NEW ZEALAND THREAT CLASSIFICATION SERIES 14

Conservation status of New Zealand marine mammals, 2013

C.S. Baker, B.L. Chilvers, S. Childerhouse, R. Constantine, R. Currey, R. Mattlin, A. van Helden, R. Hitchmough and J. Rolfe

newzealand.govt.nz

Department of Conservation
Te Papa Atawhai

Cover: Maui dolphin (*Cephalorhynchus hectori maui*) mother and calf, 2010. *Photo: Auckland University.*

New Zealand Threat Classification Series is a scientific monograph series presenting publications related to the New Zealand Threat Classification System (NZTCS). Most will be lists providing NZTCS status of members of a plant or animal group (e.g. algae, birds, spiders). There are currently 23 groups, each assessed once every 3 years. After each three-year cycle there will be a report analysing and summarising trends across all groups for that listing cycle. From time to time the manual that defines the categories, criteria and process for the NZTCS will be reviewed. Publications in this series are considered part of the formal international scientific literature.

This report is available from the departmental website in pdf form. Titles are listed in our catalogue on the website, refer www.doc.govt.nz under *Publications*, then *Science & technical*.

ISSN 2324–1713 (web PDF)
ISBN 978–0–478–15063–6 (web PDF)

This report was prepared for publication by the Publishing Team; editing and layout by Lynette Clelland. Publication was approved by the Deputy Director-General, Science and Policy, Department of Conservation, Wellington, New Zealand.

Published by Publishing Team, Department of Conservation, PO Box 10420, The Terrace, Wellington 6143, New Zealand.

In the interest of forest conservation, we support paperless electronic publishing.

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Conservation status of New Zealand marine mammals, 2013

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Abstract

The conservation status of all known New Zealand marine mammal taxa was reassessed using the New Zealand Threat Classification System (NZTCS) during a meeting on 8 May 2013. A full list is presented, along with a statistical summary and brief notes on the most important changes. Twelve species are ranked Data Deficient, 8 Threatened (5 Nationally Critical, 2 Nationally Endangered, 1 Nationally Vulnerable), 26 Non-resident Native (7 Migrant, 19 Vagrant) and 11 Not Threatened. This list replaces all previous NZTCS lists for marine mammals.

Keywords: New Zealand Threat Classification System, NZTCS, conservation status, whale, dolphin, seal, sea lion, Delphinidae, Phocoenidae, Ziphiidae, Physeteridae, Kogiidae, Cetotheriidae, Balaenopteridae, Balaenidae, Otariidae, Phocidae

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*. Department of Conservation, Wellington. 18 p.

1. Summary

Baker et al. (2010) presented results of a complete audit (carried out in 2009) of the conservation status of New Zealand marine mammals—a total of 56 taxa. The conservation status of these taxa was assessed using New Zealand Threat Classification System (NZTCS) criteria (Townsend et al. 2008). We have repeated this status assessment 3 years later (during a review by the authors in a meeting on 8 May 2013), as suggested by Townsend et al. (2008). The categories, criteria and process were identical between the two listings, and many of the panel members (the authors of Baker et al. 2010 and this document) were the same.

We assessed the status of 57 taxa (Table 1), including 5 unnamed taxa. There were some name changes between the two assessments (Table 2) resulting from a study of the subspecies status of New Zealand Bryde's whales (Society for Marine Mammalogy 2014); evidence that the New Zealand population of dusky dolphins should be recognised as an endemic subspecies (Harlin-Cognato 2010); clarification that the undescribed taxa of *Orcinus* are likely to be distinct

Table 1. Statistical summary of the status of New Zealand marine mammal taxa and taxonomically indeterminate entities assessed in 2009 (Baker et al. (2010)) and 2013 (this document).

CATEGORY	BAKER ET AL. 2010	BAKER ET AL. 2016
Extinct	0	0
Data Deficient	13	12
Threatened—Nationally Critical	5	5
Threatened—Nationally Endangered	3	2
Threatened—Nationally Vulnerable	0	1
At Risk—Declining	0	0
At Risk—Recovering	0	0
At Risk—Relict	0	0
At Risk—Naturally Uncommon	0	0
Non-resident Native—Migrant	6	7
Non-resident Native—Vagrant	20	19
Non-resident Native—Coloniser	0	0
Not Threatened	9	11
Introduced and Naturalised	0	0
Total	56	57

Table 2. Name changes, additions or deletions affecting New Zealand marine mammal species between the publication of Baker et al. (2010) and 2013 (this document).

NAME IN BAKER ET AL. 2010	NAME IN BAKER ET AL. 2016	COMMON NAME	FAMILY
Balaenoptera edeni/brydei sp.	*Balaenoptera edeni brydei*	Bryde's whale	Balaenopteridae
Lagenorhynchus obscurus	*Lagenorhynchus obscurus* subsp.	Dusky dolphin	Delphinidae
Orcinus orca Type A	*Orcinus orca*	Killer whale	Delphinidae
Orcinus orca Type B	*Orcinus* sp. Type B	Killer whale	Delphinidae
Orcinus orca Type C	*Orcinus* sp. Type C	Killer whale	Delphinidae
Orcinus orca Type D	*Orcinus* sp. Type D	Killer whale	Delphinidae
Tursiops sp. (Kermadecs)	Subsumed into *Tursiops truncatus*	Bottlenose dolphin	Delphinidae
Not in previous list	*Feresa attenuata*	Pygmy killer whale	Delphinidae
Not in previous list	*Mesoplodon mirus*	True's beaked whale	Ziphiidae

species or subspecies rather than intraspecific variants of *O. orca* (R. Pitman, pers. comm); the addition of two newly recorded species (see below); and, the removal of a putative new, unnamed *Tursiops* species from the Kermadec Islands after intitial evidence from mtDNA sequencing failed to support its taxonomic distinctiveness from *Tursiops truncatus* (Duffy et al. in press).

