

Summary of Christmas Bird Count Shorebird Monitoring 1976-2001 at Elkhorn Slough National Estuarine Research Reserve

Sherry Palacios and Kerstin Wasson, July 2002

Overview

Each year in late December, the Audubon Society coordinates the Christmas Bird Count (CBC), nation-wide. We examined the data from the Moss Landing count circle from 1976-2001, for those shorebird and waterfowl species also monitored by the Elkhorn Slough National Estuarine Research Reserve (ESNERR) Volunteer Shorebird Monitoring Program. Some bird groups showed considerable variation in abundance over time, while others remained quite stable. Overall, there were few significant long-term trends: most groups are neither increasing nor decreasing in this area over time. Species diversity has likewise remained very stable over time, ranging from 63-67 species of shorebirds and waterfowl per count for all years.

Methods

Sampling: For over 100 years, volunteer birders have gone into the field between approximately December 15th and January 5th to count bird species at designated count circles in the United States. The Moss Landing count circle encompasses the area including the Elkhorn Slough (Fig. 1) and has been monitored since 1976. The data for these annual bird counts are housed on the Audubon Society website (<http://www.audubon.org/bird/cbc/index.html>) and can be easily accessed and downloaded. The data are presented as overall counts and calculated counts per hour. The database includes upland species, raptors, and shorebirds for this site, but for the purpose of this study, only those species included in the ESNERR Volunteer Shorebird Monitoring Program have been analyzed.

Data Analysis: Data were pooled into bird group. Total counts, counts per hour and species richness (# of species) were compared across year. Only count per hour and species richness results are presented here. The CBC data and the ESNERR shorebird monitoring data (Davidson Oceanographic Season = November-February) for 2000 and 2001 were also compared.

Results and Discussion

Analysis of abundance over time revealed few long-term trends; none of the bird groups showed strong increases or decreases across the whole 25-year period. However, abundance did show variation from year to year, sometimes with marked patterns. The results for different bird groups are summarized below and illustrated in Figures 2-9.

For those groups that appeared to vary greatly in abundance between years, the results should be interpreted with some caution. Since counts were only carried out on a single day in each year, they do not provide a comprehensive assessment of abundance for the whole season (let alone the whole year). For instance, a species that migrates through the area in winter may arrive earlier in one year than another, leading to differences in CBC

abundance data between years, even if the seasonal total number of birds of that species may have been similar between years.

- Loons and grebes (Fig. 2). They were abundant during 1976-77 (40-50 bird counts per hour), but then decreased dramatically to approximately 10 bird counts per hour from 1978-2000. They showed a dramatic increase to 60 counts per hour in 2001.
- Pelicans (Fig. 3). Their abundance was generally around 0.25 – 0.50 counts per hour for the entire period with exceptions in two peak years, 1984 and 1995, with 2 counts per hour.
- Cormorants (Fig. 4). They displayed an increase in abundance early in the sampling from 1976- 1979 (4 to 8 counts per hour) then decreased gradually to 1 count per hour in 1983, rising gradually again to 7 counts per hour in 1986, decreasing to 2 counts per hour in 1990, and remaining at approximately that level with the exception of 1992 (7 counts per hour). Overall, cormorants are lower in abundance at present (2001) than at the beginning of the CBC sampling.
- Egrets and herons (Fig. 5). They remained fairly stable in abundance throughout the sampling period, in the range of 1-2 counts per hour with the exception of a few years from 1985-1990 and 1993 in which the counts were between 2 –3 counts per hour.
- Waterfowl (ducks, buffleheads, widgeons, and scoters) (Fig. 6). They are abundant in the Moss Landing count circle, ranging from 25-70 counts per hour for most of the sample period with the exception of 1985-1986 in which waterfowl abundances increased to approximately 135 counts per hour. The species most abundant during this peak were the northern shoveler, the ruddy duck, and the American coot.
- “Peeps” (killdeer, godwits, curlews, sandpipers, sanderlings, plovers, avocets, stilts, dowitchers, yellowlegs, and dunlins) (Fig. 7). They were variable throughout the sample period and this variability was due to the western and least sandpiper and dunlin populations. These three groups were extremely abundant some years (90 counts per hour) and other years were nearly non-existent, which affected the overall abundance trends greatly.
- Gulls (Fig. 8). Their abundance was high at the beginning of the sampling period (90 counts per hour) but then decreased to approximately 20 counts per hour (Fig. 8). Since 1990, gull abundances have increased gradually, with some variability, to 90 counts per hour.
- Terns (Fig. 9). Except for the first year of the sampling, which had an abundance of 9 birds per hour, tern abundance at this time of year has remained low, not exceeding 2 counts per hour.

