



CSP Research Advisory Group

14 Dec 2018



Today's Agenda

Welcome, Introductions, Scope, Objectives, Apologies

CSP Research Advisory Group

- Overview of Strategic Statement and timeline for 2018-19
- Overview on CSP medium-term research planning
- CSP Annual Research Summary 2017-18:

Interaction Projects:

- Review of CSP research recommendations
- MPI upcoming research projects
- Discussion to identify research gaps (participant input)

Population Projects:

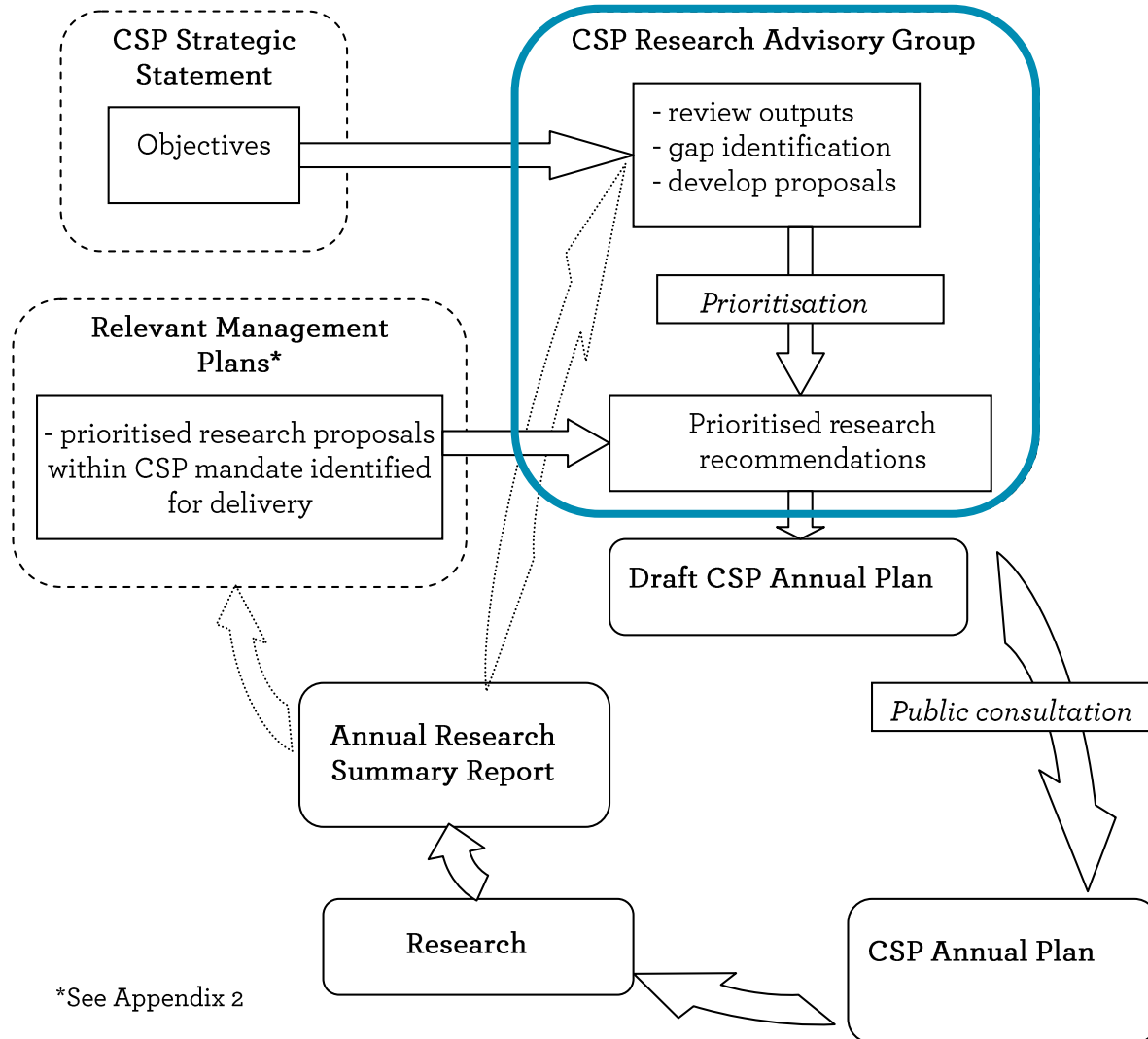
- Review of CSP research recommendations
- MPI upcoming research projects
- Discussion to identify research gaps (participant input)