There were also two additions to the list of mammal species recorded from New Zealand waters, based on records of single stranded individuals (Table 2). A True's beaked whale (*Mesoplodon mirus*) stranded at Waiatoto Beach, South Westland. This species was considered to be Data Deficient. A pygmy killer whale (*Feresa attenuata*) stranded in the far north near Te Paki. This species is well known from the tropical Pacific, and was listed as Vagrant, Data Poor.

There were few changes to the status of species listed by Baker et al. (2010) (Table 3). One Threatened species changed status: the southern right whale (*Eubalaena australis*) was moved from Nationally Endangered to Nationally Vulnerable in response to documented population increase (Carroll et al. 2013); this was also the only change reflecting a real, monitored population change. The other four status changes reflected improved knowledge rather than a real change in status: Arnoux's beaked whale (*Berardius arnuxii*) moved from the Vagrant to the Migrant category in recognition of the larger numbers and more regular annual occurrence in New Zealand waters than previously thought; the pygmy sperm whale (*Kogia breviceps*) and Gray's beaked whale (*Mesoplodon grayi*) were moved from Data Deficient to Not Threatened after reassessment of the large number of records for each of these species and the high levels of genetic diversity found in both (Thompson et al. 2013); and the spectacled porpoise (*Phocoena dioptrica*) was moved from Vagrant to Data Deficient because it may possibly be resident around New Zealand's subantarctic islands.

Table 3. Statistical summary of status changes of New Zealand marine mammal taxa and taxonomically indeterminate entities between 2009 (Baker et al. 2010, figures in Roman type) and 2013 (this document, figures in bold type).

CONSERVATION STATUS 2013	CONSERVATION STATUS 2009	DETERMINATE	INDETERMINATE	TOTAL
DATA DEFICIENT		**12**	**0**	**12**
	Data Deficient	10	0	10
	New to list	1	0	1
	Vagrant	1	0	1
THREATENED		**8**	**0**	**8**
Nationally Critical		**5**	**0**	**5**
	Nationally Critical	5	0	5
Nationally Endangered		**2**	**0**	**2**
	Nationally Endangered	2	0	2
Nationally Vulnerable		**1**	**0**	**1**
	Nationally Endangered	1	0	1
NON-RESIDENT NATIVE		**23**	**3**	**26**
Migrant		**7**	0	**7**
	Migrant	6	0	6
	Vagrant	1	0	1
Vagrant		**16**	**3**	**19**
	Vagrant	15	3	18
	New to list	1	0	1
NOT THREATENED		**9**	**2**	**11**
	Data Deficient	2	0	2
	Not Threatened	7	2	9
TOTAL		**52**	**5**	**57**

2. Conservation status of New Zealand marine mammals

Taxa are assessed according to the criteria of Townsend et al. (2008), grouped by conservation status, then alphabetically by scientific name. For non-endemic species that are threatened internationally, the IUCN category is listed alongside the NZTCS listing. Categories are ordered by degree of loss, with Extinct at the top of the list and Not Threatened at the bottom, above Introduced and Naturalised. The Data Deficient list is inserted between Extinct and Threatened. Although the true status of Data Deficient taxa will span the entire range of available categories, taxa are in that list mainly because they are very seldom seen, so most are likely to end up being considered threatened and some may already be extinct. The Data Deficient list is likely to include many of the most threatened species in New Zealand.

See Townsend et al. (2008) for details of criteria and qualifiers, which are abbreviated as follows:

CD Conservation Dependent
De Designated
DP Data Poor
EF Extreme Fluctuations
EW Extinct in the Wild
IE Island Endemic
Inc Increasing
OL One Location
PD Partial Decline
RF Recruitment Failure
RR Range Restricted
SO Secure Overseas
S?O Uncertainty as to whether the overseas taxon is secure
Sp Sparse
St Stable
TO Threatened Overseas

2.1 Taxonomically determinate

Extinct (0)

Taxa for which there is no reasonable doubt—following repeated surveys in known or expected habitats at appropriate times (diurnal, seasonal and annual) and throughout the taxon's historic range—that the last individual has died.

No taxonomically determinate marine mammal taxa are listed in this category.

Data Deficient (12)

Taxa that are suspected to be threatened, or in some instances, possibly extinct but are not definitely known to belong to any particular category due to a lack of current information about their distribution and abundance. It is hoped that listing such taxa will stimulate research to find out the true category (for a fuller definition see Townsend et al. 2008).

Data Deficient continued on next page

Data Deficient continued

NAME AND AUTHORITY	COMMON NAME	FAMILY	QUALIFIERS	IUCN STATUS
Caperea marginata (Gray, 1846)	Pygmy right whale	Cetotheriidae	S?O	Data Deficient ver 3.1
Hyperoodon planifrons Flower, 1882	Southern bottlenose whale	Ziphiidae	SO	Least Concern ver 3.1
Lagenorhynchus cruciger (Quoy and Gaimard, 1824)	Hourglass dolphin	Delphinidae	S?O	Data Deficient ver 3.1
Mesoplodon bowdoini Andrews, 1908	Andrews' beaked whale	Ziphiidae	S?O	Data Deficient ver 3.1
Mesoplodon densirostris (Blainville, 1817)	Dense-beaked whale	Ziphiidae	S?O	Data Deficient ver 3.1
Mesoplodon hectori (Gray, 1871)	Hector's beaked whale	Ziphiidae	S?O	Data Deficient ver 3.1
Mesoplodon layardii (Gray, 1865)	Strap-toothed whale	Ziphiidae	S?O	Data Deficient ver 3.1
Mesoplodon mirus True, 1913	True's beaked whale	Ziphiidae	S?O	Data Deficient ver 3.1
Mesoplodon traversii (Gray, 1874)	Spade-toothed whale	Ziphiidae	S?O	Data Deficient ver 3.1
Phocoena dioptrica Lahille, 1912	Spectacled porpoise	Phocoenidae	S?O	Data Deficient ver 3.1
Tasmacetus shepherdi Oliver, 1937	Shepherd's beaked whale	Ziphiidae	SO	Least Concern ver 3.1
Ziphius cavirostris G. Cuvier, 1823	Cuvier's beaked whale	Ziphiidae	SO	Least Concern ver 3.1

Threatened (8)

Taxa that meet the criteria specified by Townsend et al. (2008) for the categories Nationally Critical, Nationally Endangered and Nationally Vulnerable.

