

3.3.6 Spur-winged plover (*Vanellus miles novaehollandiae*)

Counts of spur-winged plovers (*Vanellus miles novaehollandiae*) were higher in winter, when 571–2216 birds were counted; however, the decrease during summer was not large, with 492–802 individuals counted (Table 3). This suggests that populations were largely resident, with little movement to the coast. This species tends to use inland habitats even after breeding and, as noted by Sagar et al. (1999), is not well monitored by these counts.

The spread of spur-winged plovers following their initial colonisation of New Zealand in 1932 (Heather & Robertson 2000) has continued. There are now significant populations occurring further north than was recorded up to 1994 (Table 9), including the Firth of Thames, Manukau Harbour and Kaipara Harbour.

TABLE 9. TEN-YEAR AVERAGES OF SPUR-WINGED PLOVER (*Vanellus miles novaehollandiae*) COUNTS. Data are presented for New Zealand sites where more than 100 birds on average were counted in winter between 1995 and 2003, or that had comparative data in Sagar et al. (1999) and other counts mentioned in the text. Winter counts are compared with those from the previous decade (Sagar et al. 1999); * = $P < 0.05$. n = the number of counts from which the average was calculated, SEM = standard error.

SITE	SUMMER 1994–2003			WINTER 1995–2003			WINTER 1983–1994		
	COUNT	SEM	n	COUNT	SEM	n	COUNT	SEM	n
Firth of Thames	121	20	10	229	20	9			
Manukau Harbour	120	20	10	187	39	9			
Whakaki Lagoon	9	9	5	150	98	5	135	42	5
Kaipara Harbour	84	16	10	131	28	9			
Whangarei Harbour	22	7	10	32	7	9			
Porangahau Estuary	9	4	7	29	1	8	54*	30	11

3.3.7 New Zealand dotterel (*Charadrius obscurus*)

New Zealand dotterels (*Charadrius obscurus*) have two disjunct populations that are now known to be taxonomically distinct (Dowding 1994) and quite different ecologically (Dowding & Murphy 2001). While the two forms were not differentiated in these counts, banding records have shown that some southern New Zealand dotterels (*C. o. obscurus*) reach as far north as Farewell Spit, while northern New Zealand dotterels (*C. o. aquilonius*) have only been recorded in the North Island (Dowding & Moore 2004). It has been assumed here that South Island records refer to the southern taxon and North Island records to the northern taxon.

Between 228 and 433 (average 318) northern New Zealand dotterels were counted annually each winter between 1994 and 2004 (Table 3; Fig. 13); summer counts were a little lower, ranging from 128 to 279 (average 227) (Table 3). No counts were returned from some of the important sites that were identified by Sagar et al. (1999), but comparable counts from specific sites in 1984-1994 showed that overall numbers have increased by 10%, although this increase has not been uniform across all sites (Table 10). Populations at Mangawhai and Kaipara Harbours have increased, while those at Tauranga and Ohiwa Harbours appear to have declined. An overall increase is further suggested by significant winter counts at sites that were not listed by Sagar et al. (1999).

