



CSP Research Advisory Group

7 Dec 2017

Today's Agenda

Welcome, Introductions, Scope, Objectives, Apologies

CSP Research Advisory Group

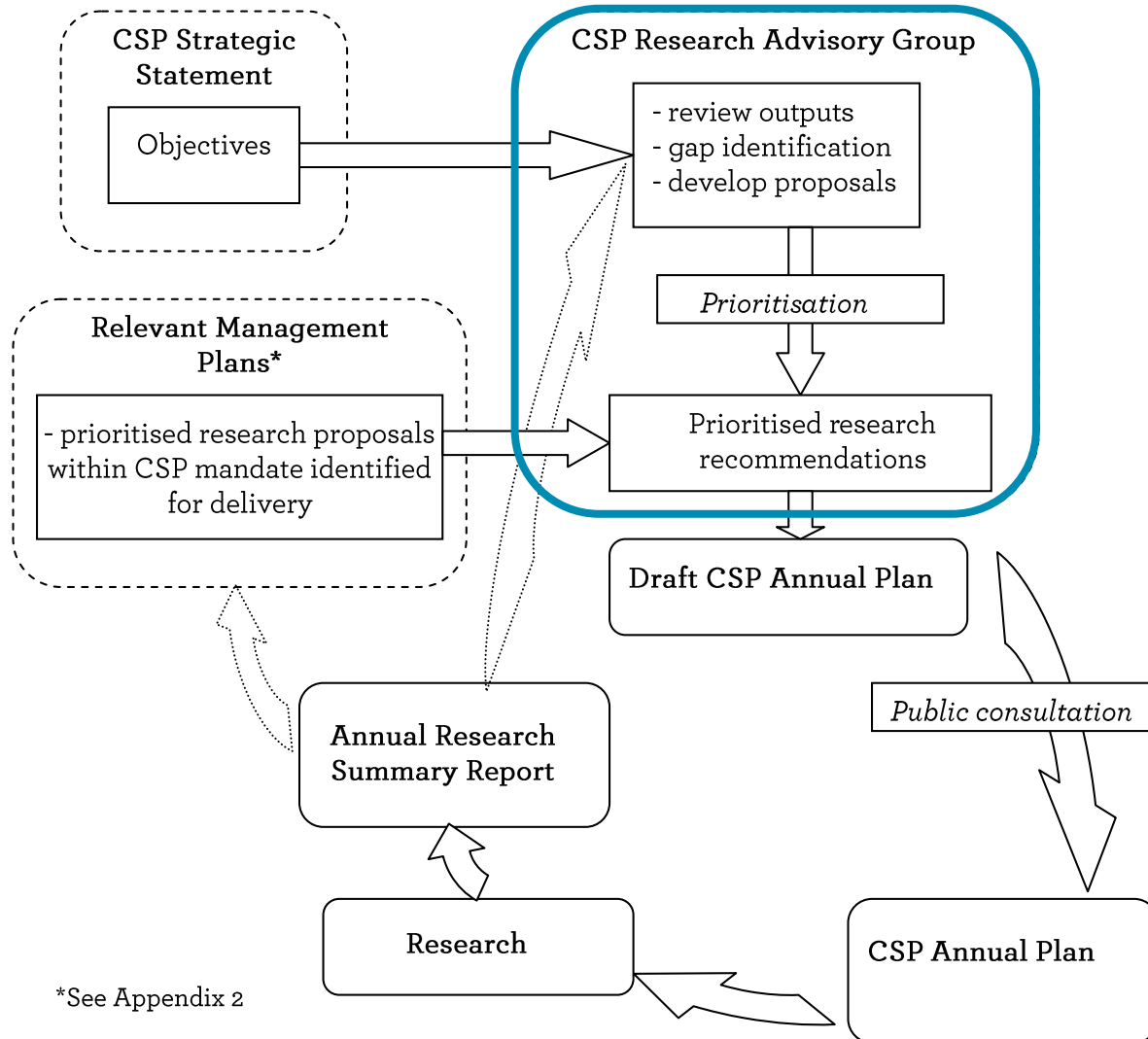
- Overview of Strategic Statement and timeline for 2017-18
- Overview on CSP medium-term research planning
- CSP Annual Research Summary 2016-17
- Review of research recommendations (per protected species group)
- Discussion to identify research gaps (participant input)

Update on MPI Aquatic Environment planning process





Purpose and Scope of CSP RAG





Purpose and Scope of CSP RAG

December

- Review of progress in relevant research and other activities
- Identify research gaps within the CSP mandate

February

- *Prioritise research gaps*
- *Recommend to DOC prioritised research projects for the inclusion in the CSP Annual Plan*

Update on CSP Strategic Statement



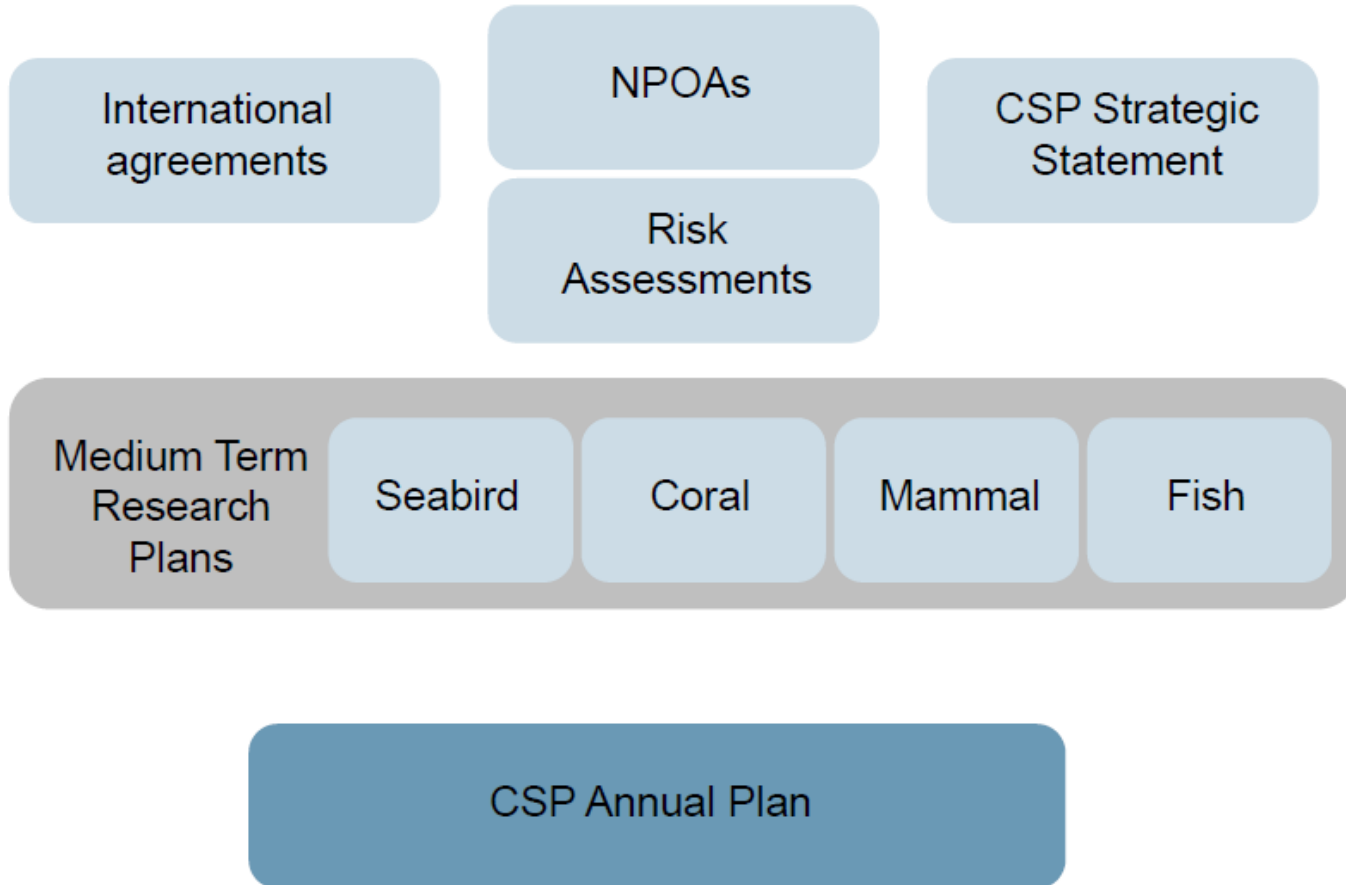
- Revised Dec 2015
- Next update postponed to 2018, so that any changes can be made to reflect:
 - Digital monitoring
 - Hector's/Maui TMP review
 - NPOA reviews
 - Any new DOC/government plans/priorities



