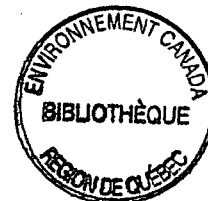


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# **Population trends of shorebirds during fall migration in insular Newfoundland 1980-2005**

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## **Summary**

An analysis of fall shorebird migration data was carried out for 14 common species from 12 sites in insular Newfoundland between 1980 and 2005, including 6 years of data collected by the Newfoundland and Labrador Shorebird Survey (NLSS) volunteers.

For most shorebird species using stopover sites in Newfoundland between 1980 and 2005, population levels fluctuated widely between years and decades. An interdecadal analysis revealed that the fluctuations of most species followed a similar pattern. For most species, the 1980's brought significant increases, the 1990's brought significant decreases, and from 2000 to 2005 most species declined at insignificant rates.

Although the population of all species fluctuated, the high population levels of the 1980's and the insignificant trends from 2000-2005 masked the large declines seen throughout the 1990's for most species. The 26 year rates of change for all 14 species were small in magnitude, with an almost even number of species demonstrating positive and negative trends.

Previous studies have reported declines in many shorebird species in the north Atlantic region since the 1970's. This analysis of Newfoundland data alone revealed that many species which have declined across the Maritimes were species that increased in Newfoundland, possibly indicating a shift in preferred migration stop over areas within the Atlantic region.

Long term volunteer monitoring programs, such as the NLSS, provide invaluable contributions to long term monitoring programs at minimal cost and help spread awareness and involvement in both regional and national conservation.

## **Résumé**

Les données recueillies de 1980 à 2005 sur la migration automnale de 14 espèces communes d'oiseaux de rivage ont été analysées pour 12 stations de l'île de Terre-Neuve. Cette analyse visait également les données amassées pendant six ans par les bénévoles participant au Relevé des oiseaux de rivage de Terre-Neuve-et-Labrador.

Chez la plupart des populations d'oiseaux de rivage qui ont fait halte à Terre-Neuve entre 1980 et 2005, les effectifs ont connu d'importantes fluctuations annuelles et décennales. Une analyse interdécennale révèle que les fluctuations enregistrées pour la plupart des espèces suivent un profil semblable. Les années 1980 ont été marquées par un essor démographique considérable, et les années 1990, par une baisse appréciable des effectifs. De 2000 à 2005, la plupart des espèces ont connu de très légères baisses de population.

Même si les populations de l'ensemble des espèces ont connu des fluctuations, les niveaux de population élevés des années 1980 et les tendances à peine perceptibles de 2000 à 2005 masquent les baisses importantes enregistrées tout au long des années 1990. Les taux de changement calculés sur 26 ans chez les 14 espèces sont faibles, et le nombre d'espèces présentant des tendances démographiques positives est à peu près égal au nombre d'espèces affichant des tendances négatives.

Des études antérieures signalent des baisses d'effectif chez de nombreuses espèces d'oiseaux de rivage de l'Atlantique Nord depuis les années 1970. Cette analyse des seules données de Terre-Neuve révèle qu'un grand nombre d'espèces caractérisées par un déclin dans les provinces Maritimes connaissent en fait un essor à Terre-Neuve, ce qui témoigne peut-être d'une tendance vers le choix de nouvelles haltes migratoires dans la région de l'Atlantique.

Les programmes de surveillance bénévole à long terme comme le Relevé des oiseaux de Terre-Neuve-et-Labrador contribuent pour beaucoup aux programmes de surveillance à long terme, tout en réduisant les coûts au minimum. De plus, ces initiatives sensibilisent la population et l'amènent à participer aux efforts de conservation régionaux et nationaux.

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## 1. Introduction

Many North American shorebird species breed in Arctic Canada and migrate to wintering grounds thousands of kilometres away in South America. Traditional flyways are generally followed during migration, the most easterly in North America being the Atlantic flyway. This flyway tracks north inland over the eastern provinces of Canada during the spring and follows a south-easterly coastal route during the fall (Morrison, 1984). This southern route includes Newfoundland and Labrador (NL) where large numbers of shorebirds stop during the late summer and early fall each year to refuel before continuing on southern migration. For many birds Atlantic Canada may be the last stop before a continuous flight over the Atlantic Ocean to South America (Hicklin, 1987).

During migration, shorebirds utilize a vast number of habitats spanning the entire hemisphere and face many threats along the way. Large scale threats include a drastic reduction in coastal wetland habitat in North America (Bildstein et al., 1991), the conversion of grassland habitat to agricultural land (Page and Gill, 1994), and changes in northern breeding areas due to hydroelectric developments (Maisonneuve, 1993). Climate change may alter food availability and weather patterns over large spatial and temporal scales, altering the opportunity to store body fat reserves and increasing metabolic migration costs (Morrison, 2001a). On a local scale, feeding patterns, habitat selection and behaviour may be interrupted by factors such as increased human disturbance at staging areas (Pfister et al., 1992; Thomas et al., 2003) and oil spills (Burger, 1997).

Declines in shorebird populations along the Atlantic coast of North America have been documented since the 1970's. Morrison and Hicklin (2001) reported that 13 of 16 shorebird species had decreased (6 significantly) from the 1970's to the 1990's in the Atlantic Provinces of Canada. An analysis of International Shorebird Survey (ISS) data from the north eastern United States indicated that 9 of 12 species declined (4 significantly) from 1972-1983 (Howe et al., 1989). Data from Breeding Bird Surveys (BBS) indicated that between 1966 and 1999, 10 of 13 shorebird species breeding in southern Canada showed negative trends (3 significant) (Morrison, 2001b). Declines have also been reported for some species at northern Canadian breeding grounds in the Rasmussen Lowlands, Northwest Territories (Gratto-Trevor et al., 1998), Creswell Bay, Nunavut (Latour et al., 2005), Churchill, Manitoba (Hitchcock and Gratto-Trevor, 1997), and Truelove lowland, Devon Island, Northwest Territories (Pattie, 1990).

In 1974 the Manomet Center for Conservation Sciences, based in Massachusetts, organized the International Shorebird Surveys (ISS) to gather information on migrating shorebirds and their habitats in North and South America. As part of that initiative, the Canadian Wildlife Service (CWS) began coordinating the Maritimes Shorebird Survey (MSS) through their Atlantic regional headquarters in New Brunswick. The MSS encompassed surveys from sites in all of the Atlantic Provinces including Newfoundland and Labrador. Widespread volunteer participation occurred in the Maritimes, however participation in Newfoundland was limited to surveys carried out by Parks Canada staff and a small number of dedicated long term volunteers.

In the year 2000, Canada and the United States each developed a shorebird conservation plan (Donaldson et. al., 2000; Brown et. al., 2001). These plans stressed the need for continued monitoring of shorebird populations. With this renewed interest in shorebird conservation, the Newfoundland and Labrador Shorebird Survey (NLSS) was

re-launched by CWS in Newfoundland with a successful new drive to increase volunteer participation. In 2003, the MSS and NLSS programs merged to form the Atlantic Canada Shorebird Survey (ACSS), however the coordination of the Newfoundland and Labrador chapter of the ACSS continued from CWS in Newfoundland.

In this report, data collected in Newfoundland by Parks Canada (Parks Canada, unpublished data) and the Shorebird Survey volunteers were analyzed for trends in 14 common shorebird species using stopover sites in insular Newfoundland during 1980-2005.

## **2. Methods**

### **2.1 Survey Sites**

Parks Canada staff and Shorebird Survey volunteers selected a survey site based on the abundance and diversity of shorebirds and the logistical convenience of the site. Although almost 200 sites have been surveyed for shorebirds in the province, only 12 sites were surveyed regularly since 1980, and these sites were used in the trend analysis. The 12 locations were well distributed throughout insular Newfoundland (Figure 1). No sites in Labrador were surveyed consistently enough throughout this period to be included.

### **2.2 Survey Protocol**

The ISS has created guidelines and protocols which are used across the western hemisphere to ensure consistent shorebird data collection. The MSS and NLSS follow the ISS protocols, which are provided for volunteers in the Atlantic Canada Shorebird Survey Newfoundland and Labrador Training Manual (Environment Canada, 2005). All volunteers were provided with the training manual and standardized sheets for recording data. As well, most volunteers attended a training presentation. Parks Canada staff followed the original protocols of the MSS since its inception, and also received the training manual, data sheets and presentation when the NLSS was re-launched in 2000. Observers determined a set survey route within their survey area and were instructed to conduct the survey at the same tide level during good weather conditions. Observers recorded the maximum number of individuals of each shorebird species present in their survey area. The start and end time, weather conditions, other wildlife, disturbances present and the plumage of the shorebirds were also noted.

Ideally, surveys were conducted once approximately every ten days from the last week of July until the last week of October to encompass the main period of fall migration. After the last survey, observers submitted their data sheets to the shorebird survey coordinator who was responsible for checking data and data entry.

### **2.3 Data Analysis**

The timing of surveys at each site ranged from July to November, which we considered fall migration. Visual inspection of the data showed that most species demonstrated a linear decline in abundance within this time period, therefore survey day of year was added as a covariate in the analysis.



Fourteen species of shorebird had sufficient data to be included in the analysis. To examine population trends, all abundance counts were first log transformed to help normalize the data, after adding 0.23. To address the issue of most sites not having data collected in all years (i.e. missing cells), and to deal with among-plot variance, a repeated measures ANCOVA was conducted in SAS (PROC MIXED, SAS Institute 2001). In the analysis, year and day of year were both treated as covariates, while site was treated as a subject. The variance components option (only variance within each site was estimated) was used to model the variance-covariance structure of the sites; more complex structures that included covariance terms would not converge due to sparse data. A similar analysis was conducted for each species within each decade (1980-1989, 1990-1999, 2000-2005) to facilitate comparisons with earlier studies (Morrison et al. 1994). Instantaneous rates of increase, extracted as the slope of the year term, were transformed to their discrete time equivalent, to present annual rates of change. Least square means were calculated and graphed for each species within each decade to compare population levels across decades.

A critical alpha of 0.05 was used throughout, means are presented  $\pm 1$  SE and all tests were two-tailed. Table wide Bonferroni adjustments in critical P-values were not made, in an effort to minimize the risk of ignoring biologically important rates of population trend. Instead, the focus was more on the magnitude and direction of rates of change in the counts.

### 3. Results

#### 3.1 Population Trends 1980 - 2005

Trends for 8 of 14 species were positive, with 4 being significant: White-rumped Sandpiper (*Calidris fuscicollis*), Semipalmated Plover (*Charadrius semipalmatus*), Sanderling (*Calidris alba*) and Ruddy Turnstone (*Arenaria interpres*). Negative trends were seen for 6 species, 3 of which were significant: Least Sandpiper (*Calidris minutilla*), Spotted Sandpiper (*Actitis macularia*), and Lesser Yellowlegs (*Tringa flavipes*). All annual % changes were relatively small, and ranged between  $+2.52\% \pm 0.57$  per year for the Sanderling, to  $-2.40\% \pm 0.45$  per year for the Spotted Sandpiper (Table 1). It is apparent from Figure 2 that there is a high amount of annual variation in shorebird population levels. This is reflected in the low  $r^2$  values associated with the regressions.

#### 3.2 Interdecadal Comparisons

Population trends differed in magnitude and direction between the 1980's, 1990's and 2000-2005 (Table 2). An analysis of the least square means for each shorebird species for each decade indicated that these population fluctuations were often significant between the decades (Figure 3).

The majority of shorebird species (11 of 14) showed significant increases during the 1980's. All other trends were insignificant. Large annual trends were evident in the White-rumped Sandpiper ( $+23.0\% \pm 6.4/\text{yr}$ ), Black-bellied Plover (*Pluvialis squatarola*) ( $+18.4\% \pm 3.8/\text{yr}$ ), Semipalmated Sandpiper (*Calidris pusilla*) ( $+17.2\% \pm 4.1/\text{yr}$ ), Semipalmated Plover ( $+16.0\% \pm 4.1/\text{yr}$ ), and Ruddy Turnstone ( $+13.5\% \pm 3.1/\text{yr}$ ) (Table 2).

Between 1990 and 1999, the majority of shorebird species (9 of 14) significantly decreased and 4 species showed insignificant decreases. The Black-bellied Plover

showed the highest annual decrease ( $-20.9\% \pm 4.7/\text{yr}$ ), followed by the Semipalmated Sandpiper ( $-14.6\% \pm 6.6/\text{yr}$ ) and Ruddy Turnstone ( $-14.0\% \pm 4.0/\text{yr}$ ) (Table 2). The only significant increase occurred for the Spotted Sandpiper ( $+15.0\% \pm 3.6/\text{yr}$ ) (Table 2).

The Sanderling ( $-16.6\% \pm 4.5/\text{yr}$ ) and American Golden Plover (*Pluvialis dominica*) ( $-4.74\% \pm 2.03/\text{yr}$ ) were the only species to demonstrate significant declines between 2000 and 2005 (Table 2). All other trends were insignificant, with 9 being negative and 3 positive.

#### **4. Discussion**

##### **4.1 Overall Trends**

In spite of some significant increases and declines, overall the populations of all 14 shorebird species remained fairly stable from 1980 to 2005. Population growth rates ranged within -2.5% to 2.5% for all 14 species examined.

##### **4.1.1 Shorebird Species Demonstrating Population Increases in Newfoundland**

There were a greater number of positive trends demonstrated during the entire study period for shorebird species stopping over in Newfoundland than in the Maritimes in previous studies (Morrison and Hicklin 2001), and individual species did not show similar trends in both areas. Many species that showed increases in Newfoundland during the entire study period were species that showed decreases in the Maritimes.

The White-rumped Sandpiper, Semipalmated Plover, Sanderling and Ruddy Turnstone showed significant increases in Newfoundland in this study, but were shown to have decreased in the Maritimes from the 1980's to the 1990's (Morrison and Hicklin 2001). The Semipalmated Sandpiper, Dunlin (*Calidris alpina*) and Short-billed Dowitcher (*Limnodromus griseus*) all showed insignificant increases in Newfoundland during the study period, but all significantly decreased in the Maritimes from the 1980's to the 1990's (Morrison and Hicklin 2001).

Many of the shorebird sites in Newfoundland are remote and are subject to few anthropogenic disturbances. In fact, the population of rural Newfoundland declined by 10.6% in the 1990's compared to a decline of less than 2.7% in the rural Maritimes (de Peuter and Sorensen, 2005a,b,c,d). This large decline in Newfoundland would presumably result in less disturbance at many locally important shorebird areas. This suggests that an increased number of birds of certain species may be choosing less disturbed sites in Newfoundland over other sites in the north Atlantic region. Undoubtedly other factors such as weather are contributing as well. The population increases documented for certain species in this study may in fact be a reflection of large scale land use shifts during migration, rather than true population increases.

Shorebird data from Newfoundland was clumped in with the Maritimes in previous studies masking the opposing trends between the two areas, suggesting that data for these two regions should not be clumped in future studies.

