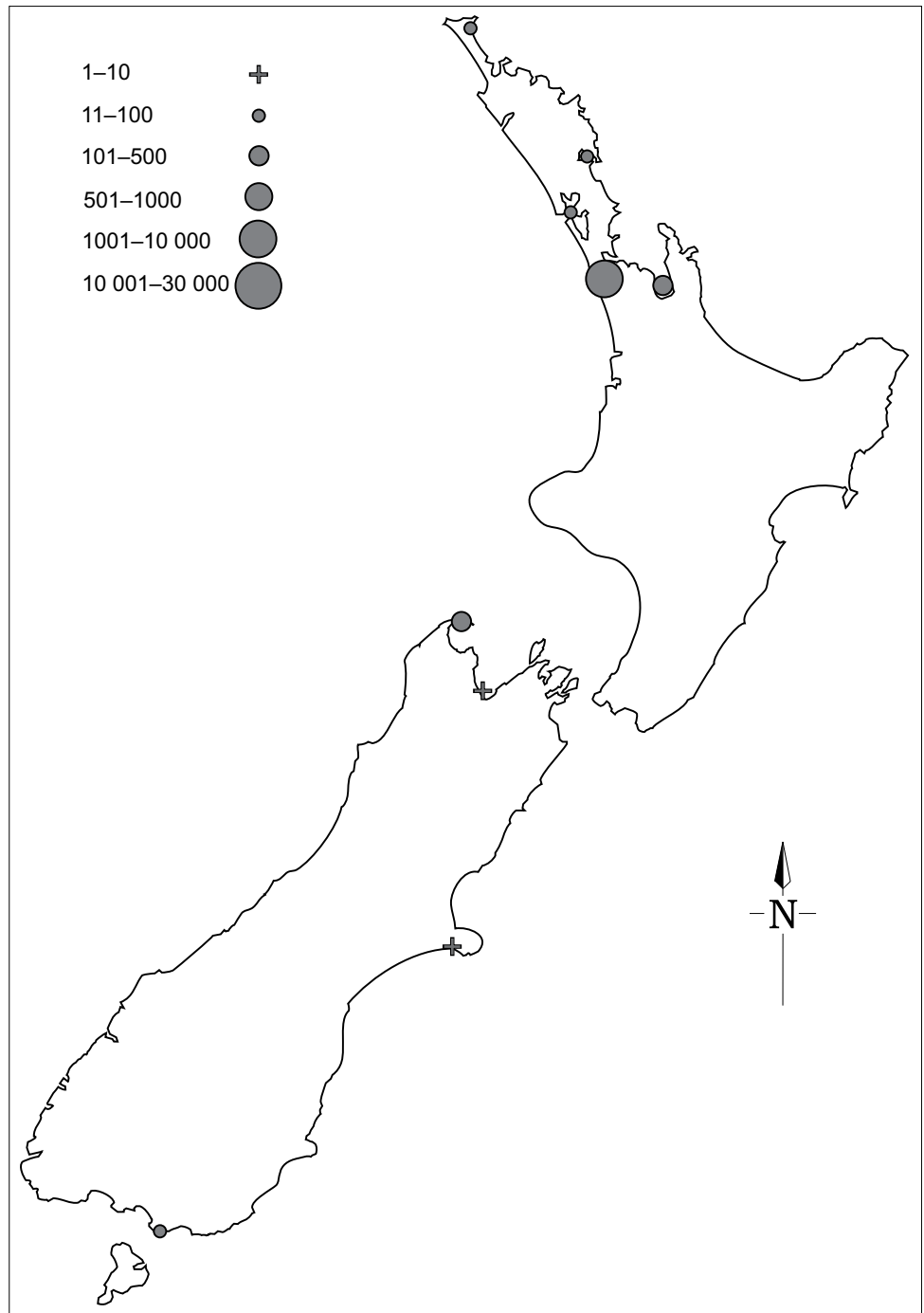


Figure 20. The distribution and abundance of lesser knots (*Calidris canutus*) in New Zealand during winter between 1994 and 2003. Only sites with more than one bird, on average, are shown.