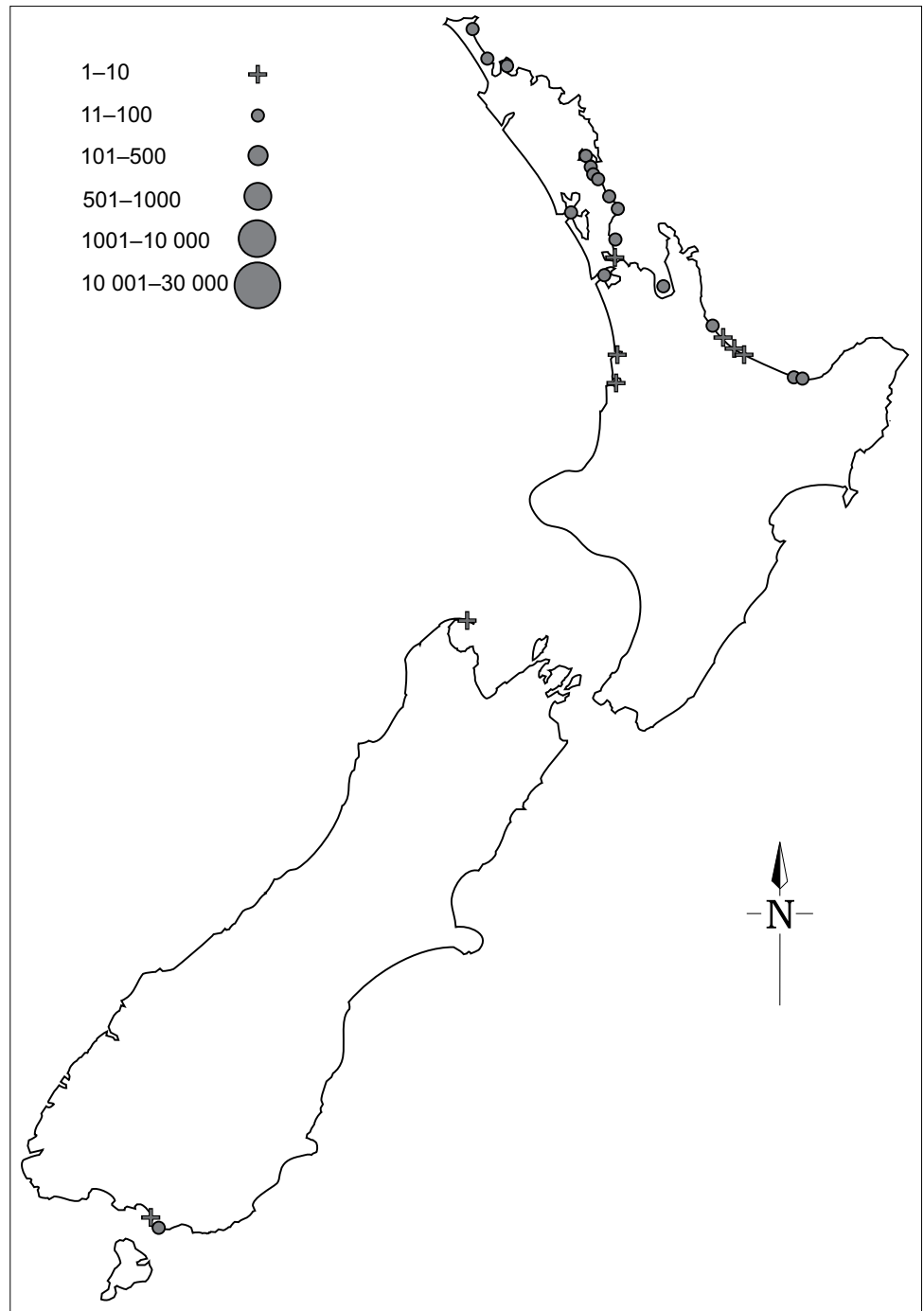
Southern New Zealand dotterels now breed only on Stewart Island/Rakiura. One of their regular wintering flocks is at Awarua Bay in Southland (Dowding & Moore 2004), where an average of 24 birds was counted in two seasons, 1996 and 1997 (Table 3; Fig. 13). These winter counts are similar to the average counts from the previous decade (Table 10). In summer, two birds were found at Awarua Bay in November 1996 and eight birds were found in February 1996, although the latter may have included the start of the post-breeding flock. Away from Southland, there was a single bird at Wainono Lagoon (Lake Ki-Wainono) in November 1994 and single birds at Farewell Spit during each count from November 2001 to June 2003.

TABLE 10. TEN-YEAR AVERAGES OF NEW ZEALAND DOTTEREL (*Charadrius obscurus*) COUNTS.

Data are presented for New Zealand sites where more than 20 birds on average were counted in winter between 1995 and 2003, or that had comparative data in Sagar et al. (1999) and other counts mentioned in the text. Winter counts are compared with those from the previous decade (Sagar et al. 1999); * = $P < 0.05$. n = the number of counts from which the average was calculated, SEM = standard error.

SITE	SUMMER 1994-2003			WINTER 1995-2003			WINTER 1983-1994		
	COUNT	SEM	n	COUNT	SEM	n	COUNT	SEM	n
Mangawhai Harbour	60	12	6	73	15	6	38*	4	11
Kaipara Harbour	35	4	9	64	10	9	32*	2	9
Omaha	14	3	3	36	0	1	32	2	11
Waipu Cove	29	5	9	30	5	9			
Manukau Harbour	27	3	9	30	3	9			
Firth of Thames	16	2	9	29	15	9			
Ohiwa Harbour	10	2	6	28	4	6	51*	8	11
Houhora Harbour	28	4	2	24	24	3			
Awarua Bay	5	3	2	24	4	2			
Rangaunu Harbour	9	9	2	23	23	3	33	4	5
Parengarenga Harbour	1	1	2	23	6	3			
Whangarei Harbour	10	6	9	22	4	9			
Tauranga Harbour	15	7	6	13	4	6	29*	4	11
Ruakaka Estuary	7	1	10	11	4	10			

Figure 13. The distribution and abundance of New Zealand dotterels (*Charadrius obscurus*) in New Zealand during winter between 1995 and 2003. Only sites with more than one bird, on average, are shown.



3.3.8 Black-fronted dotterel (*Charadrius melanops*)

Between 0 and 214 (average 60) black-fronted dotterels (*Charadrius melanops*) were counted in winter, and 1–17 (average 8) were counted in summer (Table 3). Few of the important sites identified by Sagar et al. (1999) were monitored during 1994–2003; consequently, it is hard to assess changes. However, there appears to have been a large increase of 195% (Table 11). This is mostly due to increased numbers at Ahuriri Estuary, where average counts have risen substantially. At the other two sites that were surveyed again—Washdyke Lagoon and Matata Lagoon—there were declines in the average numbers counted. In addition, up to four birds have been recorded in summer at Manukau Harbour since 2000 and eight birds were seen there in winter 2003. Black-fronted dotterels are primarily freshwater, wetland birds, and only a very small proportion of their total population (which is estimated at 17 000 individuals; Heather & Robertson 2000) was counted.

