Long-term survival of stranded rescued New Zealand orca (*Orcinus orca*)

(first presented 2013, data updated until Sept 2015)

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Figure 1 . An adult ♂ orca (#NZ126, "Putita") during a stranding in 2003, (top), he has been resighted multiple times (*e.g.,* 2006, middle) and restranded in 2010 (bottom).

Introduction

There is often controversy surrounding cetacean strandings and rescues, particularly with regards to conducting a rescue (or not) and what constitutes success. Furthermore, commercial facilities exhibiting marine mammals often use 'rescues' as a method to collect animals, including orca (*Orcinus orca*)[1]. Orca strandings have been recorded on every continent, including Antarctica[2], although rescues, if conducted are typically not well documented.

Materials and Methods

- Strandings are defined as; animal comes ashore alive (i.e., not 'beach-cast')
- Since 1992 New Zealand stranding records were collected from attending strandings and via public and Government databases (*e.g.*, Department of Conservation Stranding Database).
- Individual orca were identified using standard photo-identification techniques allowing re-identification over time (Fig. 1).
- I aimed to investigate the possible causative factors for such a high stranding rate and to document post-rescue survival.

RESULTS

New Zealand has the highest stranding rate of orca worldwide, averaging one per year. This is in comparison to Australia, with its longer coastline, where orca strandings are recorded approx. once every 14 years. Records include individuals who 'self-rescue' (*i.e.,* stranding documented but no human intervention involved, Fig. 2).

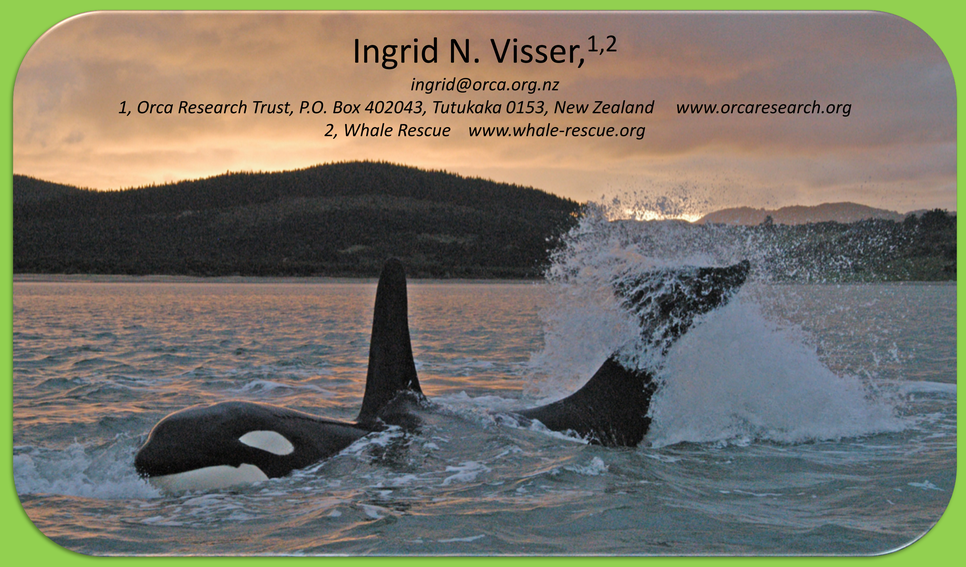

Figure 2. An adult ♂ orca (#NZ21, "Roundtop") during a stranding in 2009, from which he successfully extricated himself without assistance. He restranded 3.7 years later (and again, required no assistance) and has been resighted multiple times since these strandings.

Figure 3. An adult ♂ orca (#NZ126, "Rua") during a stranding in 2003, where his right pectoral fin was damaged, eliciting 'screaming' and 'mouth gaping' (left). His pectoral fin can be seen folded under his body (circled, right), when it should be positioned at an approximately 45˚ angle out from the body (see left pectoral fin, both images). Rua was returned to the ocean (not held in a facility) and has subsequently been resighted multiple times over more than a seven year period (2663 days) (Table 1). Photo's courtesy R. Tully.