### 3.4.3 Turnstone (*Arenaria interpres*)

During the period of this study, 959–2844 turnstones (*Arenaria interpres*) were counted in summer (Table 13; Fig. 21). Compared to the previous decade (Sagar et al. 1999), overall counts seem to be well down. However, some very important sites (e.g. Southland region and Parengarenga Harbour) were not counted often. Comparison of those sites that were monitored during both decades indicates a 46% decline in the numbers occurring in New Zealand (Table 16). In addition, there appears to have been a trend of slowly decreasing numbers during 1994–2003 (Fig. 22). Although the low numbers of counts for sites from the Southland and Far North regions do not enable an accurate analysis of changes there, all of the sites showed this trend.

In winter, numbers declined to 44–495 (Table 13; Fig. 23). As noted by Sagar et al. (1999), the number of overwintering turnstones, as a proportion of the numbers present during the previous summer, varied markedly between years. The extremes were 35% in 1998 and 3% in 1999, but the average was 9%. Regionally, the greatest differences were seen at Farewell Spit (16%), which seems to be a favoured site, and the Invercargill Estuary (1%), which is not (Table 16). Unfortunately, few counts were available for Southland, but figures from Sagar et al. (1999) also suggested that there were real regional differences in the seasonal use of sites.

TABLE 16. TEN-YEAR AVERAGES OF TURNSTONE (*Arenaria interpres*) COUNTS.

Data are presented for New Zealand sites where more than 50 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	$n$
Farewell Spit	88	11	8	564	61	10	846*	106	11
Kaipara Harbour	47	12	9	401	58	10	423	67	9
Manukau Harbour	30	6	9	278	41	10	427*	62	11
Rangaunu Harbour	7	7	2	281	177	3	256	67	6
Invercargill Estuary	2	2	2	265	101	2	574	79	10
Parengarenga Harbour	18	11	2	167	84	3	915*	164	8
Awarua Bay	5	5	2	137	97	2	203	50	11
Tasman Bay	12	4	8	119	31	8	252*	39	11
Houhora Harbour	3	3	2	74	52	3			
Tauranga Harbour	5	3	6	63	22	6	250*	21	11
Firth of Thames	2	2	9	31	4	10	106*	16	11
Fortrose Estuary	0	0	1	19	18	3	75*	12	10

Figure 21. The distribution and abundance of turnstones (*Arenaria interpres*) in New Zealand during summer between 1994 and 2003. Only sites with more than one bird, on average, are shown.