CSP Objectives

- A: Proven mitigation strategies are in place to avoid or minimise the adverse effects of commercial fishing on protected species across the range of fisheries with known interactions.
- B: The nature of direct adverse effects of commercial fishing on protected species is described.
- C: The extent of known adverse effects of commercial fishing on protected species is adequately understood.
- D: The nature and extent of indirect adverse effects of commercial fishing are identified and described for protected species that are at particular risk to such effects.
- E: Adequate information on population level and susceptibility to fisheries effects for protected species populations identified as at medium or higher risk from fisheries.

Medium Term Research plans



Seabird 5 year plan



Common name	Scientific name	L2 risk 2017	L2 risk 2015	Other fishery	L1 risk	IUCN Threat status	NZ Threat status
Black petrel	<i>Procellaria parkinsoni</i>	1.15 (VH)	✓	Hand line Purse seine light Troll	Moderate Moderate Moderate	Vulnerable	T Vulnerable
Salvin's albatross	<i>Thalassarche salvini</i>	0.78 (H)	✓			Vulnerable	T Critical
Flesh-footed shearwater	<i>Puffinus carneipes</i>	0.67 (H)	✓	Hand line Purse seine light	Moderate Moderate	Near threatened	T Vulnerable
Westland petrel	<i>Procellaria westlandica</i>	0.48 (H)	✓			Vulnerable	AR Uncommon
Southern Buller's albatross	<i>Thalassarche bulleri bulleri</i>	0.39 (H)	✓			Near threatened *	AR Uncommon
Chatham Island albatross	<i>Thalassarche eremite</i>	0.36 (H)	✓			Near threatened	AR Uncommon
New Zealand white-capped albatross	<i>Thalassarche steadi</i>	0.35 (H)	✓			Near threatened	AR Declining
Gibson's albatross	<i>Diomedea antipodensis gibsoni</i>	0.34 (H)	✓			Vulnerable *	T Critical
Northern Buller's albatross	<i>Thalassarche bulleri platei</i>	0.25 (M)	✓			Near threatened *	AR Uncommon
Antipodean albatross	<i>Diomedea antipodensis antipodensis</i>	0.20 (M)	✓			Vulnerable *	T Critical
Yellow-eyed penguin (mainland)	<i>Megadyptes antipodes</i>	0.18 (M)	✓			Endangered	T Endangered*
Otago shag	<i>Leucocarbo chalconotus</i>	0.14 (M)	✓			Vulnerable *	AR Recovering
Northern giant petrel	<i>Macronectes halli</i>	0.14 (M)	✓			Least concern	AR Recovering
Spotted shag	<i>Stictocarbo punctatus</i>	0.09 (L)	✓			Least concern	NT
Yellow-eyed penguin	<i>Megadyptes antipodes</i>	0.08 (L)	✓			Endangered	T Endangered
Campbell black-browed albatross	<i>Thalassarche impavida</i>	0.08 (L)	✓			Vulnerable *	T Vulnerable
White-chinned petrel	<i>Procellaria aequinoctialis</i>	0.05 (N)	✓			Vulnerable	NT
Northern royal albatross	<i>Diomedea sanfordi</i>	0.04 (L)	✓			Endangered	AR Uncommon
Foveaux shag	<i>Leucocarbo stewarti</i>	0.04 (N)	✓			Vulnerable *	T Vulnerable
Grey petrel	<i>Procellaria cinerea</i>	0.04 (N)	✓			Near threatened	AR Uncommon
Southern royal albatross	<i>Diomedea epomophora epomophora</i>	0.02 (N)	✓			Vulnerable	AR Uncommon
Chatham petrel	<i>Pterodroma axillaris</i>	<0.01 (N)	✓			Vulnerable	T Vulnerable
Chatham Island taiko	<i>Pterodroma magentae</i>	<0.01 (N)	✓			Critically endangered	T Critical
Snares Cape petrel	<i>Daption capense austral</i>	<0.01 (N)	✓			Least concern *	AR Uncommon
Little black shag	<i>Phalacrocorax sulcirostris</i>	<0.01 (N)	✓			Least concern	AR Uncommon
Fiordland crested penguin	<i>Eudyptes pachyrhynchus</i>	<0.01 (N)	✓			Vulnerable	T Vulnerable
Grey-headed albatross	<i>Thalassarche chrysostoma</i>	<0.01 (N)	✓			Endangered	T Vulnerable
Light-mantled sooty albatross	<i>Pheobetria palpebrata</i>	<0.01 (N)	✓			Near threatened	AR Declining
New Zealand white-faced storm petrel	<i>Pelagodroma marina maoriana</i>	<0.01 (N)		Purse seine light	Moderate	Least concern	AR Relict
North Island little shearwater	<i>Puffinus assimilis haurakiensis</i>	<0.01 (N)		Purse seine light	Moderate	Least concern*	AR Recovering
Chatham Island shag	<i>Leucocarbo onslowi</i>	<0.01 (N)		Trap & Pot	Moderate	Critically endangered	T Critical
New Zealand king shag	<i>Leucocarbo carunculatus</i>	<0.01 (N)	✓	Trap & Pot	Moderate	Vulnerable	T Endangered
New Zealand storm petrel	<i>Pealeornis maoriana</i>	<0.01 (N)	✓	Purse seine light	Extreme	Critically endangered	T Vulnerable
Pitt Island shag	<i>Stictocarbo featherstoni</i>	<0.01 (N)		Trap & Pot	High	Endangered	T Critical
Pycroft's petrel	<i>Pterodroma pycrofti</i>	<0.01 (N)		Purse seine light	Moderate	Vulnerable	AR Recovering

