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Examination of Data Derived from Pinniped Strandings in Western Australia 1980-1996.

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Introduction

During the period 1980-1996 a total of 222 pinnipeds, from six species, were recorded stranded or swimming in inshore waters along the south and west coast of Western Australia (as 16/8/1996). These reports relate to animals that required CALM involvement, either to investigate the death of the animals or to provide assistance and or veterinary care. Entries to the database are dependent on reports being received from members of the public, Fisheries Officers and CALM staff. No records are accepted unless the identification of the animal has been verified by a CALM officer (by means of photographs).

Post mortems were conducted whenever possible, but were usually only possible for those animals which were found close to major population centres where Agriculture WA veterinary staff are located. Many animals were too badly decomposed to allow post mortems to be performed, hence the smaller sample sizes for each species in the section of the tables referring to cause of death.

The bulk of the reports relate to Australian Sea-lions, with Sub Antarctic Fur Seals the next most common species, followed by Leopard Seals (Figure 1, Table 1). The reporting rate for all species combined shows a decline after 1994: it is possible that this coincides with the change from greater regionalization of CALM staff, including Wildlife Officers (Figure 2).

Species Accounts

Australian Sea-lion *Neophoca cinerea*

A total of 142 animals have been recorded on the database since 1980 (Figures 1 and 3, Table 1; 63.9% of the total records), of which 14.8% have been released back into the wild, 82.4% recovered dead or died while receiving treatment, and 2.8% for which the fate of the animals is unknown. In the 16 years in which sea lions were encountered (no animals in 1982) an average of 75.6% of the animals were recovered dead or subsequently died.

For those animals for which the cause of death was known (n=85, 59% of sample), 46 (54.1% of 85) died due to human interference (Table 2a).

New Zealand Fur-seal *Arctocephalis forsteri*

A total of 11 animals have been recorded on the database since 1980 (Figures 1 and 4, Table 1; 4.9% of the total records), of which 27.3% have been released back into the wild, 72.7% recovered dead or died while receiving treatment. In the seven individual years in which fur seals were encountered an average of 73.8% of the animals were recovered dead or subsequently died.

For those animals which the cause of death was known (n=4, 36% of sample), none died due to human interference (Table 2b).

Analysis of Causes of Death Due to Human Interference

Examination of the data on the cause of death which could be attributed directly or indirectly to humans indicates eight different categories (Table 3). The species most frequently involved was the Australian Sea-lion (n=46, 92% of total), with two records each for Sub-Antarctic Fur seals and Leopard Seals. The most common cause of death was due to shooting (n=16, 32% of total), including one mass-shooting of six animals at one location in 1980.

The next most common cause of death was boat collisions (n=7, 14%), drowning in cray pots and attached ropes (n=7, 14%), entangled in fishing line/hooks etc (n=7, 14%), drowned in fish nets (n=7, 14%), speared or shot with arrows (n=3, 6%), choked by plastic bands/straps (n=2, 4%), and clubbed to death (n=1, 2%).

Examination of the records for the 16 animals which were shot (15 Australian Sea-lions, 1 Leopard Seal) indicate that all shootings occurred in areas with active fishing fleets or major human populations.

Ten (10) shootings occurred in the Albany area (6 Bald Island, 2 Oyster Harbour, 1 Cheynes Beach, 1 Seal Island off Hopetoun). Four (4) shootings occurred along the mid-west coast fishing area from Port Gregory south to Cervantes (1 Port Gregory, 1 Geraldton, 1 East Beagle Island, 1 Cervantes). Two (2) shootings occurred along the metropolitan coast (1 Pinnaroo Point, and 1 Shoalwater Bay).

The shooting at Pinnaroo Point, near Yanchep, involved the Leopard Seal, and there was an additional animal at Shoalwater Bay which was killed with an arrow (included in the 'Speared' category in Table 3).

Natural Causes of Death

Post mortems identified the principle cause of death in 20 cases (12 Australian Sea-lions, 2 NZ Fur-seals, 5 Sub-Antarctic Fur-seals and 1 Crabeater Seal). A wide range of causes were identified (Table 4), with respiratory conditions as a group being the most common. Four (4) cases of Tuberculosis (*Mycobacterium tuberculosis*) have been recorded, with two positive records each from Australian Sea-lions and NZ Fur Seals.

The discovery of this disease in stranded animals has obvious occupational health implications for members of the public, and CALM and Ag WA staff who handle carcasses and/or live animals.

Acknowledgments

CALM gratefully acknowledges the efforts made by Agriculture WA staff, particularly Drs Cleve Main, Debbie Cousins and John Creeper for their assistance in conducting the post mortems and the pathology analyses, and the CALM and Fisheries field staff who contributed many of the reports.

