

New Zealand sea lion research 2007/08 to 2009/2010 B. L. Chilvers



NZ sea lion research objectives

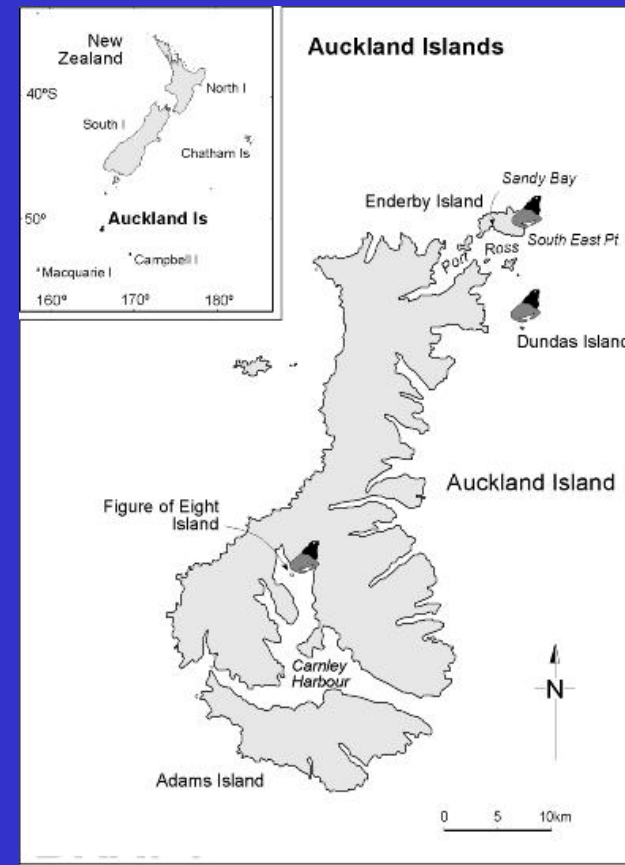
Auckland Islands

- Measure Auckland Islands pup production
- Tag pups produced each year
- Collect data to estimate survival and reproduction of previously marked female NZ sea lions
- Maintain and update the NZ sea lion database
- Characterise and analyse the at-sea distribution of poorly known age and sex classes of NZ sea lions



Pup production - methods and date of estimate

- Sandy Bay (Enderby Island) - Mark/Recapture estimate (16/1)
- Dundas Island - Mark/Recapture estimate (21/1)
- S.E. Point (Enderby Island) - Direct count - daily counts
- Figure of 8 Island - Single direct count - (9/1 or 10/1)