Seabird plan: research progress & gaps



Common name	2017/18	2018/19
Black petrel	Review M-R response	Pop est GBI, LBI
Salvin's albatross	Pop est & Track Bounty	Pop est & Track Bounty Pop est Snares
Flesh-footed shearwater	M-R study	Review M-R response
Westland petrel		Pop est mainland
Southern Buller's albatross	M-R study Snares	Review M-R response Pop est Snares
Chatham Island albatross		
New Zealand white-capped albatross	M-R study Auk Is	Review M-R study
Gibson's albatross	M-R study Auk Is	Review M-R study
Northern Buller's albatross		
Antipodean albatross	M-R study*	Review M-R study* Track and pop est Antip
Yellow-eyed penguin (mainland)		Pop est mainland
Otago shag		Pop est & Track mainland
Northern giant petrel	Pop est Campbell	Pop est Auk Is Pop est Antip
Spotted shag		Pop est & taxonomy review year 1
Campbell black-browed albatross	Pop est Campbell	
White-chinned petrel	M-R study Auk Is Pop est Campbell	M-R study Auk Is Pop est Auk Is Pop est Antip
Northern royal albatross		
Foveaux shag		Track mainland
Grey petrel		
Snares Cape petrel		Pop est & Track Snares Investigate M-R study
Little black shag		
Fiordland crested penguin		
Grey-headed albatross	Pop est Campbell	
Light-mantled sooty albatross	Trial tracking Campbell	
New Zealand white-faced storm petrel		
North Island little shearwater		
Chatham Island shag		
New Zealand king shag		
New Zealand storm petrel		
Pitt Island shag		

Seabird plan: mitigation



Common Name	Deepwater trawl	Flatfish trawl	Hake trawl	Hoki trawl	Inshore trawl	Jack mackerel trawl	Ling trawl	Middle depth trawl	SBW trawl	Scampi trawl	Squid trawl
Black petrel	0.0020	0.0000	0.0000	0.0090	0.2020	0.0000	0.0000	0.0070	0.0000	0.0110	0.0000
Salvin's albatross	0.0220	0.0280	0.0040	0.1200	0.2980	0.0000	0.0110	0.0850	0.0090	0.0770	0.0020
Flesh-footed shearwater	0.0010	0.0080	0.0000	0.0080	0.2860	0.0000	0.0020	0.0090	0.0000	0.0320	0.0000
Westland petrel	0.0000	0.0470	0.0080	0.0680	0.1465	0.0000	0.0040	0.0310	0.0000	0.0000	0.0000
Southern Buller's albatross	0.0010	0.0120	0.0060	0.1440	0.0260	0.0020	0.0050	0.0440	0.0000	0.0070	0.0480
Chatham Island albatross	0.0600	0.0000	0.0000	0.0150	0.0050	0.0000	0.0000	0.0050	0.0000	0.0020	0.0000
New Zealand white-capped albatross	0.0000	0.0530	0.0040	0.0420	0.1530	0.0010	0.0060	0.0320	0.0000	0.0080	0.0280
Gibson's albatross	0.0020	0.0000	0.0000	0.0000	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Northern Buller's albatross	0.0020	0.0000	0.0000	0.0330	0.0120	0.0000	0.0000	0.0150	0.0000	0.0300	0.0000
Antipodean albatross	0.0020	0.0000	0.0000	0.0000	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Yellow-eyed penguin (mainland)	0.0000	0.0030	0.0000	0.0000	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Otago shag	0.0000	0.1310	0.0000	0.0000	0.0110	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Foveaux shag	0.0000	0.0320	0.0000	0.0000	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Northern giant petrel	0.0050	0.0000	0.0000	0.0300	0.0040	0.0000	0.0000	0.0080	0.0000	0.0080	0.0000
Spotted shag	0.0000	0.0630	0.0000	0.0000	0.0190	0.0000	0.0000	0.0020	0.0000	0.0000	0.0000
Yellow-eyed penguin	0.0000	0.0030	0.0000	0.0000	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Campbell black-browed albatross	0.0000	0.0020	0.0000	0.0100	0.0030	0.0000	0.0010	0.0030	0.0020	0.0030	0.0000
Northern royal albatross	0.0010	0.0020	0.0000	0.0020	0.0040	0.0000	0.0000	0.0010	0.0000	0.0000	0.0010
White-chinned petrel	0.0000	0.0010	0.0000	0.0060	0.0010	0.0000	0.0000	0.0010	0.0000	0.0060	0.0090
Northern royal albatross	0.0010	0.0020	0.0000	0.0020	0.0040	0.0000	0.0000	0.0010	0.0000	0.0000	0.0010
Foveaux shag	0.0000	0.0320	0.0000	0.0000	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Grey petrel	0.0000	0.0010	0.0000	0.0010	0.0020	0.0000	0.0000	0.0000	0.0060	0.0000	0.0000
Southern royal albatross	0.0000	0.0000	0.0000	0.0010	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0010
Snares Cape petrel	0.0000	0.0000	0.0010	0.0020	0.0000	0.0000	0.0010	0.0010	0.0000	0.0000	0.0000

Seabird plan: mitigation



Common Name	Bluenose BLL	Hapuka BLL	Large ling BLL	Minor BLL	Small ling BLL	Snapper BLL	Large SLL	Small SLL	Swordfish SLL	Setnet
Black petrel	0.1840	0.0620	0.0000	0.0350	0.0000	0.2180	0.0000	0.2890	0.0260	0.0000
Salvin's albatross	0.0000	0.0020	0.0020	0.0050	0.0880	0.0000	0.0000	0.0040	0.0000	0.0000
Flesh-footed shearwater	0.0010	0.0380	0.0000	0.0410	0.0010	0.1850	0.0000	0.0180	0.0050	0.0075
Westland petrel	0.0000	0.0090	0.0000	0.0100	0.0220	0.0000	0.0000	0.0470	0.0030	0.0150
Southern Buller's albatross	0.0010	0.0010	0.0030	0.0010	0.0170	0.0000	0.0140	0.0400	0.0000	0.0000
Chatham Island albatross	0.0000	0.0060	0.0090	0.0080	0.2025	0.0000	0.0000	0.0000	0.0000	0.0000
NZ white-capped albatross	0.0000	0.0000	0.0000	0.0000	0.0030	0.0000	0.0010	0.0150	0.0010	0.0000
Gibson's albatross	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1090	0.1930	0.0000
Northern Buller's albatross	0.0030	0.0040	0.0030	0.0030	0.0210	0.0010	0.0000	0.1030	0.0010	0.0000
Antipodean albatross	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0710	0.0980	0.0000
Yellow-eyed penguin (mainland)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0570
Otago shag	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Northern giant petrel	0.0000	0.0160	0.0000	0.0070	0.0000	0.0050	0.0000	0.0000	0.0000	0.0000
Spotted shag	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0050
Yellow-eyed penguin	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0250	0.0040	0.0000
Campbell black-browed albatross	0.0030	0.0020	0.0010	0.0020	0.0010	0.0000	0.0000	0.0010	0.0020	0.0000
Northern royal albatross	0.0000	0.0000	0.0010	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000
White-chinned petrel	0.0000	0.0000	0.0050	0.0010	0.0180	0.0000	0.0000	0.0060	0.0000	0.0000
Foveaux shag	0.0000	0.0160	0.0000	0.0070	0.0000	0.0050	0.0000	0.0000	0.0000	0.0000
Grey petrel	0.0000	0.0000	0.0020	0.0000	0.0100	0.0000	0.0000	0.0080	0.0020	0.0000
Southern royal albatross	0.0000	0.0000	0.0010	0.0000	0.0010	0.0000	0.0000	0.0050	0.0000	0.0000