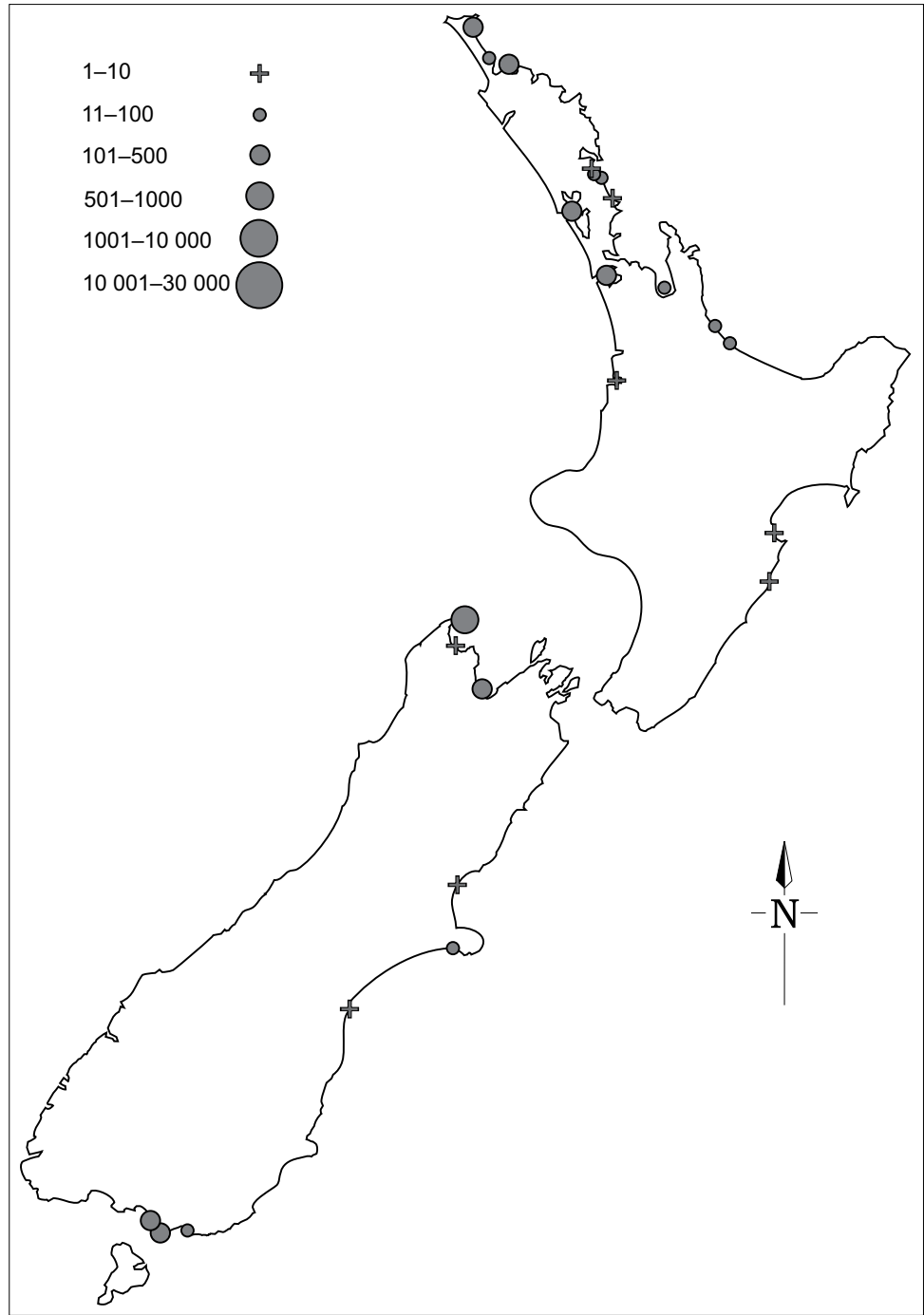


Figure 22. Population estimates for the turnstone (*Arenaria interpres*) in New Zealand during summer between 1994 and 2003.