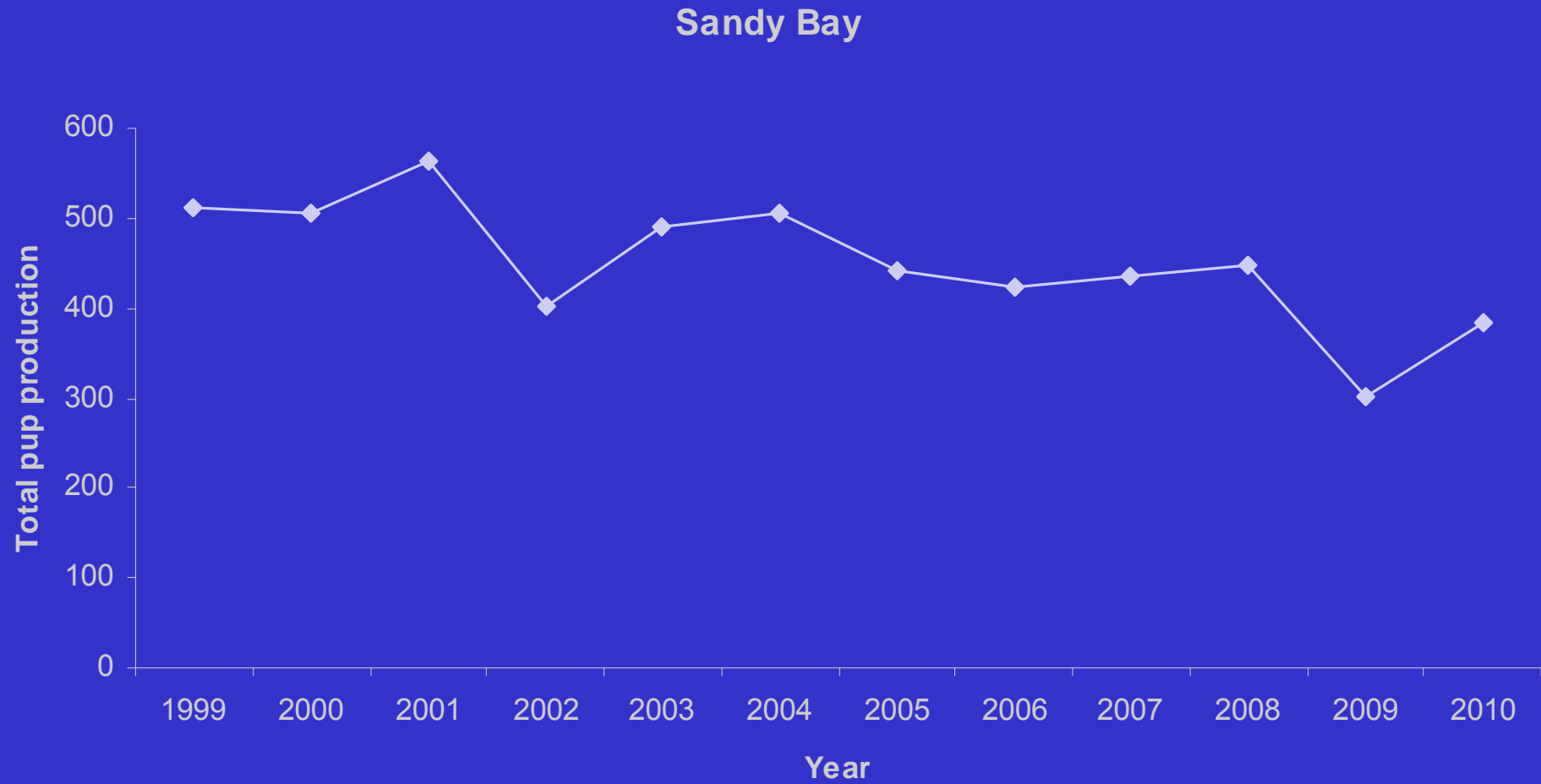
Pup production - Results

Season	Sandy Bay			Dundas Island			Figure of Eight Island			South East Point		
	total	alive	dead	total	alive	dead	total	alive	dead	total	alive	dead
98/99	513	473	40	2186	1957	229	109	100	9	59	42	17
99/00	506	482	24	2163	2039	124	137	131	6	50	37	13
00/01	562	527	35	2148	1802	346	94	92	2	55	47	8
01/02	403	320	83	1756	1395	361	96	90	6	27	21	6
02/03	489	408	80	1891	1555	336	95	89	5	43	26	17
03/04	507	473	34	1869	1749	120	87	86	1	52	39	13
04/05	441	411	30	1587	1513	74	83	79	4	37	31	6
05/06	422	383	39	1581	1349	232	62	55	7	24	20	4
06/07	437	414	23	1693	1587	106	70	67	3	24	19	5
07/08	448	425	23	1635	1512	123	74	72	2	18	13	5
08/09	301	289	12	1132	1065	67	54	48	6	14	8	6
09/10	385	364	21	1369	1218	151	55	48	7	5	1	4

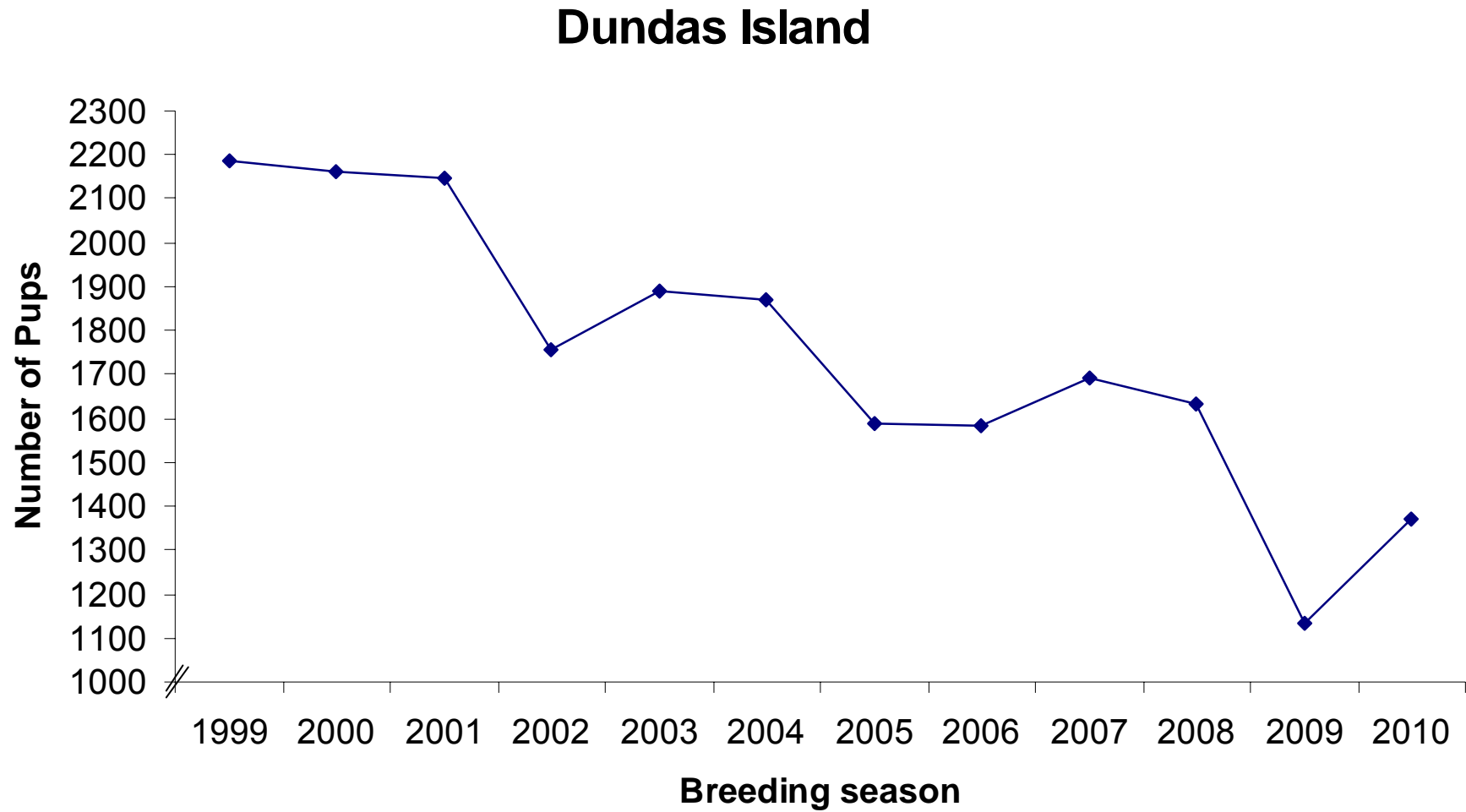
AUCKLAND ISLANDS PUP PRODUCTION 1999-2010