Fish 5 year plan



Species	Research	Year				
		1	2	3	4	5
Basking shark	L1RA L2RA MIT SURV LIVE TRACK BIO GEN	█	█	█		
Deepwater nurse shark	L1RA L2RA MIT SURV LIVE TRACK BIO GEN	█	█			
Oceanic whitetip shark	L1RA L2RA MIT SURV LIVE TRACK BIO GEN	█	█	█	█	
Whale shark	L1RA L2RA MIT SURV LIVE TRACK BIO GEN	█	█			
White pointer shark	L1RA L2RA MIT SURV LIVE TRACK BIO GEN	█	█	█	█	
Manta ray	L1RA L2RA MIT SURV LIVE TRACK BIO GEN	█	█			
Spinetail devil ray	L1RA L2RA MIT SURV LIVE TRACK BIO GEN	█	█	█	█	█
Giant grouper	L1RA L2RA MIT SURV LIVE TRACK BIO GEN	█		█		
Spotted black grouper	L1RA L2RA MIT SURV LIVE TRACK BIO GEN	█		█		

Marine Mammal 5 year plan development process



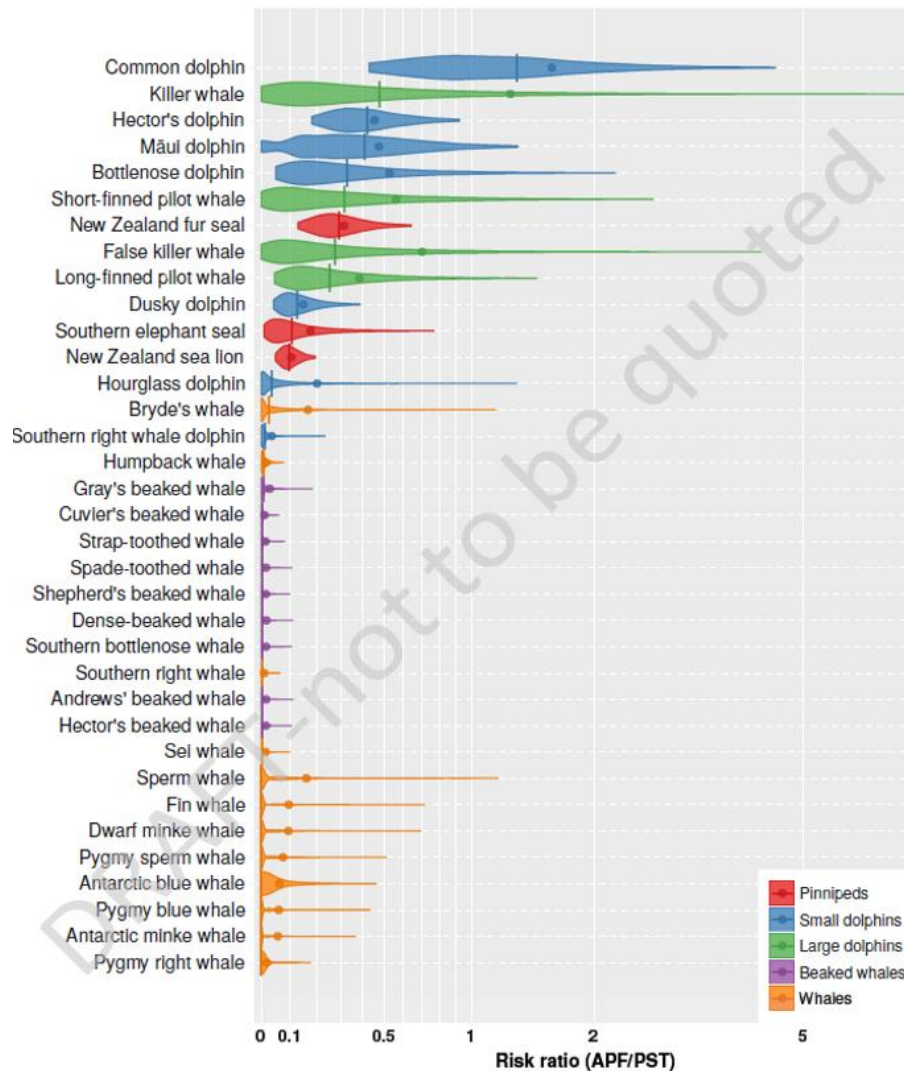
Species group	Common name	Scientific name	New Zealand threat status	
Whales	Bryde's whale	<i>Balaenoptera brydei</i>	Nationally critical	
	Southern right whale	<i>Eubalaena australis</i>	Nationally endangered	
	Sperm whale	<i>Physeter macrocephalus</i>	Not threatened	
	Antarctic minke whale	<i>Balaenoptera bonaerensis</i>	Not threatened	
	Dwarf minke whale	<i>Balaenoptera acutorostrata</i>	Not threatened	
	Antarctic blue whale	<i>Balaenoptera musculus intermedia</i>	Migrant	
	Fin whale	<i>Balaenoptera physalus</i>	Migrant	
	Pygmy blue whale	<i>Balaenoptera musculus breviceuda</i>	Migrant	
	Sei whale	<i>Balaenoptera borealis</i>	Migrant	
	Humpback whale	<i>Megaptera novaeangliae</i>	Migrant	
	Pygmy right whale	<i>Caperea marginata</i>	Data deficient	
	Pygmy sperm whale	<i>Kogia breviceps</i>	Data deficient	
	Blackfish	Killer whale Type A	<i>Orcinus orca</i>	Nationally critical
		Long-finned pilot whale	<i>Globicephala melas</i>	Not threatened
False killer whale		<i>Pseudorca crassidens</i>	Not threatened	
Beaked whales	Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Migrant	
	Andrews' beaked whale	<i>Mesoplodon bowdoini</i>	Data deficient	
	Cuvier's beaked whale	<i>Ziphius cavirostris</i>	Data deficient	
	Dense-beaked whale	<i>Mesoplodon densirostris</i>	Data deficient	
	Gray's beaked whale	<i>Mesoplodon grayi</i>	Data deficient	
	Hector's beaked whale	<i>Mesoplodon hectori</i>	Data deficient	
	Shepherd's beaked whale	<i>Tasmacetus shepherdi</i>	Data deficient	
	Southern bottlenose whale	<i>Hyperoodon planifrons</i>	Data deficient	
	Spade-toothed whale	<i>Mesoplodon traversii</i>	Data deficient	
	Strap-toothed whale	<i>Mesoplodon layardii</i>	Data deficient	
Dolphins	Māui dolphin	<i>Cephalorhynchus hectori maui</i>	Nationally critical	
	Hector's dolphin	<i>Cephalorhynchus hectori hectori</i>	Nationally endangered	
	Bottlenose dolphin	<i>Tursiops truncatus</i>	Nationally endangered	
	Southern right whale dolphin	<i>Lissodelphis peronii</i>	Not threatened	
	Common dolphin	<i>Delphinus delphis</i>	Not threatened	
	Dusky dolphin	<i>Lagenorhynchus obscurus</i>	Not threatened	
Pinnipeds	Hourglass dolphin	<i>Lagenorhynchus cruciger</i>	Data deficient	
	New Zealand sea lion	<i>Phocarcos hookeri</i>	Nationally critical	
	Southern elephant seal	<i>Mirounga leonina</i>	Nationally critical	
	New Zealand fur seal	<i>Arctophoca australis forsteri</i>	Not threatened	