Sheet1 Chart 1

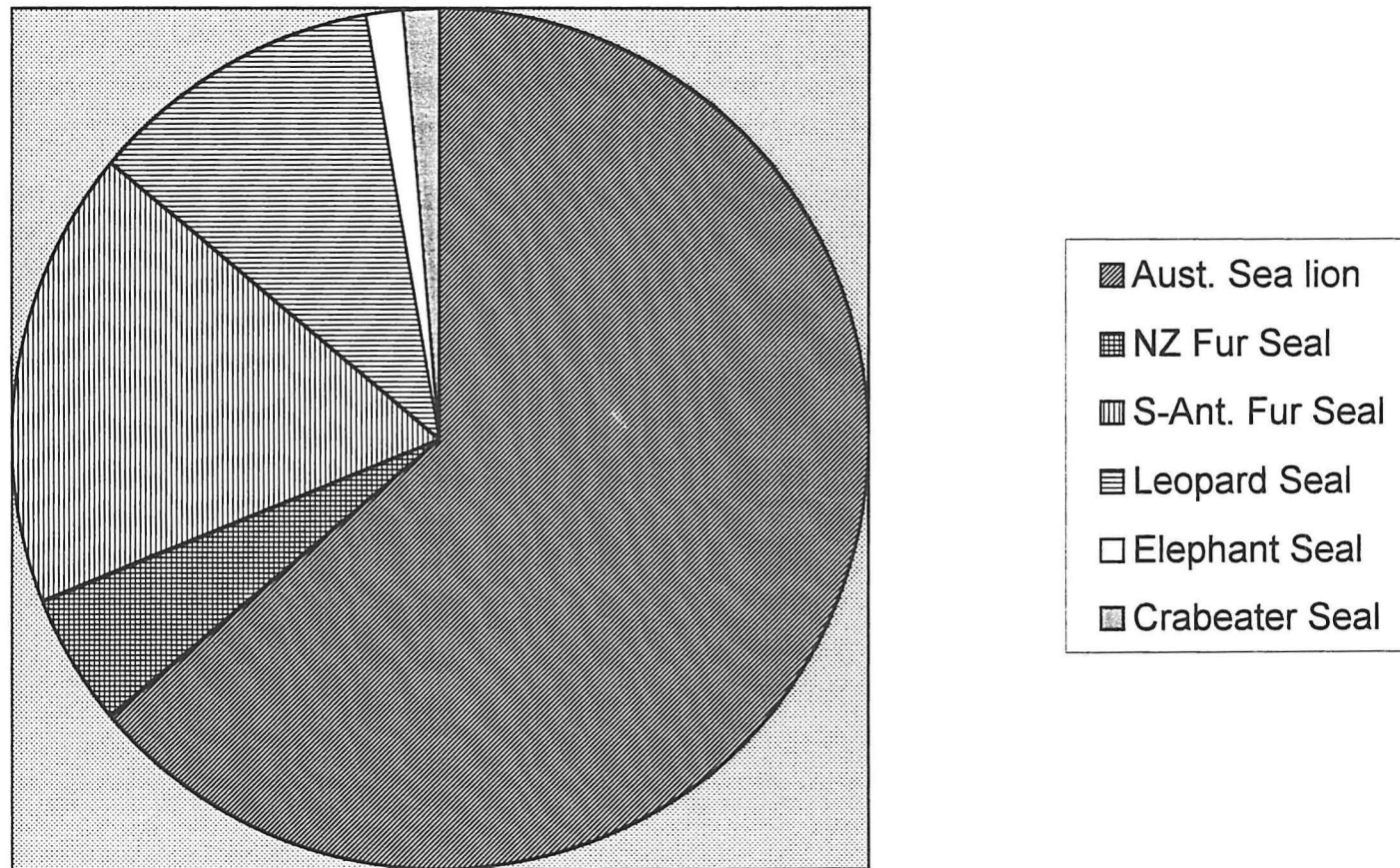


Figure1: Relative proportion of each of six species of pinniped recorded along Western Australian coast 1980-1996 (n=222).

Table 1							
Reports and strandings of pinnipeds in Western Australia 1980-1996.							
Year	Aust. Sea lion	NZ Fur Seal	S-Ant. Fur Seal	Leopard Seal	Elephant Seal	Crabeater Seal	Total
1980	8	1	0	0	0	0	9
1981	1	0	0	0	0	0	1
1982	0	0	0	0	0	1	1
1983	3	0	0	0	0	0	3
1984	2	0	0	0	0	0	2
1985	5	0	0	0	0	0	5
1986	7	0	1	6	0	0	14
1987	6	0	3	1	0	0	10
1988	17	1	2	1	0	0	21
1989	23	0	3	0	0	0	26
1990	18	3	1	8	1	0	31
1991	13	0	1	0	1	0	15
1992	8	2	11	5	0	0	26
1993	14	2	6	1	0	2	25
1994	5	1	6	0	0	0	12
1995	8	1	3	2	1	0	15
1996	4	0	1	1	0	0	6
Totals	142	11	38	25	3	3	222

Figure 2. Total pinniped strandings along the WA coast in each year 1980-1996 (n=222).