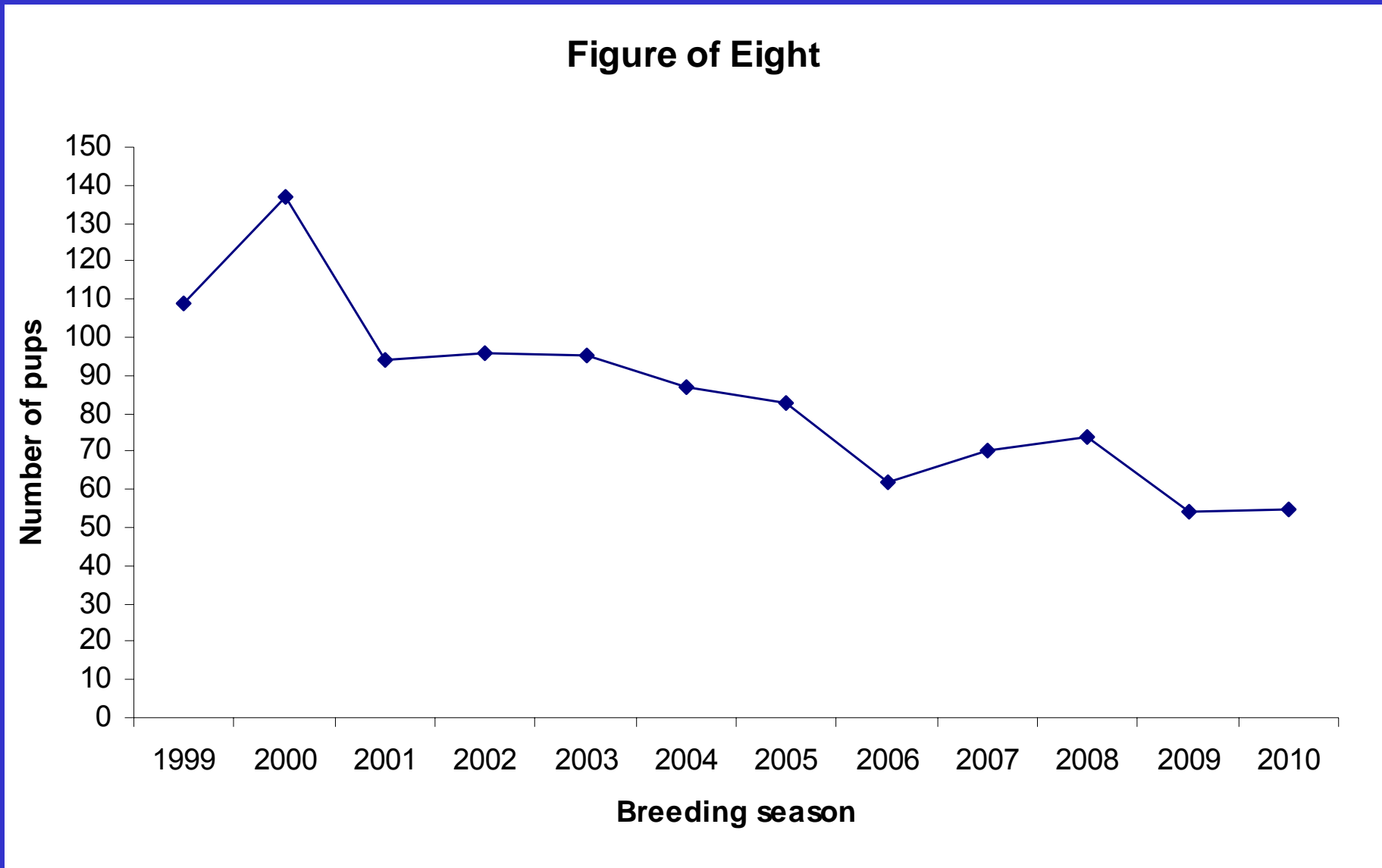
Pup counts – Sandy Bay



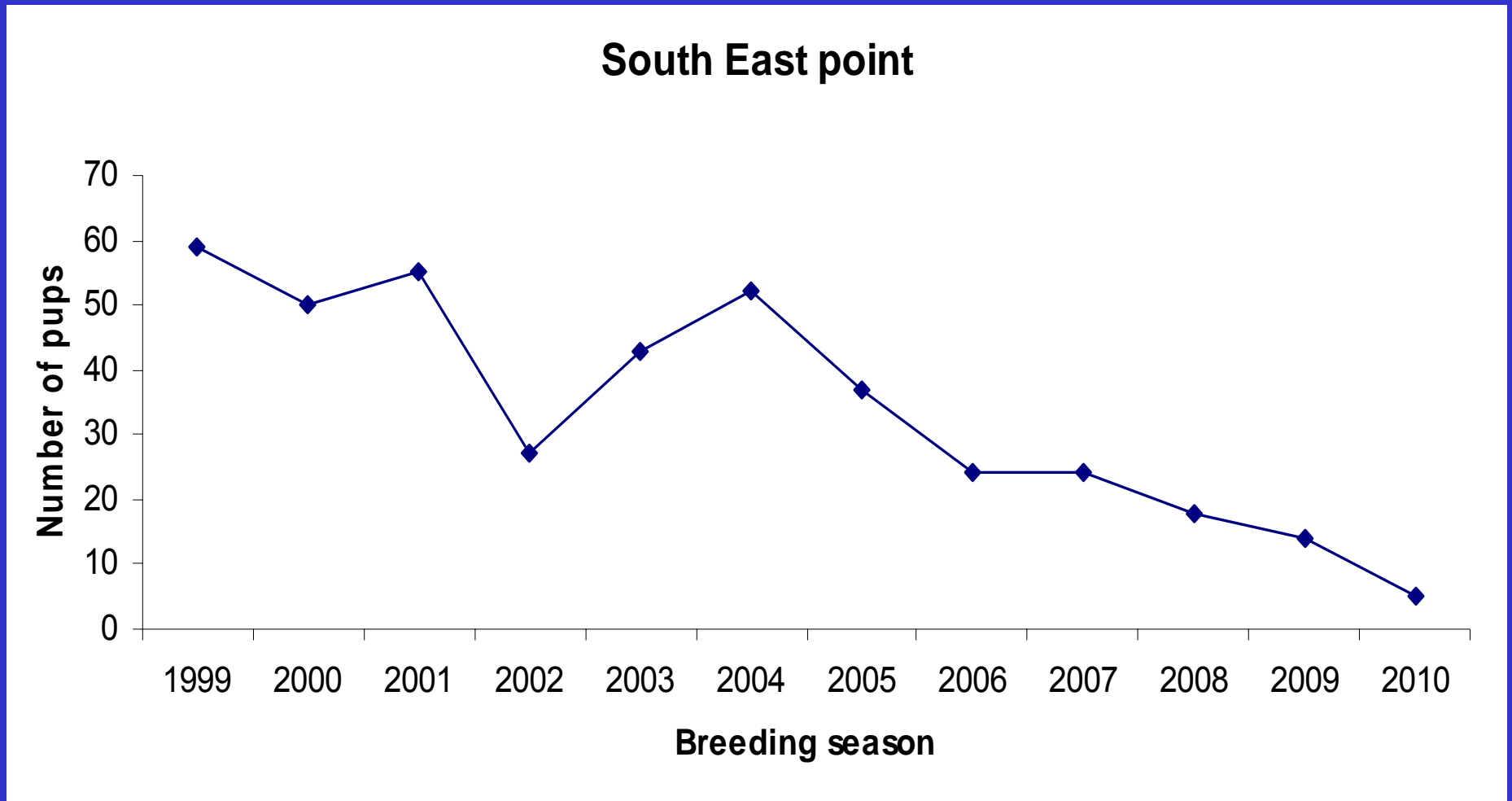
Pup counts – Dundas Island