Nationally Critical (5)

Criteria for Nationally Critical:

A—very small population (natural or unnatural)

A(1) <250 mature individuals, regardless of cause
A(2) ≤2 subpopulations, ≤200 mature individuals in the larger subpopulation
A(3) Total area of occupancy ≤1 ha (0.01 km^2)

B—small population (natural or unnatural) with a high ongoing or predicted decline

B(1/1) 250–1000 mature individuals, predicted decline 50–70%
B(2/1) ≤5 subpopulations, ≤300 mature individuals in the largest subpopulation, predicted decline 50–70%
B(3/1) Total area of occupancy ≤10 ha (0.1 km^2), predicted decline 50–70%

C—population (irrespective of size or number of subpopulations) with a very high ongoing or predicted decline (>70%)

C Predicted decline >70%

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	IUCN STATUS
Balaenoptera edeni brydei Olsen, 1913	Bryde's whale	Balaenopteridae	A(1)	S?O	Data Deficient ver 3.1
Cephalorhynchus hectori maui A Baker, Smith and Pichler, 2002	Māui dolphin	Delphinidae	A(1)	CD	Not assessed
Mirounga leonina (Linnaeus, 1758)	Southern elephant seal	Phocidae	A(1)	RR, SO	Least Concern ver 3.1
Orcinus orca (Linnaeus, 1758)	Killer whale	Delphinidae	A(1)	DP, S?O, Sp	Data Deficient ver 3.1
Phocarctos hookeri (Gray, 1844)	New Zealand sea lion	Otariidae	C	RR	Vulnerable A3b ver 3.1

Nationally Endangered (2)

Criteria for Nationally Endangered:

A—small population (natural or unnatural) that has a low to high ongoing or predicted decline

A(1/1) 250–1000 mature individuals, predicted decline 10–50%
A(2/1) ≤5 subpopulations, ≤300 mature individuals in the largest subpopulation, predicted decline 10–50%
A(3/1) Total area of occupancy ≤10 ha (0.1 km^2), predicted decline 10–50%

B—small stable population (unnatural)

B(1/1) 250–1000 mature individuals, stable population
B(2/1) ≤5 subpopulations, ≤300 mature individuals in the largest subpopulation, stable population
B(3/1) Total area of occupancy ≤10 ha (0.1 km^2), stable population

C—moderate population and high ongoing or predicted decline

C(1/1) 1000–5000 mature individuals, predicted decline 50–70%
C(2/1) ≤15 subpopulations, ≤500 mature individuals in the largest subpopulation, predicted decline 50–70%
C(3/1) Total area of occupancy ≤100 ha (1 km^2), predicted decline 50–70%

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	IUCN STATUS
Cephalorhynchus hectori hectori (Van Beneden, 1881)	Hector's dolphin	Delphinidae	C(1/1)	CD	Endangered A4d ver 3.1
Tursiops truncatus (Montagu, 1821)	Bottlenose dolphin	Delphinidae	A(1/1)	CD, SO, Sp	Least Concern ver 3.1

Nationally Vulnerable (1)

Criteria for Nationally Vulnerable:

A—small, increasing population (unnatural)

A(1/1) 250–1000 mature individuals, predicted increase >10%
A(2/1) ≤5 subpopulations, ≤300 mature individuals in the largest subpopulation, predicted increase >10%
A(3/1) Total area of occupancy ≤10 ha (0.1 km^2), predicted increase >10%

B—moderate, stable population (unnatural)

B(1/1) 1000–5000 mature individuals, stable population
B(2/1) ≤15 subpopulations, ≤500 mature individuals in the largest subpopulation, stable population
B(3/1) Total area of occupancy ≤100 ha (1 km^2), stable population

C—moderate population, with population trend that is declining

C(1/1) 1000–5000 mature individuals, predicted decline 10–50%
C(2/1) ≤15 subpopulations, ≤500 mature individuals in the largest subpopulation, predicted decline 10–50%
C(3/1) Total area of occupancy ≤100 ha (1 km^2), predicted decline 10–50%

D—moderate to large population, and moderate to high ongoing or predicted decline

D(1/1) 5000–20 000 mature individuals, predicted decline 30–70%
D(2/1) ≤15 subpopulations and ≤1000 mature individuals in the largest subpopulation, predicted decline 30–70%
D(3/1) Total area of occupancy ≤1000 ha (10 km²), predicted decline 30–70%

E—large population, and high ongoing or predicted decline

E(1/1) 20 000–100 000 mature individuals, predicted decline 50–70%
E(2/1) Total area of occupancy ≤10 000 ha (100 km²), predicted decline 50–70%

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	IUCN STATUS
Eubalaena australis (Desmoulins, 1822)	Southern right whale	Balaenidae	A(1/1)	RR, SO	Least Concern ver 3.1

At Risk (0)

Taxa that meet the criteria specified by Townsend et al. (2008) for Declining, Recovering, Relict and Naturally Uncommon.

