New Zealand sea lions: Doom or bloom?

Dive in now...

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Abstract: The New Zealand (NZ) sea lion, *Phocarctos hookeri*, is a threatened species with only three remaining breeding colonies in the NZ sub-Antarctic islands. Currently, these populations are declining and experiencing legal byctach in local trawl fisheries. A hypothesis from 15 years of research is that the sub-Antarctic area is a marginal habitat for this species. As the species has now started recolonising parts of its original breeding range at Otago (mainland NZ), we can compare both populations and test this hypothesis. Since 1996, the foraging behaviour of breeding females has been investigated at the Auckland Islands (where two of the three breeding colonies are found). We present the results of the first investigation of the foraging behaviour of breeding females at Otago. We applied satellite and time-depth recorder tags to four breeding females (from a total population of five) for six weeks in April and May 2008. We found support for the hypothesis that the sub-Antarctic area is marginal habitat for this species. The distances to foraging grounds were 80% closer to the coast and periods at sea and depths reached were on average 60% less at Otago than those in the sub-Antarctic area. The weights of breeding female NZ sea lions at Otago were also 25% heavier than of their sub-Antarctic counterparts. Our study reveals the significant differences in foraging behaviour between two geographically separated populations of the same species and the need to take area specific management actions.

Figure 1: Location and map of New Zealand, with the main New Zealand sea lion breeding ground: the Auckland Islands, and the area being recolonised: the Otago Peninsula.

Research at the Auckland Islands showed that New Zealand sea lions:

- currently breed in a remnant part of their pristine range
- are the deepest and longest diving sea lions
- travel long distances to feeding grounds
- feed on low energy preys
- have the lowest milk fat content of any Otariid
- are the slowest growing population of sea lions

Hypothesis of the marginal habitat

With a 50% decline in pup production at the Auckland Islands in 10 years and 30% of females missing at the breeding grounds in 2009, are the New Zealand sea lions doomed in a marginal habitat?

Data from Gales and Mattlin (1997) and Chilvers *et al*. (2005 and 2006) that studied the foraging behaviours of 26 lactating female New Zealand sea lions at the Auckland Islands.

Method:
We fitted 4 adult lactating female New Zealand sea lions recolonising the Otago Peninsula with time-depth recorders and satellite-tracking tags in April and May 2008 (Fig. 2). Fig. 3 shows results after filtering and integration into a GIS of the satellite locations, and analyses of the dive-data.

	Auckland Islands	Otago Peninsula
Mean dive depth (m)	129 SD 36.5	41 SD 21
Max dive depth (m)	597	127
Mean trip distance (km)	423 SD 220	28 SD 14.7
Max trip distance (km)	1087	79
Mean time at sea (hours)	66 SD 17.7	13 SD 5.1
Max time at sea (hours)	126	26
Mean dive duration (min)	4.0 SD 1.0	1.8 SD 1.0
Max dive duration (min)	10.3	5.5
Main foraging area	offshore	coastal
Mean weight (kg)	114 SD 12.4	152 SD6.5
Max weight (kg)	133	159

Table 1: Comparison of the characteristics of the foraging behaviour and weights between lactating female New Zealand sea lions at the Auckland Islands (in red) and at the Otago Peninsula (in green).

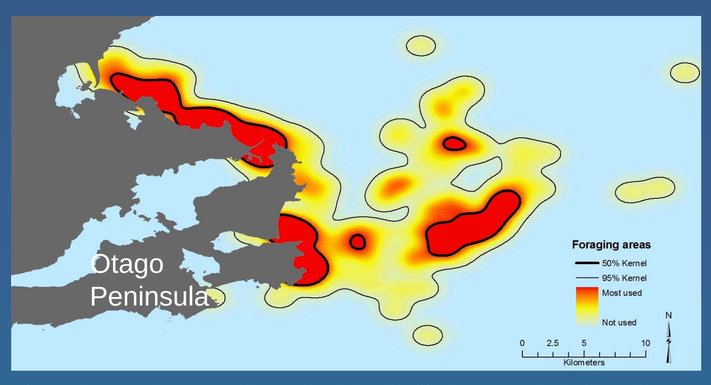

Figure 3: Foraging areas (Kernel weighted with time spent) of a lactating female New Zealand sea lion inhabiting the Otago Peninsula, New Zealand mainland, during April and May 2008.

Figure 2: Adult female New Zealand sea lion fitted with a SPLASH tag (on her back) and a VHF transmitter (close to her tail), with her 2 month old pup at the Otago Peninsula in May 2008.

Our results support the hypothesis that the marine habitat in the sub-Antarctic islands, where the New Zealand sea lion survived, is marginal for this species.

Doom if no change: The **sub-Antarctic** populations of New Zealand sea lions survived the sealing period, but were left inhabiting a marginal habitat. The current management of interactions with fisheries (competition and bycatch) must be readdressed in the light of this study.

Bloom with care: The small population re-establishing on **mainland New Zealand** after 180 years of absence is blooming in a more optimal habitat. Human presence may however disturb the recolonisation and wildlife managers need to protect the recolonising population to ensure its establishment.

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