Marine Mammal 5 year plan development process



Species group	Species	Trawl		Set net		SLL		BLL		Purse seine		Total	
		Mean	95% c.i.	Mean	95% c.i.	Mean	95% c.i.	Mean	95% c.i.	Mean	95% c.i.	Mean	95% c.i.
Pinnipeds	New Zealand fur seal	569.9	345.0–917.0	236.5	97.0–517.6	138.6	19.0–314.0	2.5	0.4–7.3	1.5	0.0–5.5	948.9	610.9–1 401.6
	New Zealand sea lion	24.5	13.0–41.0	1.2	0.0–6.0	0.0	0.0–0.1	0.0	0.0–0.3	–	–	25.8	13.5–43.0
	Southern elephant seal	0.9	0.1–3.5	0.4	0.0–3.3	0.0	0.0–0.3	0.0	0.0–0.1	0.0	0.0–0.1	1.4	0.1–5.7
Small dolphins	Bottlenose dolphin	5.1	0.2–23.8	3.5	0.0–21.4	0.6	0.0–2.4	0.0	0.0–0.2	0.0	0.0–0.1	9.3	1.1–36.0
	Common dolphin	157.3	72.0–299.0	71.3	14.4–207.5	1.7	0.1–5.1	0.1	0.0–1.4	0.1	0.0–0.9	230.4	115.8–421.7
	Dusky dolphin	9.8	2.5–28.1	18.4	5.7–43.2	0.3	0.0–1.6	0.0	0.0–0.2	0.0	0.0–0.1	28.6	11.7–58.4
	Hector's dolphin	9.0	1.1–26.6	32.3	13.8–65.8	0.0	0.0–0.1	0.0	0.0–0.1	–	–	41.3	19.1–77.7
	Hourglass dolphin	0.8	0.0–6.3	0.9	0.0–6.1	0.0	0.0–0.3	0.0	0.0–0.1	–	–	1.7	0.0–11.2
	Māui dolphin	0.0	0.0–0.1	0.2	0.0–0.5	–	–	–	–	–	–	0.2	0.0–0.5
Southern right whale dolphin	0.5	0.0–3.8	0.3	0.0–3.1	0.0	0.0–0.1	–	–	–	–	0.9	0.0–6.6	
Large dolphins	False killer whale	0.2	0.0–1.2	1.1	0.0–9.1	0.1	0.0–0.8	0.5	0.0–3.4	0.0	0.0–0.3	1.9	0.0–10.8
	Killer whale	0.2	0.0–1.4	1.0	0.0–7.9	0.1	0.0–0.4	0.4	0.0–2.6	0.0	0.0–0.2	1.6	0.0–9.5
	Long-finned pilot whale	3.3	0.2–8.7	3.4	0.0–13.9	0.5	0.0–2.3	1.5	0.1–7.1	0.0	0.0–0.3	8.7	2.1–25.2
	Short-finned pilot whale	0.9	0.0–4.9	3.1	0.0–20.9	0.3	0.0–1.6	2.8	0.0–11.9	0.1	0.0–0.6	7.0	0.0–30.5
Beaked whales	Andrews' beaked whale	0.1	0.0–0.6	0.0	0.0–0.4	0.1	0.0–0.5	0.0	0.0–0.1	0.0	0.0–0.1	0.2	0.0–1.2
	Cuvier's beaked whale	0.2	0.0–1.3	0.1	0.0–0.9	0.1	0.0–0.8	0.0	0.0–0.1	0.0	0.0–0.2	0.4	0.0–2.4
	Dense-beaked whale	0.1	0.0–0.6	0.0	0.0–0.3	0.1	0.0–0.5	0.0	0.0–0.1	0.0	0.0–0.1	0.2	0.0–1.3
	Gray's beaked whale	0.3	0.0–2.4	0.1	0.0–1.0	0.2	0.0–1.1	0.0	0.0–0.1	0.0	0.0–0.1	0.6	0.0–3.8
	Hector's beaked whale	0.1	0.0–0.6	0.0	0.0–0.4	0.1	0.0–0.5	0.0	0.0–0.1	0.0	0.0–0.1	0.2	0.0–1.4
	Shepherd's beaked whale	0.1	0.0–0.6	0.0	0.0–0.3	0.1	0.0–0.5	0.0	0.0–0.1	0.0	0.0–0.1	0.2	0.0–1.2
	Southern bottlenose whale	0.1	0.0–0.6	0.0	0.0–0.3	0.1	0.0–0.5	0.0	0.0–0.1	0.0	0.0–0.1	0.2	0.0–1.2
	Spade-toothed whale	0.1	0.0–0.6	0.0	0.0–0.3	0.1	0.0–0.5	0.0	0.0–0.1	0.0	0.0–0.1	0.2	0.0–1.2
	Strap-toothed whale	0.1	0.0–0.8	0.1	0.0–0.6	0.1	0.0–0.6	0.0	0.0–0.1	0.0	0.0–0.1	0.3	0.0–1.6
Whales	Antarctic blue whale	0.0	0.0–0.1	0.0	0.0–0.1	0.0	0.0–0.1	0.0	0.0–0.1	–	–	0.0	0.0–0.3
	Antarctic minke whale	0.1	0.0–0.5	0.0	0.0–0.2	0.0	0.0–0.1	0.0	0.0–0.1	0.0	0.0–0.1	0.1	0.0–1.0
	Bryde's whale	0.0	0.0–0.3	0.1	0.0–0.9	0.0	0.0–0.1	0.0	0.0–0.3	0.0	0.0–0.1	0.2	0.0–1.6
	Dwarf minke whale	0.0	0.0–0.2	0.1	0.0–0.3	0.0	0.0–0.2	0.0	0.0–0.1	0.0	0.0–0.1	0.1	0.0–0.8
	Fin whale	0.0	0.0–0.1	0.0	0.0–0.2	0.0	0.0–0.1	0.0	0.0–0.1	0.0	0.0–0.1	0.1	0.0–0.5
	Humpback whale	0.4	0.0–3.8	0.3	0.0–3.3	0.4	0.0–2.1	0.1	0.0–0.8	0.1	0.0–0.7	1.4	0.0–6.6
	Pygmy blue whale	0.0	0.0–0.3	0.0	0.0–0.3	0.0	0.0–0.1	0.0	0.0–0.1	0.0	0.0–0.1	0.1	0.0–0.8
	Pygmy right whale	0.0	0.0–0.1	–	–	0.0	0.0–0.1	–	–	–	–	0.0	0.0–0.1
	Pygmy sperm whale	0.0	0.0–0.2	0.0	0.0–0.1	0.0	0.0–0.3	0.0	0.0–0.1	0.0	0.0–0.1	0.1	0.0–0.8
	Sei whale	0.1	0.0–0.5	0.0	0.0–0.3	0.0	0.0–0.2	0.0	0.0–0.1	0.0	0.0–0.1	0.1	0.0–0.9
	Southern right whale	0.2	0.0–1.3	0.1	0.0–0.8	0.0	0.0–0.1	0.0	0.0–0.2	0.0	0.0–0.2	0.3	0.0–2.2
	Sperm whale	0.1	0.0–0.5	0.0	0.0–0.3	0.0	0.0–0.1	0.0	0.0–0.1	–	–	0.1	0.0–0.9