Declining (0)

Taxa that do not qualify as 'Threatened' because they are buffered by large population size and/or a slower rate of decline than the trigger points.

Criteria for Declining:

A—moderate to large population and low ongoing or predicted decline

A(1/1) 5000–20 000 mature individuals, predicted decline 10–30%
A(2/1) Total area of occupancy ≤1000 ha (10 km²), predicted decline 10–30%

B—large population and low to moderate ongoing or predicted decline

B(1/1) 20 000–100 000 mature individuals, predicted decline 10–50%
B(2/1) Total area of occupancy ≤10 000 ha (100 km²), predicted decline 10–50%

C—very large population and low to high ongoing or predicted decline

C(1/1) >100 000 mature individuals, predicted decline 10–70%
C(2/1) Total area of occupancy >10 000 ha (100 km²), predicted decline 10–70%

No taxonomically determinate marine mammal taxa are listed in this category.

Recovering (0)

Taxa that have undergone a documented decline within the last 1000 years and now have an ongoing or predicted increase of >10% in the total population or area of occupancy, taken over the next 10 years or three generations, whichever is longer. Note that such taxa that are increasing but have a population size of <1000 mature individuals (or total area of occupancy of <10 ha) are listed in one of the Threatened categories, depending on their population size (for more details see Townsend et al. (2008)).

Criteria for Recovering:

A 1000–5000 mature individuals or total area of occupancy ≤100 ha (1 km²), and predicted increase >10%

B 5000–20 000 mature individuals or total area of occupancy ≤1000 ha (10 km²), and predicted increase >10%

No taxonomically determinate marine invertebrate taxa are listed in this category.

Relict (0)

Taxa that have undergone a documented decline within the last 1000 years, and now occupy <10% of their former range and meet one of the following criteria:

Criteria for Relict:

A 5000–20 000 mature individuals; population stable (±10%)

B >20 000 mature individuals; population stable or increasing at >10%. The range of a relictual taxon takes into account the area currently occupied as a ratio of its former extent. Relict can also include taxa that exist as reintroduced and self-sustaining populations within or outside their former known range (for more details see Townsend et al. (2008)).

The range of a relictual taxon takes into account the area currently occupied as a ratio of its former extent. Relict can also include taxa that exist as reintroduced and self-sustaining populations within or outside their former known range (for more details see Townsend et al. (2008)).

No taxonomically determinate marine invertebrate taxa are listed in this category.

Naturally Uncommon (0)

Taxa whose distribution is confined to a specific geographical area or which occur within naturally small and widely scattered populations, where this distribution is not the result of human disturbance.

No taxonomically determinate marine mammal taxa are listed in this category.

Non-resident Native (23)

Taxa whose natural presence in New Zealand is either discontinuous (Migrant) or sporadic or temporary (Vagrant) or which have succeeded in recently (since 1950) establishing a resident breeding population (Coloniser).

Migrant (7)

Taxa that predictably and cyclically visit New Zealand as part of their normal life cycle (a minimum of 15 individuals known or presumed to visit per annum) but do not breed here.

NAME AND AUTHORITY	COMMON NAME	FAMILY	QUALIFIERS	IUCN STATUS
Balaenoptera borealis Lesson, 1828	Sei whale	Balaenopteridae	TO	Endangered A1ad ver 3.1
Balaenoptera musculus brevicauda Ichihara, 1966	Pygmy blue whale	Balaenopteridae	S?O	Data Deficient ver 2.3
Balaenoptera musculus intermedia Burmeister, 1871	Southern/Antarctic blue whale	Balaenopteridae	TO	Critically Endangered A1abd ver 3.1
Balaenoptera physalus (Linnaeus, 1758)	Fin whale	Balaenopteridae	TO	Endangered A1d ver 3.1
Berardius arnuxii Duvernoy, 1851	Arnoux's beaked whale	Ziphiidae	S?O	Data Deficient ver 3.1
Globicephala macrorhynchus Gray, 1846	Short-finned pilot whale	Delphinidae	S?O	Data Deficient ver 3.1
Megaptera novaeangliae (Borowski, 1781)	Humpback whale	Balaenopteridae	SO	Least Concern ver 3.1

Vagrant (16)

Taxa whose occurrences, though natural, are sporadic and typically transitory, or migrants with fewer than 15 individuals visiting New Zealand per annum.

Vagrant continued on next page

Vagrant continued

NAME AND AUTHORITY	COMMON NAME	FAMILY	QUALIFIERS	IUCN STATUS
Arctocephalus gazella (Peters, 1876)	Antarctic fur seal	Otariidae	SO	Least Concern ver 3.1
Arctocephalus tropicalis (Gray, 1872)	Subantarctic fur seal	Otariidae	SO	Least Concern ver 3.1
Feresa attenuata Gray, 1874	Pygmy killer whale	Delphinidae	DP, S?O	Data Deficient ver 3.1
Grampus griseus (G. Cuvier, 1812)	Risso's dolphin	Delphinidae	SO	Least Concern ver 3.1
Hydrurga leptonyx (Blainville, 1820)	Leopard seal	Phocidae	SO	Least Concern ver 3.1
Kogia sima (Owen, 1866)	Dwarf sperm whale	Kogiidae	S?O	Data Deficient ver 3.1
Lagenodelphis hosei Fraser, 1956	Frasers dolphin	Delphinidae	SO	Least Concern ver 3.1
Leptonychotes weddellii (Lesson, 1826)	Weddel seal	Phocidae	SO	Least Concern ver 3.1
Lobodon carcinophagus (Hombron and Jacquinot, 1842)	Crabeater seal	Phocidae	SO	Least Concern ver 3.1
Mesoplodon ginkgodens Nishiwaki and Kamiya, 1958	Ginkgo-toothed whale	Ziphiidae	S?O	Data Deficient ver 3.1
Mesoplodon peruvianus Reyes, Mead and Van Waerebeek, 1991	Lesser/pygmy beaked whale	Ziphiidae	S?O	Data Deficient ver 3.1
Ommatophoca rossi Gray, 1844	Ross seal	Phocidae	SO	Least Concern ver 3.1
Peponocephala electra (Gray, 1846)	Melon-headed whale	Delphinidae	SO	Least Concern ver 3.1
Stenella attenuata attenuata (Gray, 1846)	Offshore pantropical spotted dolphin	Delphinidae	SO	Least Concern ver 3.1
Stenella coeruleoalba (Meyen, 1833)	Striped dolphin	Delphinidae	SO	Least Concern ver 3.1
Steno bredanensis (G. Cuvier in Lesson, 1828)	Rough-toothed dolphin	Delphinidae	SO	Least Concern ver 3.1