#### 4.1.2 Shorebird Species Demonstrating Population Decreases in Newfoundland

Two upland species of shorebird, the American Golden-Plover and Whimbrel (*Numenius phaeopus*), showed opposite trends to those mentioned above. Both showed insignificant decreases in Newfoundland from 1980-2005, but increased in the Maritimes from the 1980's to the 1990's (Morrison and Hicklin 2001). This may be a reflection of the different upland habitat used by these species compared to the coastal habitat of the shorebirds that increased in Newfoundland.

Other species seem to be declining across their entire north Atlantic range. The Least Sandpiper and Spotted Sandpiper decreased significantly in Newfoundland and were also shown to have decreased in the Maritimes (Morrison and Hicklin 2001). The Lesser Yellowlegs significantly decreased in Newfoundland and showed a large significant decrease from 1980 to 1999 on their North American breeding grounds (Morrison, 2001b). Black-bellied Plovers decreased albeit insignificantly in both Newfoundland and the Maritimes (Morrison and Hicklin 2001).

#### 4.2 Interdecadal Comparisons

Because it was evident from the regression analysis that there were large fluctuations in population levels within the study period, it was informative to look at patterns on a shorter temporal scale, as did Morrison (1994) and Morrison and Hicklin (2001).

##### 4.2.1 Shorebird Populations in the 1980's

Comparisons with other studies revealed that shorebird populations followed similar patterns since 1980 in the Atlantic Provinces.

The 1980's was a time of population increase for many shorebird species. For 10 of the 14 shorebird species analyzed in this study, significant population increases occurred during the 1980's. Morrison et al. (1994) reported increases in 11 of 13 species (5 significant) in the Atlantic Provinces between 1980 and 1985, and an even number of declines and increases between 1986 and 1991. Species showing increases in both the Maritimes and Newfoundland during the 1980's were the Semipalmated Plover, Semipalmated Sandpiper, Sanderling, Black-bellied Plover, Ruddy Turnstone and Least Sandpiper.

Weather in Arctic breeding grounds may have been a key factor driving population trends. Mean June temperatures were particularly low in the eastern Canadian Arctic during the 1970's, and severe weather there in 1974 caused many shorebirds to die of starvation (Morrison et al., 1994). Severe Arctic weather conditions continued into the late 1970's. This period of bad weather may have influenced the negative trends reported by Morrison et al. (1994) and Howe et al. (1989) during the 1970's.

Shorebird populations were generally at a low level at the end of the 1970's. In the early 1980's, a time of more stable weather patterns began across the Arctic, and this coincided with a rebound in shorebird populations on the north Atlantic coast. For many species in Newfoundland, for example, White-rumped Sandpiper, Semipalmated Plover, Semipalmated Sandpiper, Sanderling and Ruddy Turnstone, the increases during the 1980's were so dramatic that they masked significant or long-term declines in subsequent decades.

#### 4.2.2 Shorebird Populations from 1990 to 2005

During the 1990's and through to 2005, most species stopping over in Newfoundland showed declines. Surveys throughout the Atlantic Provinces were also shown to be significantly lower in the 1990's than in the 1970's and 1980's (Morrison and Hicklin, 2001). The following species declined in both Newfoundland and the Maritimes during the 1990's: White-Rumped Sandpiper, Semipalmated Plover, Semipalmated Sandpiper, Sanderling, Black-bellied Plover, Ruddy Turnstone, Least Sandpiper and Dunlin.

These declines may have again been influenced by Arctic weather. The breeding season of 1992 was extremely poor across the entire Arctic (Ganter and Boyd 2000). Latour et al., (2005) reported that in 1996 a late spring with prolonged snow cover prevented all shorebird breeding in Creswell Bay, Nunavut. This late snow cover may have also affected nearby shorebird breeding areas, thus contributing to declines.

Factors occurring at other stop-over areas of the Atlantic flyway also may have contributed to the shorebird decline in the 1990's. Delaware Bay, New Jersey hosts the largest concentration of shorebirds using the Atlantic flyway on northbound migration. At this site, eggs of the Horseshoe Crab, *Limulus polyphemus* constitute the bulk of the shorebird diet (Tsipoura and Burger, 1999). Horseshoe crabs are also harvested in this area for use in the pharmaceutical industry and as bait for other fisheries. Spawning populations of Horseshoe Crab declined by approximately 75% between 1990 and 2001, and populations have remained low to 2005 (Swan et al., 2001; Swan et al., 2005).

The most abundant shorebirds using Delaware Bay as a stop-over area, and therefore the most dependant on Horseshoe Crab eggs are the Semipalmated Sandpiper, Ruddy Turnstone, Red Knot (*Calidris cantutus*) and Sanderling (Clark et al., 1993). These species were among those showing the highest decreases during the 1990's in Newfoundland, with the exception of the Red Knot for which there was not enough Newfoundland data to assess. Although the Red Knot is not a common migrant in Newfoundland, this species has shown major declines in the 1990's across its range (Morrison et al., 2004; Morrison and Hicklin, 2001). The Semipalmated Sandpiper, Ruddy Turnstone and Sanderling all showed declines in the Maritimes during the 1990's as well. This decline in prey may have been a major factor influencing the population of these shorebird species.

#### 5. Conclusion

The majority of shorebird species using Newfoundland as a stop-over area during southward migration showed high population fluctuations between years and decades, but fairly stable population levels overall from 1980 to 2005.

However, it appears that some species may be showing long term population declines. The Least Sandpiper, Spotted Sandpiper, Lesser Yellowlegs, and Black-bellied Plover have shown major decreases in both Newfoundland and the Maritimes. No species showed increases in both areas. After the large population increases of the 1980's, most shorebird species began a period of decline which continued throughout the 1990's and may be extending into the first decade of the 21<sup>st</sup> century. In order for shorebird populations to maintain the fairly stable trends they have exhibited from 1980 to 2005, they will need to enter a period of increase soon. It remains to be seen if this will occur.

Shorebirds are facing a myriad of threats which may hinder population growth. Weather in the Arctic and prey availability during migration may only be parts of the bigger picture. Climate change may play an important role in the future of this group of birds, as its effects will be felt most severely in the Arctic and low lying coastal areas (Galbraith et al., 2002; Morrison, 2001a; Piersma and Lindstrom, 2004).

A priority for future research will be to integrate long term information on trends and the biological status of shorebirds occupying stopover habitats with additional studies on habitat use to obtain a more complete understanding of the ecosystem. This may help identify possible causes for population trends observed.

A priority in Newfoundland will be to continue monitoring existing sites and increase volunteer participation in the ACSS, especially in areas where long term information has not been collected or is incomplete. Emphasis should be placed on Labrador, where little information is available.

Monitoring shorebirds at migratory stop-over sites has become the most important tool in addressing population trends in this group because of the logistical and financial difficulties associated with Arctic breeding surveys. Volunteer programs such as the ISS, ACSS, and BBS allow monitoring of these species at minimal cost, and help spread awareness and involvement in conservation issues to local people. It is because of the contributions of hundreds of such individuals who volunteer their time and energy to monitor shorebirds that we have a large part of the data used in this report. Together, this and other data collected through volunteer monitoring efforts vastly improves our understanding of the global ecosystem that we are all part of, and helps to ensure that the health of our environment is preserved for the future.

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Table 1: Population trends calculated using regression for common shorebird species in insular Newfoundland on southern migration during the period 1980-2005 (n=12 sites).

Species	Trend	Annual change (%)	P
Greater Yellowlegs	0.004	0.44	0.549
White-rumped Sandpiper	0.024	2.48	0.013
Semipalmated Plover	0.017	1.68	0.045
Semipalmated Sandpiper	0.006	0.56	0.511
Sanderling	0.025	2.52	<.0001
Black-bellied Plover	-0.010	-1.03	0.174
Ruddy Turnstone	0.019	1.92	0.004
American Golden-Plover	-0.002	-0.23	0.468
Whimbrel	-0.004	-0.38	0.338
Least Sandpiper	-0.013	-1.33	0.018
Dunlin	0.006	0.61	0.093
Spotted Sandpiper	-0.024	-2.40	<.0001
Lesser Yellowlegs	-0.012	-1.18	0.018
Short-billed Dowitcher	0.005	0.52	0.211

Grey shading indicates a significant trend



Table 2: Population trends calculated using regression for common shorebird species in insular Newfoundland on southern migration during the 1980's, 1990's and 2000-2005 (n=12 sites).

Species	1980-1989			1990-1999			2000-2005		
	Trend	Annual change (%)	P	Trend	Annual change (%)	P	Trend	Annual change (%)	P
Greater Yellowlegs	0.015	1.47	0.613	0.108	11.4	0.075	0.059	6.08	0.333
White-rumped Sandpiper	0.207	23.0	< 0001	-0.142	-13.2	0.070	-0.073	-7.01	0.326
Semipalmated Plover	0.148	16.0	< 0001	-0.022	-2.21	0.740	-0.030	-2.99	0.630
Semipalmated Sandpiper	0.159	17.2	< 0001	-0.158	-14.6	0.047	-0.024	-2.36	0.685
Sanderling	0.058	6.01	0.002	-0.107	-10.2	0.0004	-0.181	-16.6	0.001
Black-bellied Plover	0.169	18.4	< 0001	-0.235	-20.9	0.0002	-0.096	-9.17	0.072
Ruddy Turnstone	0.126	13.5	< 0001	-0.151	-14.0	0.002	-0.069	-6.70	0.210
American Golden-Plover	0.037	3.75	0.008	-0.088	-8.42	0.004	-0.049	-4.74	0.023
Whimbrel	-0.005	-0.51	0.778	-0.119	-11.3	0.002	-0.045	-4.35	0.062
Least Sandpiper	0.073	7.57	0.012	-0.062	-5.98	0.188	-0.023	-2.27	0.473
Dunlin	0.039	3.40	0.001	-0.089	-8.46	0.022	0.022	2.18	0.463
Spotted Sandpiper	-0.036	-3.49	0.117	0.140	15.0	< 0001	-0.022	-2.14	0.491
Lesser Yellowlegs	0.088	9.15	0.001	-0.104	-9.90	0.002	0.016	1.59	0.593
Short-billed Dowitcher	0.078	8.15	< 0001	-0.047	-4.55	0.166	-0.055	-5.38	0.076

Grey shading indicates a significant trend

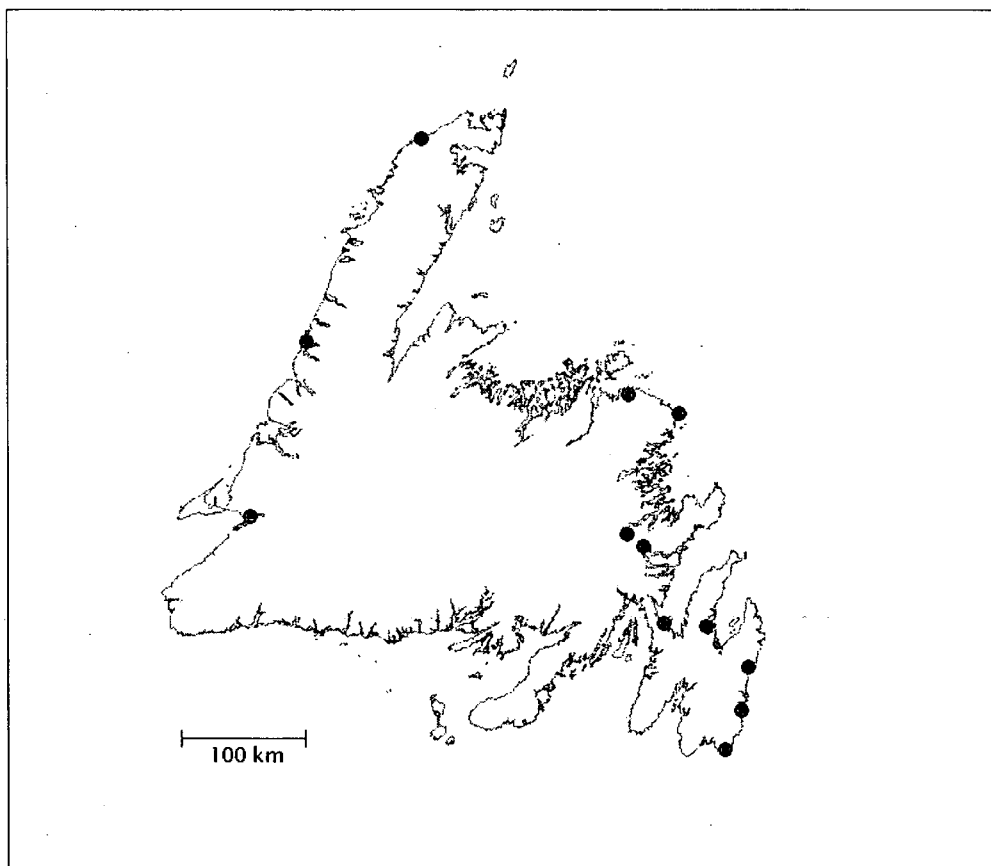


Figure 1: Shorebird survey sites in insular Newfoundland 1980-2005, with sufficient data for trend analysis.

