly, C.M.; Molloy, J.; Norton, D. (2008). New Zealand Threat Classification System Manual. Department of Conservation, Wellington, New Zealand.

<sup>5</sup> Baker, C.S.; Chilvers, B.L.; Childerhouse, S.; Constantine, R.; Currey, R.; Mattlin, R.; Van Helden, A.; Hitchmough, R.; Rolfe, J. 2016: Conservation status of New Zealand marine mammals, 2013. *New Zealand Threat Classification Series 14*. 18 p.

<sup>6</sup> Chilvers, B. L. (2015). *Phocarctos hookeri*. The IUCN Red List of Threatened Species 2015: e.T17026A1306343. <http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T17026A1306343.en>. Downloaded on 8 October 2015.

<sup>7</sup> Please note that a breeding season spans two calendar years. In this NZSL TMP, the second year will be used – for example a reference to 2015 will refer to the 2014/15 breeding season.



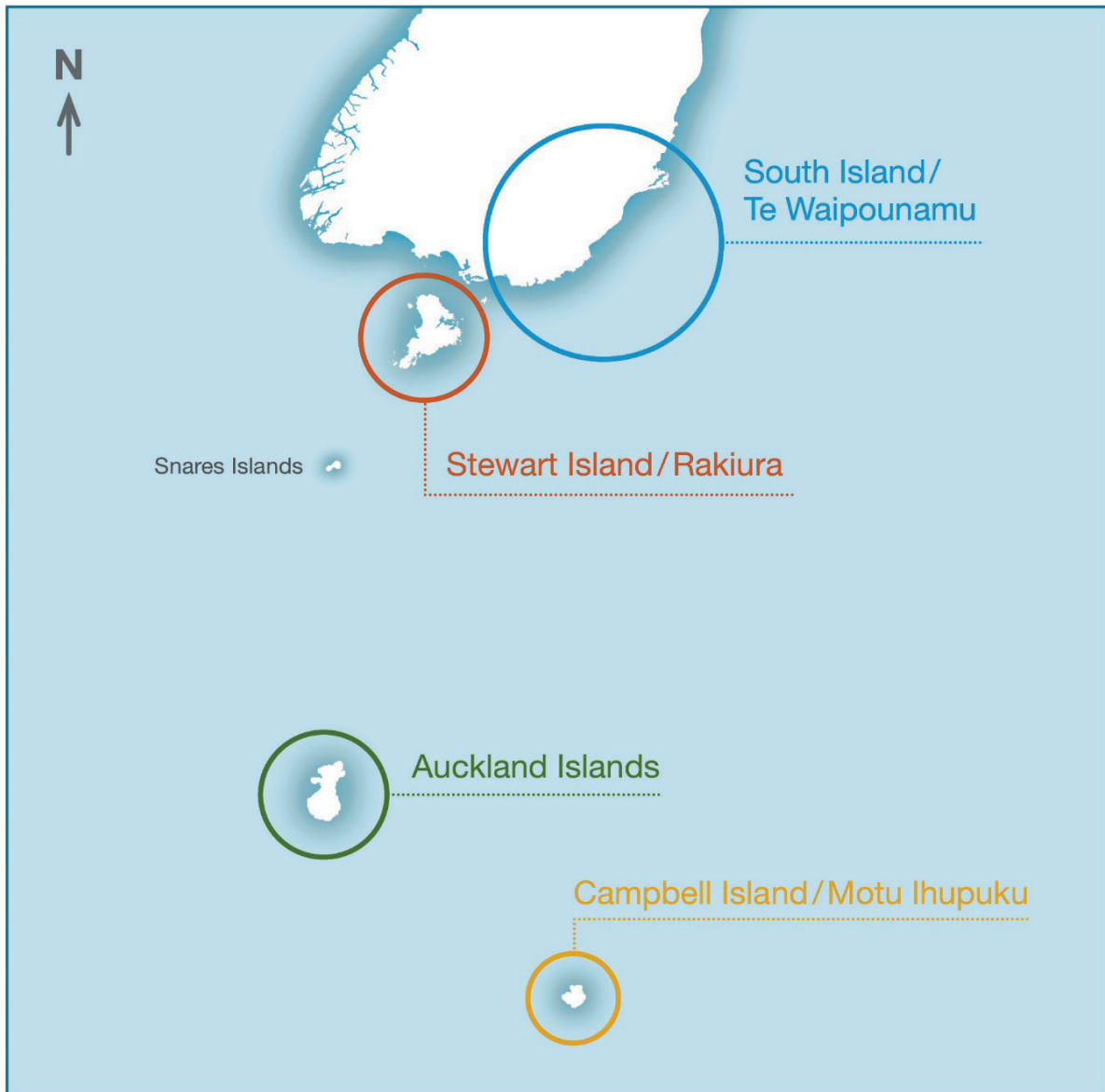


Figure 1: Current New Zealand sea lion breeding sites.

### Recent population trends

The Auckland Islands pup count conducted in January 2017 indicated that approximately 1,965 sea lion pups were born, a 14% increase on the previous year (1,727). Although a decline in pup production on the Auckland Islands since 1998 was a key driver to establishing the NZSL TMP for sea lions, pup counts appear to have stabilised around 1,600 to 1,700 pups per year at the Auckland Islands since 2009. While the pup counts suggest a potential stabilisation in the Auckland Islands breeding population, other demographic parameters such as adult female and pup survival are still lower than what would be expected for a growing population.

Pup counts at the Campbell Island/Motu Ihupuku breeding colony have been infrequent due to the difficulty and cost of getting researchers to the island; due to methodological differences between counts, it is difficult to infer population trends there. Sea lion pup counts appear to have increased over time – although the last two counts are similar, suggesting the increase may have slowed

(Figure 2). Importantly, the Campbell Island/Motu Ihupuku sea lion colony experiences some of the highest rates of pup mortality: 40–60% of pups die in their first 8 weeks).

Annual sea lion pup counts began on the Otago coast in 1994, the Catlins coast in 2006, and Stewart Island/Rakiura in 2011. The number of sea lion pups counted each year also appears to be slowly increasing at these breeding sites. Pup numbers at Stewart Island/Rakiura nearly qualify this location as a new breeding colony<sup>8</sup>, while pup counts on the South Island/Te Waipounamu are relatively low (Figure 2). The early increase of pup counts on Stewart Island/Rakiura is likely due more to increased search efforts than an increase in pup production. However, despite the increase in pup counts seen at these locations, their contribution to the overall sea lion population remains low at approximately 2%.