Mitigation Projects:

- Review of CSP research recommendations
- MPI upcoming research projects
- Discussion to identify research gaps (participant input)



Purpose and Scope of CSP RAG



*See Appendix 2



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



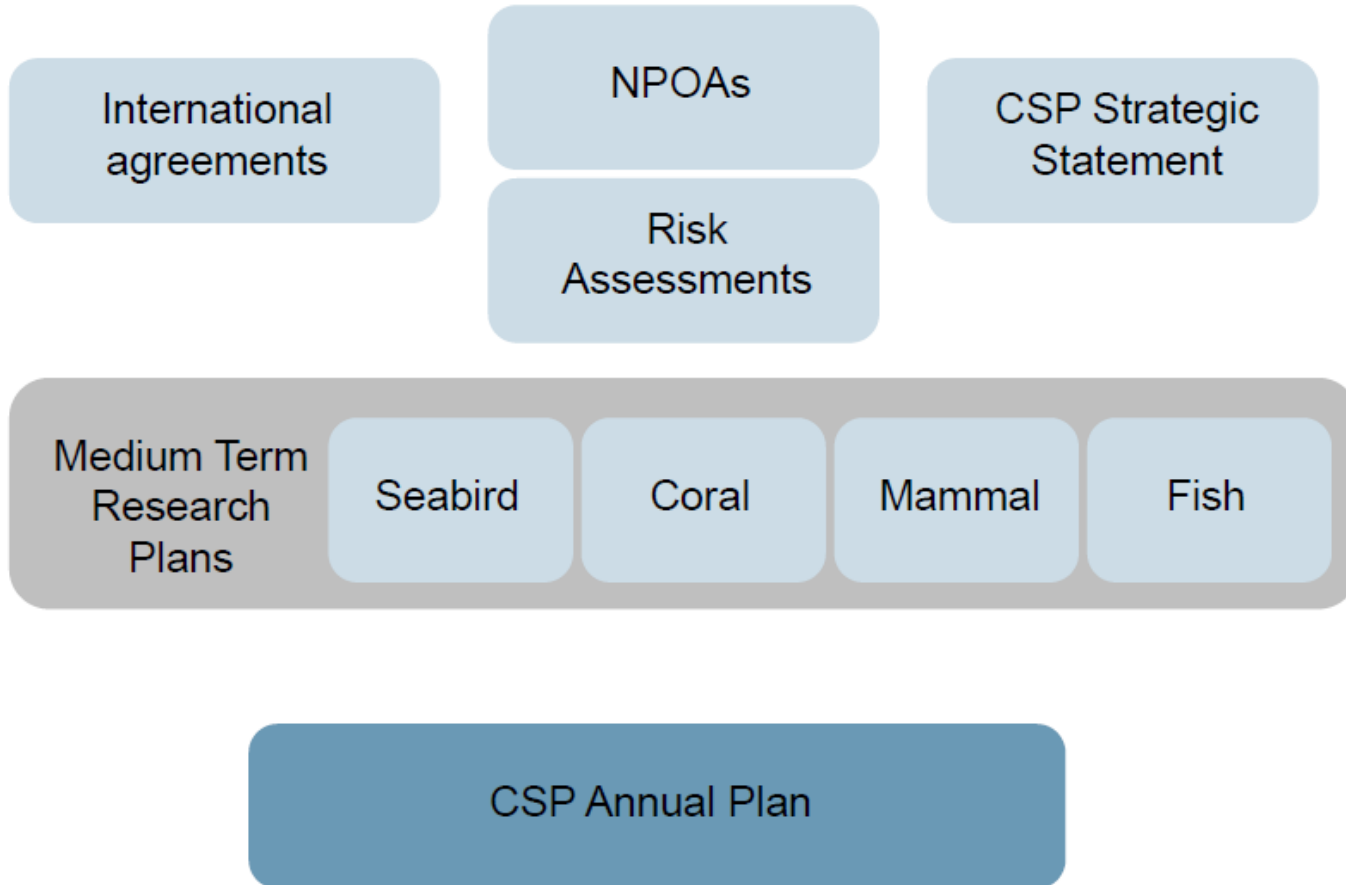
- Revised Dec 2018
- Changes made to reflect:
 - New organisational structures
 - Progress on initialisation and review of TMPs
 - NPOA reviews
 - DOC/government plans
 - Updated risk assessments/reports