In the long term, trends detected by the Moss Landing CBC can be compared to those for winter counts taken for the ESNERR Volunteer Shorebird Monitoring Program. Comparison of CBC and ESNERR data from 2000 and 2001 is suggestive, but not very informative at this early stage. For instance, both monitoring programs appear to detect an increase in gulls and a decrease in waterfowl between the two years.

Species richness for these shorebird groups did not show much variation in the CBC counts from 1976-2001, ranging from 63-67 species. Only about half as many species were observed during winter sampling for the ESNERR program, presumably because the monitoring is focused on a few specific locations on the Reserve (rather than encompassing the whole Slough area) and because birds are quantified during only five ten-minute watches, rather than over a whole day.

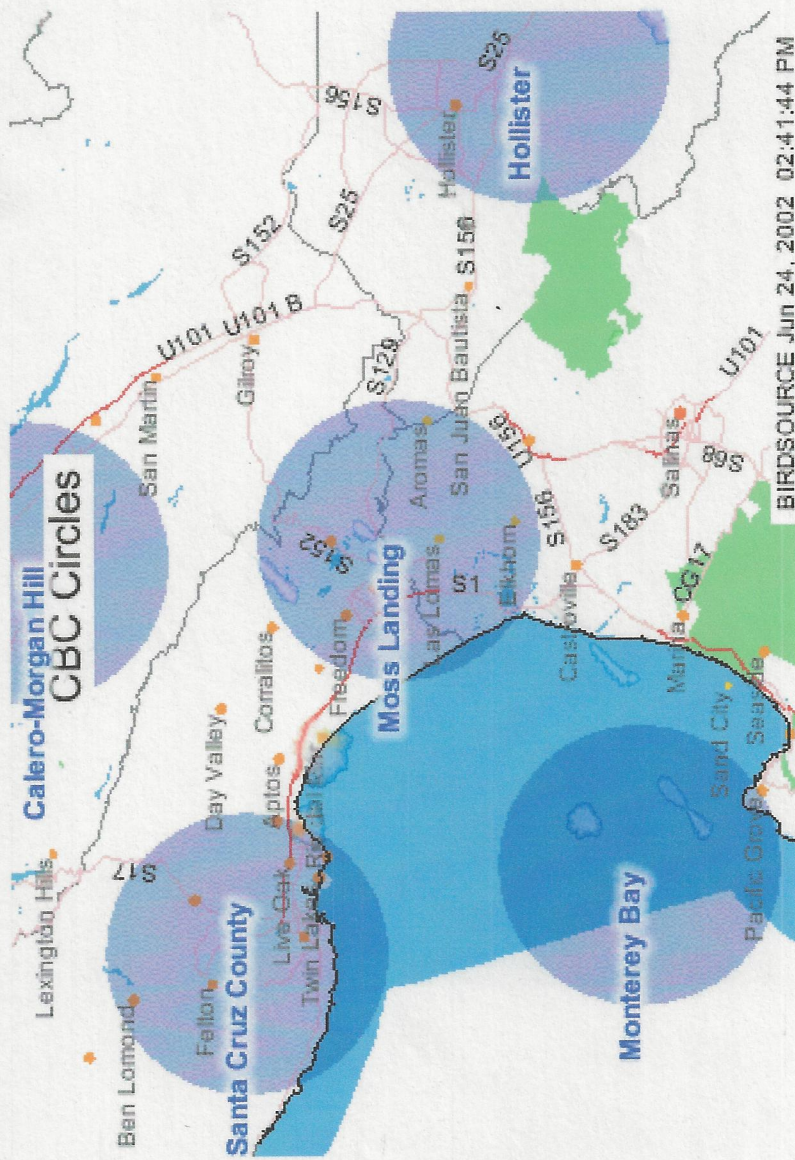


Fig. 1. Moss Landing Count Circle for the Audubon Society Christmas bird count. This circle has been sampled annually since 1976.