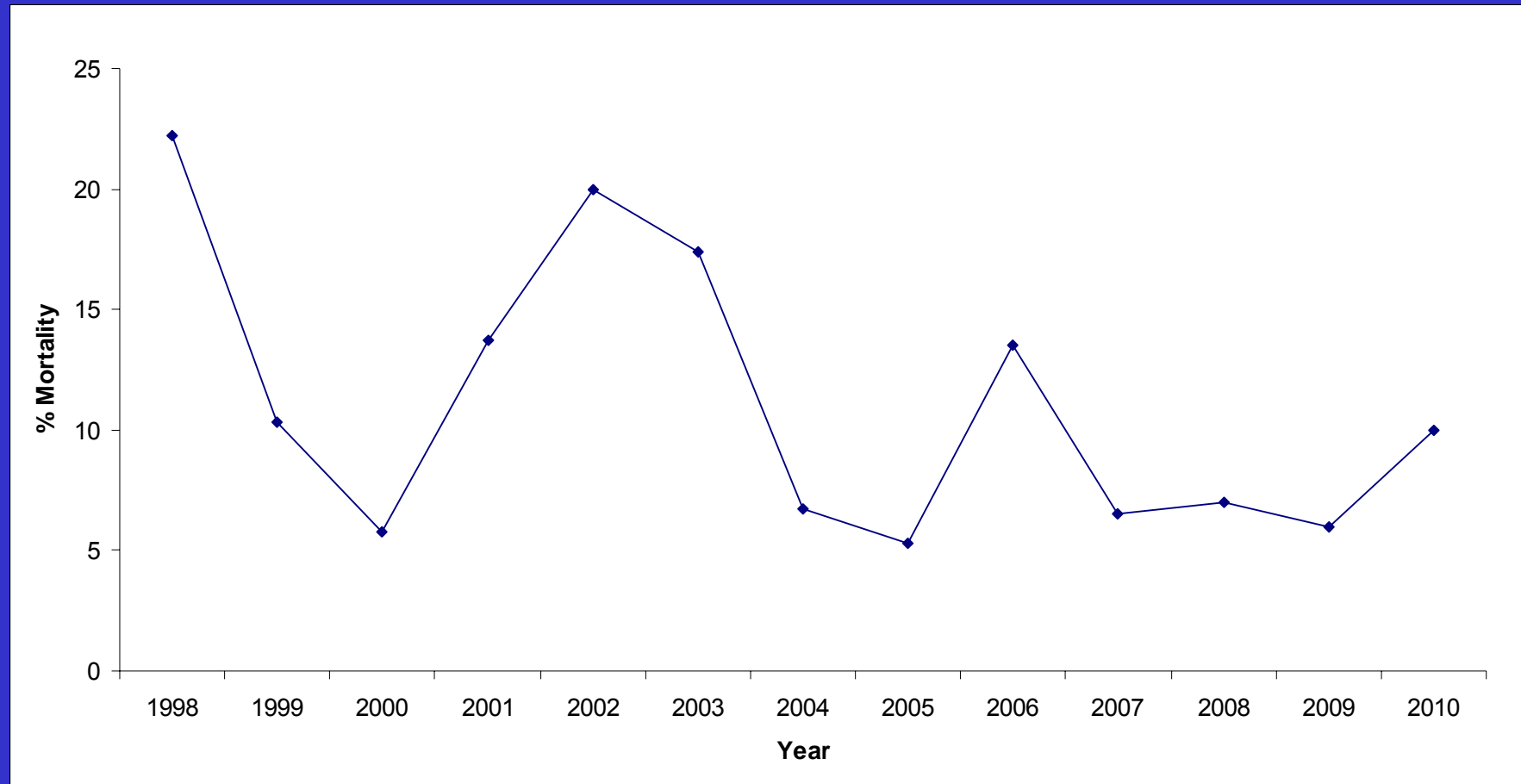
Pup counts - Figure of Eight Island



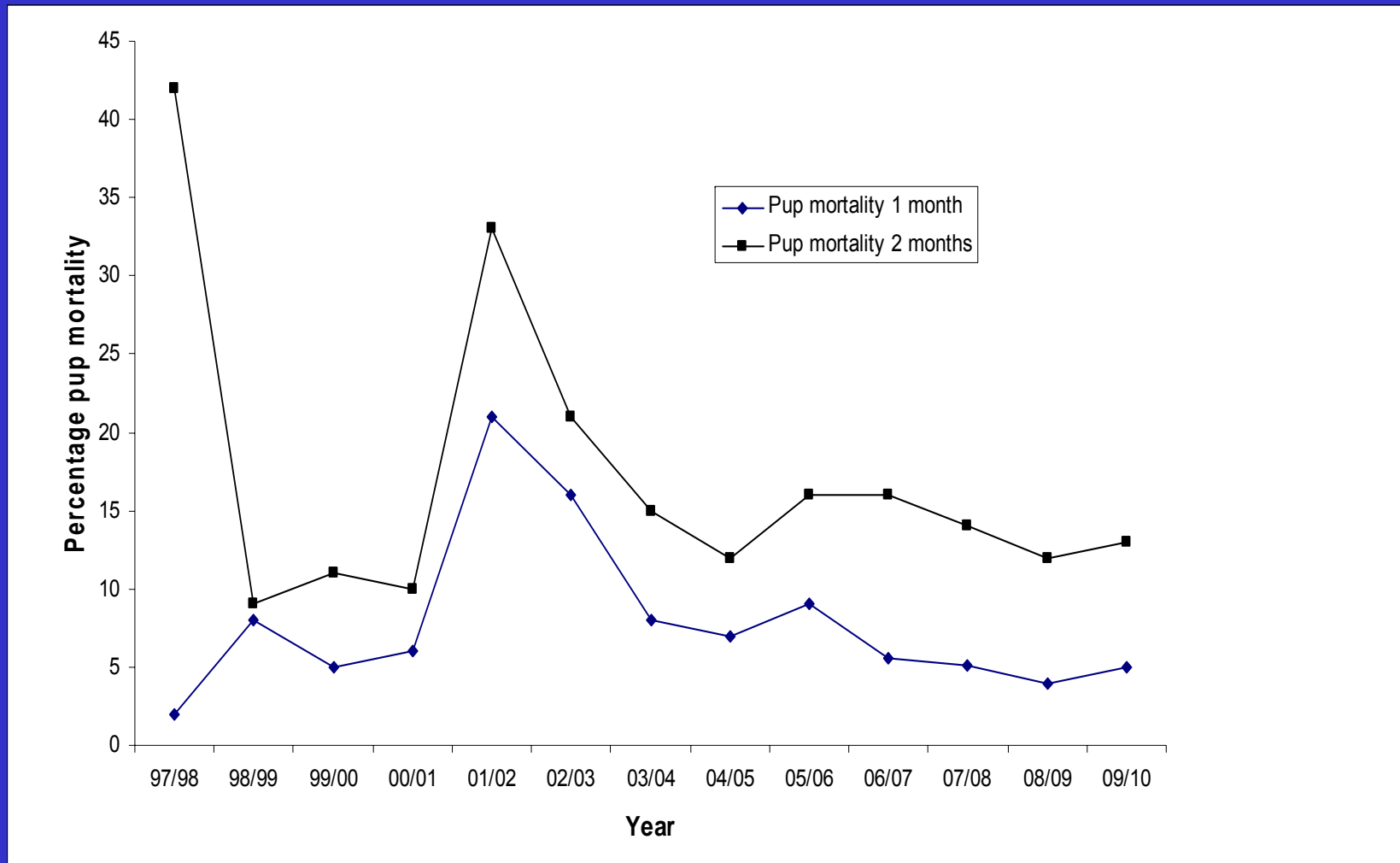