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 chrystostoma</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 Auck 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 Auck 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 Auck Is Pop est Campbell	M-R study Auck Is Pop est Auck 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



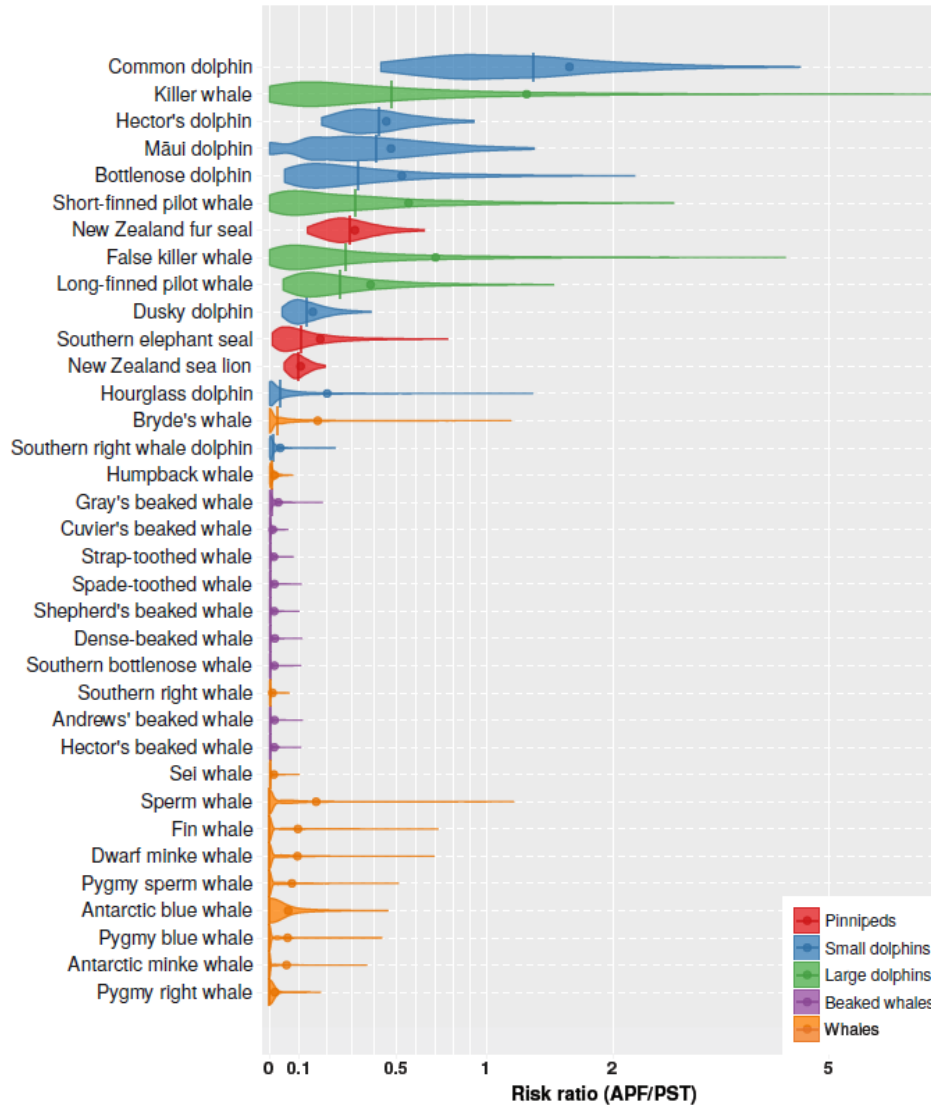
Species group	Common name	Scientific name	New Zealand threat status	
Whales	Bryde's whale	<i>Balaenoptera brydei</i>	Nationally critical	
	Southern right whale	<i>Eubalaena australis</i>	Nationally endangered	
	Sperm whale	<i>Physeter macrocephalus</i>	Not threatened	
	Antarctic minke whale	<i>Balaenoptera 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 Project ideas include:	Medium-High	All species (prioritising those at greatest risk from fishing)
<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 Project ideas include:	Medium-High	All species (prioritising those at greatest risk from fishing)
<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