Marine Mammal 5 year plan development process



Marine Mammal 5 year plan research priorities



Research Priority	Priority level*	Species involved
Characterisation of marine mammal bycatch (i.e. interaction/catch rates in all fisheries)	High	All species (prioritising those at greatest risk from fishing)
Population monitoring	Medium-High	All species (prioritising those at greatest risk from fishing)
Project ideas include:		
<ul style="list-style-type: none"> Abundance estimate (every five years) 	High	Hector's & Māui dolphins**
<ul style="list-style-type: none"> Pup count (Auckland Is/Mainland annually, Campbell Island TBD) 	High	New Zealand sea lion***
Population size and structure	Medium-High	All species (prioritising those at greatest risk from fishing)
Project ideas include:		
<ul style="list-style-type: none"> Determination of population size and structure 	Medium-High	Hector's & Māui dolphins**
<ul style="list-style-type: none"> Bounty Islands population assessment 	Medium	New Zealand fur seal
<ul style="list-style-type: none"> Cook Strait population assessment 	Medium	New Zealand fur seal
Post release survival of marine mammals in fisheries (prioritising fisheries that pose highest risk)	Medium	All species (prioritising those at greatest risk from fishing)

Marine Mammal 5 year plan research priorities



Research Priority	Priority level*	Species involved
Mitigation studies	Medium	All species (prioritising those at greatest risk from fishing)
Project ideas include:		
<ul style="list-style-type: none"> Mitigation of captures 	Medium	New Zealand fur seal
<ul style="list-style-type: none"> Mitigation of captures 	Medium	Common dolphins
<ul style="list-style-type: none"> Mitigation of dolphin captures in the set net fishery 	Medium	Common dolphins, Hector's dolphin, dusky dolphins
<ul style="list-style-type: none"> SLED efficacy (being undertaken by MPI) 	Medium	New Zealand sea lion***
Tracking/distribution studies	Low-Medium	All species (prioritising those at greatest risk from fishing)
Project ideas include:		
<ul style="list-style-type: none"> Quantifying species distribution 	Low-Medium	All species (prioritising those at greatest risk from fishing)
<ul style="list-style-type: none"> Quantifying species distribution 	Low-Medium	Hector's & Māui dolphins**
<ul style="list-style-type: none"> Analysis of existing tracking data to quantify fisheries overlap 	Low-Medium	New Zealand sea lion***

*Note: Priority level has been assigned qualitatively based on the importance of the work (i.e. whether the research addresses significant data gaps), the NZ threat classification of the species, the species' risk of fisheries related mortality, and the species' estimated annual potential fatalities.

** Action from the Hector's & Māui dolphin Threat Management Plan; to be reviewed in 2018 as part of the review of the Hector's & Māui dolphin Threat Management Plan

*** Action from the New Zealand sea lion Threat Management Plan

Conservation Services Programme Annual Research Summary



Background

- Stakeholder desire for rationalized and timely reporting
- Better integration with CSP's new strategic direction

Aim

- A single and concise summary of the year's research and outputs
- Integrating the results of observer coverage with other CSP funded research
- Updates of the status of multiyear projects
- Ties back to each years annual plan
- Helps feed in to each years planning processes e.g. CSP RAG

Conservation Services Programme Annual Research Summary 2016-17



- Interaction projects
 - Observing commercial fisheries
Status: Ongoing
 - Identification of marine mammals, turtles, and protected fish captured in New Zealand fisheries
Status: In progress - resolving data issues
 - Identification and storage of cold-water coral bycatch specimens
Status: Ongoing - 16/17 reporting complete
 - Identification of seabirds captured in New Zealand fisheries
Status: In progress - resolving data issues
 - Post release survival of white pointer sharks in New Zealand setnets fisheries
Status: Complete
 - Indirect effects of commercial fishing on Buller's shearwater and red-billed gulls
Status: Complete

2016-17 Summary

Interaction projects

INT2016-01 Observing commercial fisheries

Status: Ongoing - Delivery complete, awaiting final data set clean up

INT2015-02 Identification of marine mammals, turtles and protected fish captured in New Zealand fisheries

Status: In progress - resolving data issues

Recommendations refer to implementation of observer protocols.



2016-17 Summary

Interaction projects



INT2015-03 Identification and storage of cold-water corals bycatch specimens

Status: Ongoing - Reporting for the 16/17 year is now complete

Recommendations:

- An improved image database storage system for the Observer collected digital images - Processing methods applied and requirements for loading the data into NIWA's Atlas database have been outlined in the report.
- The backlog of unidentified protected coral samples was reduced this year (n=130) due to a decreasing number of observer sample specimens returned to identify (possibly because of an increase in digital images being collected), and few research trawl survey samples. While decreasing in number, some historical research trawl and observer samples held at NIWA remain unidentified. We recommend that this backlog continues to be addressed.

2016-17 Summary

Interaction projects

INT2016-02 Identification of seabirds captured in New Zealand fisheries

Status: Ongoing - Final reporting awaiting few bycatch records

Recommendations refer to implementation of observer protocols.

2016-17 Summary

Interaction projects

INT2016-03 Post release survival of white pointer sharks in New Zealand

Status: Complete

Recommendations:

- Bycatch could be reduced by identifying important hotspots of abundance and reducing or ceasing set net fishing in those areas at appropriate times of year. Restrictions on set netting in the Foveaux Strait–Stewart Island region during summer–autumn would greatly reduce white shark bycatch, as would closure to set netting of some other key white shark habitats.
- Reduction of set net height in key fisheries could reduce bycatch.
- 69% of sharks reported on NFPS forms were judged by fishers to be alive and in good condition, 3% were alive but injured, and 28% were dead. A post-release mortality experiment would be necessary to determine the true mortality rate of white sharks released alive from set nets. Such a study would have to run for 3–5 years to estimate PRM.