Pup counts - SEP



Pup Mortality

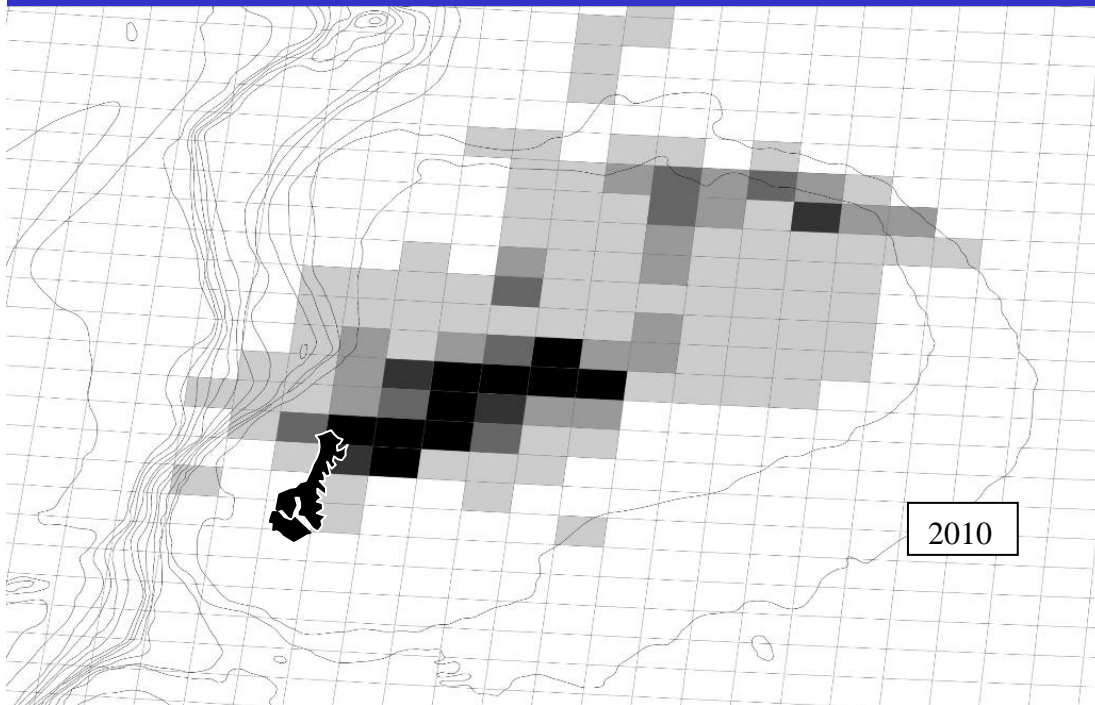
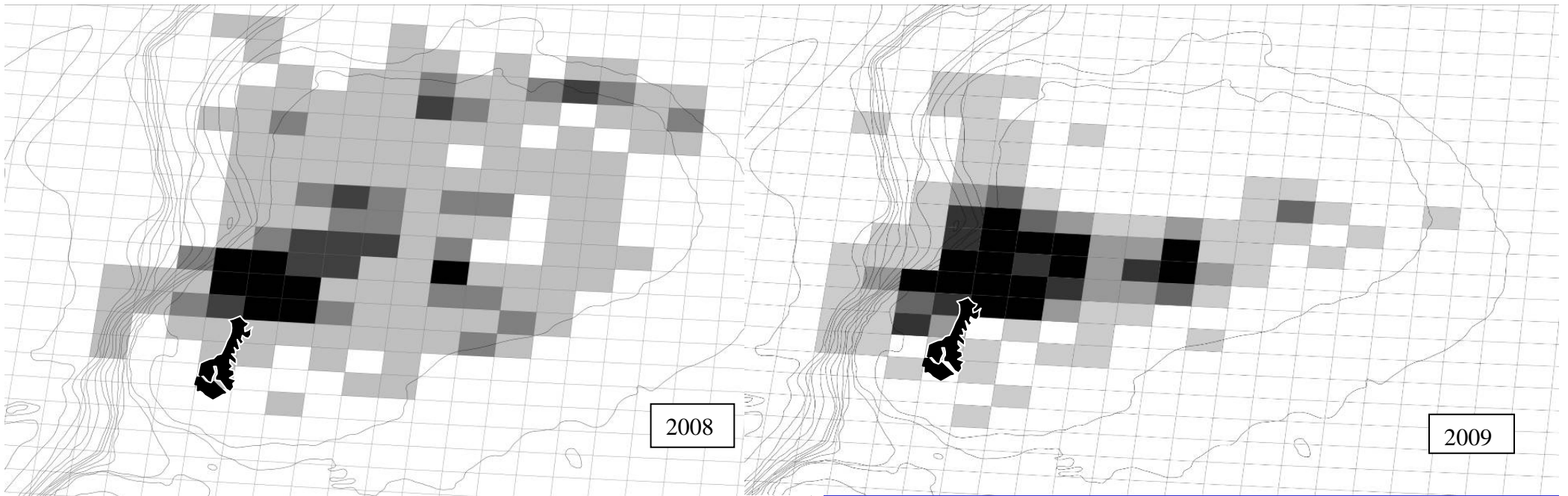