Mitigation studies	Medium	All species (prioritising those at greatest risk from fishing)
Project ideas include:		
• Mitigation of captures	Medium	New Zealand fur seal
• Mitigation of captures	Medium	Common dolphins
• Mitigation of dolphin captures in the set net fishery	Medium	Common dolphins, Hector's dolphin, dusky dolphins
• 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:		
• Quantifying species distribution	Low-Medium	All species (prioritising those at greatest risk from fishing)
• Quantifying species distribution	Low-Medium	Hector's & Māui dolphins ^{**}
• 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 2018-19 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 rationalised 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 2017-18



- Interaction projects
 - Observing commercial fisheries
Status: Ongoing
 - Identification and storage of cold-water coral bycatch specimens
Status: Ongoing - 17/18 reporting complete
 - Identification of seabirds captured in New Zealand fisheries
Status: Ongoing- 17/18 reporting complete
 - Supporting the utility of electronic monitoring to identify protected species interacting with commercial fisheries
Status: Ongoing- 17/18 reporting complete
 - Identification of marine mammals, turtles, and protected fish captured in New Zealand fisheries
Status: In progress - resolving data issues

2017-18 Summary

Interaction projects

INT2016-01 Observing commercial fisheries

Status: Ongoing - Analysis complete

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

Status: Ongoing - Reporting for the 17/18 year is due 10 Dec



2017-18 Summary

Interaction projects

INT2016-02 Identification of seabirds captured in New Zealand fisheries

Status: Ongoing

Recommendations refer to implementation of observer protocols around image and data capture



2017-18 Summary

Interaction projects

INT2017-02 Supporting the utility of electronic monitoring to identify protected species interacting with commercial fisheries

Status: Ongoing – phase one completed

- Data standards are developed and documented to specify the information that EM analysts are tasked with extracting from imagery
- Quality assurance standards are developed for EM review
- Training materials and programmes are prepared to enable EM analysts to populate data fields and to document their findings
- The development of training materials is initiated where requirements are already understood
- Photos and videos taken by fisheries observers are catalogued and stored for use as part of EM training materials and potentially for machine learning
- NZ remains abreast of the regional development of EM process and data standards
- Practitioners in NZ and internationally are encouraged to make available EM process and data standards, review protocols and training materials



2017-18 Summary

Interaction projects

INT2017-03 Identification of marine mammals, turtles and protected fish captured in NZ fisheries

Status: Ongoing





Non-CSP Interaction related projects

- 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.
- FNZ Proposed projects



CSP Interaction knowledge gaps

- Discussion

Conservation Services Programme Annual Research Summary 2017-18



- Population projects
 - Flesh-footed shearwater: Various location population project
Status: Complete
 - Yellow-eyed penguin foraging and indirect effects
Status: Complete
 - Seabird population research: Chatham Islands 2017-18
Status: Complete
 - Indirect effects of fishing on NZ sea lions
Status: Ongoing
 - Salvin's albatross Bounty Islands population project
Status: Postponed to 2018/19 due to logistic constraints
 - Seabird population research: Auckland Islands 2017-18
Status: Complete

Conservation Services Programme Annual Research Summary 2017-18



Population projects (continued)

- New Zealand sea lion: Auckland Islands pup count
Status: Complete
- Indirect effects on seabirds in north-east North Island
Status: Ongoing- due for completion June 2019
- The age and growth of NZ protected corals at high risk
Status: Final stages- due for completion Feb 2019

2017-18 Summary

Population projects - seabirds

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

Status: Complete

Recommendations:

- Further population surveys of other islands inhabited by flesh-footed shearwaters are warranted and monitoring of the populations on Ohinau and Lady Alice islands should continue.