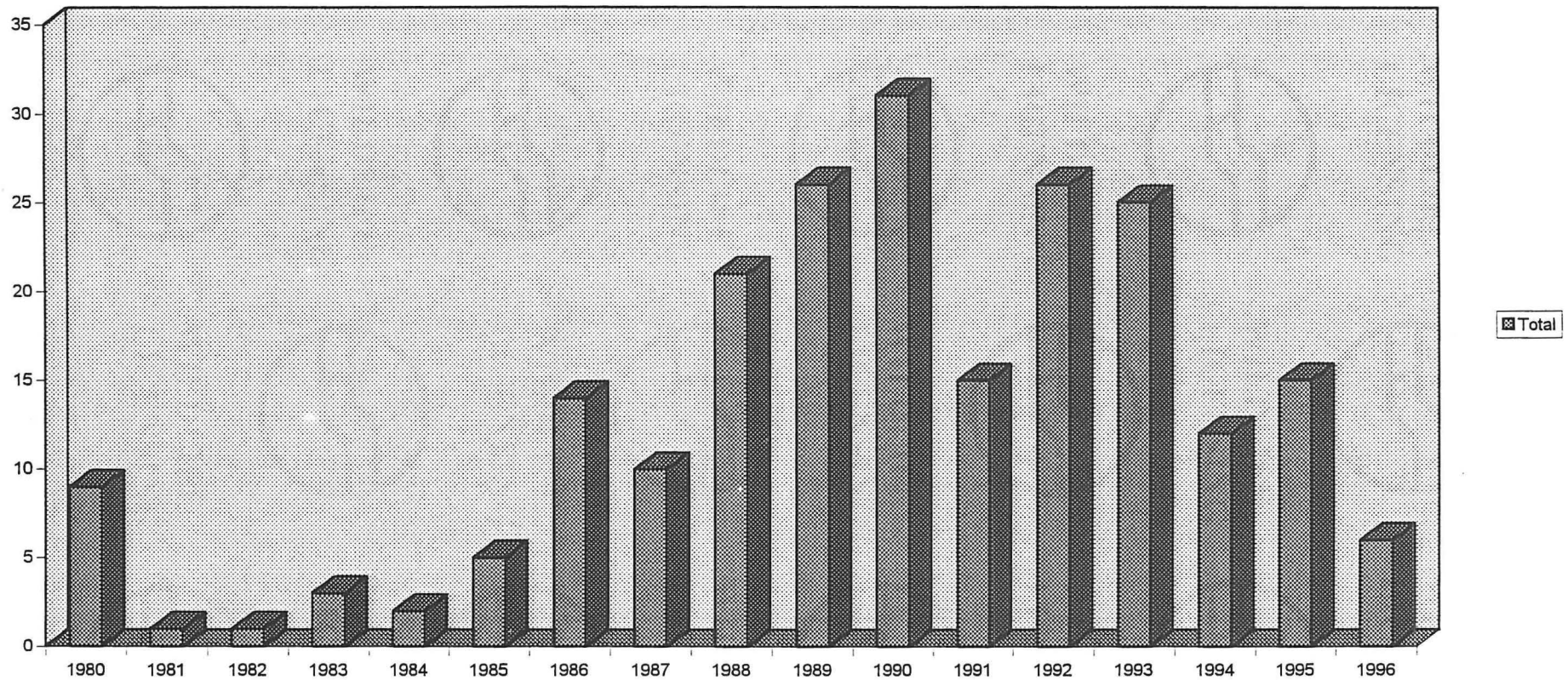


FIGURE 3. AUSTRALIAN SEA-LION STRANDINGS 1980-1996 (N=142).