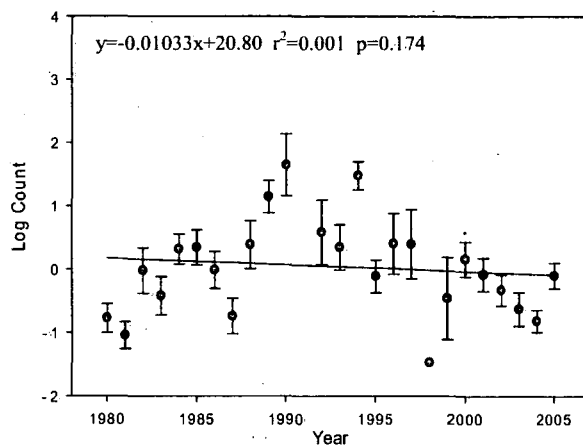
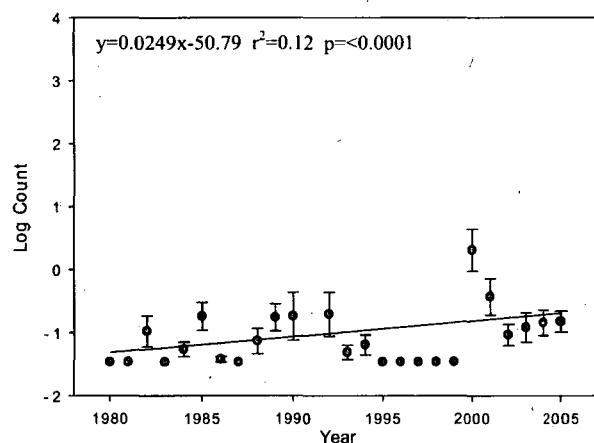
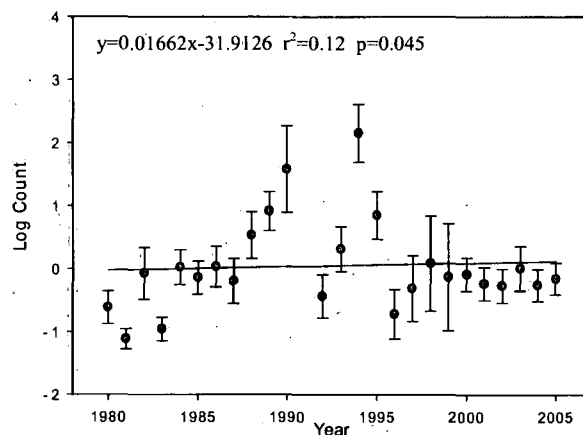
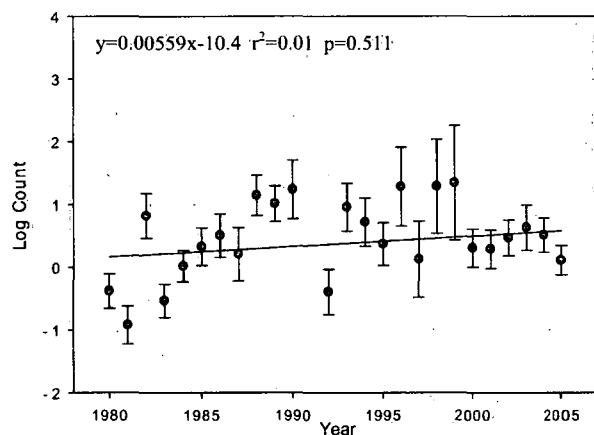
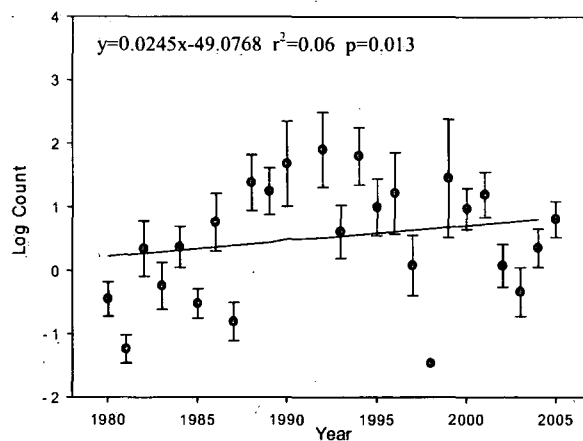
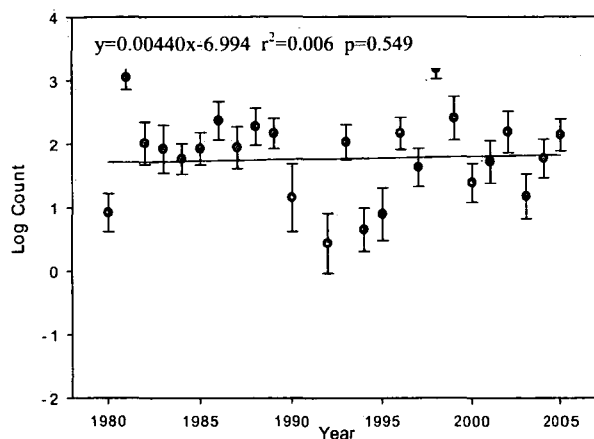
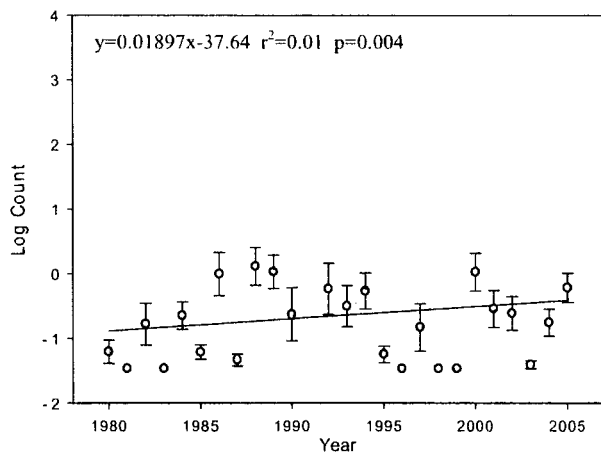
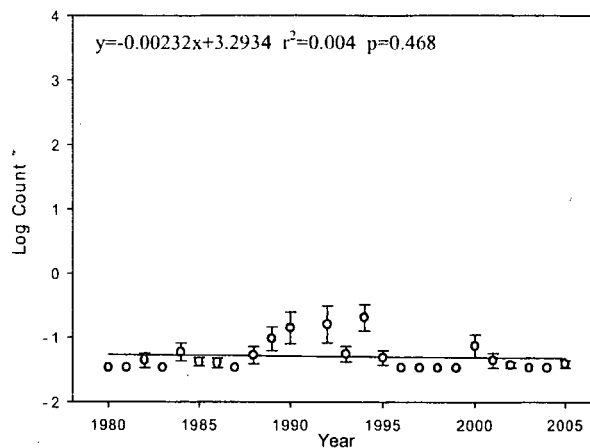


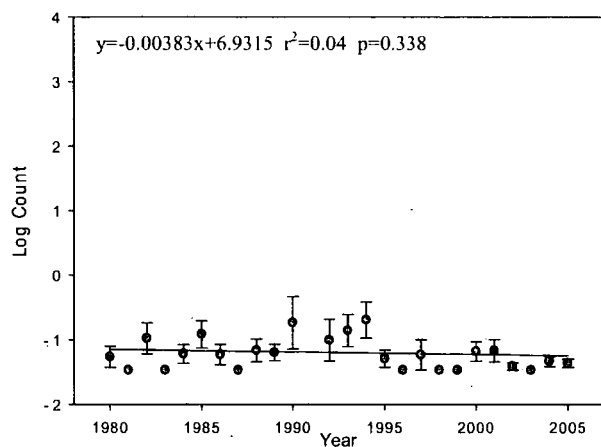
Figure 2. Population trends of 14 common shorebird species in insular Newfoundland from 1980-2005 (n=12 sites).



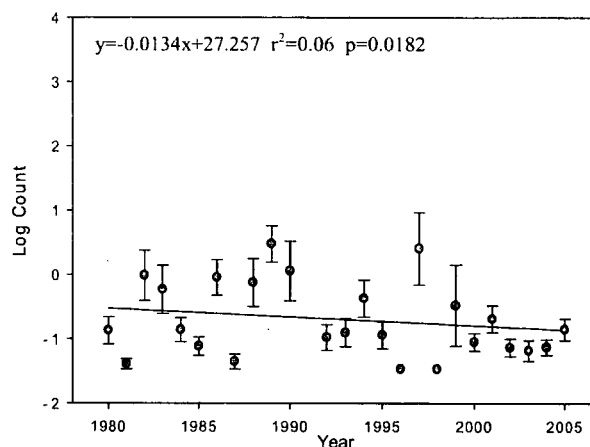
Ruddy Turnstone



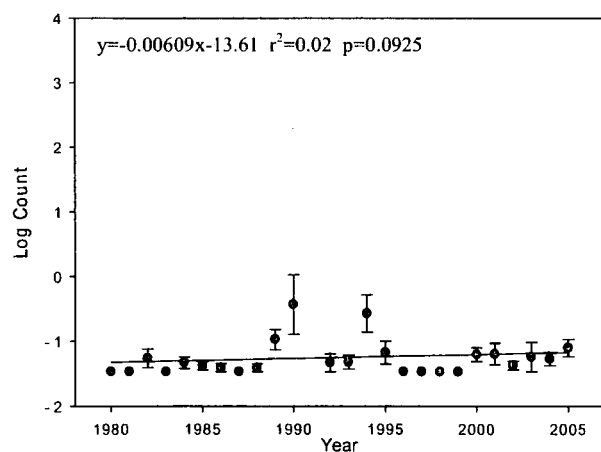
American Golden Plover



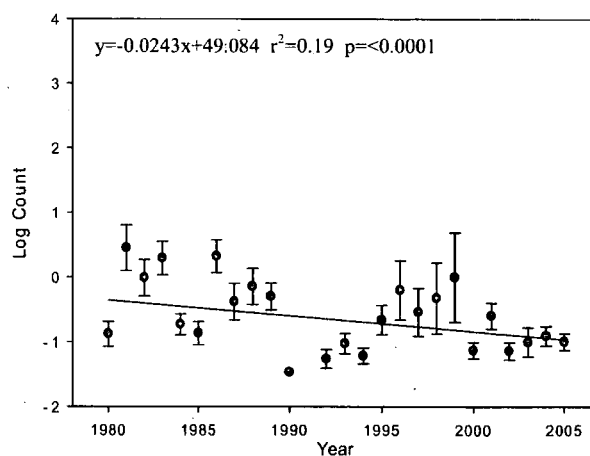
Whimbrel



Least Sandpiper

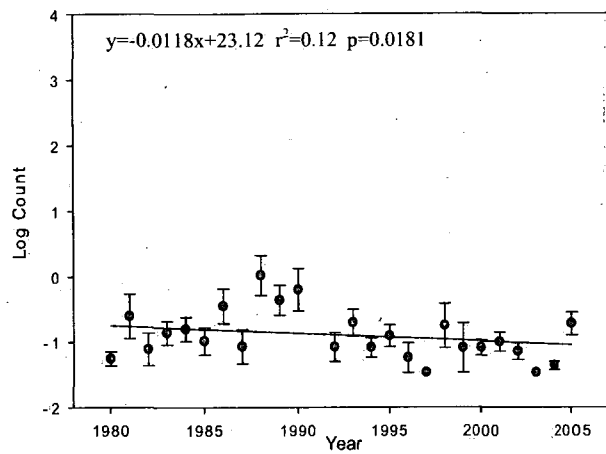


Dunlin

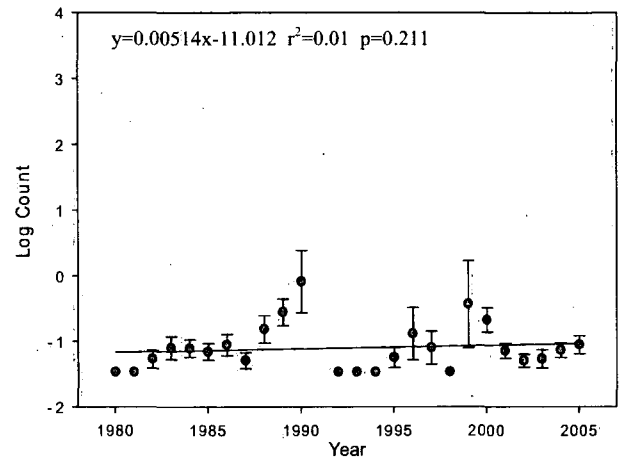


Spotted Sandpiper

Figure 2. Population trends of 14 common shorebird species in insular Newfoundland from 1980-2005 (continued) (n=12 sites).

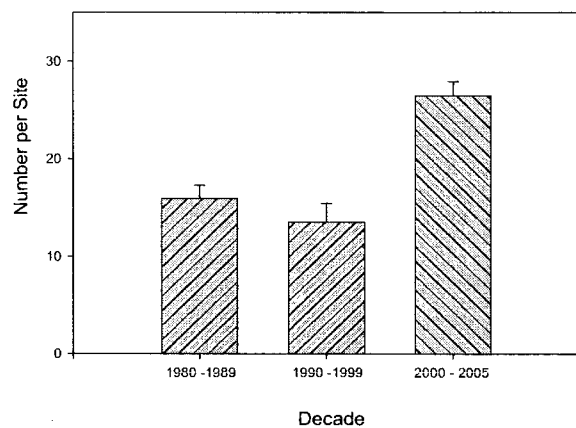


Lesser Yellowlegs

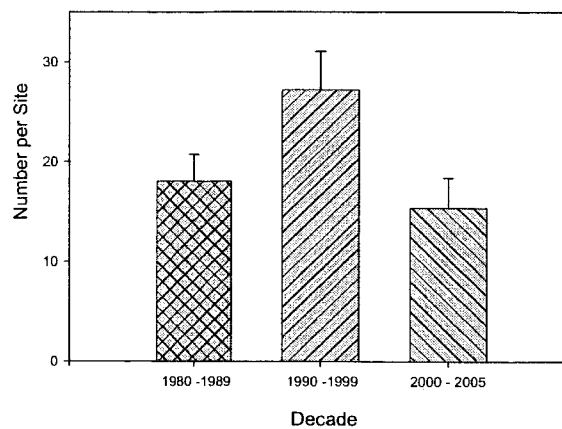


Short-billed Dowitcher

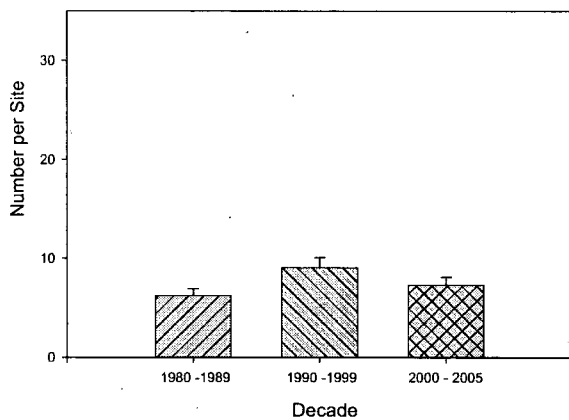
Figure 2. Population trends of 14 common shorebird species in insular Newfoundland from 1980-2005 (continued) (n=12 sites).