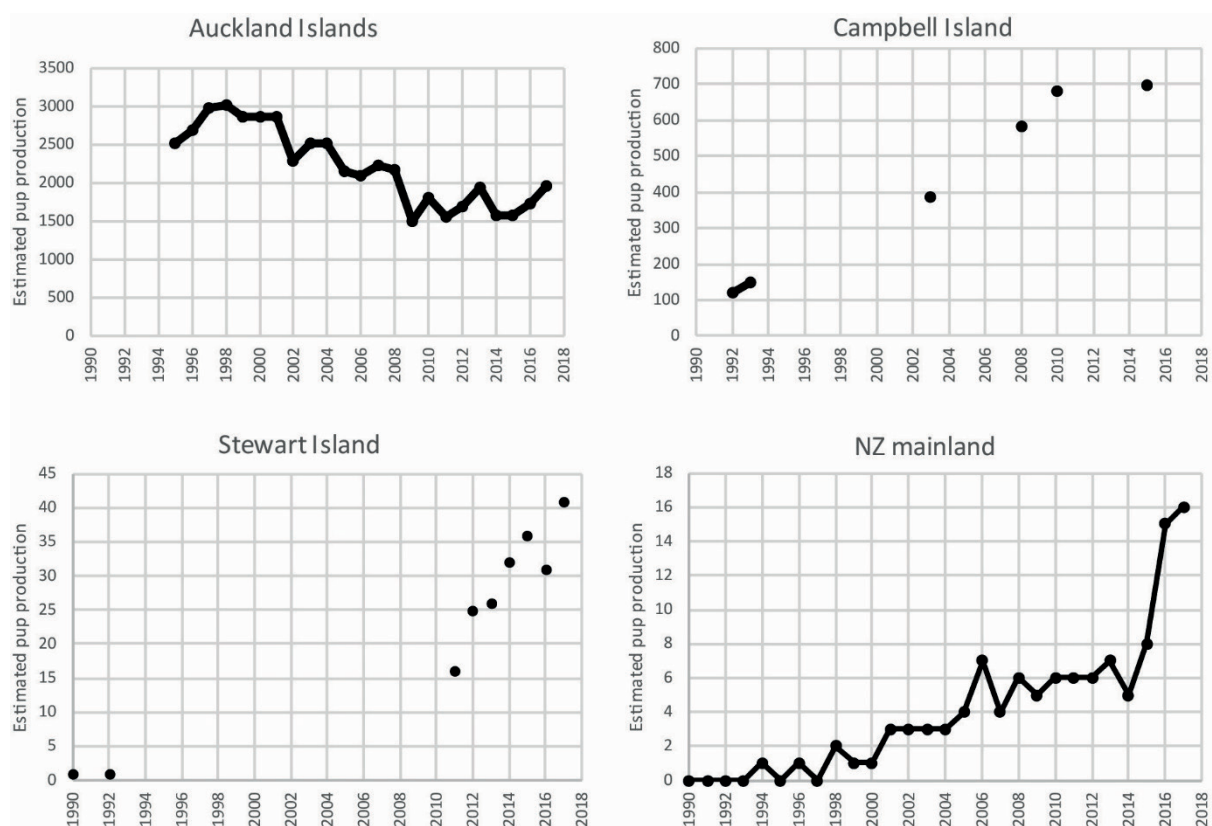


Figure 2: Annual sea lion pup count estimates from breeding sites. Note that the scale for each figure is different (adapted from Roberts and Doonan 2016, and updated with the most recent pup counts from 2016 and 2017).

<sup>8</sup> 'Breeding colony' is typically defined as producing greater than 35 pups per year for 5 consecutive years. Currently Stewart Island/Rakiura and Otago coast do not meet these criteria and are therefore breeding locations, not colonies – which is relevant for the species threat classification.

## Problem definition

New Zealand sea lion/rāpoka (*Phocarctos hookeri*), a taonga endemic species, is currently classified as 'Nationally Critical' and considered threatened with extinction. This threat classification is due to small population size, projected population decline, restricted breeding range, and a range of human related threats. To achieve 'Not Threatened' status, the overall population trend must be stable to 10%, the number of mature individuals over 20,000, and there must be more than the two current populations/breeding colonies (Auckland Islands and Campbell Island/Motu Ihupuku). A Threat Management Plan to guide the recovery of the New Zealand sea lion/rāpoka is therefore needed.

## Developing the NZSL TMP

In the three years since the NZSL TMP process began, several work programmes have begun or been maintained. The background document<sup>9</sup> contains information on New Zealand sea lion biology, threats, legislation, history of commercial fishing mitigation, and describes the research undertaken during the development of the NZSL TMP. Extensive research on sea lions has taken place over the past 30 years. Identifying the relative importance and interdependencies of various threats and/or environmental drivers contributing to the decline of the sea lion population is inherently complex.

Substantial work undertaken to support the development of the NZSL TMP includes a workshop on pup mortality, the quantitative risk assessment, and recommendations from the inaugural meetings of the New Zealand sea lion/rāpoka Forum and Advisory Group. Multiple papers on sea lions are available as background to the NZSL TMP:

1. [Discussion paper on New Zealand sea lion mortality: causes and mitigation](#)
2. [Review of threats to the recovery of New Zealand sea lions including a literature review of similar species overseas](#)
3. [Quantitative Risk Assessment of Threats to New Zealand Sea lions](#)
4. [A Summary of the Risk Assessment of Threats to New Zealand Sea lions](#)
5. [Aquatic Environment and Biodiversity Annual Review 2015 - sea lion chapter](#)
6. [Background document: New Zealand sea lion/rāpoka Threat Management Plan](#)
7. [Consultation document: New Zealand sea lion/rāpoka Threat Management Plan](#)

Sea lions were previously managed through the [New Zealand sea lion Species Management Plan \(2009-2014\)](#). DOC and MPI will now manage sea lions through the implementation of this NZSL TMP to progress the recovery of the sea lion population. It is an overarching strategic programme of work agreed by the Ministers of Conservation and for Primary Industries.