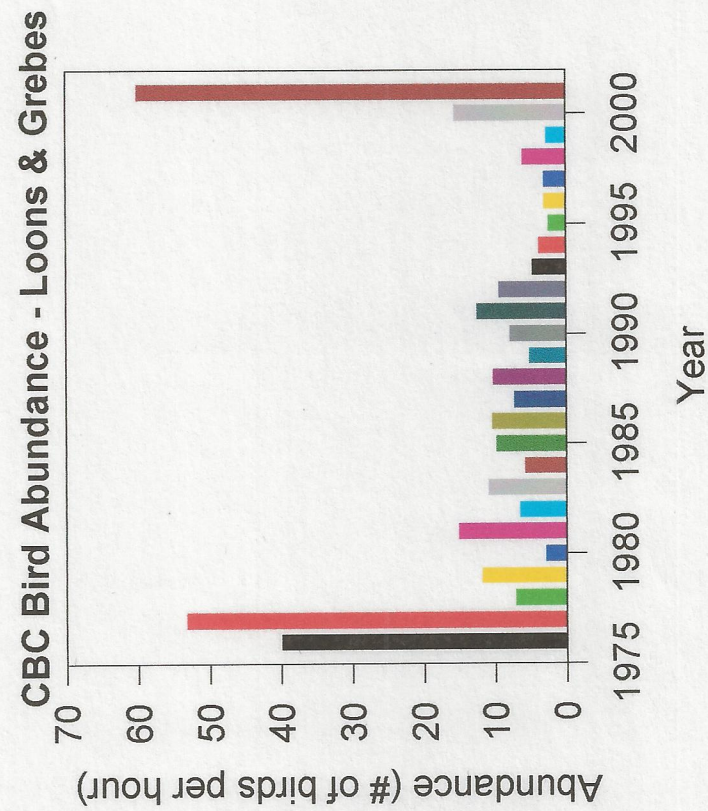


Fig. 2. Loon and Grebe abundance (counts per hour) in the Elkhorn Slough 1976 – 2001.

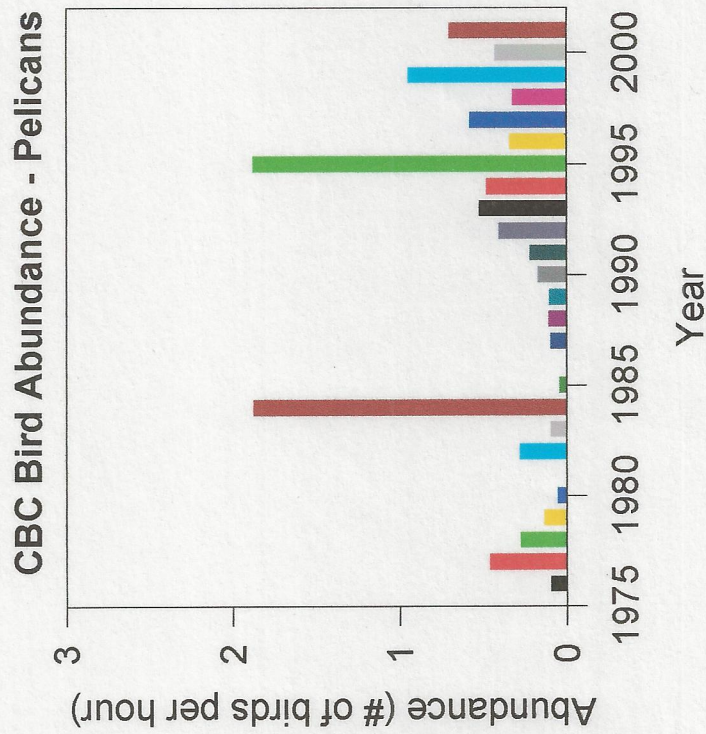


Fig. 3. Pelican abundance (counts per hour) in the Elkhorn Slough 1976 – 2001.