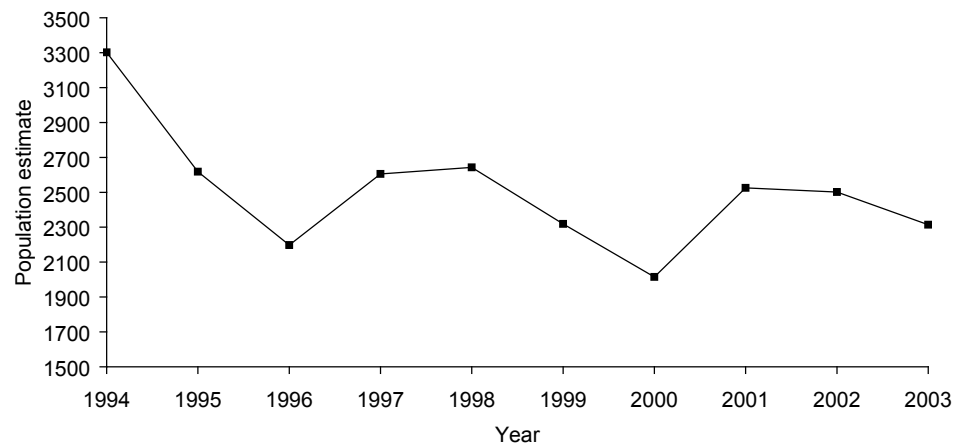
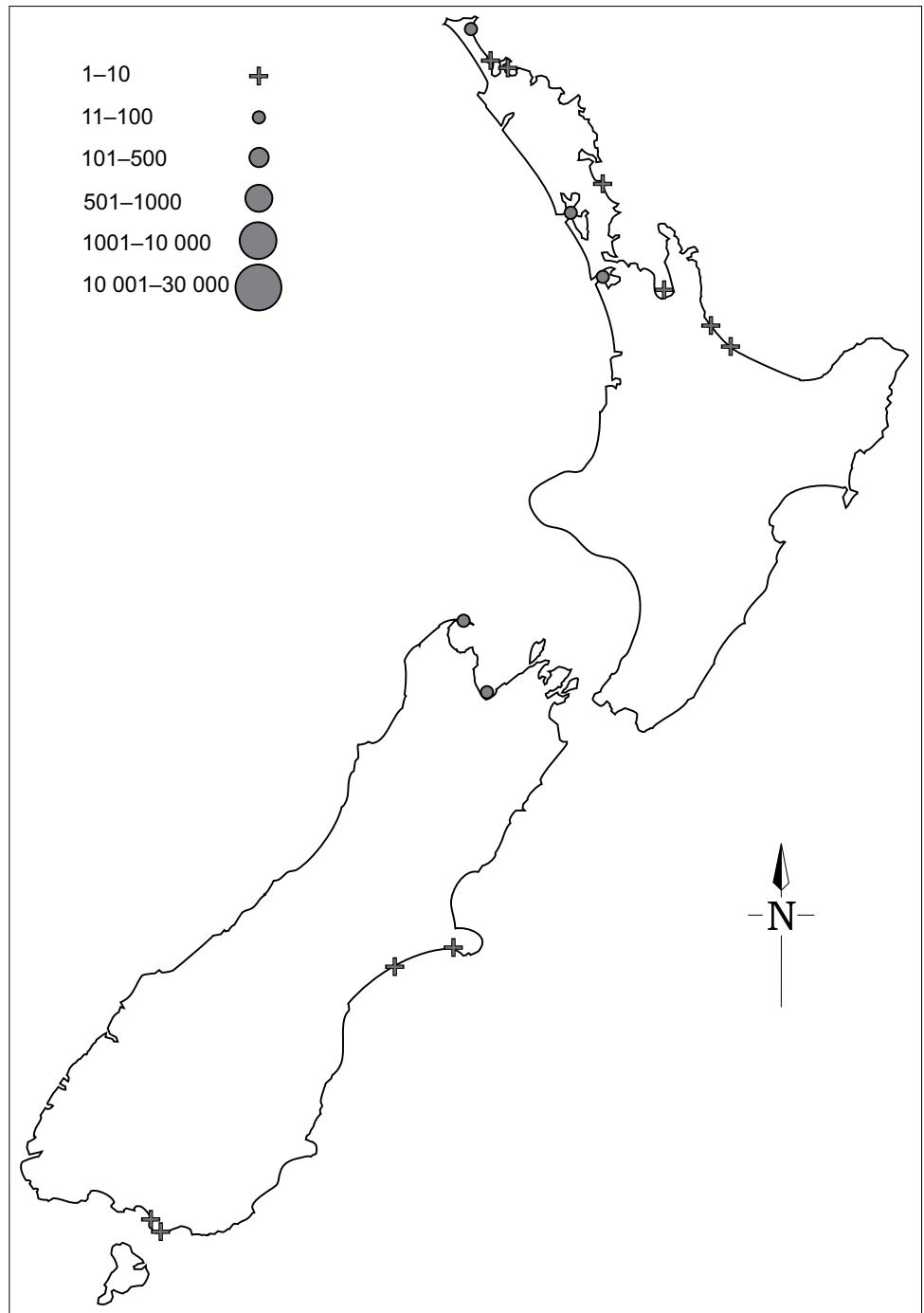


Figure 23. The distribution and abundance of turnstones (*Arenaria interpres*) in New Zealand during winter between 1995 and 2003. Only sites with more than one bird, on average, are shown.



### 3.4.4 Pacific golden plover (*Pluvialis fulva*)

Pacific golden plovers (*Pluvialis fulva*) were widespread, with 73–234 (average 156) birds counted in summer (Table 13; Fig. 24). However, very few of them (0.5%) overwinter in New Zealand, with a maximum of four birds being counted in any one year (Table 13). The most important sites appeared to be Kaipara Harbour, Lake Ellesmere (Te Waihora), Parengarenga Harbour, Farewell Spit and Kaituna Cut/Maketu Estuary. Pacific golden plovers are difficult to count and were probably often missed at some sites. Rather than using regular high-tide roosts, Pacific golden plovers will often move onto paddocks, especially when recently ploughed, and can be difficult to locate. They are also wary and may quickly leave a roost when disturbed. Three sites (Parengarenga Harbour, Whangarei Harbour and Manukau Harbour) tended to have larger flocks, but birds were not found during half or more of the counts. If these zero counts were disregarded, these sites would be among the top five locations for this species.