2017-18 Summary

Population projects - seabirds

POP2016-05 Yellow-eyed penguin foraging and indirect effects

Status: Complete

Recommendations:

- Use GPS dive trackers at representative sites on an annual basis to detect any changes in foraging ranges in relation to anthropogenic activities.
- Establish a non-invasive diet monitoring programme.
- Regular collection of feathers and blood samples for current and future stable isotope analyses.
- Conduct a comprehensive baseline study of Yellow-eyed penguin foraging ecology on the sub-Antarctic Islands.
- Include Moeraki and South Catlins in juvenile tracking sampling.
- Extend spatial and temporal tracking of 2nd year juveniles to identify interactions with commercial fisheries.
- Gather further information on ecological parameters of both commercially valuable and non-commercially valuable fish species of specific value to hoiho.
- Investigate options to engage with fishers to develop options for gear switching in bottom fishing fisheries and reducing spatial and temporal overlaps to reduce potential indirect and direct effects
- Investigate options to determine whether there has been an increase in predation rates as a result of indirect effects of fishing of sharks and barracoutta.
- Continue to undertake habitat mapping with the particular objective to understand permanent bottom modification of commercial fisheries using multi-beam survey and cameras on hoiho.
- Engage with fishers to gather information on different habitat types found along the coast of the South East and Southern South Island.



2017-18 Summary

Population projects - seabirds



POP2017-01 Seabird population research: Chatham Islands 2017-18

Status: Complete

Recommendations:

- Continue a programme of population monitoring using aerial surveys and ground counts as appropriate.
- Start a demographic study on Northern Royals, especially on Motuhara.
- Start chick cohort banding.

POP2017-03 Salvin's albatross Bounty Islands population project

Status: Postponed to 2018/19 due to logistic constraints

2017-18 Summary

Population projects - seabirds

POP2017-04 Seabird population research: Auckland Islands 2017-18

Status: Complete

Recommendations:

Gibson's albatross

- While the conservation status of Gibson's wandering albatross is poor, monitoring the size of the population and its structure and trend on Adams Island remains a priority.

White-capped albatross

- **Study focus:** Further visits can now primarily focus on resighting banded birds, with banding further new individuals a secondary aim.
- **Study timing and duration:** To maximise resighting rates and minimise breeding failures, we recommend timing visits to the brood-guard period in early February. A minimum of five days on the island are needed for suitable boat conditions and weather contingency.
- **Data exploration:** Simulation modelling suggested another 3-6 years of resighting data to obtain robust, precise demographic rate estimates suitable for risk assessments and conservation status. Further modelling should allow for time-varying demographic rates.



2017-18 Summary

Population projects - seabirds



POP2017-06 Indirect effects of seabirds in north-east North Island region

Status: Ongoing- due for completion in June 2019

Recommendations:

- GPS tracking of Buller's shearwaters, fairy prions and Australasian gannets, extension to Indirect Effects contract.
- An additional season (2019-2010) of plankton sampling (as per POP2017-06) following now-established protocols
- Collection of blood & feather samples from flesh-footed shearwaters to investigate ecophysiology, nutrition and foraging ecology variables; help provide a more informative understanding of seabird health. Corticosterone stress hormones (indicative of nutritional stress) can be detected either in plasma and/or feathers of both adults and chicks. Matching this with data on stable isotope and plasma nutrient profiles can provide a fuller insight into inter-colony dietary differences and foraging quality. Also collect regurge and faecal samples as per POP2017-06.