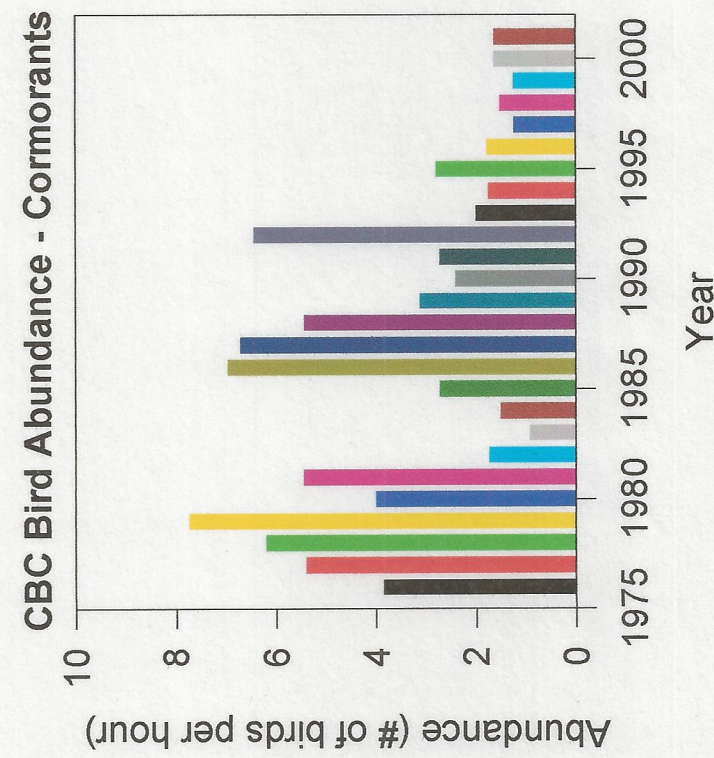


Fig. 4. Cormorant abundance (counts per hour) in the Elkhorn Slough 1976 – 2001.

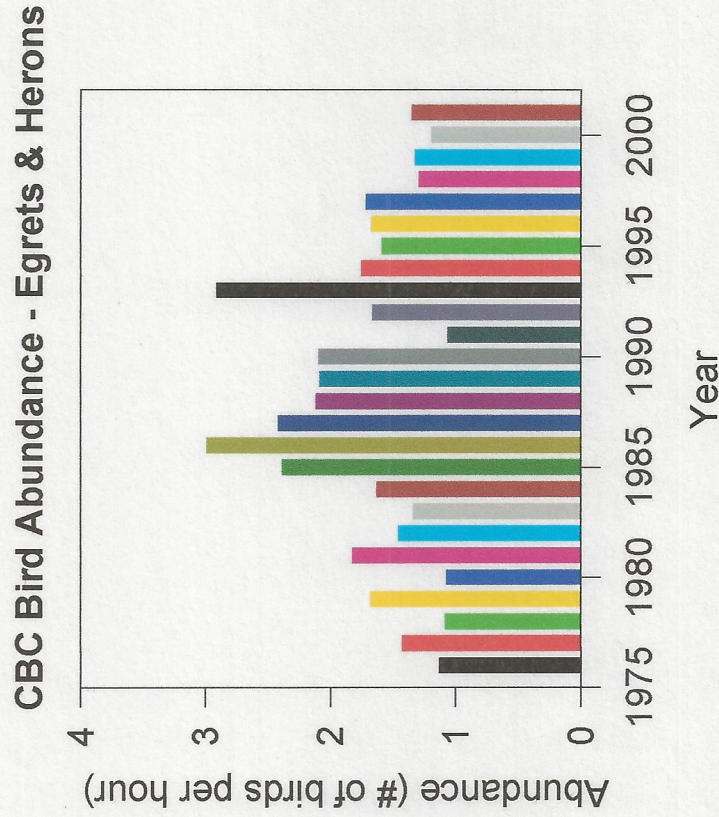


Fig. 5. Egret and Heron abundance (counts per hour) in the Elkhorn Slough 1976 – 2001.

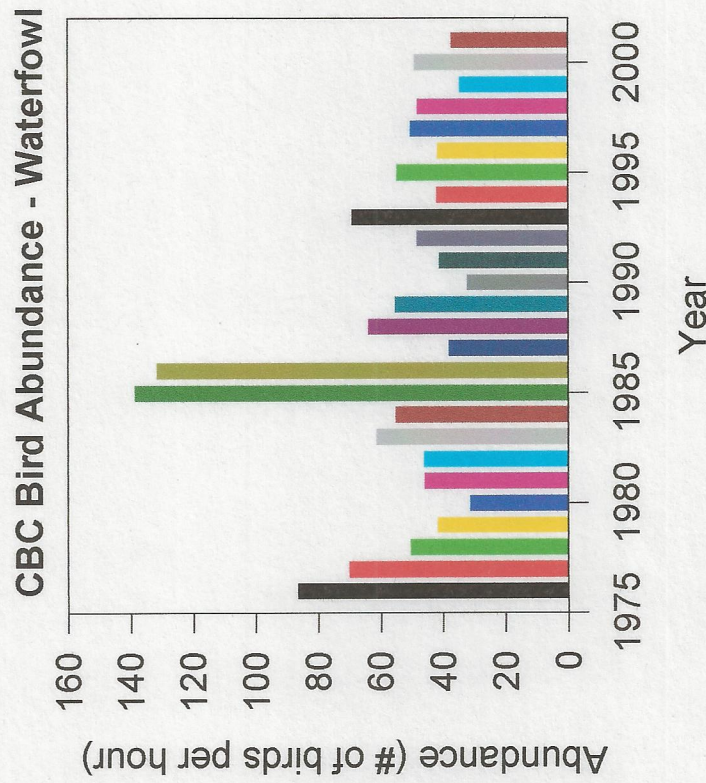


Fig. 6. Waterfowl abundance (counts per hour) in the Elkhorn Slough 1976 – 2001.