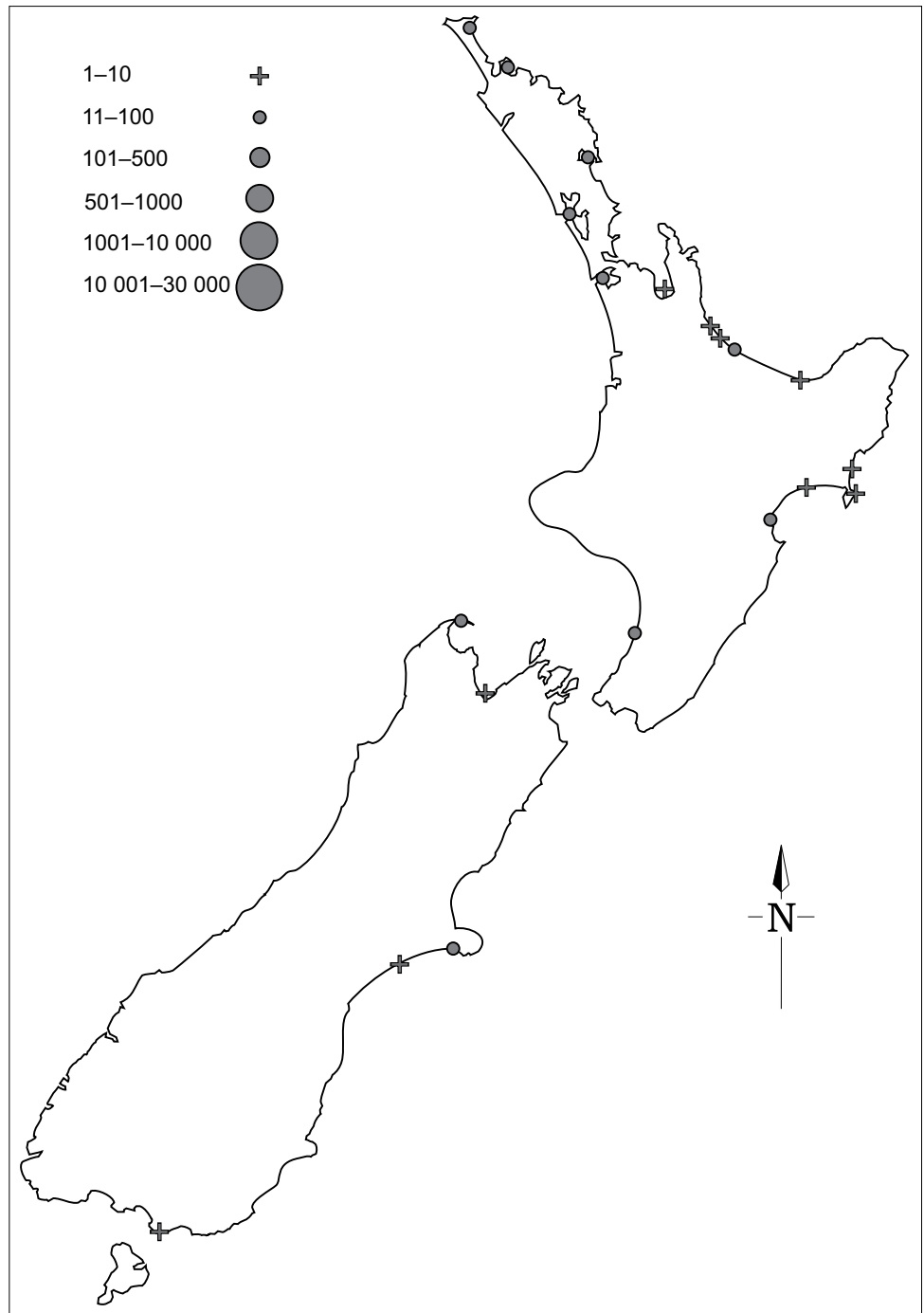
Between 1994 and 2003, numbers in this study were considerably lower than were recorded in the previous decade (Sagar et al. 1999). Not only was there poorer coverage of sites, but at the sites for which there were comparative data, numbers had halved (50%) overall (Table 17). This decline may have been exaggerated by the comparative shortage of good counts in this study; however, it is strongly indicated by a fall in numbers at almost every site. Only at Lake Ellesmere (Te Waihora) and Kaipara Harbour were similar numbers recorded as during the previous decade.

TABLE 17. TEN-YEAR AVERAGES OF PACIFIC GOLDEN PLOVER (*Pluvialis fulva*) COUNTS.