TABLE 11. TEN-YEAR AVERAGES OF BLACK-FRONTED DOTTEREL (*Charadrius melanops*) COUNTS.

Data are presented for New Zealand sites where more than 1 bird on average was counted in winter between 1995 and 2003, or that had comparative data in Sagar et al. (1999) and other counts mentioned in the text. Winter counts are compared with those from the previous decade (Sagar et al. 1999); *= $P < 0.05$. n = the number of counts from which the average was calculated, SEM = standard error.

SITE	SUMMER 1994–2003			WINTER 1995–2003			WINTER 1983–1994		
	COUNT	SEM	n	COUNT	SEM	n	COUNT	SEM	n
Ahuriri Estuary	7	2	8	61	25	8	9*	5	11
Washdyke Lagoon	1	1	4	3	2	6	8*	4	8
Matata Lagoon	0	0	6	1	0	6	5	0	1
Manukau Harbour	1	1	10	1	0	9			

3.3.9 Black stilt (*Himantopus novaezelandiae*) and hybrids

There has been long-term confusion about the classification of black stilts (*Himantopus novaezelandiae*) and their hybrids with pied stilts. However, the identity of intermediate-plumaged ('smudgy') birds was clarified by Pierce (1984), who described and illustrated both hybrids and maturing black stilts. Therefore, count results had two categories: 'black stilt' and 'black stilt/hybrid'. In spite of this, different regions tended to use one or the other to tally their birds. Since observers in different regions were probably not consistent with their allocations, I have combined both counts for the purpose of these analyses, even though this means that detail has been obscured.

Annual winter counts varied from 10 to 32 birds, with an average of 21 (Table 3; Fig. 14). This reflects an overall increase from the average of 15 that can be calculated for the 1984-1994 period if counters were categorising birds in a similar way each time. In summer, the numbers of birds remaining at the wintering sites were much lower, with birds being seen most consistently in Canterbury (Table 12), where all individuals were classified as 'black stilt/ hybrid' rather than 'black stilt'.

TABLE 12. TEN-YEAR AVERAGES OF BLACK STILT (*Himantopus novaezelandiae*) COUNTS.

Data are presented for New Zealand sites where more than one bird on average was counted in winter between 1994 and 2003. *n* = the number of counts from which the average was calculated, SEM = standard error.

SITE	SUMMER 1994-2003			WINTER 1995-2003		
	COUNT	SEM	<i>n</i>	COUNT	SEM	<i>n</i>
Kawhia Harbour	0	0	9	7	1	9
Manukau Harbour	0	0	10	6	1	9
Canterbury region	2	1	8	3	0	6
Kaipara Harbour	1	0	10	1	0	9
Bay of Plenty region	0	0	6	1	0	6

Figure 14. The distribution and abundance of black stilts (*Himantopus novaezelandiae*) and hybrids in New Zealand during winter between 1995 and 2003. Only sites with more than one bird, on average, are shown.