---

<sup>9</sup> DOC and MPI 2016. Background document New Zealand sea lion/rāpoka Threat Management Plan. Wellington, New Zealand. 31 pp.  
<http://www.doc.govt.nz/Documents/conservation/native-animals/marine-mammals/nz-sea-lion-tmp/nzsl-tmp-background-document.pdf>

## NZSL TMP vision and objectives

The vision of the NZSL TMP is to:

*Promote the recovery and ensure the long-term viability of New Zealand sea lions, with the ultimate goal of achieving 'Not Threatened' status<sup>10</sup>.*

The principles of mātauranga Māori will be incorporated to achieve the vision of the NZSL TMP. Working in partnership on issues relating to sea lions will enable whānau, hapū, and iwi to fulfil their kaitiakitanga responsibilities towards sea lions. The scope of the plan includes all key threats to the sea lion population and all known breeding sites.

The objectives are to:

1. Halt the decline of the New Zealand sea lion population within 5 years
2. Ensure the New Zealand sea lion population is stable or increasing within 20 years, with the ultimate goal of achieving 'Not Threatened' status.

The sea lion population will be monitored to evaluate progress against the above objectives and vision using the following population indicators at breeding sites:

1. Pup counts
2. Pup survival (modelled based on tag re-sights)
3. Adult female sea lion survival (modelled based on tag re-sights)
4. Number of mature individuals
5. Number of breeding locations and colonies.

Actions to achieve the objectives will be specific to each location (**Figure 3**). This recognises the difference in both the scale of pup production at breeding locations and the threats affecting sea lions at each site.

**For the Auckland Islands:**

**Aim – pup numbers continue to increase from the 2014 count**

- Demographic parameters such as adult female survival rate and pup survival rate improve and
- Pup numbers consistently above 1,575 (the 2014 pup count), and ideally over 1,965 (the 2017 pup count).

**For Campbell Island/Motu Ihupuku:**

**Aim – reduce the level of pup mortality and support population growth**

- Increased frequency and consistency of monitoring the population.
- Pup counts at or above 696 (the 2015 pup count).
- Demographic parameters such as adult female survival rate and pup survival rate improve.

---

<sup>10</sup> Threat classification considers the following criteria: number of mature individuals, predicted population trend, number of populations, number of mature individuals in the largest population, and area of occupancy of total population. To achieve Not Threatened status, the overall population trend would need to be stable to 10%, the number of mature individuals over 20,000, and more than the two current populations/breeding colonies (Auckland Islands and Campbell Island/Motu Ihupuku).

**For Stewart Island/Rakiura:****Aim – facilitate population growth to achieve breeding colony status**

- Pup counts remain at a number higher than 35 for 5 years in a row, qualifying Stewart Island/Rakiura as a new breeding colony.
- Continued increase in number of pups born to enable colonial breeding behaviour.
- No deliberate human-caused mortality (eg shootings).
- Increased public interest and involvement in the conservation of sea lions.

**For the South Island/Te Waipounamu:****Aim – facilitate population growth**

- Pup counts increase above 16 (the 2017 pup count) per year along the Otago and Southland coastline, with an increased number of breeding sites.
- No deliberate human-caused mortality.
- Increased public interest and involvement in the conservation of sea lions.

## **The NZSL TMP**

The NZSL TMP is a 5 year strategic programme of work with four workstreams outlined in **Figure 4**. Due to the complexity of the programme, a Project Coordinator will oversee the first 5 year cycle of the NZSL TMP. They will coordinate the Engagement and Evaluation workstreams, and will ensure all four workstreams are linked.

2017 – 2022

# New Zealand sea lion/rāpoka Threat Management Plan



**Vision:** Promote the recovery and ensure the long-term viability of New Zealand sea lions, with the ultimate goal of achieving 'Not Threatened' status.

**5 year objective:** Halt the decline of the New Zealand sea lion population within 5 years.

**20 year objective:** Ensure the New Zealand sea lion population is stable or increasing within 20 years.

## Site specific measures of success

### Stewart Island/Rakiura

#### Support population growth to achieve breeding colony status:

- Pup counts remain higher than 35 for 5 years in a row, qualifying this site as a new breeding colony
- Pup production continues to increase to allow for colonial breeding
- There are no cases of deliberate human-caused mortality
- Public involvement in the conservation of sea lions increases.

