

## Estimation of Safe Limits for Sea Lion Mortalities in the SBW6I Fishery

1. As part of the MSC Certification requirements for SWB6I, DWG is required to establish that this fishery is not adversely affecting the NZSL sub-population on Campbell Island
2. Estimated captures each year since 1996 are shown in Table1 (i.e. in effect the estimated numbers of mortalities)
3. Note the rising trend in the numbers of captures over recent years and, as SLEDs were used during 2013, one could presume that the number of captures in 2013 would have been higher without their use
4. DWG has contracted NIWA to estimate the safe Potential Biological Removal (PBR) levels for Campbell Island sea lions (i.e. the average number of annual deaths due to fishing that would not affect the sustainability of this NZSL sub-population)
5. PBR assessments are very sensitive to the chosen parameters and therefore it is critical that defensible assumptions are used, but not so as to provide unreasonably cautious or unreasonably optimistic outcomes
6. The draft PBR results were presented to MPI's AEWG on 10 February. These results provided a wide range of possible answers – between 15 and 94 captures per year on average.
7. DWG assesses the most plausible range to be 15-30 captures per year on average
8. AEWG members suggested that we should use the more conservative parameters, especially the  $F_R$  term which the PBR equation is particularly sensitive to
9. Accepting AEWG's feedback and recalculating the PBR (yet to be done) will likely reduce the lower bound to below 15 captures per year on average.
10. We are therefore currently operating the SBW6I fishery with a running annual average number of captures that is very close to the likely PBR and that will exceed the likely PBR in some years, unless capture rates are reduced by mitigation (or by good fortune).

Table 1: Annual trawl effort, observer coverage, observed sea lion captures and estimates of total sea lion captures in the Campbell Island southern blue whiting trawl fishery, rounded to the nearest integer. Model used to generate estimates described in Thompson *et al.*, 2013; fishing season runs from 1 April to 31 March.

Season	Total Tows	% tows Observed	Observed Captures	Estimated Captures	Running Mean of Captures	
					3 Year	5 Year
1996	474	27	0	1	1	1
1997	641	34	0	1	1	1
1998	963	28	0	1	1	1
1999	788	28	0	1	1	1
2000	447	52	0	0	1	1
2001	672	60	0	0	0	1
2002	980	28	1	3	1	1
2003	599	43	0	0	1	1
2004	690	34	1	3	2	1
2005	726	37	2	5	3	2
2006	521	28	3	10	6	4
2007	544	32	6	18	11	7
2008	557	41	2	5	11	8
2009	627	20	0	1	8	8
2010	550	43	11	25	10	12
2011	815	40	6	14	13	13
2012	591	77	0	0	13	9
2013	689	100	21	21	12	12