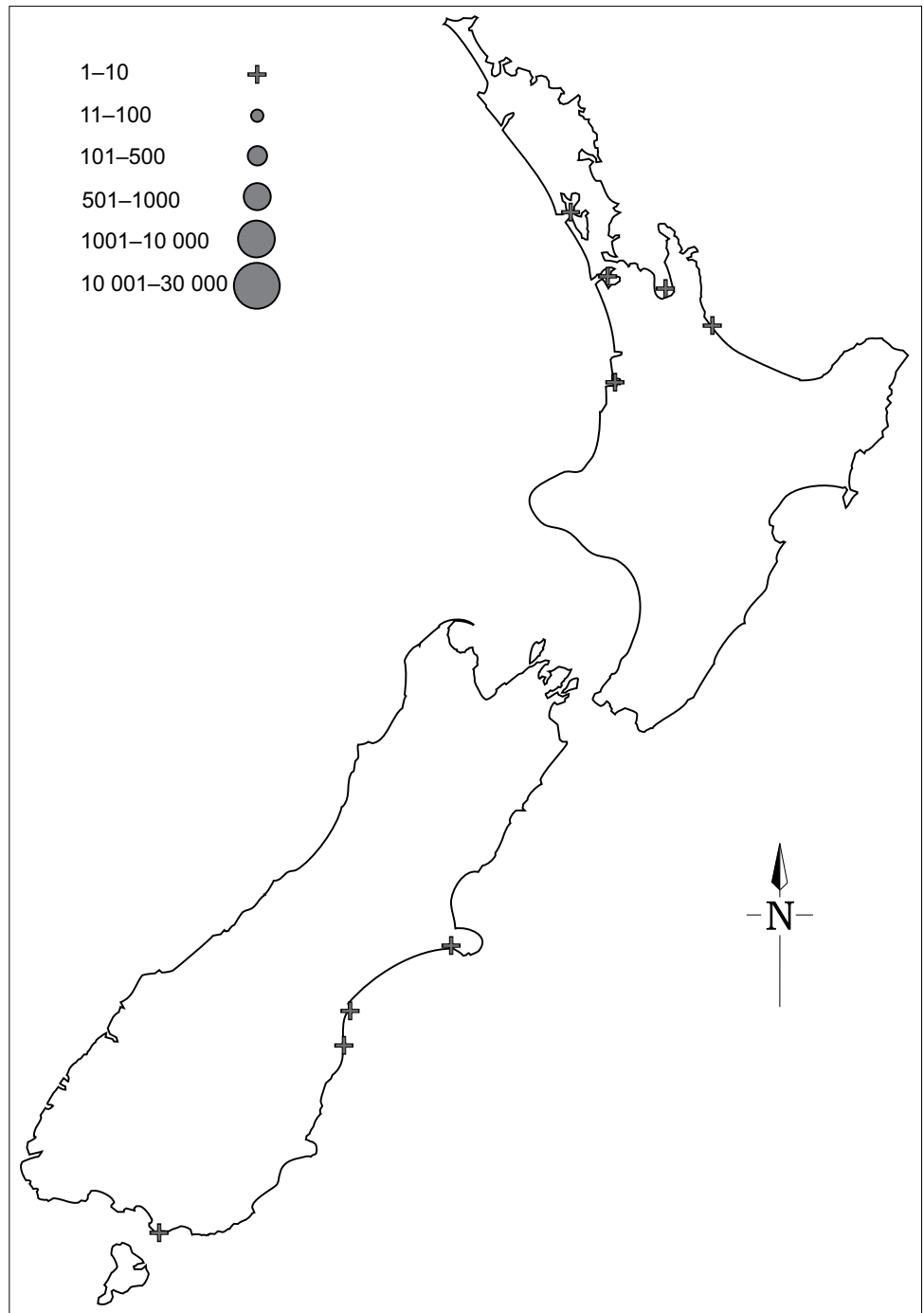


TABLE 13. SUMMARY OF COUNTS AND POPULATION ESTIMATES OF ARCTIC MIGRANTS IN NEW ZEALAND BETWEEN NOVEMBER 1994 AND JUNE 2003. Population estimates were derived from the summer counts and cover only those sites from which at least one count was returned (SEM = standard error of the mean). Population estimates for 1983–1994 are from Sagar et al. (1999).

SPECIES	MEASURE	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	MEAN	SEM	ESTIMATE 1983–1994
Eastern bar-tailed godwit	Winter count		5807	8073	10051	7734	11604	8510	8658	4426	5796	7851	747	
	Summer count	100938	82492	87274	79618	83563	80083	73813	65867	59528	60652	77383	4046	
	Population estimate	105560	104296	97552	94053	98912	94609	97760	92062	85271	83001	95308	2297	101698
Lesser knot	Winter count		4691	2704	5568	1426	1643	1010	3829	3932	2313	3013	525	
	Summer count	61985	66513	45569	38323	45379	30561	29965	35027	27281	38671	41927	4203	
	Population estimate	63340	68582	47551	47639	54540	39707	39176	45141	37528	49032	49224	3253	58637
Turnstone	Winter count		495	117	158	430	44	241	176	193	165	224	49	
	Summer count	2844	2409	2066	1614	1664	1338	959	1469	1445	1323	1713	179	
	Population estimate	3302	2618	2198	2605	2643	2319	2015	2525	2501	2314	2504	110	5069
Pacific golden plover	Winter count		0	1	1	0	0	4	0	0	2	1	0	
	Summer count	223	73	97	158	234	141	141	125	209	157	156	17	
	Population estimate	231	156	112	207	319	201	233	229	301	229	222	19	649
Red-necked stint	Winter count		14	29	54	8	18	32	3	9	41	23	6	
	Summer count	92	53	135	113	69	100	152	145	137	96	109	10	
	Population estimate	120	137	138	146	180	131	184	184	169	169	136	8	175
Whimbrel	Winter count		18	0	8	0	1	4	11	5	9	6	2	
	Summer count	152	106	36	47	66	45	72	75	54	51	70	11	
	Population estimate	152	114	39	64	83	68	100	103	82	74	88	10	117
Curlew sandpiper	Winter count		20	0	1	0	0	2	1	4	6	4	2	
	Summer count	63	49	49	24	5	20	14	24	21	8	28	6	
	Population estimate	64	63	50	33	27	30	24	34	31	18	37	5	86
Sharp-tailed sandpiper	Winter count		0	0	12	0	0	0	0	0	0	1	1	
	Summer count	34	10	16	12	9	8	9	37	24	17	18	3	
	Population estimate	35	17	18	18	20	15	16	45	31	25	24	3	81
Eastern curlew	Winter count		24	3	3	1	2	1	1	3	3	5	2	
	Summer count	17	25	28	18	15	16	12	21	11	19	18	2	
	Population estimate	20	31	30	26	25	24	22	31	21	27	26	1	34
Pectoral sandpiper	Winter count		0	0	0	0	0	0	0	0	0	0	0	
	Summer count	5	0	5	1	5	3	3	16	8	8	5	1	
	Population estimate	5	6	6	2	11	4	4	18	9	10	8	1	

3.4 ARCTIC MIGRANTS

Counts and population estimates for each Arctic migrant species are summarised in Table 13.