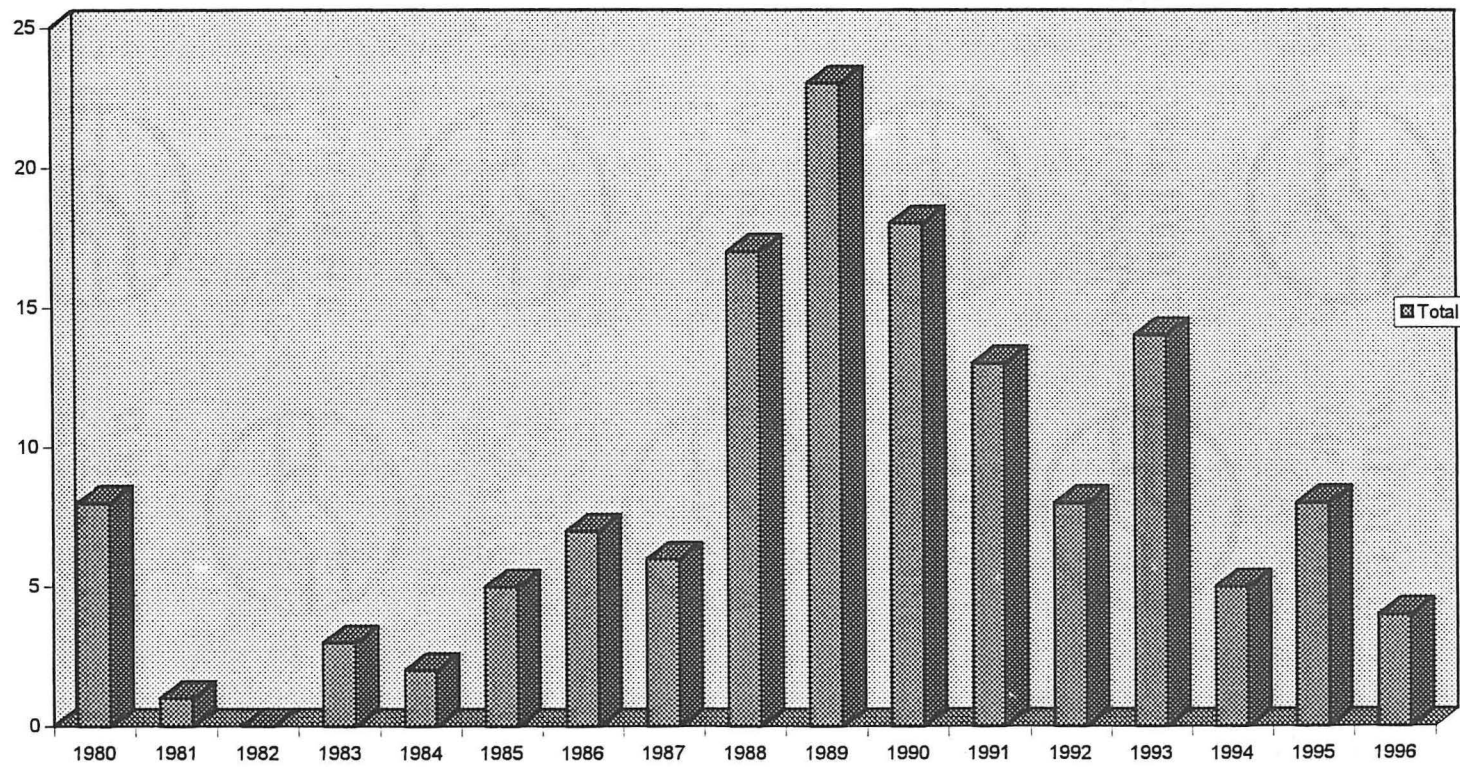


Table 2a									
Australian Sealion (<i>Neophoca cinerea</i>)									
Fate of Animal					Cause of Death Where Known				
Year	# Released Alive	# Dead	Unknown	Total	% Dead	Natural	Man*	Total	% Man*
1980	1	6	1	8	75.00	0	8	8	100.00
1981	1	0	0	1	0.00	1	0	1	0.00
1982	0	0	0	0	0.00	0	0	3	66.67
1983	1	2	0	3	66.67	1	2	3	66.67
1984	0	2	0	2	100.00	0	2	2	100.00
1985	2	3	0	5	60.00	3	1	4	25.00
1986	5	2	0	7	28.57	2	6	8	75.00
1987	2	4	0	6	66.67	4	1	5	20.00
1988	3	14	0	17	82.35	7	7	14	50.00
1989	3	20	0	23	86.96	4	5	9	55.56
1990	0	18	0	18	100.00	2	3	5	60.00
1991	1	11	1	13	84.62	6	1	7	14.29
1992	0	8	0	8	100.00	0	3	3	100.00
1993	2	11	1	14	78.57	3	6	9	66.67
1994	0	4	1	5	80.00	2	1	3	33.33
1995	0	8	0	8	100.00	0	0	0	0.00
1996	0	4	0	4	100.00	1	0	1	0.00
Totals	21	117	4	142	82.39	36	46	85	54.12

FIGURE 4. NZ FUR-SEAL STRANDINGS 1980-1996.