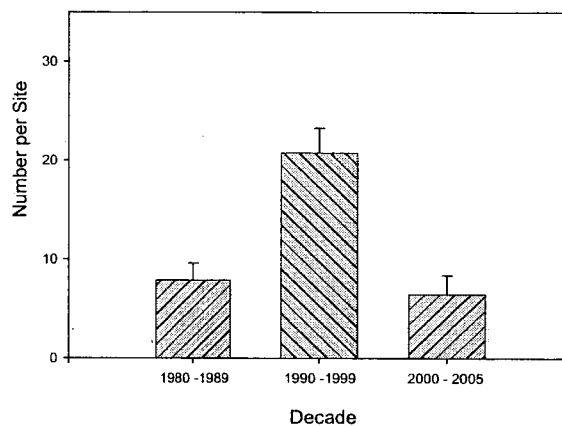
Greater Yellowlegs



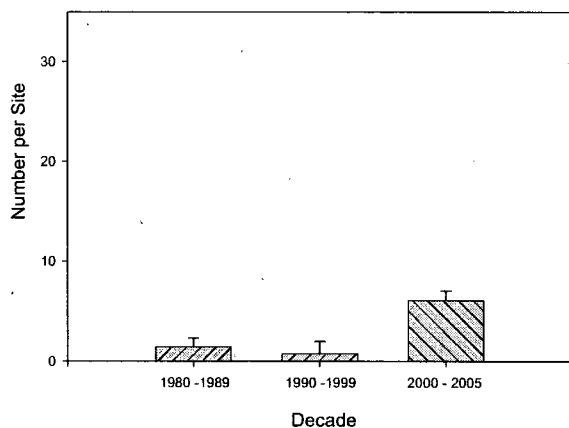
White-rumped Sandpiper



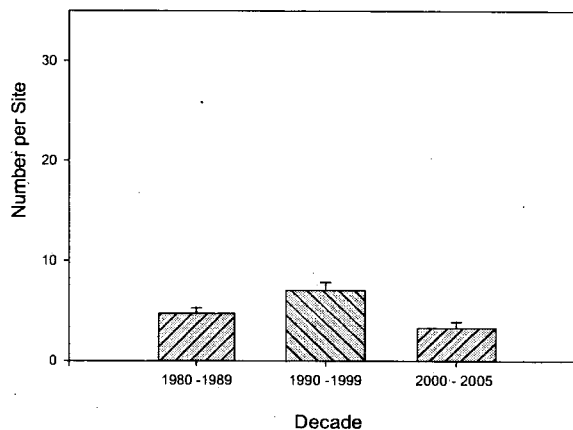
Semipalmated Plover



Semipalmated Sandpiper

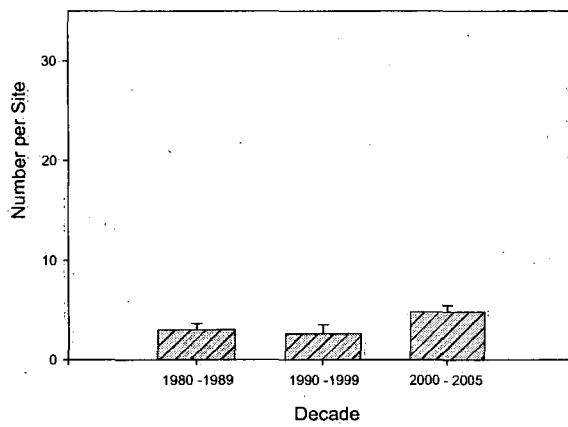


Sanderling

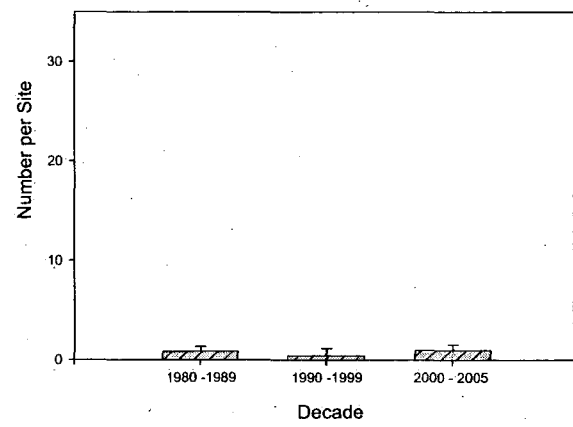


Black-bellied Plover

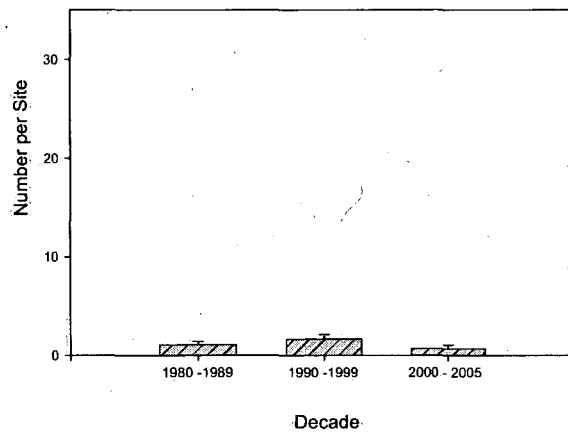
Figure 3: Least square means of shorebird populations in insular Newfoundland from 1980-1989, 1990-1999 and 2000-2005 (n=12 sites).



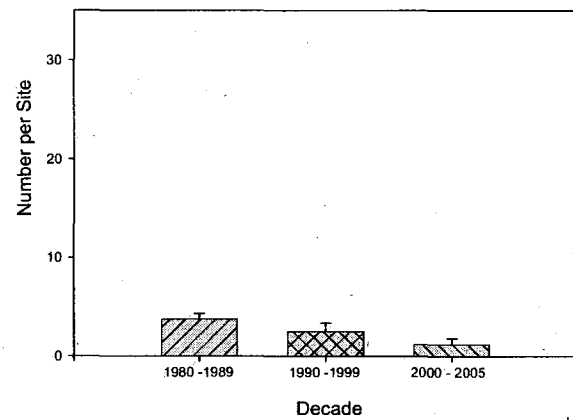
Ruddy Turnstone



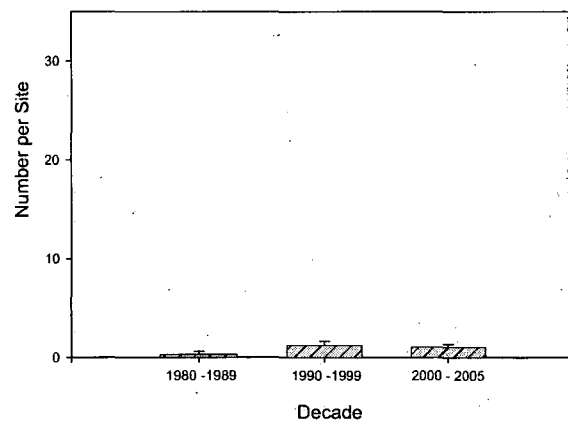
American Golden Plover



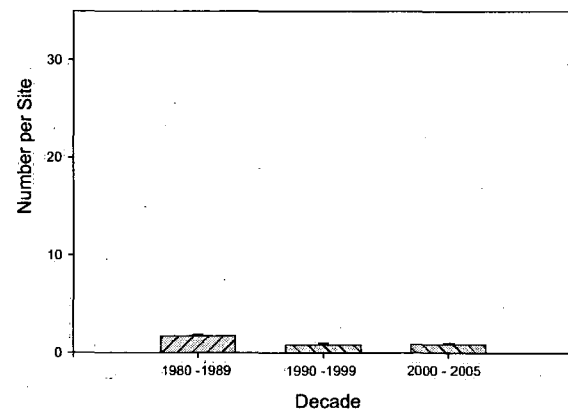
Whimbrel



Least Sandpiper

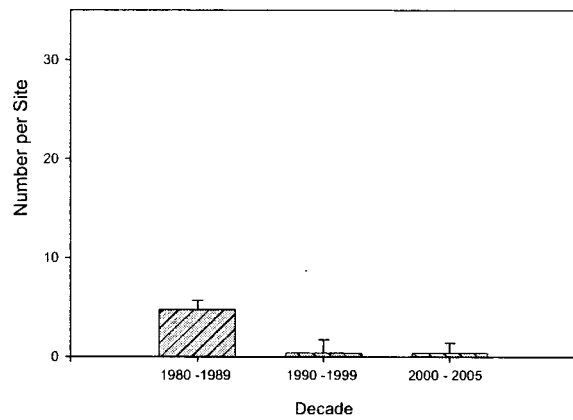


Dunlin

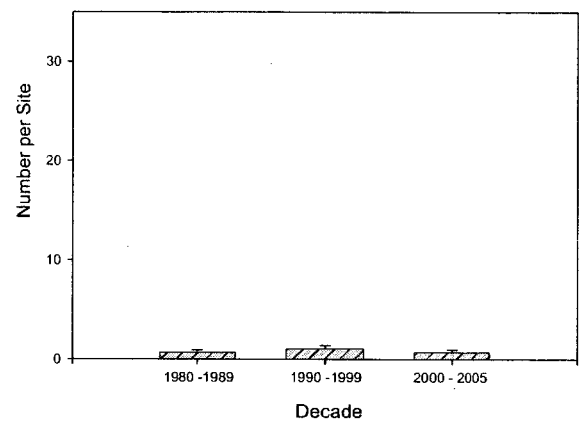


Spotted Sandpiper

Figure 3: Least square means of shorebird populations in insular Newfoundland from 1980-1989, 1990-1999 and 2000-2005 (continued) (n=12 sites).



Lesser Yellowlegs



Short-billed Dowitcher

Figure 3: Least square means of shorebird populations in insular Newfoundland from 1980-1989, 1990-1999 and 2000-2005 (continued) (n=12 sites). Bars with same hatched line directions are not significantly different (Tukey post-hoc test).



## **Appendix: Shorebird data**

# Bellevue Beach

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
9/3/1984	0	0	0	1	0	0	2	0	0	0	0	0	0	0
9/9/1984	0	0	0	0	0	0	0	0	0	0	0	0	0	13
9/8/1988	0	0	7	0	0	0	2	0	4	0	1	0	3	0
10/29/1989	0	0	0	9	0	0	0	0	1	0	1	0	0	14
8/22/2000	0	0	50	12	0	1	6	1	20	1	0	3	1	0
9/4/2000	0	0	0	0	0	0	0	1	0	0	0	0	0	0
9/4/2000	20	4	12	15	0	0	20	2	20	3	0	10	15	4
8/14/2001	38	0	40	40	0	3	35	0	200	1	0	2	50	0
8/17/2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# Cape Freels

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
9/28/1980	8	0	0	0	0	0	0	0	45	0	0	0	60	0
7/19/1982	0	0	0	0	2	3	0	0	0	0	0	0	0	0
7/29/1982	5	0	0	11	19	12	4	0	7	6	0	0	0	0
9/20/1982	11	0	0	1	0	0	0	0	4	0	0	0	5	23
10/10/1982	3	0	0	1	0	0	0	0	40	0	0	0	0	14
7/31/1984	2	0	0	1	21	4	16	0	76	3	0	1	1	0
8/24/1984	6	0	0	6	39	10	15	11	156	2	0	4	9	12
7/22/1985	0	0	0	2	70	8	3	0	0	2	0	0	1	1
9/1/1985	36	0	0	0	2	0	5	2	0	0	0	0	47	6
9/1/1985	36	0	0	0	2	0	5	2	0	0	0	0	4	6
9/7/1985	9	0	0	0	2	0	5	0	4	0	0	0	14	27
7/14/1986	1	0	0	0	0	5	0	0	0	4	0	0	0	0
8/15/1986	5	0	0	2	42	8	34	5	111	5	0	0	4	0
8/20/1988	3	0	0	18	7	0	34	14	24	1	0	0	2	0
8/27/1988	2	0	0	1	0	0	10	17	0	0	0	0	0	0
9/5/1988	17	0	0	7	5	0	4	0	10	0	0	0	41	19
8/6/1989	0	0	0	1	0	14	13	6	133	21	0	2	4	0
8/2/2000	0	0	0	0	9	0	100	0	0	0	1	8	0	0
8/4/2000	0	0	0	8	0	0	0	0	0	0	0	0	0	0
8/6/2000	12	0	0	10	0	0	100	3	50	1	0	3	10	50
8/7/2000	0	0	0	0	0	0	14	0	140	0	0	1	0	0
8/19/2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/27/2000	10	0	10	0	14	0	0	4	0	4	0	0	0	0
8/29/2000	44	0	0	4	0	0	2	0	50	0	1	3	50	100
8/30/2000	0	0	0	0	0	0	0	0	0	0	0	0	0	200
9/2/2000	10	0	0	15	0	0	0	2	5	0	0	1	50	100
9/23/2000	26	0	3	0	0	0	6	0	0	0	0	0	5	238

9/24/2000	100	0	14	25	0	0	10	0	50	0	5	4	50	100
10/14/2000	12	0	6	0	0	0	0	0	2	0	4	0	5	100
10/21/2000	0	0	0	0	0	0	0	0	10	0	0	0	0	5
7/30/2001	12	0	0	0	50	0	20	0	75	25	0	0	60	0
8/4/2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/7/2001	3	0	0	3	27	1	67	1	54	0	0	0	8	14
8/19/2001	0	0	8	12	0	0	0	0	0	0	0	3	0	0
8/31/2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/3/2001	48	38	0	0	0	0	41	3	25	0	0	0	20	13
9/16/2001	2	0	0	0	0	0	8	2	3	0	0	0	2	41
10/5/2001	4	0	2	0	0	0	0	0	25	2	2	0	0	8
10/11/2001	0	0	3	0	0	0	0	0	25	0	0	0	0	3
10/21/2001	1	0	0	0	0	0	0	0	108	0	0	0	0	70
7/29/2005	0	0	0	1	0	0	44	22	29	0	0	8	0	0
8/10/2005	27	0	4	1	0	0	10	15	128	0	0	4	38	40
8/28/2005	34	0	1	2	1	0	4	25	223	0	0	40	155	4
9/3/2005	20	10	6	0	5	0	26	0	56	0	0	6	0	4
9/24/2005	7	0	5	0	0	0	3	0	33	0	7	0	0	56
10/2/2005	0	0	3	0	0	0	0	0	22	0	1	0	0	0

# Carmenville

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
8/11/1985	0	0	0	0	0	12	8	0	0	0	0	0	0	0
8/16/1985	0	0	7	0	0	0	15	0	0	0	0	4	0	0
8/24/1985	5	0	11	0	0	0	19	0	0	0	0	9	0	0
9/1/1985	0	0	6	0	0	0	22	0	0	0	0	0	0	0
9/7/1985	0	0	7	0	0	0	17	0	0	0	0	0	5	0
10/20/1985	0	0	26	0	0	0	6	0	7	0	0	0	0	0
11/3/1985	0	0	0	0	0	0	1	0	3	0	0	0	0	0
11/17/1985	0	0	0	0	0	0	0	0	4	0	0	0	0	0
8/2/1986	0	0	1	0	0	0	0	0	0	0	0	0	0	0
8/6/1986	0	0	0	0	0	10	10	0	0	0	0	0	0	0
8/8/1986	0	0	1	0	0	5	0	0	0	0	0	0	0	0
8/11/1986	0	0	3	0	0	6	12	0	0	1	0	0	0	0
8/17/1986	0	0	0	0	0	0	12	0	0	0	0	0	0	0
8/21/1986	6	0	0	0	0	8	16	0	0	0	0	4	0	0
8/23/1986	17	0	3	0	0	0	30	0	0	0	0	7	0	0
8/28/1986	0	0	0	0	0	3	12	0	0	0	0	0	0	0
9/2/1986	10	0	0	0	0	3	7	0	0	0	0	0	0	0
7/31/1987	0	0	0	0	0	5	7	0	0	4	0	0	0	0
8/2/1987	0	0	0	0	0	7	8	0	0	0	0	0	0	0
8/11/1987	0	0	0	0	0	6	8	0	0	0	0	0	0	0
8/15/1987	10	0	0	0	0	8	8	0	0	0	0	0	0	0
8/18/1987	10	0	0	0	0	3	8	0	0	0	0	1	0	0
9/23/1987	5	0	0	0	0	3	15	0	0	0	0	3	0	0
8/30/1987	50	0	15	0	0	4	14	0	0	0	0	0	4	0
9/12/1987	0	0	0	0	0	0	28	0	0	0	0	0	7	0
10/4/1987	0	0	14	0	0	0	0	0	20	0	0	0	0	0
11/12/1987	0	0	0	0	0	0	0	0	50	0	0	0	0	0