3.4.1 Eastern bar-tailed godwit (*Limosa lapponica baueri*)

In summer, between 59 528 and 100 938 eastern bar-tailed godwits (*Limosa lapponica baueri*) were counted (Table 13; Fig. 15), making them the most common of the Arctic migrant waders in New Zealand. This wide range in count totals between years is due largely to a lack of counts from some important sites in some years. Including estimates for the uncounted sites gives a total population estimate of 83 001–105 560 birds (Table 13). Average numbers at specific sites in 1984–1994 (Sagar et al. 1999) and 1994–2003 were very similar (Table 14), with a small increase of 9% overall. There was, however, a tendency for the population estimates to decline throughout the period 1993–2003 (Fig. 16).

In winter, numbers of eastern bar-tailed godwits decreased to between 4426 and 11 604 birds (Table 13), about 9% of the summer totals. This proportion was fairly consistent across all sites (Table 14; Fig. 17).

TABLE 14. TEN-YEAR AVERAGES OF EASTERN BAR-TAILED GODWIT (*Limosa lapponica baueri*) COUNTS. Data are presented for New Zealand sites where more than 2000 birds on average were counted in summer between 1994 and 2003. Summer counts are compared with those from the previous decade (Sagar et al. 1999); *= $P < 0.05$. n =the number of counts from which the average was calculated, SEM=standard error.

SITE	WINTER 1995-2003			SUMMER 1994-2003			SUMMER 1983-1993		
	COUNT	SEM	n	COUNT	SEM	n	COUNT	SEM	n
Kaipara Harbour	1208	229	9	16883	941	10	10381*	1068	9
Manukau Harbour	2050	327	9	16859	1674	10	15534	1246	11
Farewell Spit	1676	941	8	11402	1690	10	13557*	796	11
Firth of Thames	763	114	9	7979	784	10	6479*	806	11
Tauranga Harbour	421	73	6	4859	421	6	5105	252	11
Ohiwa Harbour	360	61	6	4017	353	6	3952	166	11
Tasman Bay	329	100	8	3880	487	8			
Kawhia Harbour	280	63	9	3850	435	9	3693	265	11
Parengarenga Harbour	449	249	2	3568	2216	3	3717	480	9
Rangaunu Harbour	97	97	2	3750	250	3	3975	879	6
Whangarei Harbour	307	29	9	3043	374	10	3224	495	10
Houhora Harbour	250	250	2	2567	1723	3			

Figure 15. The distribution and abundance of eastern bar-tailed godwits (*Limosa lapponica baueri*) in New Zealand, during summer between 1994 and 2003. Only sites with more than one bird, on average, are shown.