Pup Mortality – Sandy Bay



Dates, tag number, satellite tag id, sex, age, weight, length, girth, number of days deployed and number of satellite locations received from juvenile sea lions captured

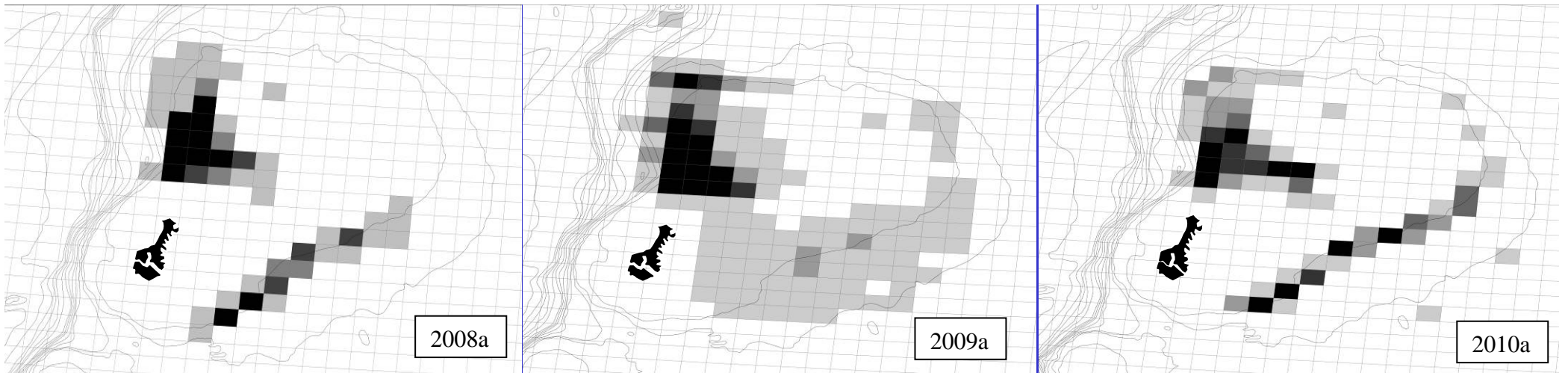
Date	Tag	Satellite tag id	Sex	Age	Weight (kg)	Length (cm)	Girth (cm)	Days	Number of satellite locations
14/01/2008	4121	49094	M	5	103.5	180	108	14	215
14/01/2008	5051	49095	M	4	134.5	184	126	49	366
14/01/2008	5093	54757	M	4	83	164	100	2	7
14/01/2008	3727	54760	M	5	102	177	106	16	309
17/01/2008	6130	76964	F	3	68	153	87	17	248
18/01/2008	5857	76966	F	3	71	141	92	14	183
24/01/2008	5863	54756	F	3	68	152	89	2	26
25/01/2008	6463	67259	F	2	73.5	146	91	31	322
25/01/2008	5913	54761	F	3	68	156	95	11	217
26/01/2008	6059	54759	F	3	84.5	154	96	4	39
11/01/2009	4907	1757	M	5	117	184	107	14	138
15/01/2009	7458	49093	F	2	57	140	90	13	105
15/01/2009	6363	76964	F	3	79	165	98	10	135
19/01/2009	6485	67260	M	3	85	159	98	12	208
19/01/2009	7610	76965	F	2	54	140	84	25	316
20/01/2009	6214	54760	M	3	81	160	104	13	139
20/01/2009	6218	54761	M	3	76	155	92	38	570
20/01/2009	6536	76963	F	3	70	157	93	19	235
25/01/2009	7445	89574	F	2	53	138	83	9	149
25/01/2009	8023	49094	F	2	54	135	84	17	206
15/01/2010	7199	76963	F	3	78.5	154	107	16	209
15/01/2010	7458	98814	F	3	73	153	98	16	222
24/01/2010	7584	76965	F	3	68	152	100	7	143
28/01/2010	5752	54760	M	5	150	209	125	31	569
28/01/2010	7260	76964	M	3	89	157	111	12	247
30/01/2010	8179	49094	M	2	77.5	156	91	71	1157