Coloniser (0)

Taxa that otherwise trigger Threatened categories because of small population size, but have arrived in New Zealand without direct or indirect help from humans and have been successfully reproducing in the wild only since 1950.

No taxonomically determinate marine mammal taxa are listed in this category.

Not Threatened (9)

Resident native taxa that have large, stable populations.

NAME AND AUTHORITY	COMMON NAME	FAMILY	QUALIFIERS	IUCN STATUS
Arctocephalus forsteri (Lesson, 1828)	New Zealand fur seal	Otariidae	Inc, SO	Least Concern ver 3.1
Balaenoptera bonaerensis Burmeister, 1867	Antarctic minke whale	Balaenopteridae	DP, S?O	Data Deficient ver 3.1
Delphinus delphis Linnaeus, 1758	Common dolphin	Delphinidae	DP, SO	Least Concern ver 3.1
Globicephala melas (Traill, 1809)	Long-finned pilot whale	Delphinidae	DP, S?O	Data Deficient ver 3.1
Kogia breviceps (Blainville, 1838)	Pygmy sperm whale	Kogiidae	DP, S?O	Data Deficient ver 3.1
Lissodelphis peronii (Lacépède, 1804)	Southern right whale dolphin	Delphinidae	DP, S?O	Data Deficient ver 3.1
Mesoplodon grayi von Haast, 1876	Gray's beaked whale	Ziphiidae	DP, S?O	Data Deficient ver 3.1
Physeter macrocephalus Linnaeus, 1758	Sperm whale	Physeteridae	DP, TO	Vulnerable A1d ver 3.1
Pseudorca crassidens (Owen, 1846)	False killer whale	Delphinidae	DP, S?O	Data Deficient ver 3.1

Introduced and Naturalised (0)

Taxa that have become naturalised in the wild after being deliberately or accidentally introduced into New Zealand by human agency.

No taxonomically determinate marine mammal taxa are listed in this category.

2.2 Taxonomically indeterminate

This section includes described taxa whose taxonomic status is uncertain and requires further investigation, and also potentially distinct marine mammals whose taxonomic status has yet to be determined.

Non-resident Native (3)

Vagrant (3)

NAME	COMMON NAME	FAMILY	QUALIFIERS	IUCN STATUS
Orcinus sp. Type B	Killer whale	Delphinidae	DP, S?O	Not assessed
Orcinus sp. Type C	Killer whale	Delphinidae	DP, S?O	Not assessed
Orcinus sp. Type D	Killer whale	Delphinidae	DP, S?O	Not assessed

Not Threatened (2)

NAME	COMMON NAME	FAMILY	QUALIFIERS	IUCN STATUS
Balaenoptera acutorostrata un-named subsp.	Dwarf Minke whale	Balaenopteridae	DP, SO	Least Concern ver 3.1
Lagenorhynchus obscurus unnamed subsp.	Dusky dolphin	Delphinidae	S?O	Data Deficient ver 3.1

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Appendix 1

Background notes on threatened species and others with changed status or qualifiers or with significant new information

Deleted taxon

Kermadec Islands bottlenose dolphin, *Tursiops* sp.

A separate listing was added by Baker et al. (2010) based on an observation of a large school of very small bottlenose-like dolphins near the Kermadec Islands. This listing was removed based on more recent observations of typical bottlenose dolphins (*Tursiops truncatus*) around the Kermadec Islands and sequencing data from two specimens confirming that identity (Duffy et al. 2015). There may be two distinct taxa present around the Kermadec Islands but that was considered too uncertain at this stage to justify maintaining the separate listing.

Data Deficient taxa

True's beaked whale, *Mesoplodon mirus*

Addition to the list, as Data Deficient. This species was added on the basis of the stranding of a pregnant female at Waiatoto Beach, South Westland (Constantine et al. 2014). The species has a North Atlantic and southern Indian Ocean/Tasman Sea distribution.

Spade-toothed whale, *Mesoplodon traversii*

A total of four individuals found stranded in New Zealand (Thompson et al. 2012).

Spectacled porpoise, *Phocoena dioptrica*

Moved from Vagrant to Data Deficient. This species may possibly be resident around the New Zealand subantarctic islands rather than a vagrant visitor. This level of uncertainty suggested that the best classification at present is as Data Deficient.