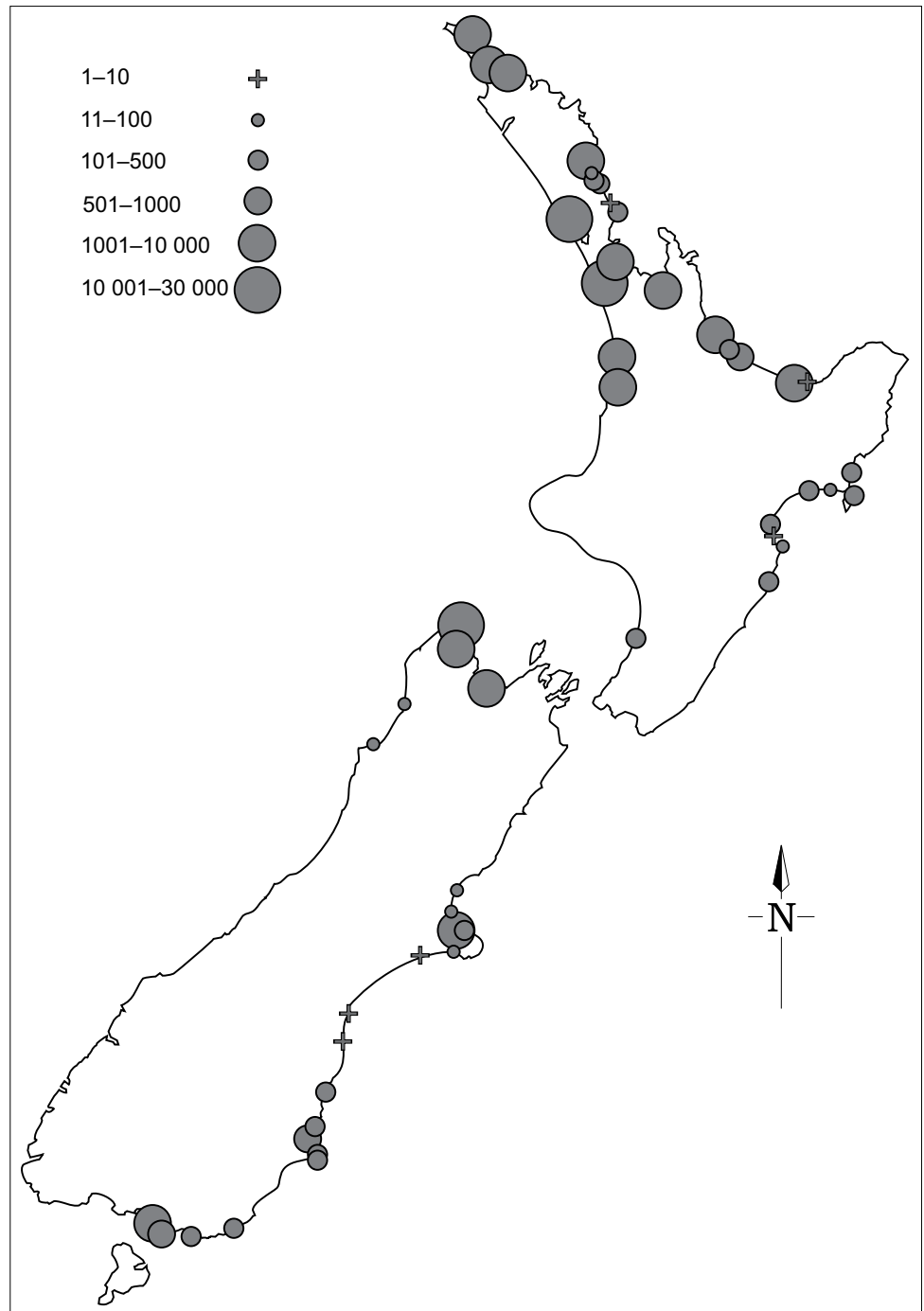


Figure 16. Population estimates for the eastern bar-tailed godwit (*Limosa lapponica baueri*) in New Zealand during summer between 1994 and 2003.