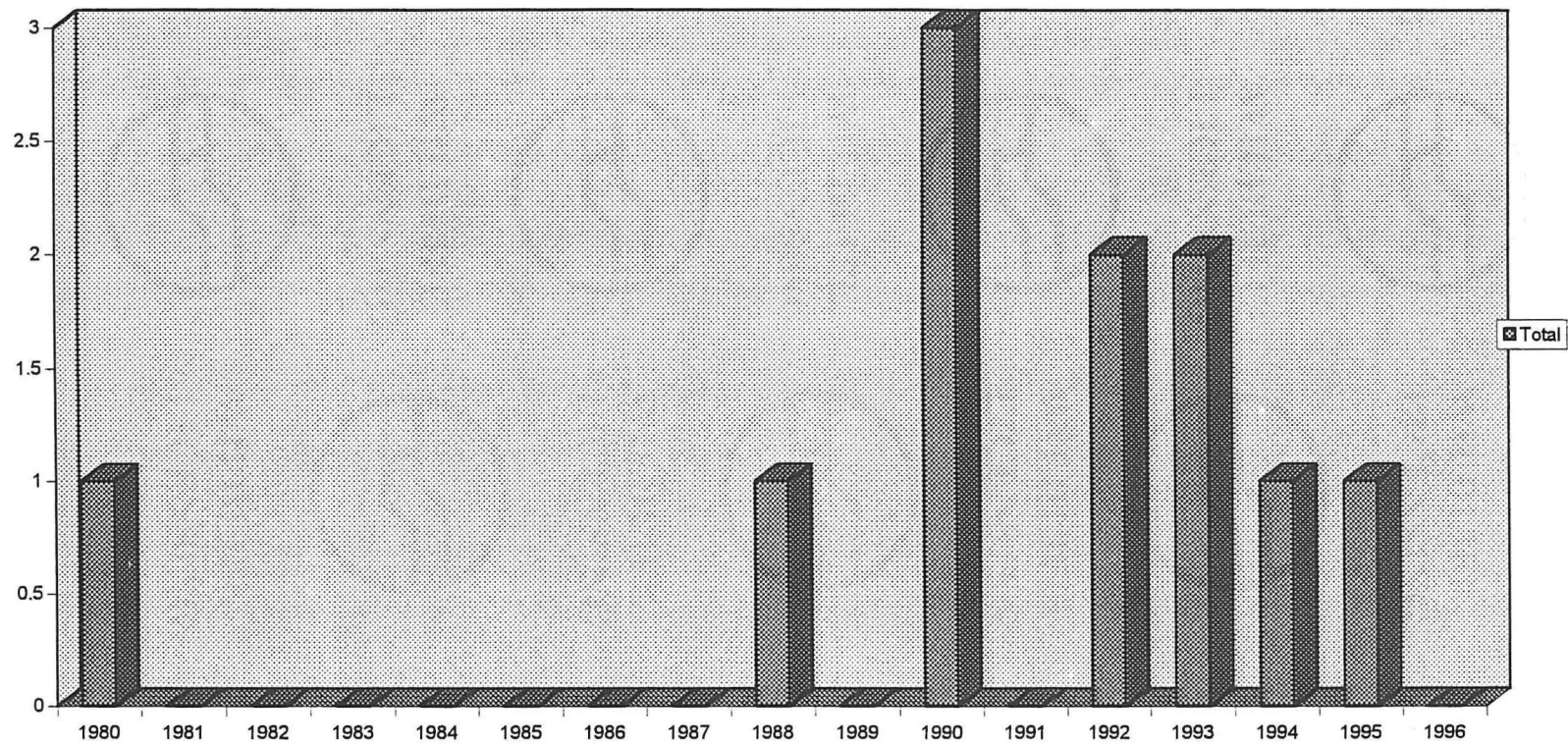


		Table 2b								
New Zealand Fur Seal		<i>(Arctocephalus forsteri)</i>								
		Fate of Animal				Cause of Death Where Known				
Year	# Released Alive	# Dead	Unknown	Total	% Dead	Natural	Man*	Total	% Man*	
1980	0	1	0	1	100.00	1	0	1	0.00	
1981	0	0	0	0	0.00	0	0	0	0.00	
1982	0	0	0	0	0.00	0	0	0	0.00	
1983	0	0	0	0	0.00	0	0	0	0.00	
1984	0	0	0	0	0.00	0	0	0	0.00	
1985	0	0	0	0	0.00	0	0	0	0.00	
1986	0	0	0	0	0.00	0	0	0	0.00	
1987	0	0	0	0	0.00	0	0	0	0.00	
1988	0	1	0	1	100.00	0	0	0	0.00	
1989	0	0	0	0	0.00	0	0	0	0.00	
1990	1	2	0	3	66.67	1	0	1	0.00	
1991	0	0	0	0	0.00	0	0	0	0.00	
1992	1	1	0	2	50.00	0	0	0	0.00	
1993	0	2	0	2	100.00	1	0	1	0.00	
1994	1	0	0	1	0.00	0	0	0	0.00	
1995	0	1	0	1	100.00	1	0	1	0.00	
1996	0	0	0	0	0.00	0	0	0	0.00	
Totals	3	8	0	11	72.73	4	0	4	0.00	