### Auckland Islands

#### Pup production continues to increase from the 2014 count:

- Adult female survival rate and pup survival rate improve
- Pup numbers are consistently above 1,575 (2014 pup count) and ideally over 1,965 (2017 pup count).

### South Island/Te Waipounamu

#### Support population growth:

- Pup counts along this stretch of coastline increase to above 16 per year, eventually reaching 35, on track to achieving breeding colony status
- There are no cases of deliberate human-caused mortality
- Public involvement in the conservation of sea lions increases.

### Campbell Island/Motu Ihupuku

#### Reduce pup mortality and support population growth:

- Pup counts are consistently at or above 696 (2015 pup count)
- Pup mortality rates are consistently lower than 40% per annum, and
- Frequency and consistency of monitoring of sea lions has increased.

## Success across the New Zealand sea lion range

- Pup mortality from falling into natural holes is reduced
- Disease research yields answers to inform recommendations to reduce pup mortality from *Klebsiella pneumoniae*
- Estimation of SLED efficacy and cryptic mortality affecting adult female survival improves
- The effects of climate change and fisheries on sea lion nutritional status are better understood
- Sea lion breeding sites developing and colonies establishing at new locations
- The New Zealand sea lion threat status improves from Nationally Critical to Not Threatened.

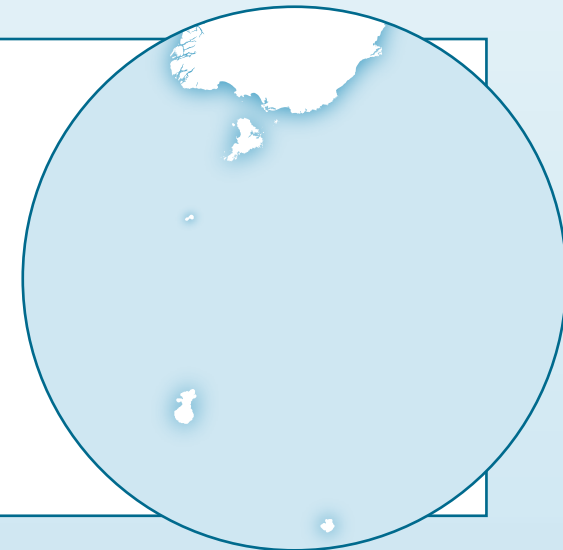


Figure 3: What success looks like at each site and across the entire population.

# 2017 – 2022

## New Zealand sea lion/rāpoka Threat Management Plan

**Vision:** Promote the recovery and ensure the long-term viability of New Zealand sea lions, with the ultimate goal of achieving ‘Not Threatened’ status.

**Partnership:** The principles of mātauranga Māori will be woven throughout all four workstreams to achieve the vision of the Threat Management Plan.