Non CSP Population Projects - seabirds

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

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

Northern royal albatross – additional aerial surveys at Chathams (DOC)
- ongoing management and monitoring at Taiaroa Head (DOC)

Yellow-eyed penguin: breeding counts mainland (DOC/YEPT)
distribution/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)

King shag – population monitoring (DOC/OSNZ/King Salmon)

FNZ Proposed projects

CSP Population knowledge gaps - seabirds

- Discussion



2017-18 Summary

Population projects – marine mammals

POP2017-05 New Zealand Sea lion: Auckland Islands pup count

Status: complete

No recommendations in final report as prior year

POP2017-02 Indirect effects of fishing on NZ sea lions

Status: Ongoing





Non-CSP Population Research – marine mammals

- 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 research
 - Oregon State Uni - Field surveys finished, analysis ongoing
 - NIWA – Satellite tagging trial completed
 - Further work planned from OSU, NIWA and Akl Uni to describe abundance, distribution, and threats
- NIWA hydrophone monitoring – analysis ongoing
- MPI-funded Hector’s dolphin aerial surveys
 - Farewell Spit to Doubtful Sound – **completed**
 - South Coast South Island – **coming up**



Non-CSP Population Research – marine mammals

- Fiordland Bottlenose Dolphin Population Monitoring
- Southern right whale population monitoring – subantarctic
 - Otago Uni - Ongoing; Fieldwork commenced in July 2018
 - Auckland Uni - 5-year programme commenced on genetics, abundance and distribution
 - NZDF contributing photos collected on monitoring flights
- 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

+FNZ Proposed projects



CSP Population knowledge gaps – marine mammals

- Discussion

Non-CSP Population Research - protected fish

- MPI Qualitative risk assessment
- Population connectivity of oceanic manta rays (*Mobula birostris*)
 - collaboration with Conservation International
 - photo-identification and satellite tagging (2019-2021)
 - Wildlife Computers SPLASH10-321 towed satellite tags deployed by divers on free-swimming rays
 - purpose is determine extent of movements of manta rays occurring off north east North Island
- White shark photo-identification and movements
 - photo-id population estimate for Stewart Island aggregation site
 - size and sex composition of Stewart Island and Chatham Islands aggregations
 - use of northern North Island coastal habitats by juveniles and sub-adults

FNZ proposed projects



CSP Population knowledge gaps – projected fish

– Discussion



2017-18 Summary

Population projects - coral

POP2017-07 The age and growth of NZ protected corals at high risk

Status: Final stages- due for completion February 2019

Draft report available online now





Non-CSP Population Research - coral

- Radiocarbon dating and growth rates of three stony branching coral species, *Solenosmilia variabilis*, *Goniocorella dumosa* and *Madrepora oculata* (NIWA)
- Marsden grant 2016: Corals, currents, and phytoplankton: Reconstructing 3000 years of circulation and marine productivity in the world's largest ocean gyre (NIWA/VUW)
- Smart Ideas 2018: Reconstructing baseline ocean dynamics around NZ (NIWA/VUW)
- Diversity and taxonomic status of plexaurid (Family Plexauridae) octocorals (NIWA)
- High Seas, NZ EEZ, and Chatham Rise regions HSM for Vulnerable Marine Ecosystem (VME) taxa including protected corals
- Black coral mapping, Fiordland (NIWA)
- FNZ proposed projects

CSP Population knowledge gaps – coral

– Discussion



Conservation Services Programme Annual Research Summary 2017-18



Mitigation projects

- Small vessel seabird mitigation project
Status: Ongoing
- Protected species bycatch media
Status: Complete
- Entanglement of cetaceans in pot/trap lines and setnets and a review of potential mitigation methods
Status: Ongoing
- Protected species liaison project
Status: Ongoing
- Characterisation and development of offal management for small vessels
Status: Complete
- Characterisation and mitigation of protected species interactions in the inshore trawl fishery
Status: Complete

2017-18 Summary

Mitigation projects

MIT2015-02 Small vessel seabird mitigation project (JPEC)

Status: Ongoing

Recommendations:

- Progress haul mitigation work in smaller-vessel bottom longline fisheries includes prioritising mitigation efforts in FMA 1, given the relatively large numbers of captures of high risk seabirds reported there.
- For surface longline fisheries, a fleet-level approach to haul mitigation is recommended, given vessels are often mobile amongst FMAs due to the highly migratory nature of target fish species and relatively smaller number of vessels involved.
- Mitigation efforts should include exploring device deployments (e.g. buoys) to reduce haul captures, and improving the quality and consistency of fish waste management practices that minimise capture risks during hauling.
- Enhance data collection to improve knowledge and understanding of the nature and extent of haul captures in New Zealand's smaller-vessel longline fisheries.