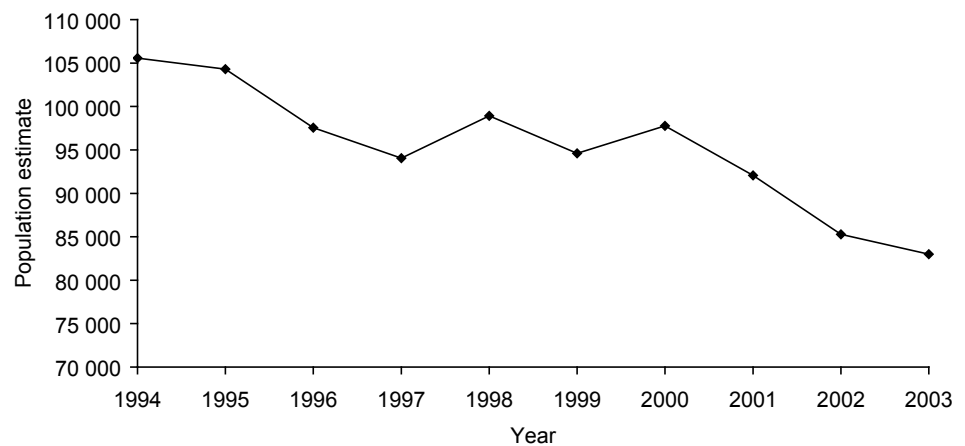
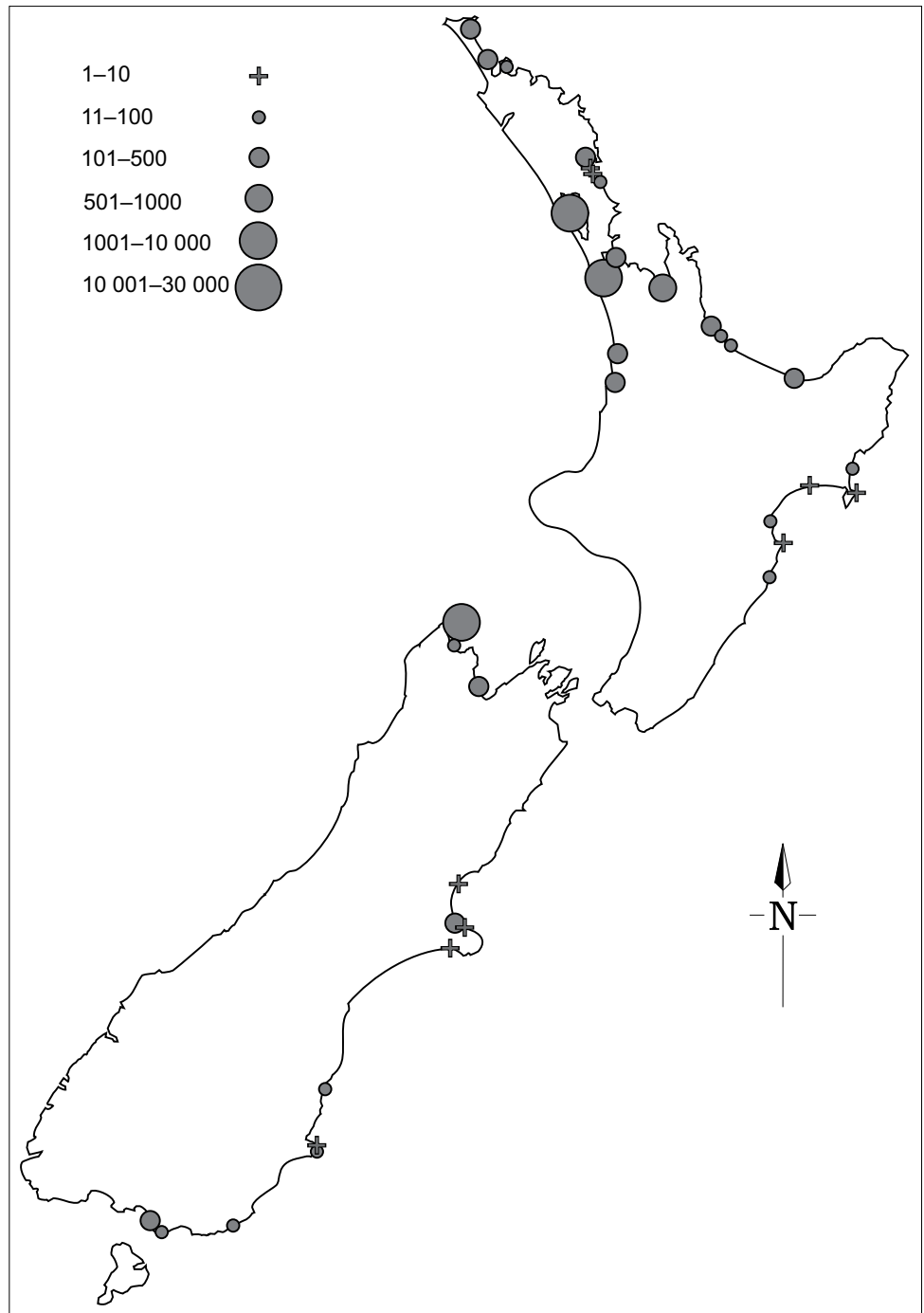


Figure 17. The distribution and abundance of eastern bar-tailed godwits (*Limosa lapponica baueri*) in New Zealand, during winter between 1995 and 2003. Only sites with more than one bird, on average, are shown.



3.4.2 Lesser knot (*Calidris canutus*)

Lesser knots (*Calidris canutus*) were the second most common Arctic migrant in New Zealand, with 27 281–66 513 (average 41 927) individuals being counted in summer, mostly concentrated at a small number of sites (Table 13; Fig. 18). Comparison of average numbers at specific sites with counts from the previous 10 years shows that there has been an overall decline of 14%. There has also been a further decline throughout this study (Table 13; Fig. 19). However, changes were markedly different between sites (Table 15). For example, numbers declined significantly at Manukau Harbour (22%), Whangarei Harbour (21%) and Farewell Spit (47%), but increased at Kaipara Harbour (30%) and the Firth of Thames (37%).

Over winter, the numbers of lesser knots fell to between 1010 and 5568 (average 3013). The numbers counted in winter in New Zealand varied from 3% to 15% (average 6%) of the summer population (Table 13), but they were not evenly spread (Fig. 20). The proportion of the summer flock remaining at Manukau Harbour over winter was very high (20% on average); in contrast, only 2%–6% remained elsewhere in New Zealand (Table 15). This means that 56%–94% (average 78%) of the total winter population of lesser knots in New Zealand was found at Manukau Harbour, and when the lower counts were recorded there, the national total was also low. The importance of Manukau Harbour for overwintering lesser knots may have increased, as an average of 60% of the winter flock was present there in the decade before this study (Sagar et al. 1999). However, this difference is not a result of an increase in the numbers of birds at Manukau Harbour, as the average counts there for both winter and summer were actually lower in this study.

TABLE 15. TEN-YEAR AVERAGES OF LESSER KNOT (*Calidris canutus*) COUNTS.

Data are presented for New Zealand sites where more than 1000 birds on average were counted in summer between 1994 and 2003. Summer counts are compared with those from the previous decade (Sagar et al. 1999); * = $P < 0.05$. n = the number of counts from which the average was calculated, SEM = standard error.