7/8/1989	0	0	2	0	0	5	25	2	0	0	0	0	0	0
8/7/1989	0	0	0	0	0	6	3	0	0	1	0	2	0	0
8/14/1989	10	0	3	0	0	3	15	0	0	3	0	3	0	0
8/23/1989	21	0	7	0	0	6	30	2	0	0	0	0	5	0
9/1/1989	8	0	7	0	0	3	36	0	0	0	0	0	3	0
9/13/1989	32	0	0	0	0	0	22	0	0	0	0	0	13	0
10/12/1989	0	0	0	0	0	0	1	0	8	0	0	0	0	0
11/6/1989	0	0	0	0	0	0	0	0	16	0	0	0	0	0
8/18/1993	27	0	0	0	0	5	8	0	0	0	0	0	0	0
8/27/1993	7	0	0	0	0	2	9	0	0	0	0	0	4	0
9/4/1993	15	0	6	0	0	0	21	0	0	0	0	0	0	0
9/12/1993	19	0	7	0	0	0	29	2	2	0	0	0	8	0
9/19/1993	10	0	2	0	0	0	39	3	7	0	0	0	2	0
10/2/1993	1	0	19	0	0	0	11	0	16	0	0	0	0	0
10/17/1993	0	0	2	2	0	0	3	0	22	0	0	0	0	0
10/30/1993	0	0	0	0	0	0	5	0	31	0	0	0	0	0
11/6/1993	0	0	0	0	0	0	1	0	7	0	0	0	0	0
7/29/1995	0	0	0	0	0	5	20	0	0	3	0	0	0	0
8/15/1995	7	0	0	0	0	1	26	0	0	0	0	6	9	0
8/30/1995	6	0	2	0	0	0	46	2	8	0	0	8	20	0
9/12/1995	16	0	7	0	0	0	18	0	14	0	0	0	0	0
10/15/1995	0	0	0	0	0	0	0	0	12	0	0	0	0	0
11/15/1995	29	0	9	0	0	6	110	2	34	3	0	0	29	0
7/29/1996	0	0	0	0	0	6	11	0	0	0	0	0	0	0
8/16/1996	8	0	0	0	0	5	14	0	0	0	0	0	3	0
8/24/1996	7	0	1	0	0	1	18	2	0	0	0	2	5	0
8/29/1996	28	0	5	0	0	4	15	0	2	0	0	8	1	0
9/3/1996	34	0	12	0	0	1	14	0	16	0	0	0	0	0
9/10/1996	12	0	6	0	0	0	16	0	37	0	0	0	0	0
9/14/1996	6	0	6	0	0	0	9	0	16	0	0	0	0	0

9/25/1996	7	0	1	0	0	0	2	0	12	0	0	0	0	0
10/1/1996	0	0	1	0	0	0	5	0	18	0	0	0	0	0
10/20/1996	0	0	0	0	0	0	2	0	3	0	0	0	0	0
7/31/1997	0	0	0	0	0	4	7	0	0	5	0	0	0	0
8/12/1997	6	0	0	0	0	7	9	0	0	2	0	4	5	0
8/19/1997	28	0	0	0	0	6	14	0	2	0	0	2	6	0
9/1/1997	44	0	2	0	0	1	12	0	14	0	0	0	0	0
9/8/1997	12	0	4	0	0	0	8	0	19	0	0	0	0	0
10/10/1997	0	0	0	0	0	0	2	0	16	0	0	0	0	0
10/18/1997	0	0	0	0	0	0	1	0	3	0	0	0	0	0
11/5/1997	0	0	0	0	0	0	0	0	2	0	0	0	0	0
8/5/1999	0	0	0	0	0	11	7	0	0	6	0	0	0	0
8/14/1999	6	0	0	0	0	3	21	0	0	3	0	3	8	0
8/31/1999	28	0	3	0	0	2	31	2	16	0	0	8	19	0
9/8/1999	16	0	7	0	0	0	7	0	30	0	0	0	0	0
9/15/1999	21	0	0	0	0	0	16	0	19	0	0	0	0	0
10/6/1999	0	0	0	0	0	0	3	0	12	0	0	0	0	0
8/7/2000	0	0	0	0	0	6	3	0	0	3	0	0	0	4
8/20/2000	0	0	4	0	0	5	8	0	0	2	0	3	2	2
8/27/2000	0	0	4	0	0	6	6	1	4	0	0	0	11	12
9/3/2000	2	0	2	0	0	2	9	0	18	0	0	1	7	3
9/24/2000	8	0	14	0	0	0	28	0	36	0	0	0	0	0
9/30/2000	21	0	0	0	0	0	7	0	19	0	0	0	0	0
10/8/2000	19	0	0	0	0	0	4	0	3	0	0	0	0	0
10/20/2000	7	0	0	0	0	0	0	0	0	0	0	0	0	0
11/5/2000	0	0	0	0	0	0	1	0	0	0	0	0	0	0
11/13/2000	0	0	0	0	0	0	1	0	3	0	0	0	0	0
8/6/2001	0	0	0	0	0	3	5	0	0	7	0	0	0	0
8/13/2001	0	0	3	0	0	10	7	0	0	2	0	0	3	5
8/15/2001	0	0	2	0	0	5	14	0	0	2	0	0	3	0

8/21/2001	0	0	0	0	0	4	10	0	0	0	0	0	0	7
8/28/2001	0	0	5	0	0	1	2	0	7	0	0	2	10	0
9/2/2001	3	0	1	0	0	0	9	0	18	0	0	0	2	0
9/16/2001	12	0	0	0	0	0	12	0	12	0	0	0	0	0
10/3/2001	36	0	0	0	0	0	22	0	26	0	0	0	0	0
10/11/2001	0	0	0	0	0	0	7	0	0	0	0	0	0	0
10/16/2001	1	0	0	0	0	0	0	0	26	0	0	0	0	0
10/16/2001	9	0	0	0	0	0	1	0	4	0	0	0	0	0
11/5/2001	0	0	0	0	0	0	3	0	12	0	0	0	0	0
08/02/2002	0	0	0	0	0	6	3	0	0	1	0	0	0	0
08/12/2002	0	0	0	0	0	3	13	0	0	0	0	0	0	2
08/20/2002	0	0	2	0	0	1	12	0	0	0	0	0	3	0
09/01/2002	3	0	2	0	0	0	18	0	2	0	0	0	0	0
09/14/2002	18	0	0	0	0	0	32	0	5	0	0	4	0	0
10/10/2002	0	0	0	0	0	0	12	0	16	0	0	0	0	0
10/20/2002	0	0	0	0	0	0	6	0	10	0	0	0	0	0
11/05/2002	0	0	0	0	0	0	1	0	5	0	0	0	0	0
08/03/2003	0	0	0	0	0	9	5	0	0	3	0	0	0	0
08/08/2003	0	0	0	0	0	5	13	0	2	2	0	0	6	2
08/22/2003	0	0	3	0	0	8	14	0	13	0	0	2	12	9
09/01/2003	8	0	9	0	0	2	29	0	26	0	0	5	18	2
09/08/2003	18	0	5	0	0	0	21	0	33	0	0	0	30	3
09/27/2003	12	0	7	0	0	0	16	0	47	0	0	0	36	0
10/06/2003	2	0	0	0	0	0	6	0	0	0	0	0	10	0
10/16/2003	0	0	0	0	0	0	2	0	0	0	0	0	0	0
10/27/2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/14/2003	0	0	0	0	0	0	2	0	27	0	0	0	0	0
07/20/2004	4	0	0	0	0	8	9	0	0	3	0	0	0	0
09/02/2004	8	0	0	0	0	0	11	0	0	2	0	0	0	0
08/08/2004	6	0	3	0	0	4	14	0	0	0	0	0	0	0



08/15/2004	9	0	0	0	0	6	13	0	9	0	0	2	13	4
08/17/2004	0	0	0	0	0	3	21	0	2	0	0	0	0	0
08/20/2004	7	0	0	0	0	2	0	0	11	0	0	3	14	0
08/24/2004	3	0	0	0	0	0	14	0	5	0	0	0	0	0
08/27/2004	21	0	6	0	0	2	17	0	19	0	0	0	12	0
09/05/2004	100	0	2	0	0	1	6	0	4	0	0	0	3	0
09/06/2004	12	0	0	0	0	0	9	0	0	0	0	0	0	0
09/15/2004	35	0	0	0	0	0	5	0	12	0	0	0	5	0
9/20/2004	0	0	0	0	0	0	13	0	0	0	0	0	0	0
09/20/2004	13	0	0	0	0	0	0	0	0	0	0	0	0	0
09/30/2004	16	0	4	0	0	0	8	0	19	0	0	0	7	0
10/06/2004	8	0	0	0	0	0	5	0	6	0	0	0	9	0
10/10/2004	0	0	8	0	0	0	0	0	7	0	2	0	0	60
10/20/2004	0	0	0	0	0	0	3	0	16	0	0	0	0	0
11/05/2004	0	0	0	0	0	0	1	0	11	0	0	0	0	0
7/31/2005	0	0	0	0	0	7	11	0	5	2	0	2	0	0
8/8/2005	0	0	3	0	0	5	9	0	0	0	0	0	2	0
8/18/2005	2	0	0	0	0	1	19	0	4	0	0	0	10	0
8/27/2005	12	0	0	0	0	9	4	0	14	0	0	0	3	0
9/10/2005	14	0	0	0	0	0	7	0	4	0	0	0	0	0
9/18/2005	0	0	0	0	0	0	5	0	0	0	0	0	2	0
9/23/2005	0	0	0	0	0	0	7	0	0	0	0	0	0	0
10/20/2005	5	0	0	0	0	0	2	0	7	0	0	0	4	0
11/2/2005	0	0	2	0	0	0	2	0	0	0	0	0	0	3
11/12/2005	0	0	0	0	0	0	0	0	2	0	0	0	0	0

# Eddie's Cove East

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
8/9/1980	4	0	0	0	0	0	14	0	8	11	0	0	10	0
8/1/1982	0	0	1	0	4	1	22	0	25	4	0	0	0	0
8/20/1984	4	0	0	2	0	0	0	30	0	200	0	0	20	0
8/31/1984	7	0	3	85	0	3	54	4	63	11	1	0	121	0
8/3/1986	0	0	2	15	1	0	29	0	10	0	0	0	1	0
8/4/1986	5	0	0	18	0	2	5	0	72	19	0	0	3	0
8/5/1986	9	0	3	8	1	11	69	0	136	30	0	0	3	0
8/8/1986	17	0	2	24	0	4	33	3	474	4	0	0	30	0
8/9/1986	23	0	1	12	0	9	34	2	318	27	0	0	17	0
8/30/1986	0	0	1	0	0	3	32	3	5	0	0	0	28	0
8/31/1986	8	0	10	32	0	1	69	6	169	5	2	3	175	1
8/21/1988	6	0	3	13	0	4	87	17	178	27	0	10	88	0
8/4/1989	4	0	0	10	0	24	85	6	32	25	0	1	4	0
9/1/1994	0	0	0	0	0	2	2	0	0	0	0	0	8	0
7/13/2000	0	0	0	0	0	0	15	0	0	0	0	0	0	0
8/30/2000	0	0	0	0	0	0	100	0	10	0	0	18	0	0
10/25/2000	0	0	0	0	0	0	0	0	10	0	0	0	0	0
8/21/2001	0	0	1	0	0	0	9	0	10	0	0	0	0	0
7/28/2002	1	0	0	20	2	0	95	5	200	10	0	2	20	3
8/18/2002	3	0	2	18	0	0	52	0	12	0	0	0	18	0
8/27/2002	5	0	2	9	0	0	64	0	0	0	0	0	192	0
09/08/2002	13	0	0	1	0	0	57	2	1	2	2	1	5	6
10/04/2002	0	0	0	1	0	0	5	0	6	0	0	0	13	0
10/13/2002	0	0	1	0	0	0	2	0	52	0	0	0	0	0
10/18/2002	0	0	0	0	0	0	0	0	85	0	1	0	0	12
11/09/2002	0	0	0	0	0	0	0	0	28	0	0	0	0	0
07/09/2004	0	0	0	0	3	2	41	0	0	2	0	0	0	0

07/18/2004	0	0	0	0	0	2	51	3	0	4	0	0	0	0
07/25/2004	0	0	0	2	0	1	97	0	0	4	0	0	0	0
08/01/2004	0	0	0	50	3	8	123	0	35	0	0	0	0	0
08/18/2004	15	0	0	0	2	0	100	0	95	0	0	0	0	0
08/21/2004	5	0	0	9	0	0	203	1	20	0	0	0	45	0
08/29/2004	72	0	2	40	0	3	197	0	55	0	0	2	53	0
09/05/2004	20	0	3	42	0	0	121	0	26	5	3	5	20	12
09/16/2004	0	0	2	10	0	0	160	0	13	0	20	2	35	3
09/26/2004	10	0	13	1	0	0	97	0	2	0	0	2	1	0
10/07/2004	0	0	14	18	0	0	65	0	169	0	0	0	0	16
10/24/2004	0	0	11	0	0	0	17	0	104	3	0	1	0	17
10/26/2004	1	0	0	1	0	0	8	0	43	0	0	0	0	61
11/04/2004	0	0	0	0	0	0	1	0	21	0	0	0	0	0
11/21/2004	0	0	0	0	0	0	0	0	2	0	0	1	0	0
11/25/2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/28/2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/10/2005	0	0	0	0	0	4	40	7	0	10	0	0	0	0
7/17/2005	0	0	0	0	0	0	65	5	0	5	0	0	0	0
7/22/2005	0	0	0	0	0	0	52	4	0	1	0	0	0	0
7/24/2005	2	0	0	0	0	0	165	3	0	5	0	0	0	0
7/31/2005	5	0	0	21	0	0	80	5	6	46	0	0	0	0
8/7/2005	0	0	0	28	0	0	128	0	73	15	0	0	30	0
8/16/2005	11	0	0	43	0	0	104	0	62	12	0	6	58	2
9/8/2005	1	0	0	37	0	0	90	0	3	0	0	3	0	4
9/11/2005	4	0	2	44	0	0	79	1	6	0	0	2	14	1
9/13/2005	0	0	2	25	0	0	60	0	22	0	0	1	5	2
10/2/2005	0	0	15	9	0	0	32	0	1	0	31	0	0	0
10/6/2005	0	0	6	0	0	0	17	0	38	0	28	0	0	0
10/12/2005	0	0	0	0	0	0	6	0	41	0	0	0	0	0
10/14/2005	0	0	0	1	0	0	18	0	51	0	3	0	0	0

10/20/2005	0	0	4	1	0	1	7	0	62	0	0	0	0	0
10/23/2005	0	0	4	0	0	0	0	0	121	0	1	0	0	4
10/30/2005	0	0	5	3	0	0	0	0	41	0	0	0	0	0