Data are presented for New Zealand sites where more than 10 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 1983–1994		
	COUNT	SEM	$n$	COUNT	SEM	$n$	COUNT	SEM	$n$
Kaipara Harbour	0	0	9	44	10	10	49	9	9
Lake Ellesmere (Te Waihora)	0	0	6	36	8	8	39	13	11
Parengarenga Harbour	0	0	2	29	29	3	75	27	8
Farewell Spit	0	0	3	21	9	3	15	3	11
Kaituna Cut/Maketu Estuary	0	0	6	17	5	6	27*	5	11
Whangarei Harbour	1	0	9	14	5	10			
Manukau Harbour	0	0	9	12	5	10	47*	7	11
Manawatu Estuary	0	0	1	12	0	1	32	2	11
Ahuriri Estuary	0	0	8	11	3	8	23*	5	11
Ohiwa Harbour	0	0	6	8	3	6	10	2	11
Awarua Bay	0	0	2	8	7	3	18	6	10
Wairoa Estuary	0	0	5	6	6	5	17*	5	11
Firth of Thames	0	0	9	4	2	9	32*	14	11
Invercargill Estuary	0	0	2	0	0	3	34*	11	9

Figure 24. The distribution and abundance of Pacific golden plovers (*Pluvialis fulva*) in New Zealand during summer between 1994 and 2003. Only sites with more than one bird, on average, are shown.



### 3.4.5 Red-necked stint (*Calidris ruficollis*)

The most common of the smaller sandpipers was the red-necked stint (*Calidris ruficollis*), with 53–152 birds counted in summer (Fig. 25) and 3–54 birds (5% of the summer population) overwintering at the same sites (Table 13). Most red-necked stints (69%) were found at just two sites, Lake Ellesmere (Te Waihora) and Awarua Bay. Occasionally, at some sites, more birds were counted in winter than in summer; however, it is unclear whether this reflects movement or birds being missed in counts.

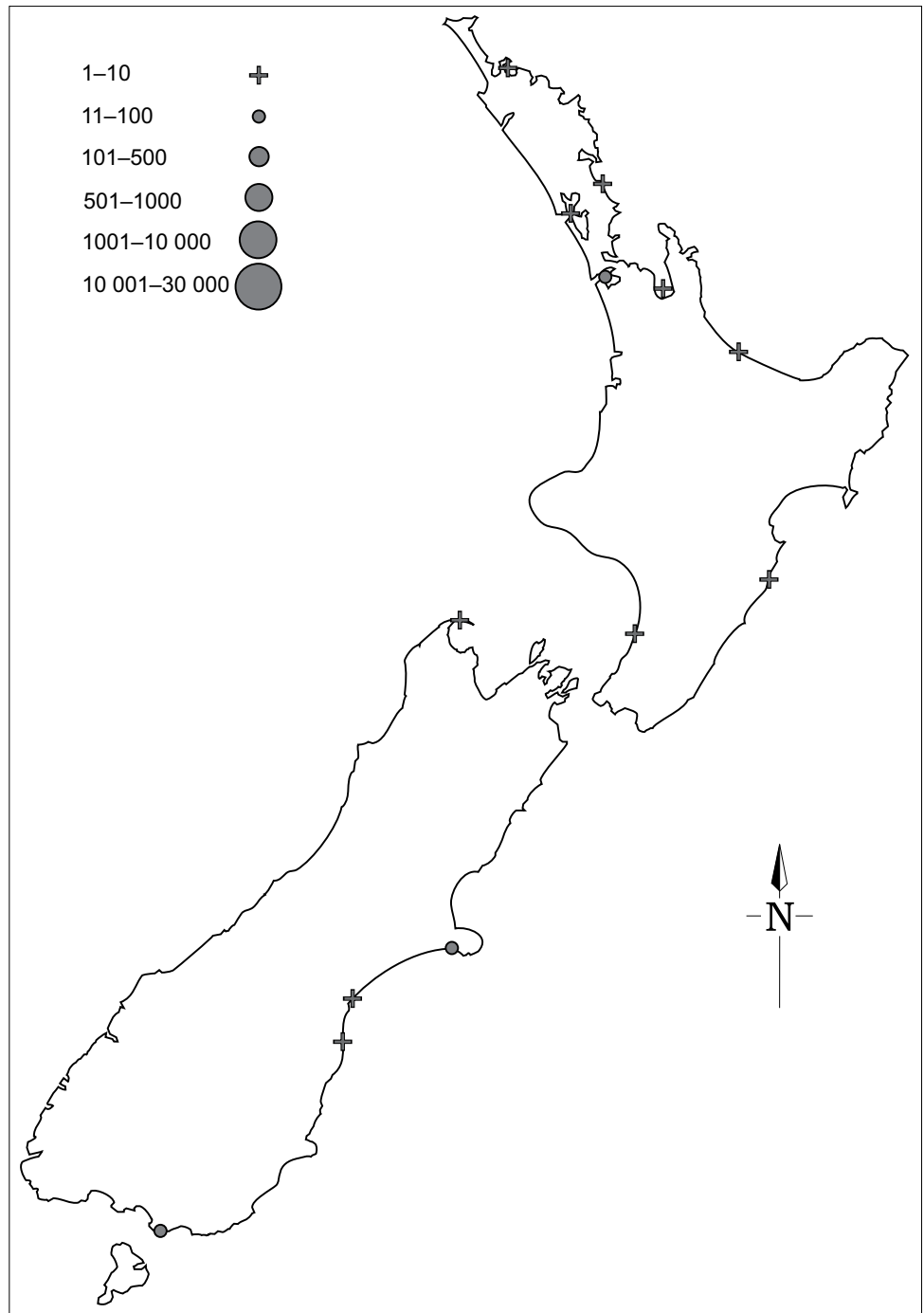
Although fewer red-necked stints were counted than in the previous decade (Sagar et al. 1999), average numbers at specific sites were very similar (+1%), with some sites a little higher and some a little lower (Table 18). The only well-counted site where numbers fell significantly was the Firth of Thames.