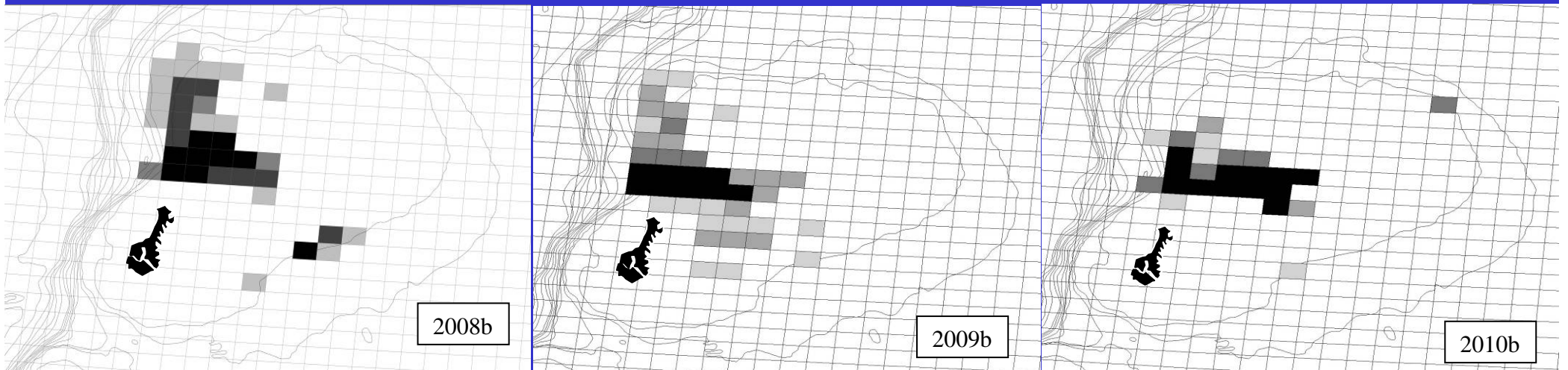
Estimated distribution of juvenile NZ sea lions (satellite locations/10 x 10 km area January & February)