# George's Brook

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
11/11/2000	0	0	0	0	0	0	1	0	0	0	0	0	0	0
08/16/2002	0	0	6	0	0	0	103	0	0	0	0	0	0	0
09/04/2002	5	0	2	0	0	0	47	0	0	0	0	0	0	0
09/20/2002	9	0	2	0	0	0	27	0	0	0	0	0	0	0
10/04/2002	0	0	0	0	0	0	5	0	0	0	0	0	0	0
10/21/2002	0	0	1	0	0	0	4	0	0	0	0	0	0	0
11/05/2002	0	0	0	0	0	0	2	0	0	0	0	0	0	0
09/16/2003	4	0	0	0	0	0	26	0	0	0	0	0	0	0
10/10/2003	0	0	0	0	0	0	12	0	0	0	0	0	0	0
09/15/2004	15	0	2	0	0	0	15	0	0	0	1	0	0	0
09/30/2004	3	0	0	0	0	0	15	0	0	0	0	0	0	0
10/13/2004	0	0	0	0	0	0	5	0	0	0	0	0	0	0
11/02/2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/28/2005	0	0	0	0	0	3	123	0	0	0	0	0	0	0
08/11/2005	0	0	0	0	0	2	120	0	0	0	0	0	0	0
09/07/2005	6	0	0	0	0	0	48	0	0	0	0	0	0	3
09/22/2005	0	0	1	0	0	0	11	0	0	0	0	0	0	0
10/07/2005	0	0	0	0	0	0	17	0	0	0	0	0	2	0
7/18/2001	0	0	0	0	0	7	102	0	0	0	0	0	0	0
8/29/2001	4	0	1	0	0	0	29	0	0	0	0	0	0	0
9/11/2001	8	0	0	0	0	0	19	0	1	0	0	0	0	0
9/29/2001	0	0	0	0	0	0	9	0	0	0	0	0	0	0
11/15/2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# Long Beach

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
8/6/1985	19	0	0	5	0	2	0	0	64	8	0	0	9	2
9/28/1985	6	2	0	0	1	0	0	0	0	0	0	0	1	2
7/23/1988	0	0	0	0	0	16	1	0	0	8	0	0	4	4
8/13/1988	1	0	0	2	0	3	0	0	3	0	0	0	0	0
9/4/1988	0	0	0	1	0	0	0	0	0	0	0	0	0	0
9/4/2000	0	200	0	0	35	0	0	0	0	0	0	0	0	30
11/19/2000	1	0	0	16	0	0	0	0	0	0	1	0	0	5
9/29/2001	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11/24/2001	0	0	0	0	0	0	0	0	22	0	0	0	0	3
12/1/2001	0	0	0	8	0	0	0	0	5	0	0	0	0	1
8/2/2005	0	0	0	4	2	3	0	0	0	0	0	0	0	0

# Newman Sound (Terra Nova)

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
7/26/1980	0	0	0	0	0	7	15	0	0	0	0	0	0	0
7/31/1980	0	0	0	0	0	2	4	1	0	0	0	0	0	0
8/11/1980	0	0	0	0	0	6	4	0	0	0	0	0	0	0
8/18/1980	0	0	0	0	0	5	22	4	5	1	0	0	3	0
8/23/1980	6	0	0	0	0	4	19	0	0	12	0	0	8	0
9/02/1980	22	0	9	0	0	4	36	0	0	1	0	0	0	0
9/3/1980	0	0	0	0	0	0	14	0	0	1	0	0	15	0
9/6/1980	0	0	0	0	0	0	8	0	0	0	0	0	0	0
9/10/1980	0	0	0	0	0	0	10	0	0	0	0	0	0	0
9/12/1980	3	0	0	0	0	0	4	0	0	0	0	0	9	0
9/16/1980	0	0	0	0	0	0	1	0	0	1	0	0	0	0
9/17/1980	14	0	0	0	0	0	11	0	0	0	0	0	3	0
9/19/1980	8	0	0	0	0	0	7	0	0	0	0	0	5	0
9/22/1980	0	0	0	0	0	0	21	0	0	0	0	0	0	0
9/23/1980	0	0	0	0	0	0	2	0	0	0	0	0	0	0
9/26/1980	1	0	1	0	0	0	16	0	0	0	0	0	0	0
9/29/1980	9	0	0	0	0	0	6	0	0	0	0	0	2	0
10/1/1980	3	0	10	0	0	0	11	0	0	0	0	0	0	0
10/3/1980	0	0	6	0	0	0	2	0	0	0	0	0	0	0
10/8/1980	0	0	0	0	0	0	16	0	0	0	0	0	0	0
10/10/1980	0	0	0	0	0	0	4	0	0	0	0	0	0	0
10/14/1980	0	0	6	0	0	0	10	0	0	0	0	0	0	0
10/19/1980	0	0	2	0	0	0	0	0	6	0	0	0	0	0
10/20/1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/21/1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/27/1980	0	0	0	0	0	0	0	0	4	0	0	0	0	0

10/29/1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/31/1980	0	0	0	0	0	0	0	0	7	0	0	0	0	0
11/5/1980	0	0	0	0	0	0	0	0	5	0	0	0	0	0
11/7/1980	0	0	0	0	0	0	0	0	5	0	0	0	0	0
11/13/1980	0	0	0	0	0	0	0	0	1	0	0	0	0	0
11/14/1980	0	0	0	0	0	0	0	0	10	0	0	0	0	0
11/17/1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/3/1981	0	0	0	0	0	10	39	0	0	0	0	0	0	0
7/21/1981	0	0	0	0	0	16	38	0	0	0	0	0	1	0
7/24/1981	0	0	0	0	0	12	31	0	0	0	0	0	0	0
8/1/1981	0	0	0	0	0	1	36	0	0	0	0	0	0	0
8/2/1981	0	0	0	0	0	17	35	2	0	0	0	0	0	0
10/10/1981	0	0	0	0	0	7	31	2	0	0	0	0	0	0
10/16/1981	0	0	0	0	0	6	32	2	0	0	0	0	0	0
10/23/1981	0	0	0	0	0	2	17	1	0	0	0	0	0	0
10/24/1981	0	0	0	0	0	2	43	1	0	0	0	0	0	0
10/31/1981	0	0	10	0	0	5	31	1	0	0	0	0	1	0
9/5/1981	11	0	1	0	0	4	11	0	0	1	0	0	1	0
9/9/1981	0	0	0	0	0	1	34	0	0	0	0	0	0	0
9/10/1981	0	0	1	0	0	0	27	0	0	0	0	0	0	0
9/14/1981	10	0	0	0	0	0	14	0	0	0	0	0	0	0
9/15/1981	0	0	0	0	0	0	25	0	0	0	0	0	0	0
9/17/1981	0	0	0	0	0	1	24	0	0	0	0	0	0	0
9/21/1981	11	0	0	0	0	0	27	0	0	0	0	0	2	0
9/28/1981	0	0	0	0	0	0	12	0	0	0	0	0	0	0
10/1/1981	0	0	1	0	0	0	4	0	0	0	0	0	0	0
10/6/1981	0	0	0	0	0	0	1	0	0	0	0	0	0	0
10/9/1981	0	0	0	0	0	1	25	131	24	0	0	0	0	0
7/15/1982	0	0	0	0	0	7	31	0	0	0	0	0	0	0
7/17/1982	0	0	0	0	0	3	37	0	9	0	0	0	0	0



8/15/1982	9	0	6	0	0	3	52	1	8	2	0	0	0	0
8/16/1982	0	0	3	0	0	1	44	0	0	3	0	0	0	0
8/22/1982	8	0	3	0	0	3	10	0	0	2	0	0	0	0
8/27/1982	7	0	10	0	0	2	10	0	0	1	0	0	0	0
8/28/1982	4	0	9	0	0	0	11	0	0	0	0	0	1	0
9/6/1982	18	0	0	0	0	1	31	0	0	0	0	0	4	0
9/8/1982	8	0	1	0	0	0	29	0	3	0	0	0	5	0
9/13/1982	28	0	0	0	0	0	13	0	0	0	0	0	14	0
9/16/1982	9	0	0	0	0	0	24	0	0	0	0	0	1	0
9/19/1982	3	0	0	0	0	0	26	0	0	0	0	0	0	0
9/21/1982	0	0	0	0	0	0	30	0	0	0	0	0	0	0
9/25/1982	0	0	0	0	0	0	14	0	0	0	0	0	0	0
9/29/1982	1	0	3	0	0	0	5	0	0	0	0	0	0	0
10/6/1982	0	0	0	0	0	0	5	0	0	0	0	0	0	0
10/18/1982	0	0	0	0	0	0	1	0	10	0	0	0	0	0
10/27/1982	0	0	0	0	0	3	23	188	14	0	0	0	0	0
7/15/1983	0	0	0	0	0	1	25	0	0	0	0	0	0	0
7/16/1983	0	0	1	0	0	1	6	0	0	0	0	0	0	0
7/24/1983	0	0	0	0	0	5	7	1	0	0	0	0	0	0
7/27/1983	0	0	0	0	0	4	9	1	0	0	0	0	0	0
7/28/1983	0	0	1	0	0	4	25	0	0	0	0	0	0	0
7/30/1983	0	0	0	0	0	4	57	2	0	0	0	0	0	0
8/1/1983	0	0	0	0	0	5	57	1	0	0	0	0	0	0
8/6/1983	0	0	0	0	0	6	54	0	0	10	0	0	0	0
8/7/1983	1	0	0	0	0	3	31	1	0	19	0	0	0	0
8/14/1983	5	0	0	0	0	0	60	0	0	19	0	2	1	0
8/17/1983	4	0	4	0	0	1	25	1	0	18	0	3	1	0
8/19/1983	0	0	0	0	0	1	22	2	1	5	0	1	0	0
8/20/1983	4	0	14	0	0	5	5	0	0	8	0	2	1	0
8/21/1983	3	0	7	0	0	4	13	0	0	9	0	0	0	0

8/22/1983	0	0	0	0	0	3	14	1	0	0	0	0	0	0
8/25/1983	1	0	10	0	0	3	3	0	2	2	0	0	0	0
9/3/1983	0	0	0	0	0	1	3	0	0	0	0	0	0	0
9/16/1983	2	0	3	0	0	0	12	0	2	0	0	0	2	0
9/17/1983	8	0	2	0	0	1	5	0	23	0	0	0	2	0
10/8/1983	1	0	0	0	0	0	1	0	13	0	0	0	3	0
10/19/1983	0	0	3	0	0	0	0	0	23	0	0	0	0	0
11/2/1983	0	0	0	0	0	0	0	0	1	0	0	0	0	0
11/11/1983	0	0	0	0	0	0	0	0	4	0	0	0	0	0
11/17/1983	0	0	0	0	0	0	0	0	47	0	0	0	0	0
7/15/1984	0	0	0	0	0	2	33	0	0	0	0	0	0	0
7/23/1984	0	0	0	0	0	2	27	0	0	0	0	0	0	0
7/26/1984	0	0	0	0	0	6	37	1	0	0	0	0	0	0
7/27/1984	0	0	0	0	0	0	26	0	0	0	0	0	0	0
7/29/1984	0	0	1	0	0	5	41	2	0	0	0	0	0	0
7/30/1984	0	0	1	0	0	0	50	0	0	0	0	0	1	0
8/1/1984	0	0	0	0	0	2	10	0	0	0	0	0	2	0
8/7/1984	0	0	0	0	0	0	13	0	0	0	0	0	0	0
8/9/1984	0	0	0	0	0	0	24	0	0	0	0	0	0	0
8/10/1984	0	0	5	0	0	1	51	1	0	0	0	0	0	0
8/12/1984	4	0	7	6	0	0	36	1	0	1	0	0	32	0
8/13/1984	0	0	4	0	0	0	6	0	0	0	0	0	1	0
8/23/1984	0	0	0	0	0	2	13	1	16	0	0	0	0	0
8/24/1984	2	0	2	1	0	0	25	0	0	1	0	0	2	0
8/28/1984	3	0	4	0	0	2	39	0	0	0	0	0	0	0
9/1/1984	0	0	5	0	0	0	23	1	0	0	0	0	0	0
9/10/1984	0	0	2	0	0	0	16	0	0	0	0	0	0	0
9/17/1984	3	0	2	0	0	0	4	0	0	0	0	0	0	0
9/20/1984	0	0	0	0	0	0	1	0	0	0	0	0	0	0
9/26/1984	0	0	1	0	0	0	10	0	8	0	0	0	0	0

9/27/1984	5	0	2	0	0	0	10	1	0	1	0	0	5	0
9/29/1984	6	0	1	0	0	0	18	1	0	0	0	0	1	0
10/3/1984	8	0	0	0	0	0	18	1	22	0	0	0	3	0
10/9/1984	10	0	3	0	0	0	2	0	12	0	0	0	4	0
10/10/1984	6	0	1	0	0	0	10	0	0	0	0	0	5	0
10/13/1984	4	0	0	0	0	0	8	0	0	0	0	0	0	0
10/14/1984	6	0	11	0	0	0	8	0	5	0	0	0	6	0
10/15/1984	2	0	13	0	0	0	0	0	0	0	0	0	2	0
10/20/1984	0	0	7	0	0	0	6	0	0	0	0	0	0	0
10/22/1984	0	0	0	0	0	0	0	0	22	0	0	0	0	0
10/23/1984	0	0	5	0	0	0	0	0	51	0	0	0	0	0
10/24/1984	0	0	4	0	0	0	1	0	20	0	0	0	0	0
10/26/1984	0	0	6	0	0	0	2	0	21	0	0	0	0	0
10/28/1984	0	0	0	0	0	0	0	0	5	0	0	0	0	0
11/1/1984	0	0	0	0	0	0	0	0	10	0	0	0	0	0
11/3/1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/5/1984	0	0	0	0	0	5	11	119	2	0	0	0	0	0
7/7/1985	0	0	0	0	0	0	29	0	0	0	0	0	0	0
7/13/1985	0	0	0	0	0	0	47	0	0	0	0	0	0	0
7/29/1985	0	0	0	0	0	0	37	0	0	0	0	0	0	0
8/5/1985	0	0	3	0	0	0	22	0	0	0	0	0	0	0
8/19/1985	4	0	0	0	0	1	35	5	0	0	0	0	0	0
8/20/1985	7	0	6	0	0	0	33	0	0	0	0	0	6	0
8/21/1985	0	0	0	0	0	3	2	0	0	0	0	0	0	0
8/27/1985	5	0	3	0	0	1	32	0	0	0	0	0	0	0
9/3/1985	0	0	2	0	0	1	32	0	0	0	0	0	0	0
9/7/1985	11	0	0	0	0	0	13	0	0	0	0	0	3	0
9/13/1985	23	0	3	0	0	0	15	0	0	0	0	1	0	0
9/14/1985	0	1	14	0	0	0	16	0	0	0	0	1	11	0
9/17/1985	0	0	5	0	0	0	11	0	0	0	0	1	0	0