**FIGURE 5. SUB-ANTARCTIC FUR-SEAL STRANDINGS
1980-1996.**

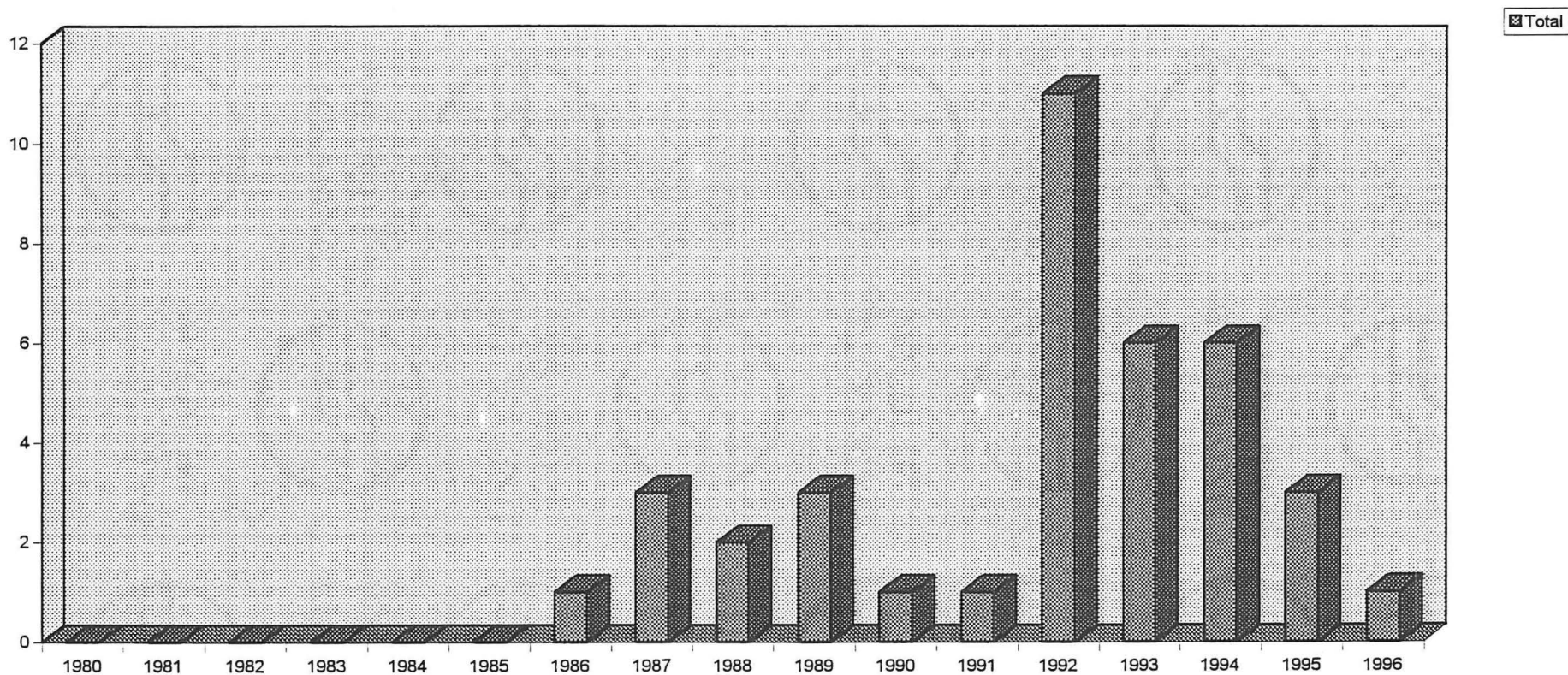


Table 2c									
Sub Antarctic Fur Seal		<i>(Arctocephalus tropicalis)</i>							
Fate of Animal					Cause of Death Where Known				
Year	# Released Alive	# Dead	Unknown	Total	% Dead	Natural	Man*	Total	% Man*
1980	0	0	0	0	0.00	0	0	0	0.00
1981	0	0	0	0	0.00	0	0	0	0.00
1982	0	0	0	0	0.00	0	0	0	0.00
1983	0	0	0	0	0.00	0	0	0	0.00
1984	0	0	0	0	0.00	0	0	0	0.00
1985	0	0	0	0	0.00	0	0	0	0.00
1986	1	0	0	1	0.00	0	0	0	0.00
1987	1	2	0	3	0.00	1	0	1	0.00
1988	1	1	0	2	50.00	1	0	1	0.00
1989	1	2	0	3	0.00	1	0	1	0.00
1990	0	1	0	1	100.00	1	0	1	0.00
1991	0	1	0	1	0.00	0	0	0	0.00
1992	1	10	0	11	90.91	8	1	9	11.11
1993	4	2	0	6	33.33	2	1	3	33.33
1994	3	3	0	6	50.00	3	0	3	0.00
1995	2	1	0	3	33.33	1	0	1	0.00
1996	0	1	0	1	0.00	1	0	1	0.00
Totals	14	24	0	38	63.16	19	2	21	9.52

FIGURE 6. LEOPARD SEAL STRANDINGS 1980-1996.