2016-17 Summary

Interaction projects

INT2016-04 Indirect effects of commercial fishing on Buller's shearwater and red-billed gulls

Status: Complete

Recommendations:

- Integrate seabird monitoring with other marine ecosystem programmes (including fisheries).
- Maintain a database of seabird colonies.
- Investigate prey types of priority procellariform species using regurgitations gathered opportunistically, stable isotopes (current and historical), and sampling through fish schools including trawling with micron-mesh nets for fish spawn and studying stomach contents of fish species. The latter derived from both the purse-seining fishery and targeted sampling.
- Determine the contribution feeding in associations with fish schools for the diet of priority procellariform species at critical stages of breeding.
- Data collection within seabird colonies (i.e. chick development, adult attendance, provisioning and breeding success) for Buller's and fluttering shearwaters, and initiate a contemporary survey and breeding study for fairy prion over five years.



2016-17 Summary

Interaction projects

INT2016-04 Indirect effects of commercial fishing on Buller's shearwater and red-billed gulls

Status: Complete

Recommendations (Continued):

- Baseline population estimates for priority procellariiform species and key breeding sites.
- Ensemble modelling using at-sea and aerial survey data (using existing Hauraki Gulf subset) of observed seabird/fish school events to predict likely fish school occurrence with priority procellariiform species in north-eastern North Island.
- Initiate a GPS and PTT tracking programme of priority procellariiform species at different stages of breeding.
- The tracking programme undertaken synchronistically with aerial and/or boat-based surveying for fish school and cetacean feeding to 'ground truth' activity observed from the tracking data. These surveys would also provide a means to document through photography and video imaging of fish school activity as it relates to seabird activity.
- Island surveys for burrowing seabirds throughout northern North Island offshore islands working to a priority list (Appendix 5).
- Investigate cetacean and Procellariiformes associations – importance for diet of black petrel.



Conservation Services Programme Annual Research Summary 2016-17



- Population projects
 - Flesh-footed shearwater: Various location population project
Status: Ongoing
 - Seabird population research: Chatham Islands 2016-17
Status: Ongoing
 - Seabird population research: Auckland Islands 2016-17
Status: Ongoing
 - Updates basking shark bycatch review
Status: Complete
 - Yellow-eyed penguin foraging and indirect effects
Status: Ongoing
 - Salvin's albatross Bounty Islands: methodology development
Status: Complete
 - New Zealand sea lion: Auckland Islands pup count
Status: Complete

2016-17 Summary

Population projects

POP2015-02 Flesh-footed shearwater: various locations
population project

Status: Ongoing - 2 year project

Recommendations referred to methodology for next field season.



2016-17 Summary

Population projects



POP2016-01 Seabird population research: Chatham Islands
2016-17
Status: Ongoing

Recommendations:

- Further research into the population trends of Northern Royal Albatross is warranted and highly recommended.

2016-17 Summary

Population projects



POP2016-02 Seabird population research: Auckland Islands 2016-17

Status: Ongoing – Objectives 1 & 2 are now complete, field component for white-chinned petrel complete and reporting will be finalized next year.

Recommendations:

- Population size and trend, and adult survival should continue to be estimated for Gibson's albatross at regular intervals until the population substantially increases.
- A detailed modelling exercise such as the one carried out by Francis et al in 2012 would give a better indication of the trajectory of the whole population and should be undertaken within the next five years.
- Recent estimates of the size of the population are sufficiently accurate that a whole-island census is probably unnecessary.
- A further five-day visit to Disappointment Island would allow the banded population to be increased to more than 600 birds. We recommend that visits to Disappointment Island plan for at least five days on the island.

2016-17 Summary

Population projects



POP2016-02 Seabird population research: Auckland Islands 2016-17

Status: Ongoing – Objectives 1 & 2 are now complete, field component for white-chinned petrel complete and reporting will be finalized next year.

Recommendations (continued):

- White-chinned petrel survey data from Antipodes need analysing fully. Numbers on Campbell are coarse; local burrow occupancy data and surveys of Jacquemart are needed. For population trend data at New Zealand islands, Auckland and Campbell estimates should be repeated (5-10 years). The Antipodes population needs re-survey in next 1-2 years.
- Tracking of WCP is needed at Campbell (only island with unknown range). Bycatch petrels in areas used by only one population should be linked to island of origin. Petrel density data should be overlaid with fishing effort.
- WCP resightings at Adams study colony should continue for demographic parameter estimates
- The potential to genetically assign bycatch white-chinned petrels to island needs testing and development, targeting bycatch petrels from areas where populations overlap.

2016-17 Summary

Population projects



POP2016-03 Updated basking shark bycatch review

Status: Complete

Recommendations:

- Collection of tissue samples (e.g. fin clips) for feeding into international studies of basking shark genetics.
- Collection of white muscle samples, and sampling of stomach contents, to determine the trophic level occupied by basking sharks, and what they feed on, in subsurface habitats.
- Shark length should be measured or estimated, and sex determined, for all sharks caught in commercial fisheries.
- Vessels should retain any small juveniles caught for scientific study.
- Attempts should be made to deploy popup satellite tags on free-swimming basking sharks. This will rely on the ability to find animals at the surface in an accessible location

2016-17 Summary

Population projects

POP2016-09 Support to cetacean habitat suitability modelling

Status: Project on hold



2016-17 Summary

Population projects



POP2016-05 Yellow-eyed penguin foraging and indirect effects

Status: Ongoing

Recommendations:

- Increase sample size and representation of fledglings from across Otago/Southland for 2017/18 breeding season (n=10)
- Recruitment of yellow-eyed penguins has declined from c. 26% (Richdale 1957) to 12.3% (Stein et al. 2017). More than c. 60% of juvenile yellow-eyed penguins that are seen post-fledge do not survive to adulthood, and further foraging research into pre-moult juvenile foraging would be beneficial, as pre-moult appears to be the second-highest point of mortality in the juvenile year.
- Yellow-eyed penguins breeding in the Catlins travelled long distances at pre-moult and in winter, but relatively little is known about their movements during the guard and post-guard stages of chick rearing. Baseline data are needed for this subpopulation, which have declined sharply over the last five years.

2016-17 Summary

Population projects



POP2016-06 Salvin's albatross Bounty Islands: methodology development

Status: Complete

Recommendations:

- Two-year project.
- Satellite mapping of island to allow area of occupancy to be quantified.
- Aerial photographic survey in year 1 (and ideally repeated in year 2) to estimate total number of breeding pairs and area of occupancy.
- Ground visit in both years, coinciding with aerial survey to allow ground truthing.
- Deployment of GLS and PPT transmitting devices
- Identify any potential constraints limiting breeding success.
- Band and resight birds with potential to establish a study site area on Proclamation Island (easiest access and most existing data).