9/27/1985	0	0	0	0	0	0	8	0	0	0	0	0	0	0
10/2/1985	1	0	6	0	0	0	1	0	0	0	0	0	0	0
10/16/1985	0	0	0	0	0	0	1	0	0	0	0	0	0	0
10/24/1985	1	0	4	0	0	0	2	0	0	0	0	0	1	0
10/27/1985	0	0	4	0	0	0	48	281	9	0	0	0	0	0
7/13/1986	0	0	0	0	0	0	28	0	0	0	0	0	0	0
8/3/1986	1	0	2	0	0	0	61	1	0	0	0	0	0	0
8/14/1986	3	0	0	0	0	0	12	0	0	2	0	0	2	0
9/5/1986	0	0	0	0	0	0	1	0	0	0	0	1	0	0
9/15/1986	2	0	0	0	0	0	7	0	0	0	0	0	1	0
10/1/1986	0	0	0	0	0	0	0	0	5	0	0	0	0	0
11/3/1986	0	0	0	0	0	1	24	181	0	0	0	0	0	0
8/10/1987	0	0	0	0	0	0	32	0	1	0	0	0	0	0
8/14/1987	0	0	0	0	0	0	26	0	0	0	0	0	0	0
8/17/1987	0	0	0	0	0	2	29	0	0	0	0	0	0	0
8/24/1987	17	0	0	0	0	0	11	0	0	0	0	0	4	0
8/26/1987	21	0	0	0	0	0	24	2	0	0	0	0	6	0
8/28/1987	19	0	4	1	0	1	24	1	0	0	0	0	8	0
8/30/1987	9	0	3	1	0	0	12	0	6	0	0	0	6	0
9/6/1987	14	0	0	0	0	0	24	0	0	0	0	0	30	0
9/10/1987	27	0	0	0	0	0	24	0	1	0	0	0	27	0
9/24/1987	0	0	0	0	0	0	14	0	0	0	0	0	3	0
10/6/1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/9/1987	0	0	3	0	0	0	2	0	0	0	0	0	0	0
10/12/1987	0	0	1	0	0	0	4	0	0	0	0	0	0	0
10/23/1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/22/1987	0	0	0	0	0	1	14	97	0	0	0	0	0	0
8/7/1989	0	0	1	0	0	4	0	0	0	0	0	0	0	0
8/13/1989	0	0	0	0	0	0	2	0	0	0	0	0	0	0
8/19/1989	0	0	0	0	0	0	3	0	0	0	0	0	0	0

8/28/1989	0	0	0	0	0	0	14	213	0	1	0	0	0	0
9/6/1989	6	0	0	0	0	0	49	59	30	35	0	0	0	0
7/21/1993	0	0	0	0	0	1	9	0	0	0	0	0	0	0
7/27/1993	0	0	0	0	0	0	38	0	0	0	0	0	0	0
7/4/1993	0	0	0	0	0	1	8	0	0	0	0	0	0	0
8/11/1993	0	0	0	0	0	0	40	0	0	0	0	0	0	0
8/18/1993	4	0	0	0	0	1	45	0	0	0	0	0	2	0
8/22/1993	20	0	0	0	0	0	0	0	0	0	0	0	0	0
8/29/1993	11	0	0	0	0	1	23	0	0	0	0	0	9	0
9/1/1993	11	0	0	0	0	1	23	0	0	0	0	0	9	0
9/8/1993	0	0	0	0	0	0	9	0	0	0	0	0	0	0
9/30/1993	16	0	18	0	0	0	12	1	0	0	0	0	5	0
10/7/1993	0	0	7	0	0	0	11	2	0	0	0	0	0	0
10/12/1993	0	0	0	0	0	0	15	2	4	0	0	0	0	0
10/26/1993	0	0	0	0	0	0	0	0	30	0	0	0	0	0
7/30/1995	0	0	0	0	0	5	56	0	0	0	0	0	0	0
8/13/1995	6	0	2	0	0	0	6	1	0	1	0	0	3	0
8/20/1995	8	0	2	0	0	1	12	1	0	1	0	0	8	0
8/26/1995	0	0	0	0	0	2	83	0	0	0	0	0	0	0
9/3/1995	19	0	6	0	0	1	34	1	0	0	0	0	11	0
9/10/1995	18	0	0	0	0	0	66	4	1	0	0	0	7	0
8/27/1995	12	0	3	0	0	0	19	1	0	0	0	0	16	0
7/29/1998	0	0	0	0	0	5	37	0	0	0	0	0	0	0
8/6/1998	0	0	0	0	0	2	43	0	0	0	0	0	0	0
8/20/1998	21	0	0	0	0	3	27	1	0	0	0	0	19	0
8/25/1998	27	0	0	0	0	0	25	1	0	0	0	0	10	0
9/9/1998	7	0	0	0	0	0	17	1	0	0	0	0	3	0
9/21/1998	5	0	0	0	0	0	17	0	0	0	0	0	0	0
10/9/1998	7	0	0	0	0	0	14	0	0	0	0	0	0	0
08/10/2002	16	0	0	0	0	0	58	0	0	0	0	0	4	0

08/22/2002	3	0	0	0	0	2	33	0	0	0	0	0	0	0
08/31/2002	15	0	0	0	0	1	45	0	0	0	0	0	2	0
09/16/2002	2	0	0	0	0	0	5	0	0	0	0	0	0	0
09/23/2002	18	0	0	0	0	0	11	0	0	0	0	0	2	0
11/19/2002	0	0	0	0	0	0	6	0	0	0	0	0	0	0
06/08/2003	11	0	0	0	0	0	53	0	0	0	0	0	9	0
08/21/2003	10	0	0	0	0	0	31	0	0	0	0	0	5	0
09/12/2003	32	0	1	0	0	0	20	0	0	0	0	0	3	0
09/24/2003	22	0	5	0	0	0	20	0	0	0	0	0	2	0
10/07/2003	14	0	0	0	0	0	4	0	0	0	0	0	1	0
10/17/2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/27/2003	3	0	0	0	0	0	7	0	0	0	0	0	0	0
11/13/2003	0	0	0	0	0	0	1	0	0	0	0	0	0	0
08/02/2004	0	0	0	0	0	0	57	0	0	0	0	0	9	0
08/12/2004	0	0	0	0	0	0	42	0	0	0	0	0	0	0
08/26/2004	5	0	0	0	0	0	41	1	0	0	0	0	0	0
09/11/2004	29	0	0	0	0	0	21	0	0	0	0	0	14	0
09/25/2004	18	0	0	0	0	0	3	0	0	0	0	0	6	0
10/05/2004	2	0	0	0	0	0	19	0	0	0	0	0	0	0
10/19/2004	0	0	0	0	0	0	9	0	0	0	0	0	0	0
11/12/2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/29/2005	3	0	0	0	0	1	67	0	0	0	0	0	0	0
8/11/2005	1	0	0	0	0	0	52	0	0	0	0	0	0	0
8/23/2005	2	0	0	0	0	2	23	0	0	0	0	0	0	0
9/2/2005	12	0	2	0	0	0	27	0	7	0	0	0	12	0

# Renews

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
8/6/1985	19	0	0	0	0	2	1	0	1	10	0	0	4	0
9/22/1985	9	0	8	0	0	0	11	0	1	0	1	0	9	31
9/28/1985	9	0	7	0	1	0	0	0	2	0	0	0	2	0
11/17/1985	0	0	1	0	0	0	0	0	0	0	0	0	0	0
8/5/1986	0	0	0	67	0	0	6	0	6	3	0	0	0	0
8/9/1986	0	0	0	61	0	2	4	0	104	2	0	0	0	0
8/17/1986	17	0	1	1	0	10	19	2	4	3	0	0	13	0
8/30/1986	0	3	0	0	0	3	0	0	0	0	0	0	0	0
7/23/1988	7	0	0	0	0	10	12	8	1	36	0	0	3	0
7/30/1988	12	0	0	2	0	12	16	12	0	27	0	0	1	0
8/6/1988	14	0	0	4	0	0	10	0	43	8	0	0	2	0
8/13/1988	27	0	0	2	0	3	14	6	7	3	0	0	1	0
9/4/1988	6	0	0	0	0	1	14	1	1	1	0	1	2	0
10/18/1988	2	0	1	0	0	0	2	0	16	0	0	0	0	0
10/23/1988	1	0	1	0	0	0	2	0	28	0	0	0	1	0
7/23/1989	1	0	0	0	0	14	6	0	0	35	0	0	1	0
8/9/1989	46	0	1	2	0	5	10	2	5	14	0	0	1	0
8/20/1989	2	0	6	0	0	1	5	0	0	0	0	1	0	0
9/3/1989	108	1	2	0	0	0	12	0	3	5	0	0	33	5
9/23/1989	4	0	11	0	0	1	2	0	0	2	1	0	2	4
10/15/1989	14	0	7	0	0	0	4	0	18	0	1	0	0	0
9/8/2000	0	0	0	0	0	0	12	0	0	0	0	0	0	0
10/8/2000	25	0	4	0	0	0	10	2	13	0	0	0	2	29
7/27/2001	30	0	1	0	0	8	60	4	5	10	0	1	5	0
8/1/2001	16	0	0	13	0	12	21	2	18	15	0	0	0	0
8/29/2005	5	0	9	5	0	0	2	0	1	1	2	0	0	1

Spaniard's Bay

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
8/5/1984	12	0	4	0	0	2	8	0	8	0	0	5	0	0
8/29/1984	24	0	12	0	0	0	1	0	14	0	0	0	7	0
9/19/1984	0	0	6	1	0	1	19	0	0	0	0	0	1	0
8/8/1984	4	0	10	1	0	0	7	0	1	0	0	0	0	0
8/10/1985	14	0	16	0	0	3	40	0	1	0	0	0	0	0
8/19/1985	0	0	16	0	0	0	45	5	1	1	0	1	0	0
8/24/1985	22	0	28	1	0	0	57	4	4	1	0	0	19	0
9/3/1985	14	0	3	0	0	0	17	0	0	0	0	0	11	0
10/14/1985	4	0	22	1	0	0	7	0	25	0	2	0	0	2
7/19/1986	0	0	0	0	0	3	14	0	0	1	0	0	0	0
8/15/1986	17	0	13	1	0	4	63	5	0	1	0	0	10	0
8/19/1986	11	0	9	0	0	5	50	1	10	0	0	0	3	0
9/7/1986	0	0	1	0	0	0	15	0	0	0	0	0	0	0
7/23/1988	0	0	0	0	0	2	30	0	0	0	0	0	0	0
7/30/1988	7	0	0	0	0	2	37	1	1	0	0	0	0	0
8/3/1988	6	0	7	1	0	1	44	1	0	0	0	0	2	0
8/12/1988	31	0	16	3	0	0	31	1	15	0	0	1	0	0
8/19/1988	13	0	13	3	0	0	31	2	22	0	0	1	2	0
8/28/1988	18	0	15	0	0	1	27	1	30	0	0	3	12	0
9/3/1988	4	0	10	0	0	3	33	0	0	0	0	2	12	1
9/11/1988	10	0	11	1	1	1	32	3	3	0	0	2	0	0
9/18/1988	0	0	6	0	0	0	19	0	0	0	0	0	0	0
10/8/1988	0	0	11	1	0	0	7	0	22	0	0	0	0	0
7/16/1989	1	0	0	0	0	8	24	0	0	0	0	0	0	0
7/30/1989	1	0	4	1	0	5	89	1	0	7	0	0	0	0
8/12/1989	27	0	11	9	0	1	52	2	26	6	1	1	3	0



8/20/1989	0	0	10	24	0	2	17	2	0	0	0	1	0	0
8/27/1989	18	0	11	19	0	1	24	4	7	1	0	3	1	0
9/3/1989	29	0	23	26	0	0	38	1	4	0	0	3	3	10
9/10/1989	22	0	3	8	0	0	26	1	0	0	1	2	0	17
9/17/1989	0	0	4	0	0	1	20	0	0	0	0	0	0	0
9/24/1989	4	0	3	1	0	0	8	0	1	0	0	0	7	1
8/13/2000	15	0	15	40	0	1	130	0	40	1	0	1	1	0
8/20/2000	20	0	40	35	0	1	100	0	80	0	0	6	1	1
8/21/2000	40	0	25	50	0	0	100	1	50	0	0	4	3	1
8/26/2000	0	0	20	20	0	0	20	0	30	0	0	1	20	0
9/4/2000	20	0	15	30	0	0	30	0	10	0	0	0	15	4
9/15/2000	0	8	0	12	0	0	37	0	0	0	0	0	0	0
9/15/2000	37	0	2	12	0	0	18	0	5	0	0	0	10	0
9/22/2000	5	0	3	33	0	0	45	0	0	0	0	0	0	0
9/25/2000	1	0	15	5	0	0	20	0	1	1	0	0	3	0
10/1/2000	0	0	22	2	0	0	36	0	11	0	2	0	0	0
10/16/2000	0	0	0	0	0	0	4	0	0	0	0	0	0	0
10/22/2000	0	0	0	0	0	0	1	0	6	0	0	0	0	10
7/18/2001	0	0	0	0	0	1	94	5	0	1	0	0	0	0
8/1/2001	22	0	3	32	0	3	139	4	12	6	0	0	0	0
8/5/2001	24	0	3	35	0	2	100	1	33	3	0	0	2	0
8/16/2001	30	0	25	45	0	1	100	1	45	4	0	0	15	0
8/26/2001	49	0	12	23	0	1	73	0	46	0	0	2	25	0
9/25/2001	5	0	5	0	0	0	60	0	2	0	0	1	1	0
10/10/2001	0	0	12	0	0	0	40	0	0	0	0	0	2	0
7/26/2002	0	0	3	30	0	0	75	0	0	1	0	0	0	0
8/7/2002	23	0	9	21	0	1	99	1	8	2	0	0	2	0
8/18/2002	16	0	37	24	0	0	110	0	45	1	0	0	0	0
8/28/2002	12	0	34	3	0	0	48	0	0	0	0	0	1	1
9/7/2002	0	0	9	0	0	0	55	1	0	0	0	0	0	0

9/17/2002	4	1	4	0	0	0	38	0	1	0	0	0	2	0
9/27/2002	1	0	3	0	0	0	24	1	0	0	0	0	0	0
7/27/2005	0	0	3	16	0	0	44	2	0	1	0	0	0	0
7/28/2005	0	0	0	0	0	0	3	0	0	0	0	0	0	0
8/6/2005	24	0	8	32	0	4	76	0	13	4	0	0	8	0
8/7/2005	24	0	5	1	0	0	31	0	3	0	0	0	7	0
8/11/2005	33	0	9	19	0	0	33	0	6	0	0	0	33	0
8/17/2005	27	0	21	12	0	0	54	0	28	7	0	0	9	0
8/21/2005	5	0	7	5	0	0	9	0	0	0	0	0	0	5
9/24/2005	12	0	8	0	0	0	19	0	0	0	0	0	0	0
9/25/2005	0	0	0	0	0	0	7	0	0	0	0	0	0	0
10/9/2005	0	0	0	0	0	0	15	0	0	0	0	0	0	0