Low Med High

Tow start positions /10km²

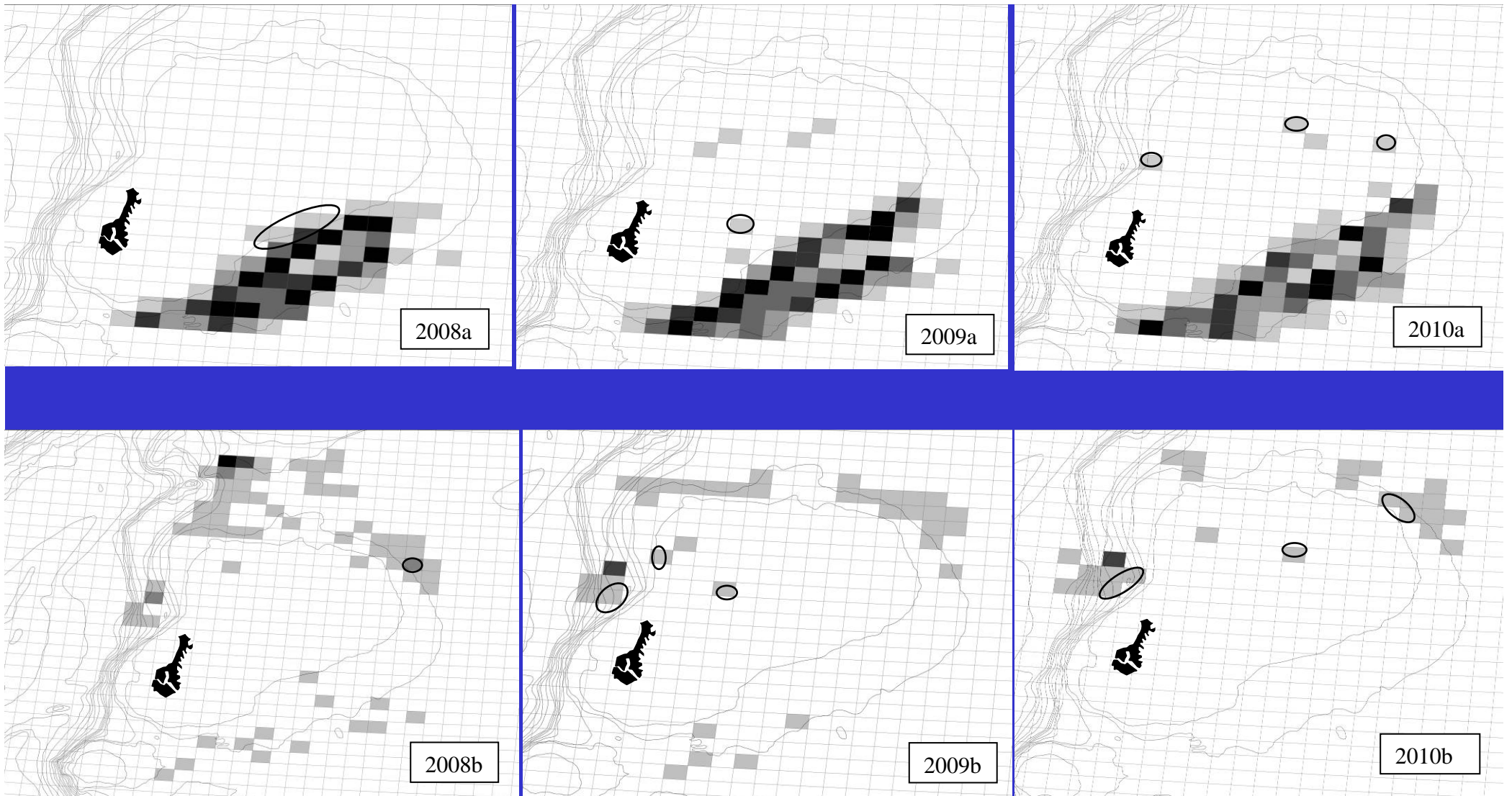


Low Med High
 Tow start positions /10km²



Low Med High
 Interaction probability

- a) The distribution of fishing effort in the 6T squid trawl fishery (tow start positions/10 x 10 km area, February to June at close of fishery 2008-2010) in the Auckland Islands 6T area (Scale 1-10 locations or tows per area (Low), 11- 20, 21-30 (Med), 31-40, 40+ (High)).
- b) The estimated interaction probability between juvenile NZ sea lion distribution and fishing activities for each year are presented in 3b (Scale 1 (Low), 2, 3-4 (Med), 5-6, 7 (High)).



a) The spatial distribution of scampi fisheries (October to June each season) and b) all other tows recorded in other fisheries for each season 2008, 2009, 2010 in the Auckland Islands 6T area (Scale 1-10 locations or tows per area (Low), 11-20, 21-30 (Med), 31-40, 40+ (High)). Circles indicate the only areas where overlap with juvenile NZ sea lion satellite locations occur.

Juvenile at sea distribution

- Most juvenile NZ sea lions (≤ 4 yrs old) foraging distributions close to Auckland Islands, predominantly N and NE areas.
- There was significant overlap between juvenile NZ sea lion foraging locations and squid 6T fisheries activities.
- Which, as does occur, is likely to result in fisheries/juvenile sea lion interactions and deaths of sea lions.
- There was little overlap of juvenile NZ sea lion from Enderby Island with scampi or other fisheries activities in the area.
- Similar to adult female NZ sea lion foraging studies, the current 12-nautical-mile (22-km) marine protected area (MPA) around the Auckland Islands would only protect the entire foraging area of two juvenile female NZSLs
- Exposing 77% of juvenile animals tracked here to fisheries interactions and bycatch death.

2010-2011 Field Objectives:

1) Collect field data that will allow quantification and estimation of:

- sea lion pup production
- survival of previously marked NZ sea lions
- reproduction by known-age female NZ sea lions

2) Maintain and update NZ sea lion database

Field Trip Logistics

First Team: 3 people

Leave Bluff 2nd December 2010

Return ~ 13th January 2011

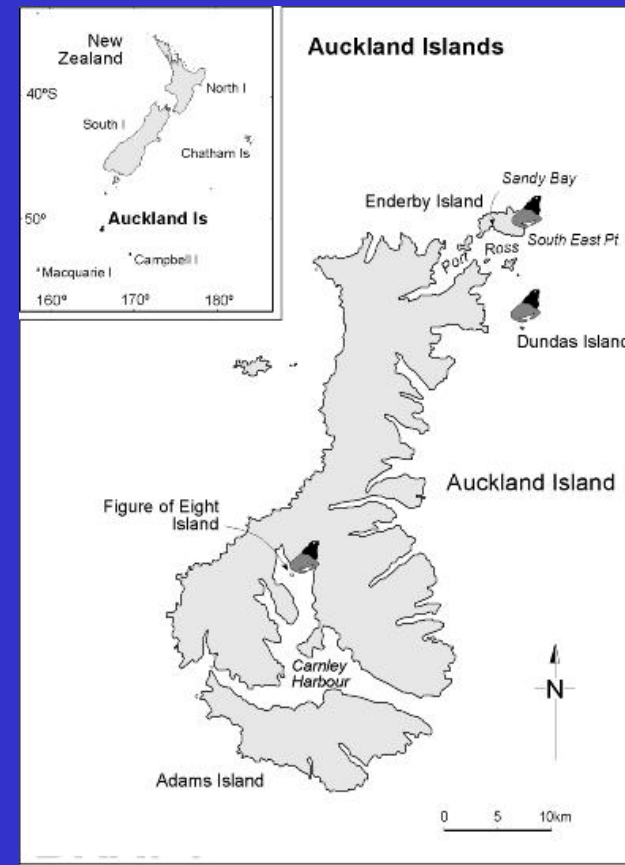
Second Team: 6 people

Leave Bluff 7th January 2010

Return ~ 20th February 2011

Pup production field data - methods and date of estimate

- Sandy Bay (Enderby Island)
- Mark/Recapture estimate
(16/1/11)
- Direct count & daily counts
- Dundas Island -
Mark/Recapture estimate
(21/1/11)
- S.E. Point (Enderby Island) -
Direct count & daily counts
- Figure of 8 Island - Single
direct count - (10/1/11)



Pup tagging

- All pups at Sandy Bay and SEP will be double flipper tagged with blue DALTON super tags.
- 400 pups from Dundas Island (300 female and 100 males) will be double flipper tagged with yellow DALTON super tags.
- As many pups as possible will be double flipper tagged with red DALTON super tags at Figure of Eight Island (numbers of pups tagged restricted due to location logistics).



Collect field data to allow quantification and estimation of:

- survival of previously marked NZ sea lions
- reproduction by known-age female NZ sea lions

- * Daily resightings of previously tagged and branded animals at SEP & Sandy Bay between early Dec & late Feb.
- * Opportunist sightings collected from Figure of Eight & Dundas Island.
- * Opportunist sightings collected from islands in the Ross Harbour and Auckland Island mainland.
- * At the time of resighting tag number, tag colour, number of tags, date of sighting, location and reproductive status are recorded.
- * When possible animals double tag scares will have their PIT tags read.
- * All sightings will be added to the NZ sea lion database.