Nationally Critical taxa

Bryde's whale, *Balaenoptera edeni brydei*

No change to listed status. Name changed from *Balaenoptera edeni/brydei* sp. New Zealand specimens are found inshore but genetically and morphologically they fit the 'offshore *brydei*' type. No new population estimate is available since the estimates of Wiseman (2008), based on her photo mark-recapture study. Her estimates of adult population size were 159 (CV = 0.35) if the population is assumed to be closed and entirely resident, and 46 (CV = 0.08) if the population is assumed to be open to immigration and emigration. Her photographic catalogue includes 87 individuals, including some long-term residents, some temporary residents, and some transients. Some mitochondrial haplotypes match those found in populations overseas, including some in the North Pacific and Indian Oceans. An aerial survey programme with distance sampling over the Hauraki Gulf started in late 2014. There has been observed ship-strike mortality of 2.4 individuals per annum in the Hauraki Gulf. Between 1996 and 2012, 42 Bryde's whales were found dead; 23 of unknown cause, 16 of vessel strike; and 3 from entanglements (Constantine et al. 2015). What decline rate this implies is not yet determined, but known mortality suggests a possible decline. Status of the species further offshore in New Zealand's Exclusive Economic Zone is uncertain.

Maui dolphin, *Cephalorhynchus hectori maui*

No change to listed status. Recent population estimates from genotype capture/recapture suggest a population of fewer than 100 (Baker et al. 2013). There is also evidence of decline from

both a semi-quantitative risk assessment and capture/recapture analysis (Currey et al. 2012; Hamner et al. 2014b). The subspecies is listed on the basis of Criterion A(1) (small population) but also meets Criterion C (high rate of decline). No evidence has been detected of successful reproduction by Hector's dolphin individuals sampled within the core Maui's range (one dead and two live females, and one dead male) (Hamner et al. 2014a).

Southern elephant seal, *Mirounga leonina*

No change to listed status. There are fewer than 20 breeding in the New Zealand subantarctic. The decline on Macquarie Island is continuing.

Killer whale, *Orcinus orca*

Name changed from *Orcinus orca* Type A as it is incorrect to call the New Zealand population type A; that name applies to Antarctic populations only (R. Pitman, pers. comm.). No new information. No trend information is available, so the St (Stable) qualifier has been removed.

New Zealand sea lion, *Phocarctos hookeri*

No change to listed status. The sea lion was listed as Nationally Critical on the basis of criterion C: a taxon is 'Nationally Critical' when the population has an ongoing trend or predicted decline of >70% in the total population due to existing threats taken over the next 10 years or three generations, whichever is longer.

The definition of 'generation' in Appendix 1 of the NZTCS manual (Townsend et al 2008) is: **Generation**: The average time between the birth/germination of successive generations of reproducing individuals. In groups where there are separate sexes, females are usually the limiting factor in population growth, so generation time is the average difference in age between mothers and their successfully breeding daughters.

Year-to-year fluctuation around the trend (based on pup counts) puts the rate of decline at just over or just under 70% over 30 years (three generations) depending on the most recent counts, assuming a linear trend (i.e. no density dependence; Fig. A1.1). Other decline trends including an exponential trend were also considered; however, the rate of decline could not be ascertained with sufficient certainty to rule out the possibility of a decline consistent with 70% over 30 years, given the structural uncertainty about the effect of density dependence (i.e. compensation or depensation). Therefore, based on the precautionary approach required by the NZTCS manual, the species should be left in Nationally Critical. Better trend data are required for Campbell Island/Motu Ihupuku, but we did examine the trend over the three data points with the available Campbell Island census data added to the Auckland Island trend, and this also indicated a decline of >70% over three generations (Fig. A1.2).

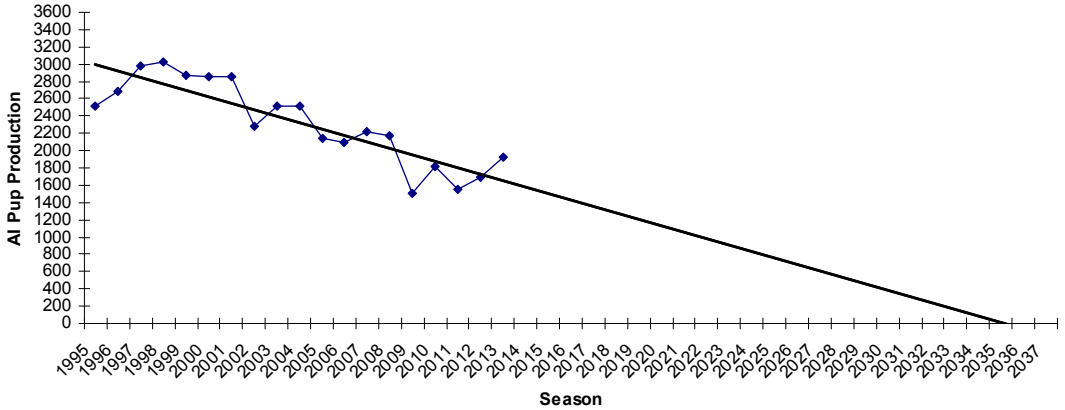

Figure A1.1. Decline based on the Auckland Island population pup production only (73% of species). If pup production continues to decline at current trend rate since 1994/95, a decline of >70% from the 2013 pup production estimate (1930 pups) will have occurred before 2036 for the Auckland Island population.