2017-18 Summary

Mitigation projects

MIT2015-02 Small vessel seabird mitigation project (Vita Maris)

Status: Ongoing

Recommendations:

- -Haul mitigation devices should be considered in conjunction with how the discarding of used bait, offal and fish can be best managed to minimise risk to birds.
- -Further investigate the efficacy of a dangler – type approach, in conjunction with managing the discarding of loose baits, offal and fish, in a wider range of conditions and fisheries.
- -Encourage wider uptake of specific hauling mitigation devices, supply similar setups to other vessels, and gather feedback from skippers.
- -Consider using camera footage collected under the Trident monitoring project to investigate the circumstances around live captures, and the possibility of trialling hauling mitigation devices on vessels fitted with cameras to investigate efficacy.



2017-18 Summary

Mitigation projects

MIT2016-01 Protected species bycatch media

Status: Complete

Recommendations:

- Continue the production and circulation of the Bycatch Bylines newsletter at a quarterly frequency,
- Produce a pictorial guide for fishers on handling protected species after capture in fishing operations,
- Continue the production of fact sheets on key bycatch mitigation measures (e.g. line-weighting)
- Develop a series of short (e.g. three to five minute) videos presented as “how-to” guides for fishers, on the basic use of key bycatch mitigation measures such as tori lines, line-weighting and fish waste retention. Videos would highlight fishers demonstrating how these measures can be applied safely and effectively on vessels.



2017-18 Summary

Mitigation projects

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

Status: Ongoing

- 16/17 Report available online



2017-18 Summary

Mitigation projects

MIT2017-01 Protected Species Liaison Project

Status: Ongoing

Recommendations:

- Maintain the Programme's focus on continuous improvement in reducing the bycatch risks associated with interactions between protected species and commercial fisheries.
- Underpin and encourage ongoing improvement with robust policy, management and monitoring frameworks.
- Continue building a set of Programme documents that is consistent across fisheries in the Programme. Continue to develop awareness and outreach resources for use across the programme.
- Continue to monitor the implementation of PSRMPs at sea, noting that this can be accomplished by human observers and (to some degree) using electronic monitoring.
- Operate a feedback loop from Liaison Officers back to vessel operators, when at-sea audits of PSRMP are undertaken.



2017-18 Summary

Mitigation projects

MIT2017-02 Characterisation and development of offal management for small vessels

Status: Complete

Recommendations:

- More work is needed on batch discarding reducing seabird captures comparing batch location (haulside, offside) and discard type (offal, whole fish, baits) with continuous batching and no discarding. Trip reports require more detail.
- Effectiveness of sticker removal for trawl vessels mostly unknown and needs more assessment
- Vessel lighting effects may be a major driver of deck strikes as seen elsewhere in the world, should be explored as a potential way to mitigate deck strikes.



2017-18 Summary

Mitigation projects

MIT2017-03 Characterisation and mitigation of protected species interactions in the inshore trawl fishery

Status: Complete

Recommendations:

- Lighting management: Lighting should be explored as a potential way to mitigate deck strikes, particularly around high-risk areas (titi islands, Hauturu, Codfish), assessing levels (deck lights, stern lights, both?) and light spill (deck cover, light shields?).
- Net availability: Data on the duration of net availability at the surface during shooting and hauling need to be explored further to assess potential effects of gear type and characteristics (e.g. PSH linked to longer surface time than standard codend). Operational practises that could reduce net surface time should also be explored.
- Warp testing: Potential for seabird warp mitigation using Dyneema® warps could be tested. Trial Dyneema cf. Steel warps.



Non-CSP Mitigation Research



FNZ proposed projects



CSP Mitigation knowledge gaps

- Discussion



Final discussion