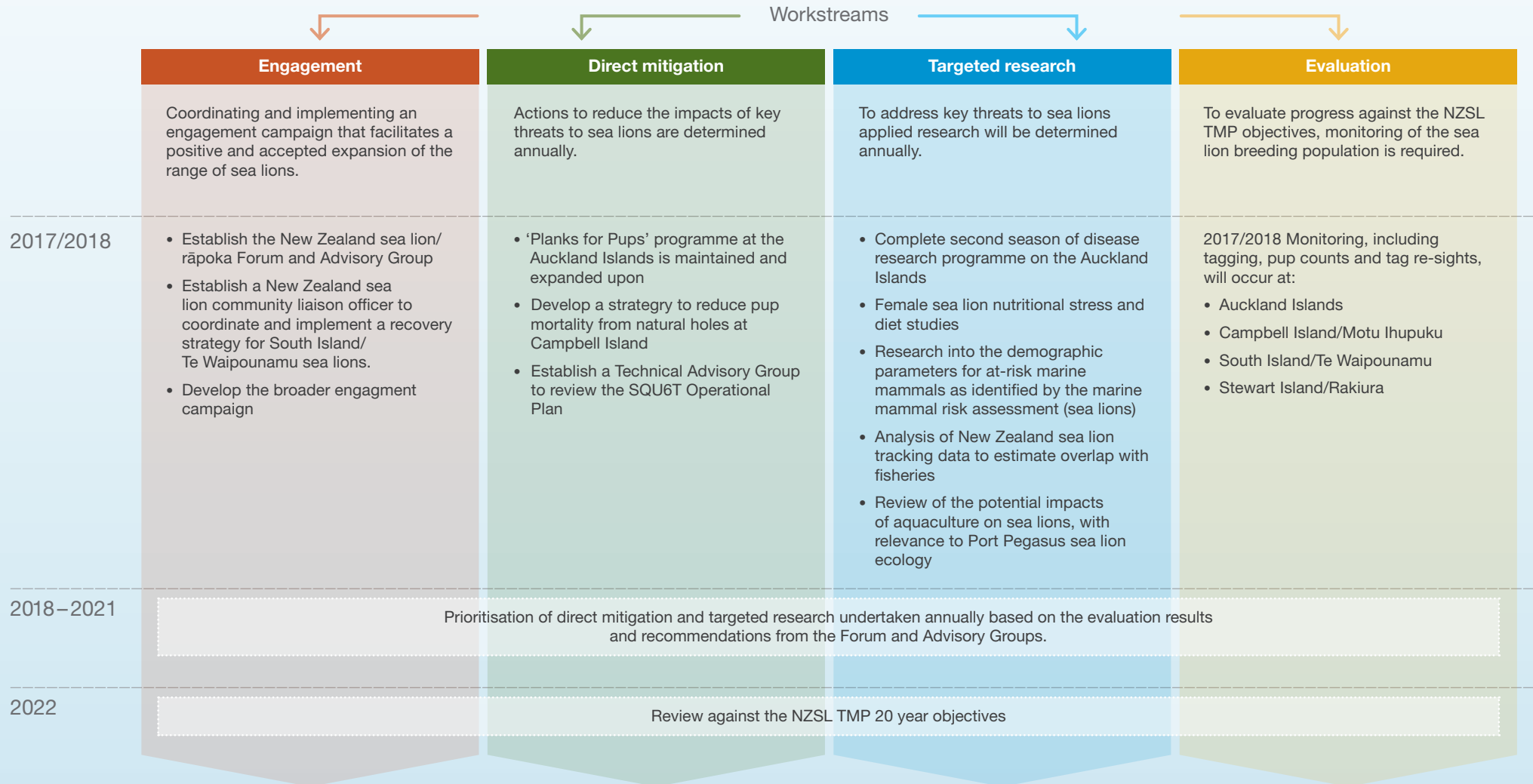


Figure 4: The four workstreams of the NZSL TMP

## Description of work streams

### 1. Engagement

#### **Establishing a New Zealand sea lion/rāpoka Forum, and an Advisory Group.**

These two groups will allow iwi, the Crown and stakeholders to come together to discuss and prioritise recovery actions under the NZSL TMP. The Forum will focus on facilitating population growth on the South Island/Te Waipounamu and Stewart Island/Rakiura. The Advisory Group will focus on halting the decline and facilitating population growth across the species range, with emphasis on the subantarctic breeding colonies. These groups will each meet at least annually to make recommendations and prioritise actions for the year ahead, prior to a full review of the NZSL TMP in 2022.

#### **Establishing a Rāpoka Community Liaison role within DOC**

Working with DOC rangers, the Rāpoka Community Liaison officer will be involved with the recovery of sea lions from Stewart Island/Rakiura to the Otago and Southland coasts, and will focus on supporting population growth and re-colonisation of the South Island/Te Waipounamu. Activities could include:

- Working with local whānau, hapū, communities, stakeholders and regulatory bodies to support population growth and promote positive messaging around sea lions
- Coordinating an engagement campaign that facilitates a positive and accepted expansion of the range of sea lions
- Coordinating the New Zealand sea lion/rāpoka Forum and fostering positive working relationships with stakeholders
- Supporting local DOC staff with monitoring, sea lion incidents, and callouts throughout the prescribed South Island/Te Waipounamu range
- Ensuring coordination of protocols to guide decision-making on local interventions for sick or injured sea lions.