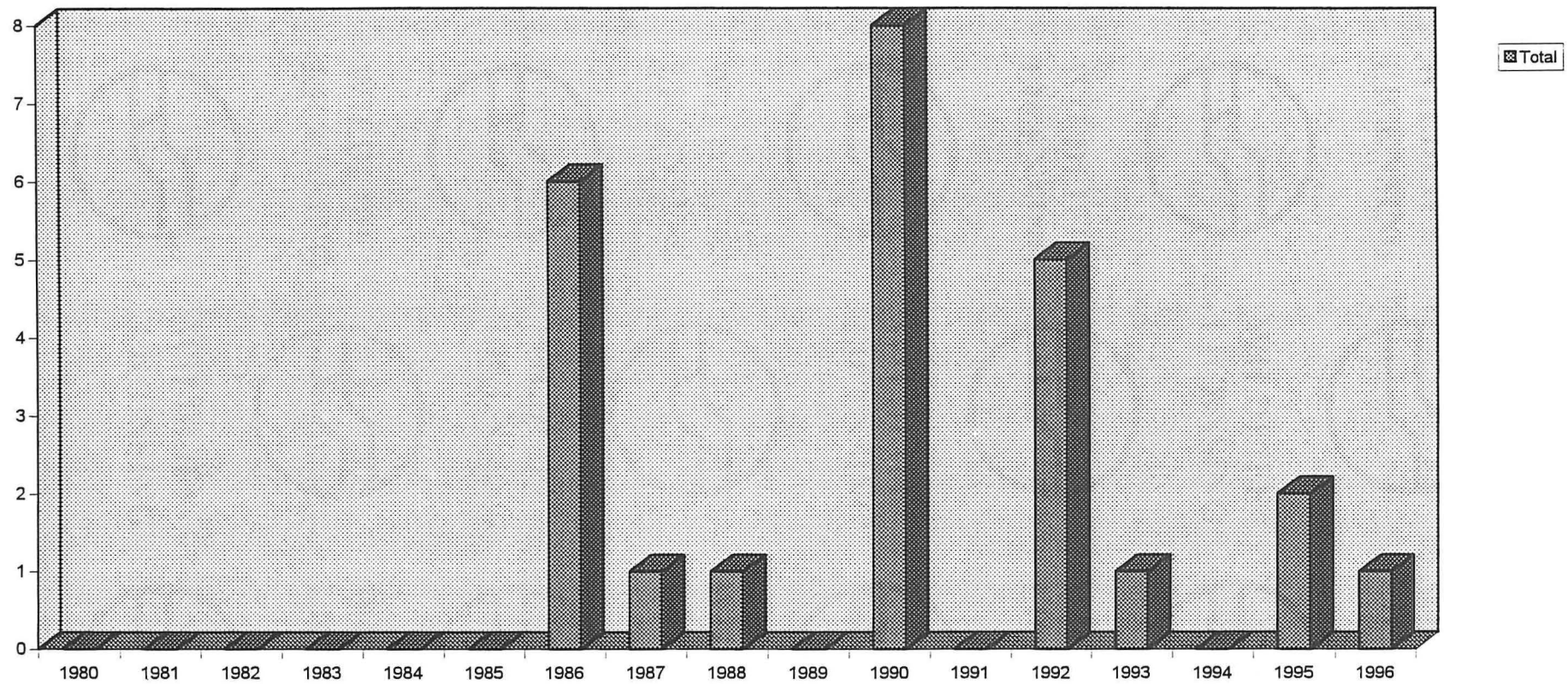


Table 2d									
Leopard Seal (<i>Hydrurga leptonyx</i>)									
Fate of Animal					Cause of Death Where Known				
Year	# Released Alive	# Dead	Unknown	Total	% Dead	Natural	Man*	Total	% Man*
1980	0	0	0	0	0.00	0	0	0	0.00
1981	0	0	0	0	0.00	0	0	0	0.00
1982	0	0	0	0	0.00	0	0	0	0.00
1983	0	0	0	0	0.00	0	0	0	0.00
1984	0	0	0	0	0.00	0	0	0	0.00
1985	0	0	0	0	0.00	0	0	0	0.00
1986	1	5	0	6	0.00	4	2	6	33.33
1987	0	1	0	1	0.00	1	0	1	0.00
1988	1	0	0	1	0.00	0	0	0	0.00
1989	0	0	0	0	0.00	0	0	0	0.00
1990	6	2	0	8	25.00	0	0	0	0.00
1991	0	0	0	0	0.00	0	0	0	0.00
1992	2	3	0	5	60.00	2	0	2	0.00
1993	0	1	0	1	100.00	1	0	1	0.00
1994	0	0	0	0	0.00	0	0	0	0.00
1995	0	2	0	2	100.00	2	0	2	0.00
1996	0	0	1	1	0.00	0	0	0	0.00
Totals	10	14	1	25	56.00	10	2	12	16.67