SITE	WINTER 1994–2003			SUMMER 1995–2003			SUMMER 1983–1993		
	COUNT	SEM	n	COUNT	SEM	n	COUNT	SEM	n
Manukau Harbour	2339	489	9	12 522	1658	10	16 083*	1349	11
Kaipara Harbour	60	20	9	10 186	1030	10	7846*	1660	9
Farewell Spit	264	54	8	8220	1282	10	15 538*	1193	11
Firth of Thames	201	95	9	5259	650	10	3848*	271	11
Rangaunu Harbour	0	0	2	4067	1832	3	1839	334	6
Parengarenga Harbour	47	23	2	3200	1616	3	4897	1224	10
Whangarei Harbour	33	17	9	1988	221	10	2528*	367	10
Houhora Harbour	0	0	2	1200	611	3	1876	276	6
Waitemata Harbour	0	0	4	1036	724	4			

Figure 18. The distribution and abundance of lesser knots (*Calidris canutus*) in New Zealand during summer between 1994 and 2003. Only sites with more than one bird, on average, are shown.

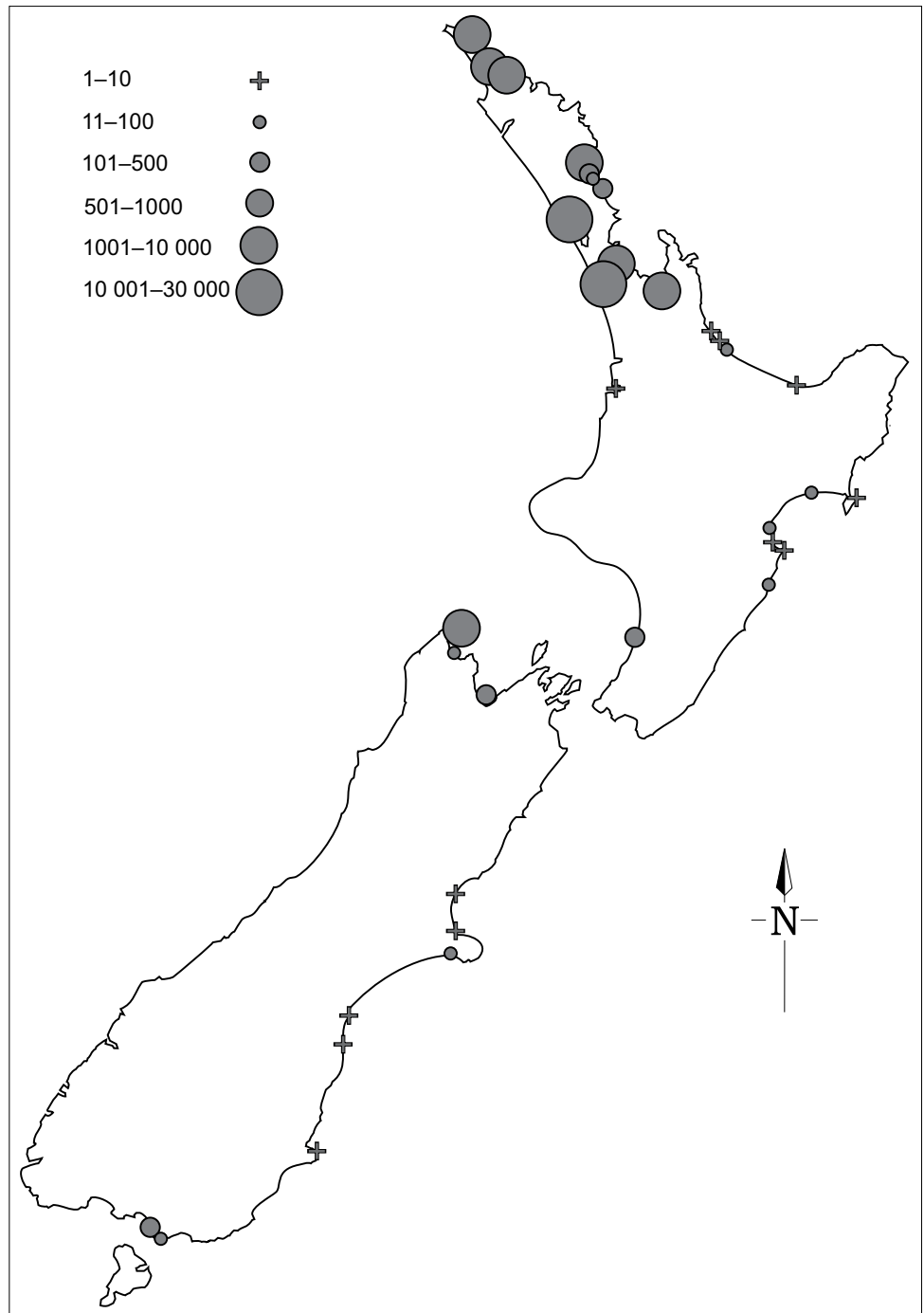


Figure 19. Population estimates for the lesser knot (*Calidris canutus*) in New Zealand during summer between 1994 and 2003.