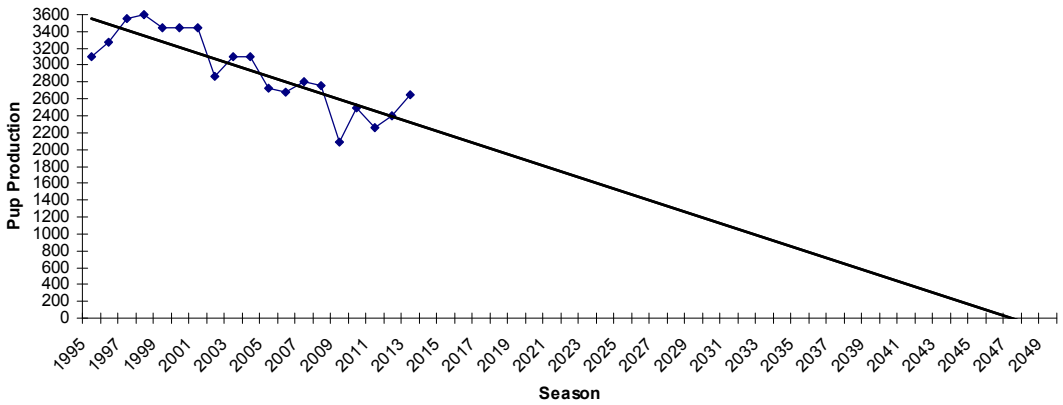

Figure A1.2. Decline based on the Auckland Island population plus 583 pups from Campbell Island/Motu Ihupuku from 1994/95 to 2008/09 (Maloney et al. 2009), then plus 681 pups from Campbell Island from 2009/10 (Maloney et al. 2012), plus pups from Otago Peninsula from 1994/95 (http://www.sealiontrust.org.nz) and pups from Stewart Island 2011 to 2013.

Although criterion C places the sea lion into the Nationally Critical category regardless of population size, a population size estimate was also tabled, and is presented below as additional information.

The definitions of population and mature individuals in Appendix 1 of the NZTCS manual (Townsend et al 2008) are:

Population: The total number of individuals that are resident or that breed in New Zealand. For functional reasons, primarily owing to differences between life-forms, population numbers are expressed as numbers of mature individuals only.

Mature individuals: The number of mature individuals is defined as the number known, estimated or inferred to be capable of reproduction. When estimating this quantity, the following points will be borne in mind:

- Where the population is characterised by natural fluctuations, the minimum number will be used.
- This measure is intended to count individuals capable of reproduction and will therefore exclude those whose reproductive capacity is suppressed in the wild through environmental, behavioural or other factors.
- In the case of populations with biased adult or breeding sex ratios, it is appropriate to use lower estimates for the number of mature individuals, which take this into account (i.e. the estimated effective population size).
- Reproducing units within a clone will be counted as individuals, except where such units are unable to survive alone (e.g. corals).
- In the case of taxa that naturally lose all or a subset of mature individuals at some point in their life cycle, the estimate will be made at the time when mature individuals are available for breeding.

The breeding female population size estimate was calculated by multiplying the observed number of pups by 1.54, because only 65% of fertile females produce pups in any one year. About 27% of all female NZSLs surviving to age 3 will never breed (Chilvers et al. 2010). Taking into account survival from age 3 to all breeding ages, approximately 20% of all mature females will never breed. These non-breeders are not included in this estimate, which is based on monitoring of the subsequent pupping rate of branded females which had already produced at least one pup (Chilvers et al. 2009).

The breeding population sex ratio was estimated at 1 male : 8 females (L. Chilvers unpubl. data); this is based on all males breeding in any one year. For the males, we have interpreted those (seven eighths, not allowing for different age structure and age at maturity of males and females) not on the beach holding harems as falling into the category 'individuals capable of reproduction …

whose reproductive capacity is suppressed in the wild through … behavioural … factors'. Also 'with biased … breeding sex ratios, … use lower estimates for the number of mature individuals, … (i.e. the estimated effective population size)'. Most males will never breed and will therefore not contribute genetically to the next generation.

Based on these adjustments, the total breeding population (all known populations) was therefore estimated at 3789 individuals (Table A1.1). Comparative data from 1998–99 are provided in Table A1.2.

Table A1.1. Details of estimate of 2013 mature breeding population of New Zealand sea lions. The calculation is (pups/65% fertile females pupping = # mature females) + 1/8 males.

SUBPOPULATION	NUMBER OF PUPS	CALCULATION	BREEDING POPULATION ESTIMATE
Auckland Islands	1575	1575 pups/65% = 2423 females + 1/8 males (303 males)	2726
Campbell Island/Motu Ihupuku	583	583 pups/65% = 897 + 1/8 males (112 males)	1009
Otago	5	5 pups/65% = 8 + 1 male	9
Stewart Island/Rakiura	26	26 pups/65% = 40 + 5 males	45
Total	2189		3789

Table A1.2. Details of estimate of 1998-99 mature breeding population of New Zealand sea lions. Calculations as in Table A1.1.

SUBPOPULATION	NUMBER OF PUPS	CALCULATION	BREEDING POPULATION ESTIMATE
Auckland Islands	3021	3021/65% = 4648 females + 1/8 = 581 males	5229
Campbell Island/Motu Ihupuku	102	102/65% = 157 females + 20 males	177
Total	3123		5406

Nationally Endangered taxa

Hector's dolphin, *Cephalorhynchus hectori hectori*

No change to listed status. There was very little new information. Eighteen Hector's dolphin necropsies were carried out in 12 months of 2012–13. This is likely to be well above a sustainable rate of human-induced mortality if a significant proportion of those animals died when interacting with fisheries, because only a small proportion of animals killed as by-catch will come ashore. The population size of those dolphins encountered around Banks Peninsula appears roughly stable under management (Gormley et al. 2012), but decline is inferred to be continuing over the rest of the subspecies' range. The South Coast population has now been shown to constitute two separate subpopulations; both are small and vulnerable.