Southern Elephant Seal		Table 2e (<i>Mirounga leonina</i>)							
		Fate of Animal			Cause of Death Where Known				
Year	# Released Alive	# Dead	Unknown	Total	% Dead	Natural	Man*	Total	% Man*
1980	0	0	0	0	0.00	0	0	0	0.00
1981	0	0	0	0	0.00	0	0	0	0.00
1982	0	0	0	0	0.00	0	0	0	0.00
1983	0	0	0	0	0.00	0	0	0	0.00
1984	0	0	0	0	0.00	0	0	0	0.00
1985	0	0	0	0	0.00	0	0	0	0.00
1986	0	0	0	0	0.00	0	0	0	0.00
1987	0	0	0	0	0.00	0	0	0	0.00
1988	0	0	0	0	0.00	0	0	0	0.00
1989	0	0	0	0	0.00	0	0	0	0.00
1990	1	0	0	1	0.00	0	0	0	0.00
1991	1	0	0	1	0.00	0	0	0	0.00
1992	0	0	0	0	0.00	0	0	0	0.00
1993	0	0	0	0	0.00	0	0	0	0.00
1994	0	0	0	0	0.00	0	0	0	0.00
1995	1	0	0	1	0.00	0	0	0	0.00
1996	0	0	0	0	0.00	0	0	0	0.00
Totals	3	0	0	3	0.00	0	0	0	0.00

Table 2f									
Crabeater Seal		(Lobodon carcinophagus)							
Fate of Animal					Cause of Death Where Known				
Year	# Released Alive	# Dead	Unknown	Total	% Dead	Natural	Man*	Total	% Man*
1980	0	0	0	0	0.00	0	0	0	0.00
1981	0	0	0	0	0.00	0	0	0	0.00
1982	0	1	0	1	100.00	1	0	1	0.00
1983	0	0	0	0	0.00	0	0	0	0.00
1984	0	0	0	0	0.00	0	0	0	0.00
1985	0	0	0	0	0.00	0	0	0	0.00
1986	0	0	0	0	0.00	0	0	0	0.00
1987	0	0	0	0	0.00	0	0	0	0.00
1988	0	0	0	0	0.00	0	0	0	0.00
1989	0	0	0	0	0.00	0	0	0	0.00
1990	0	0	0	0	0.00	0	0	0	0.00
1991	0	0	0	0	0.00	0	0	0	0.00
1992	0	0	0	0	0.00	0	0	0	0.00
1993	1	1	0	2	50.00	1	0	1	0.00
1994	0	0	0	0	0.00	0	0	0	0.00
1995	0	0	0	0	0.00	0	0	0	0.00
1996	0	0	0	0	0.00	0	0	0	0.00
Totals	1	2	0	3	66.67	2	0	2	0.00

Table 3		Causes of death involving human influences.																	
Cause	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total	
Shot	7	0	0	1	1	0	2	1	0	1	1	1	0	1	0	0	0	16	
Boat Propellor	0	0	0	0	1	1	0	0	2	0	1	1	0	1	0	0	0	7	
Cray pots and lines	0	0	0	0	0	0	1	0	1	2	1	0	2	0	0	0	0	7	
Fishing gear	2	0	0	0	0	0	2	0	0	0	0	0	0	3	0	0	0	7	
Fishing nets	0	0	0	0	0	0	0	0	3	1	0	0	1	2	0	0	0	7	
Speared	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	3	
Plastic bands	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	
Clubbed	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Total	10	0	0	2	2	1	6	1	7	4	3	2	3	8	1	0	0	50	
Note: N=46 <i>N. cinerea</i> , N=2 <i>A. tropicalis</i> , N=2 <i>H. leptonyx</i>																			

Table 4:					
Principle cause of death (where known) in cases not involving humans.					
	Aust. Sea Lion	NZ Fur Seal	S-Ant. Fur Seal	Crabeater Seal	
<i>Principle Cause</i>					Total
Pneumonia	3	0	1	0	4
Pleurisy	2	0	0	0	2
Bronchitis	1	0	0	0	1
<i>Mycobacterium tuberculosis</i>	2	2	0	0	4
Histiocytic tumor	2	0	0	0	2
Septicaemia	1	0	0	0	1
Toxaemia	0	0	0	1	1
Gastro-enteritis	0	0	1	0	1
Cestodes/nematodes	0	0	3	0	3
Abcess	1	0	0	0	1