### 2. Direct mitigation

In the first 5 year cycle of the NZSL TMP, mitigation will focus on the main threats highlighted by the risk assessment. Initially, mitigation actions will address the threat of pup mortality in natural holes at breeding sites (expanding the 'planks for pups' programme), and mitigating interactions with commercial fisheries. Broadly, the interventions proposed are:

- Reducing sea lion pup mortality from pups falling into holes, by maintaining and improving the existing programme on the Auckland Islands, and developing methods and effective solutions for Campbell Island/Motu Ihupuku.
- Developing fishery-specific approaches to understanding and managing commercial fisheries interactions. In the first instance this will focus on the fisheries where there is good information on interactions and mitigation. This includes the southern squid trawl fishery near the Auckland Islands (SQU6T) and the southern blue whiting trawl fishery around Campbell Island/Motu Ihupuku (SBW6I). The Operational Plan to manage the incidental capture of sea lions in the southern squid trawl fishery (SQU6T) will be reviewed in 2017 through a technical advisory group and public consultation process.



- Developing fishery-specific approaches to understanding and managing commercial fisheries where the information regarding sea lion interactions and mitigation is less detailed – for example, scampi fisheries around the Auckland Islands (SCI6A) and fisheries around the South Island/Te Waipounamu and Stewart Island/Rakiura.

### 3. Targeted research

Research is needed to inform decisions on the management of sea lions, especially where a threat and its impact on the population is poorly understood. Research efforts will initially be focused on the threats where considerable information gaps and/or uncertainties remain. Therefore, the proposed focal areas for research are:

- Disease research, to develop and trial actions to reduce pup mortality from *Klebsiella pneumoniae*
- Research to better understand adult female nutritional stress and diet
- Research to better understand sea lion interactions with fishing effort, and to estimate interaction rates
- Examination of sea lion exclusion device (SLED) efficacy, to better inform estimates of sea lion interactions and cryptic mortality in fisheries that deploy SLEDs
- Review of the potential impacts of aquaculture on sea lions with relevance to Port Pegasus sea lion ecology.

DOC and MPI will run research projects in these areas, using their research prioritisation, funding and review processes (Conservation Services Programme and Aquatic Environment Working Group). They will update both the New Zealand sea lion/rāpoka Forum and the Advisory Group, to inform discussions on prioritising resources and research in future.

It is recognised there has been a considerable amount of research on sea lions from different researchers in the past. To make the data more easily accessible for gap analyses and future research, consideration will be given to a central research repository of sea lion data.

### 4. Evaluation

To measure progress against the NZSL TMP objectives, for the next 5 years we will:

- Conduct annual pup counts and tag re-sighting on the Auckland Islands.
- Undertake annual monitoring programmes for Campbell Island/Motu Ihupuku, Stewart Island/Rakiura and the South Island/Te Waipounamu. For Campbell Island/Motu Ihupuku this will increase the frequency and consistency of pup counts and enable increased effort on tag re-sighting. For Stewart Island/Rakiura and the South Island/Te Waipounamu, this will maintain the annual pup counts but increase the effort and expand the types of data collected (eg increased effort on tag re-sighting, increased search effort to locate new breeding locations, and increased data collected on causes of pup mortality).
- Collect data on causes of mortality, to assess progress towards achieving the goal of no deliberate human-caused mortalities.

## **Review of the NZSL TMP**

The NZSL TMP has two key review timeframes: the annual work plan and the 5 year review.

The process to review the detailed work plan will take place annually, and will be informed by all workstreams. Based on the previous year's results, the New Zealand sea lion/rāpoka Forum and Advisory Group will recommend priorities for each workstream for the following year.

The NZSL TMP will be reviewed every 5 years to evaluate our progress towards achieving the vision and the 20 year objective (of a stable or increasing New Zealand sea lion population). However, if an Auckland Islands pup count is lower than the 2014 pup count of 1,575, an early review will be triggered.

## **Acknowledgements**

The 3 year development of this NZSL TMP would not have been possible without the significant work in the New Zealand sea lion/rāpoka space in the past. DOC and MPI acknowledge the knowledge, expertise, and contribution of many parties to our understanding of our sea lion population, and the threats it faces.