TABLE 18. TEN-YEAR AVERAGES OF RED-NECKED STINT (*Calidris ruficollis*) COUNTS.

Data are presented for New Zealand sites where more than 5 birds on average were counted in summer between 1994 and 2003, or that had comparative data in Sagar et al. (1999). 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	$n$
Lake Ellesmere (Te Waihora)	18	3	8	78	8	8	68*	8	11
Awarua Bay	11	11	2	28	9	3	27	6	11
Manukau Harbour	4	1	10	16	3	10	16	3	11
Kaipara Harbour	0	0	10	10	2	10	5*	1	9
Porangahau Estuary	3	1	7	8	1	7	7	2	8
Farewell Spit	1	1	3	8	4	3	15	2	11
Firth of Thames	1	0	10	2	1	10	5*	2	11
Parengarenga Harbour	2	2	2	0	0	3	6*	3	8

Figure 25. The distribution and abundance of red-necked stints (*Calidris ruficollis*) in New Zealand during summer between 1994 and 2003. Only sites with more than one bird, on average, are shown.





### 3.4.6 Whimbrel (*Numenius phaeopus*)

In summer, 36–152 (average 70) whimbrels (*Numenius phaeopus*) were counted (Fig. 26); 0–18 birds (about 6% of the summer population overall) remained during winter (Table 13). Numbers at specific sites with comparative data have declined by 23% since 1984–1994. However, there were few counts from Parengarenga Harbour and Farewell Spit, which typically hold larger populations (Table 19).

TABLE 19. TEN-YEAR AVERAGES OF WHIMBREL (*Numenius phaeopus*) COUNTS.

Data are presented for New Zealand sites where more than 1 bird on average was counted in summer between 1994 and 2003, or that had comparative data in Sagar et al. (1999). 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	$n$
Farewell Spit	1	0	3	16	7	3	15	2	11
Firth of Thames	1	0	9	16	2	10	19*	4	11
Kaipara Harbour	0	0	9	15	4	10	16	1	9
Whangarei Harbour	1	1	9	14	5	10			
Parengarenga Harbour	0	0	2	13	7	3	26	6	8
Manukau Harbour	1	1	9	5	3	10	6	2	11
Kawhia Harbour	1	0	9	6	1	9			
Oraka Beach/Mahia Peninsula	0	0	5	6	2	5			
Kaituna Cut/Maketu Estuary	0	0	6	3	1	6	3	1	11
Ohiwa Harbour	0	0	6	1	1	6	3*	1	11
Rangaunu Harbour	2	2	3	5	5	2			
Orowaiti Lagoon	2	0	1	0	0	0			

Figure 26. The distribution and abundance of whimbrels (*Numenius phaeopus*) in New Zealand during summer between 1994 and 2003. Only sites with more than one bird, on average, are shown.