St. Paul's Inlet

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
8/6/1980	3	0	11	28	1	2	3	1	15	4	0	0	0	0
8/9/1980	33	0	10	28	82	1	3	1	0	26	0	0	0	0
8/2/1982	15	0	35	135	14	0	2	0	80	9	0	0	16	6
8/25/1982	18	5	41	66	0	2	1	0	418	90	4	4	222	0
8/30/1984	42	11	34	47	0	1	14	0	140	3	0	5	58	3
8/31/1984	66	23	75	65	8	0	12	0	90	3	13	4	150	0
9/1/1984	8	17	22	5	0	0	7	0	87	15	0	10	55	0
8/20/1988	18	4	49	16	0	1	9	1	180	10	0	0	25	0
8/21/1988	1	2	20	6	0	0	6	1	91	27	0	1	63	0
7/27/1989	4	0	9	0	0	0	9	0	0	15	0	0	13	0
7/31/1989	15	0	31	11	27	1	108	6	9	2	0	4	5	0
8/1/1989	1	0	7	29	4	2	2	0	30	27	0	0	16	0
8/2/1989	24	0	18	3	0	0	66	0	1	26	0	1	44	0
8/2/1989	0	0	8	65	1	2	0	0	41	33	0	0	23	0
8/4/1989	4	0	22	47	2	0	1	0	124	12	0	0	4	0
8/8/1989	20	0	12	3	0	2	73	2	235	31	0	0	44	0
8/15/1989	54	0	21	0	2	0	96	11	335	19	0	32	75	0
8/17/1989	0	0	8	2	0	0	3	0	266	0	0	17	0	0
8/19/1989	11	2	37	2	0	0	26	2	206	4	0	7	49	0
8/23/1989	46	2	69	5	0	0	60	1	410	11	0	60	63	0
9/3/19-89	16	162	7	1	0	0	28	6	30	24	0	2	122	0
9/13/1989	6	48	14	0	0	0	4	0	12	0	0	0	47	1
9/25/1989	28	1	12	0	0	0	5	0	10	0	2	0	12	0
10/5/1989	8	0	7	0	0	0	2	0	8	0	6	0	20	1
10/8/1989	3	0	0	0	0	0	0	0	0	0	0	0	0	0
7/21/1990	29	1	0	0	0	0	0	5	0	1	36	0	0	0

7/27/1990	8	0	11	0	42	0	28	4	0	9	0	0	32	0
8/13/1990	13	2	50	18	5	0	63	4	61	36	0	1	34	1
8/22/1990	14	0	36	2	0	0	7	3	218	7	0	3	26	0
8/24/1990	59	0	105	52	14	0	46	6	114	38	0	77	348	3
8/25/1990	9	0	14	0	0	0	0	0	115	0	0	7	125	0
8/28/1990	0	0	12	2	0	0	1	0	80	8	0	0	24	0
9/3/1990	18	0	4	0	0	0	11	1	0	0	0	32	6	0
9/10/1990	1	1	8	0	0	0	8	1	1	1	0	0	4	73
9/17/1990	2	3	20	0	0	0	33	1	0	1	9	1	0	0
9/17/1990	1	2	0	0	0	0	0	0	0	0	60	0	0	0
9/21/1990	29	0	26	0	0	0	15	0	35	0	1	6	146	2
9/24/1990	1	0	10	0	0	0	12	0	1	0	1	0	110	0
10/3/1990	9	0	2	0	0	0	5	1	0	0	0	0	0	0
11/5/1990	0	0	3	0	0	0	0	0	36	0	0	0	0	0
11/9/1990	0	0	0	0	0	0	0	0	32	0	0	0	0	0
11/14/1990	0	0	0	0	0	0	0	0	18	0	0	0	0	0
7/19/1992	1	0	0	0	34	2	0	0	0	3	0	0	1	0
8/21/1992	0	0	5	3	0	0	1	0	0	0	0	0	0	0
8/25/1992	0	0	19	29	0	0	1	0	5	0	0	0	2	0
8/26/1992	14	0	68	8	10	0	62	5	185	0	0	0	6	0
8/30/1992	0	2	54	0	0	0	11	3	175	0	0	0	0	0
8/31/1992	3	0	54	11	0	0	2	0	87	0	0	0	1	0
9/3/1992	8	0	3	2	0	0	82	0	123	1	0	0	0	0
9/13/1992	14	1	3	5	0	0	7	0	330	1	0	0	4	4
9/20/1992	3	11	24	0	0	0	1	0	5	1	0	0	6	13
9/24/1992	1	6	0	5	0	1	34	0	5	1	3	0	19	11
10/5/1992	0	0	0	0	0	0	4	0	0	0	0	0	0	8
10/9/1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/26/1992	0	0	2	0	0	0	0	0	22	0	0	0	0	0
10/30/1992	0	0	0	0	0	0	0	0	39	0	0	0	0	0

11/10/1992	0	1	3	0	0	0	2	1	6	0	0	0	0	0
11/11/1992	0	0	0	0	0	0	0	0	3	0	0	0	0	0
11/17/1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/19/1992	0	0	0	0	0	0	0	0	21	0	0	0	0	0
11/27/1992	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7/21/1993	0	0	0	0	32	0	36	3	0	0	0	0	0	0
8/13/1993	1	0	41	3	13	0	14	5	0	4	0	0	24	0
8/19/1993	42	0	8	6	1	0	3	0	6	3	0	0	4	0
8/22/1993	10	2	4	0	9	0	9	0	14	8	0	0	10	0
8/23/1993	90	1	23	11	4	0	0	0	118	3	4	0	24	0
8/27/1993	17	0	25	78	1	0	4	2	44	7	1	0	58	1
9/1/1993	6	0	8	36	0	0	1	0	8	2	0	0	3	0
9/2/1993	33	0	18	3	0	0	39	2	177	0	0	0	31	5
9/6/1993	17	3	10	18	0	0	2	2	24	0	0	0	21	0
7/15/1994	4	0	1	0	2	1	0	0	0	15	0	0	4	0
7/24/1994	0	0	2	0	19	1	25	1	0	2	0	0	0	11
7/25/1994	0	0	5	0	28	2	4	1	0	0	0	0	10	0
7/28/1994	0	0	5	0	4	0	6	0	0	0	0	0	0	2
8/6/1994	53	0	6	2	10	0	8	0	0	13	0	0	300	0
8/6/1994	0	0	6	2	0	0	28	0	11	0	0	0	0	0
8/7/1994	60	0	10	6	14	0	5	0	0	3	0	0	150	0
8/17/1994	0	0	5	0	0	0	19	1	27	0	0	0	1	0
8/21/1994	0	1	21	34	0	0	0	0	155	10	0	0	5	0
8/22/1994	3	1	3	1	0	0	3	0	75	0	0	0	14	0
8/25/1994	12	2	14	10	0	0	0	0	360	12	0	0	109	2
8/26/1994	1	0	4	3	0	0	3	0	0	2	0	0	18	0
9/2/1994	47	1	10	0	0	0	23	1	92	5	0	0	175	0
9/2/1994	14	1	10	0	0	0	2	0	0	0	0	0	134	0
9/3/1994	6	0	5	2	0	0	3	0	0	0	0	0	16	0
9/5/1994	4	0	1	0	0	0	1	0	5	0	0	0	0	0

9/7/1994	24	2	29	5	0	0	6	2	75	0	10	0	320	0
9/8/1994	35	0	4	4	0	0	5	0	45	10	0	0	275	0
9/11/1994	40	0	4	3	0	0	0	0	30	0	8	0	100	0
9/12/1994	27	0	18	9	1	0	0	0	7	1	1	0	62	0
9/28/1994	8	10	12	0	0	0	42	4	2	2	15	0	83	0
10/3/1994	0	0	4	0	0	0	0	0	45	0	8	0	12	0
10/6/1994	1	4	0	0	0	0	0	0	35	0	0	0	10	0
10/8/1994	0	0	7	0	0	0	0	0	12	0	0	0	0	0
10/15/1994	1	1	12	1	0	0	16	0	6	0	14	0	8	0
10/21/1994	7	0	5	0	0	0	17	0	20	0	8	0	0	0
10/23/1994	0	4	1	0	0	0	0	0	40	0	0	0	25	0
10/24/1994	0	1	6	0	0	0	0	0	50	0	7	0	8	0
11/3/1994	0	0	8	0	0	0	0	0	96	0	0	0	0	0
11/9/1994	0	0	0	0	0	0	0	0	8	0	0	0	0	0
7/2/1995	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7/18/1995	7	0	0	0	0	5	0	0	0	12	0	0	0	0
7/22/1995	17	0	1	0	0	7	2	1	1	10	1	0	46	0
7/23/1995	9	0	0	0	1	0	2	0	6	0	0	0	0	0
7/27/1995	3	0	2	1	10	0	0	0	0	0	0	0	6	0
8/3/1995	5	0	2	4	0	0	5	0	0	0	0	0	10	0
9/10/1995	3	0	2	2	0	0	2	0	36	0	6	0	52	0
9/16/1995	1	1	2	0	0	0	2	1	90	0	0	0	0	0
9/24/1995	0	5	4	0	0	0	2	0	0	0	0	0	1	0
10/9/1995	0	0	0	0	0	0	0	0	135	0	0	0	14	0
10/21/1995	0	0	3	0	0	0	0	0	136	0	16	0	12	0
10/23/1995	0	0	0	0	0	0	0	0	90	0	0	0	15	0
10/24/1995	0	0	1	0	0	0	0	0	141	0	0	0	33	0
10/30/1995	0	0	16	0	0	0	0	0	113	0	0	0	15	0
11/3/1995	0	0	0	0	0	0	0	0	4	0	0	0	0	0
11/5/1995	0	0	0	0	0	0	0	0	2	0	0	0	0	0

11/11/1995	0	0	0	0	0	0	0	0	10	0	0	0	0	0
11/20/1995	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7/19/1997	0	0	0	4	6	1	9	0	0	11	0	0	0	0
8/5/1997	35	0	17	18	0	0	8	0	1	95	0	0	0	0
8/22/1997	0	0	40	0	0	0	8	0	0	8	0	0	0	0
9/9/1997	0	0	16	0	0	0	7	0	0	19	0	0	50	0
9/22/1997	0	0	13	0	0	0	9	0	0	0	0	0	17	0
9/28/1997	0	0	5	1	0	0	3	0	0	4	0	0	0	0
10/27/2000	0	10	10	0	0	0	0	0	24	0	0	0	10	0
8/8/2001	0	0	6	100	7	0	7	0	0	0	0	1	0	0
7/31/2005	0	0	0	0	0	0	2	9	12	4	0	0	0	0
8/17/2005	0	0	17	6	0	0	9	5	6	0	0	0	100	0
9/5/2005	4	0	4	3	0	0	4	3	4	0	0	0	26	0
9/9/2005	15	0	8	0	0	0	0	0	7	0	0	0	19	0
9/23/2005	10	0	3	2	0	0	3	6	5	0	3	0	23	0
10/14/2005	0	0	13	0	0	0	0	0	0	0	0	0	0	0

# Stephenville Crossing

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
7/10/1982	2	0	0	0	0	4	0	0	0	28	0	0	0	0
8/4/1982	63	0	3	0	0	10	32	0	6	31	4	0	19	1
8/25/1982	8	0	60	0	0	12	15	1	0	126	0	3	210	0
9/1/1984	30	0	25	2	0	1	6	1	15	2	0	0	105	0
9/2/1984	0	0	1	1	0	0	4	0	0	0	1	1	2	0
8/11/1986	103	0	55	3	0	0	62	1	27	10	0	1	1	0
8/12/1986	36	0	34	10	0	0	46	1	18	6	0	0	3	0
8/14/1986	49	0	63	10	0	3	49	12	35	5	0	3	26	0
7/31/1989	0	0	1	0	0	0	2	0	0	15	0	0	19	0
10/7/1989	0	0	24	0	0	0	11	1	85	11	11	0	94	22
10/8/1989	2	0	15	6	0	0	15	0	63	2	18	0	58	165
10/8/1989	0	5	32	5	0	0	5	0	28	0	6	0	3	1
7/30/2000	0	0	0	0	1	0	3	0	0	11	0	0	0	0
11/13/2000	0	0	5	0	0	0	3	0	100	0	0	0	0	23
10/15/2001	0	0	24	0	0	0	8	0	65	0	0	0	3	125
10/17/2001	0	0	0	0	0	0	0	0	0	0	40	0	0	0
10/30/2001	0	0	44	0	0	0	1	0	90	0	35	0	0	70
07/08/2003	0	0	2	0	0	0	7	0	0	4	0	0	0	0
10/24/2003	0	0	0	0	0	0	2	0	20	0	110	0	0	0



# Witless Bay

DATE	SEPL	GOPL	BBPL	RUTU	WHIM	SPSA	GRYE	LEYE	WRSA	LESA	DUNL	SBDO	SESA	SAND
8/14/1984	0	0	0	2	0	0	0	0	0	0	0	0	0	0
08/01/2002	6	0	0	0	0	0	0	3	0	0	0	0	2	0
08/03/2002	6	0	0	1	0	0	0	0	4	0	0	0	5	0
08/30/2002	8	0	0	0	0	0	0	0	0	0	0	0	1	0
08/31/2002	15	0	0	0	0	0	0	0	0	0	0	0	1	6
10/05/2002	3	0	0	0	0	0	0	0	0	0	0	0	0	0
08/29/2003	8	0	0	0	0	0	2	0	0	0	0	0	1	0
09/11/2003	10	0	0	0	0	0	0	0	0	0	0	0	4	0
09/18/2003	11	0	0	0	0	0	0	0	0	0	0	0	0	11
10/03/2003	5	0	4	1	0	0	0	0	0	0	0	0	0	0
10/26/2003	2	0	0	0	0	0	0	0	0	0	0	0	0	0
11/02/2003	4	0	0	0	0	0	0	0	0	0	0	0	0	0
07/04/2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/10/2004	5	0	0	4	0	0	0	0	0	0	0	0	26	0
09/06/2004	8	0	0	0	0	0	0	0	0	0	0	0	0	3
09/06/2004	4	0	0	0	0	0	1	0	0	0	0	0	0	2
09/08/2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/24/2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/08/2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/27/2004	12	0	0	5	0	0	5	0	0	0	0	0	7	0
9/2/2005	0	0	0	0	0	0	1	0	0	0	0	0	0	0
9/3/2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/4/2005	9	0	0	0	0	0	0	1	0	0	0	0	0	5
9/17/2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/24/2005	0	0	0	0	0	0	0	1	0	0	0	0	0	0

## Species Codes

Code	Species
SEPL	Semipalmated Plover
GOPL	American Golden-Plover
BBPL	Black-bellied Plover
RUTU	Ruddy Turnstone
WHIM	Whimbrel
SPSA	Spotted Sandpiper
GRYE	Greater Yellowlegs
LEYE	Lesser Yellowlegs
WRSB	White-rumped Sandpiper
LESA	Least Sandpiper
DUNL	Dunlin
SBDO	Short-billed Dowitcher
SESA	Semipalmated Sandpiper
SAND	Sanderling