Bottlenose dolphin, *Tursiops truncatus*

No change to listed status. This listing now includes the population of unknown size and residency patterns around the Kermadec Islands. The Doubtful Sound population has very skewed reproductive success: of 71 calves from 18 mothers between 1995 and 2012, 6 mothers had 70% calf survival, 6 mothers 0%, and 6 had 22% survival (Brough 2013). Trends in the sub-populations most in decline would qualify for listing as Nationally Critical, but it is unclear whether these are representative of an overall trend for the species. The following summarises the published estimates of abundance and associated CV (or for oceanic bottlenose, the minimum number identified) and converts this to a number of mature individuals assuming

60% mature (Taylor et al. 2007). Uncertainty has been carried through the calculation, using the original CV (or an estimate based on available variance information), the binomial variance associated with the proportion of mature dolphins and aggregating the uncertainty across abundance estimates for the total. Based on the available abundance estimates, there are approximately 637 mature bottlenose dolphins in New Zealand waters (log-normal 95% CI: 434–936) in areas with an estimate of abundance (Table A1.3). There would need to be at least 363 more mature bottlenose dolphins (equating to approx. 605 dolphins in total) in regions without a current abundance estimate (e.g. Kermadecs, Stewart Island, additional offshore areas) for total numbers of mature bottlenose dolphins in New Zealand waters to exceed 1000 animals, or a minimum of 566 more mature bottlenose dolphins (equating to approx. 943 dolphins in total) if the lower 95% CI is required to exceed 1000 mature animals. This indicates the New Zealand 'population' is unlikely to exceed 1000 mature individuals; hence the classification as Nationally Endangered is consistent with available information.

Nationally Vulnerable taxa

Southern right whale, *Eubalaena australis*

Shifted from Nationally Endangered to Nationally Vulnerable. A strong recovering trend has now been demonstrated (7% per annum (95% CL 5–9%) based on a genotypic mark-recapture analysis of male southern right whales) (Carroll et al. 2013), but the mean total population estimate still suggests that there are fewer than 1000 mature individuals. The population around the New Zealand mainland has now been demonstrated to be an extension of the subantarctic subpopulation, not a distinct subpopulation.

Migrant taxa

Arnoux's beaked whale, *Berardius arnuxii*

Shifted from Vagrant to Migrant. The species is now known to be present around New Zealand every year, and some large (mid teens) groups have been observed and have stranded, putting the estimated population size over the 15 visitors per year threshold for the Migrant category.

Blue whale: pygmy blue whale, *Balaenoptera musculus brevicauda*, and southern/ Antarctic blue whale, *Balaenoptera musculus intermedia*

No change to listed status. The South Taranaki Bight appears to be an important year-round feeding ground for blue whales (Torres 2013) and acoustic recordings indicate the widespread presence year-round in New Zealand waters of blue whales with calls distinct from those of the Antarctic population (Miller et al. 2013, 2014). DNA sequencing indicates that these are pygmy blue whales (R. Constantine, pers. comm.). However, although calves are present in the population, calving of any blue whales in New Zealand waters has yet to be confirmed, so the decision was made to leave the listed status for both subspecies as Migrant until such confirmation is received.

Vagrant taxa

Pygmy killer whale, *Feresa attenuata*

Addition to the list as Vagrant, DP. This species is well known from the tropical Pacific, but the first known New Zealand specimen recently stranded in the far north near Te Paki.

Ginkgo-toothed beaked whale, *Mesoplodon ginkgodens*

There are five records of stranded adults.

Orcinus sp. Type B

Formerly listed as *Orcinus orca* Type B. The undescribed taxa of *Orcinus* are likely to be distinct species or subspecies rather than intraspecific variants of *O. orca* (R. Pitman, pers. comm).

Orcinus sp. Type C

Formerly listed as *Orcinus orca* Type C. The undescribed taxa of *Orcinus* are likely to be distinct species or subspecies rather than intraspecific variants of *O. orca* (R. Pitman, pers. comm).

Orcinus sp. Type D

Formerly listed as *Orcinus orca* Type D. The undescribed taxa of *Orcinus* are likely to be distinct species or subspecies rather than intraspecific variants of *O. orca* (R. Pitman, pers. comm).

Not Threatened taxa

New Zealand fur seal, *Arctocephalus forsteri*

No change to listed status. Following debate in the published literature following the publication of the pinniped phylogeny of Higdon (2007), there was discussion of the proposed generic name change to *Arctophoca*, and on whether the New Zealand fur seal is a full species or a subspecies of *A. pusillus*, but no change was made to the listing. These taxonomic and nomenclatural changes would not change the listed status of the taxon.

Common dolphin, *Delphinus delphis*

No change to listed status. No new information was submitted to the panel. By-catch of this species is believed to be small compared to the population size. There is high genetic diversity in New Zealand, consistent with a large population, although there is genetic evidence of some population subdivision (Stockin & Amaral et al. 2013). Further studies are underway.

Pygmy sperm whale, *Kogia breviceps*

Shifted from Data Deficient to Not Threatened. There are many recorded strandings of this species (418 in total and 134 since the beginning of 2005), with the periodicity possibly indicating the presence of inshore-offshore migration. There is high genetic diversity of mitochondrial haplotypes (Plön 2004), indicating that the stranded animals are from a large, non-bottlenecked population.

Gray's beaked whale, *Mesoplodon grayi*

Shifted from Data Deficient to Not Threatened. This species has good mitochondrial haplotype diversity, with no indication of population subdivision, and many stranding records (253 stranding records since 1960; 150 tissue sample collections in 20 years), (Thompson 2013, Thompson et al. 2013) suggesting it is best regarded as Not Threatened.

False killer whale, *Pseudorca crassidens*

No change to listed status. The possibility that the species should be considered Naturally Uncommon rather than Not Threatened on the basis of the results of Zaeschmar et al. (2014) was discussed. However, Zaeschmar et al. (2014) studied only those animals visiting the Bay of Islands area, and the species could occur over a much larger area in the warmer parts of the New Zealand EEZ. The decision was therefore to leave this species listed as Not Threatened.

Dusky dolphin, *Lagenorhynchus obscurus* unnamed subsp.

The New Zealand population is now considered to be an endemic unnamed subspecies (Society for Marine Mammalogy Committee on Taxonomy, 2014), therefore the SO (Secure Overseas) qualifier has been removed, and the listing moved from the Determinate to the Taxonomically Indeterminate section of the list.

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