2016-17 Summary

Population projects

POP2016-07 New Zealand Sea Lion: Auckland Islands pup
count

Status: Complete

No recommendations in final report



Conservation Services Programme Annual Research Summary 2016-17



- Mitigation projects
 - Seabird bycatch reduction (small vessel longline fisheries)
Status: Complete
 - Small vessel seabird mitigation project
Status: Complete
 - Protected species bycatch media
Status: Ongoing
 - Entanglement of cetaceans in pot/trap lines and setnets and a review of potential mitigation methods
Status: Complete

2016-17 Summary

Mitigation projects

MIT2015-01 Seabird bycatch reduction (small vessel longline fisheries)

Status: Complete

Recommendations:

- Start the liaison role earlier in the season, prior to birds arriving and observer trips starting.
- Include effort fishing west of North Cape, and South of East Cape
- Report to a wider audience during the contract period including observed and fisher-reported capture rates, and set targets for improvement.
- Have liaison officers spend time at sea with new entrants to the fishery as part of an 'induction'.
- Develop a Brickle curtain type device suitable for, particularly, bluenose vessels.
- Investigate all captures.
- Publish results of camera trials and use camera footage to judge fishers on their performance.



2016-17 Summary

Mitigation projects

MIT2015-02 Small vessel seabird mitigation project

Status: Complete

Recommendations:

- Supply complete tori line setups and poles, as required, to all small longliners. Follow up with skippers to provide help and support with installation, testing, and modification to maximise performance.
- Promote tori lines as part of a suite of mitigation measures necessary to reduce captures rather than a 'tick box' regulatory approach. This empowers fishers to consider all aspects of the fishing operation with respect to minimising captures.
- Try a longer aerial section on surface liners.
- Continue to monitor tori line use and performance with tori line observations on government observer trips. Given the propensity for night setting, data collection opportunities will be rare. However, with more pelagic vessels working weighted gear and setting early for swordfish, some useful data will be collected, especially in areas of overlap with black petrels in the summer bigeye and swordfish fishery.
- Continue to gather feedback from skippers to improve tori line designs.



2016-17 Summary

Mitigation projects

MIT2016-01 Protected species bycatch media

Status: Ongoing – year one of two is now complete

Beyond the current project term, there are additional opportunities to improve resources available for fishers working to reduce the risks that commercial fishing presents to protected species.

Recommendations for future work include:

- Continuing the production and circulation of the newsletter at a quarterly frequency
- Producing a pictorial guide for fishers on handling protected species after capture in fishing operations,
- Continuing the production of fact sheets on key bycatch mitigation measures (e.g. line-weighting), and
- Developing a series of short (e.g. five minute) videos on the use of key bycatch mitigation measures, such as tori lines, line-weighting and fish waste retention, that show how these measures can be applied safely and effectively on vessels.



2016-17 Summary

Mitigation projects

MIT2016-02 Entanglement of cetaceans in pot/trap lines and setnets and a review of potential mitigation methods

Status: Complete

Recommendations:

- Conducting observations of the use of NZRLC's 'OceanSnap' application and if/how this consequently results in fishers moving/removing gear in instances when whales are sighted.
- Training of additional personnel (within and outside of DOC) as part of the New Zealand disentanglement network.
- Conduct an audit of all internal DOC entanglement-related records and collate the results.
- Enhance data reporting protocols for entanglement events.
- Conducting scar-based studies would help quantify the extent of the entanglement problem for whales migrating past New Zealand.
- Determining sex via DNA analysis in order to help inform impact on particular demographics, or particular risk, as well as add to the data informing population dynamics of other genetic collections.
- Monitor (or assist with), the global development of fisheries gear modification focused on lowering the rate of whale interactions with fisheries.





Non CSP Developments



Interaction research

Black petrels SNA/BNS BLL EM trials- the use of full hemispherical cameras to detect seabird bycatch across a range of vessels and weather conditions on demersal longline vessels.

Seabird activity (2017/18) delivering on CSP priorities

Antipodean albatross: monitoring and tracking planned (DOC/MPI/Albatross Research)

Chatham Island albatross: ongoing translocation (Chatham Islands Taiko Trust)

Northern royal albatross – ongoing management and monitoring at Taiaroa Head (DOC)

Yellow-eyed penguin: breeding counts mainland (DOC/YEPT)
fisheries interaction characterisation (MPI)

Chatham petrel & taiko – ongoing management at Rangatira and Tuku/Sweetwater (DOC/ Chatham Islands Taiko Trust)

New Zealand storm petrel – ongoing monitoring at Little Barrier Island and at-sea (collaborative programme)



Protected fish Research

- MPI Qualitative risk assessment workshop
 - Mapping of the distribution of catches of all NZ's sharks, rays and chimaeras (including protected shark and ray species) for the most recent five years.
 - Updated risk assessment next year 2018
- New Zealand Threat Classification for Chondrichyans in New Zealand Waters
- Biology of deep-sea sharks and chimaeras
 - PhD looking at characteristics such as length at maturity, fecundity, and diet,
 - Analysing scientific research trawl surveys, looking at species distributions and behavioural characteristics, such as aggregations and determination of potential population segregations.
 - Aim is to increase the understanding of vulnerability to fishing pressure.



Marine Mammal Research



- Māui dolphins
 - Abundance estimate (genetic sampling & analysis) by Oregon Uni & A Uni -- **completed**
 - Boat-based survey work & photo ID – **ongoing**
 - Array of C-PODs being established to examine offshore distribution – **ongoing**
 - Distribution work in 2017-18 – CPODs deployed in Taranaki/Whanganui
- Blue whale surveys – Oregon State Uni
 - Field component finished, analysis ongoing and attempt to source funding for follow-up
- NIWA hydrophone monitoring – **extended to include tagging this year**
- Cook Strait whale survey on hold, data analysis & reporting phase currently
- MPI-funded Hector's dolphin aerial surveys
 - Farewell Spit to Doubtful Sound – **completed**
 - South Coast South Island – **coming up**

Marine Mammal Research



- Fiordland Bottlenose Dolphin Population Monitoring
- Southern right whale population monitoring – subantarctic (Otago Uni)
 - Planned in near future, funding has been obtained for the work
- Fur seals
 - West Coast pup mark-recapture monitoring – planned for 2017-18
 - Relationship between pup parameters and climate – current
- Sea lions
 - Ongoing (population) monitoring work in Otago, Stewart Island & Subants
 - Disease research on Enderby Island
 - Threat Management Plan implementation
 - SLED review – MPI
 - Campbell Island monitoring and pup behaviour in relation to holes

Cold Water Coral Research

- Planned Radio carboning of *Goniocorella* & *Madrepora* (stony coral - Branching) - NIWA
- *Solenosmilia* (stony coral - Branching) ageing paper underway - NIWA
- Black coral mapping, Port Pegasus, Stewart Island - Pikihatiti Salmon Farms Assessment - Government Funding
- Marsden grant 2016: Corals, currents, and phytoplankton: Reconstructing 3000 years of circulation and marine productivity in the world's largest ocean gyre.



Mitigation research





Discussion to identify research gaps