Between 1995 and 2013, 13 orca were rescued & successfully returned to the ocean. Of these, 11 have been resighted over periods of more than 20 years (*i.e.,* 7344 days) (Table 1). Of all the live stranded orca, there was a 85% resighting rate (catalogued animals shown in Table 1). Although a small entertainment park exhibiting marine mammals existed in New Zealand during the study period, no stranded and rescued orca were held in facilities for rehabilitation or permanent captivity, despite injuries on some (Fig. 3).

Post-rescue, two orca have been documented to produce calves which have survived (*e.g.,* Fig. 4). A further two individuals have subsequently restranded (e.g., Fig. 1 and Table 1) (at intervals of 3.7 and 7 years post their original stranding, Table 1) and both orca have been resighted following their second stranding. All strandings occurred on shallow sand-bars or gently sloping sandy beaches where orca are known to foraging for various species of rays in extremely shallow (< 3 m) waters.

Table 1. Resighting of catalogued orca in New Zealand waters. Note: Includes animals which have stranded more than once. Updated 2015.

ORCA Catalogue # & Name	♂♀ Age class	1st STRANDING / RELEASE DATE (if different) yyyymmdd	Resighting post 1st stranding yyyymmdd & (days since 1st stranding)	2nd STRANDING / RELEASE DATE (if different) yyyymmdd [# days since 1st stranding]	Resighting post 2nd stranding yyyymmdd & [days since 2st stranding]	Most Recent Resighting yyyymmdd	Timeframe since 1st stranding until most recent resighting [2nd stranding until most recent resighting]	Comment
NZ63 "Miracle"	♀ juv	19930823	19950818 **(725 days)**			20131001	**7344 days**	1st calf 2001, 2nd calf 2009
NZ101 "Ben"	♂ juv	19970614 / (19970615)	19971027 **(134 days)**			20130404	**5772 days**	Boat-strike victim in 1998, split fin, survived
NZ126 "Putita"	♂ juv then subadult	20030702	20040722 **(386 days)**	20100525 **[2519 days]**	20100530 **(5 days)**	20101025	**2672 days [153 days]**	Restranded Presumed brother of NZ91 who stranded in 2003
NZ91 "Rua"	♂ adult	20030711	20060906 **(1153 days)**			20101025	**2663 days**	Presumed brother of NZ126 who stranded in 2003 & 2010
NZ20 "Double Dent"	♀ adult	20041123	20041123 **(same day)**			20101005	**2142 days**	new calf in Oct 2010
NZ24 "Rudie"	♂ adult	20041123	20041123 **(same day)**			20111215	**2142 days**	
NZ21 "Roundtop"	♂ adult	20060727	20070714 **(352 days)**	20100509 **[1382 days]**	20100509 **(same day)**	20100926	**1522 days [140 days]**	'self-rescue' both times
NZ19 "Nobby"	♂ adult	20080927	20081116 **(50 days)**			20101025	**758 days**	Often travels with NZ101 (who stranded in 1997)
NZ123 "Koru"	♂ adult	20130520	20130520 **(same day)**			20130630	**41 days**	

Figure 4. An adult ♀ orca (#NZ63, "Miracle") stranded in 1993 and has since had two calves (the first in 2001, left), both of which have survived.

Discussion

As all live strandings occurred where hunting in shallow water has been documented, these strandings are likely related to foraging methods. The high resighting rate, post rescue illustrates the success of rescues of orca. Of note is that rehabilitation in captive facilities has not been necessary. These are long-term implications for conservation management of stranded orca worldwide, as a similar success rates may be viable for other populations, if suitable rescue techniques are employed.

References: 1.VISSER, I. N. & HARDIE, T. M. 2011. "Morgan" the orca can and should be rehabilitated. With additional notes on why a transfer to another 'captive orca facility' is inappropriate and release is preferred. Available from www.orcaresearch.org., 2. CASTELLO, H. P., TOMO, A. P. & PANIZZA, J. S. 1974. First Antarctic record of a killer whale stranding. *Scientific Reports of the Whales Research Institute, Tokyo, 26, 255-258.*

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