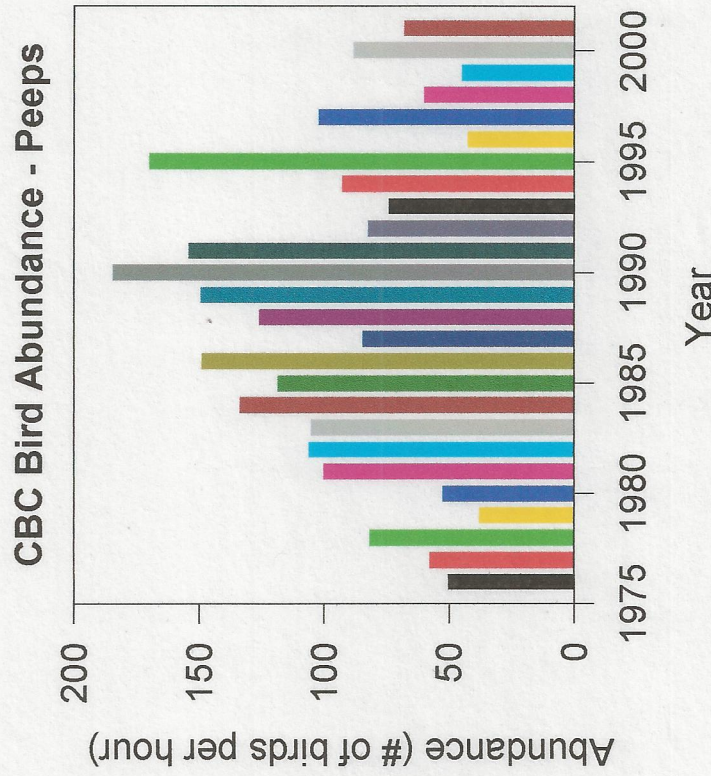


Fig. 7. Peeps abundance (counts per hour) in the Elkhorn Slough 1976 – 2001.

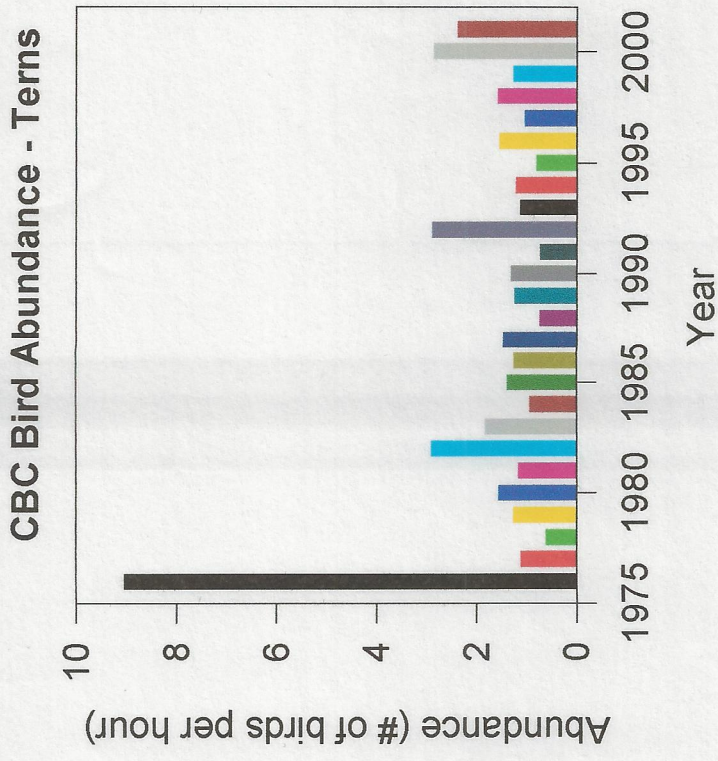


Fig. 9. Tern abundance (counts per hour) in the Elkhorn Slough 1976 – 2001.

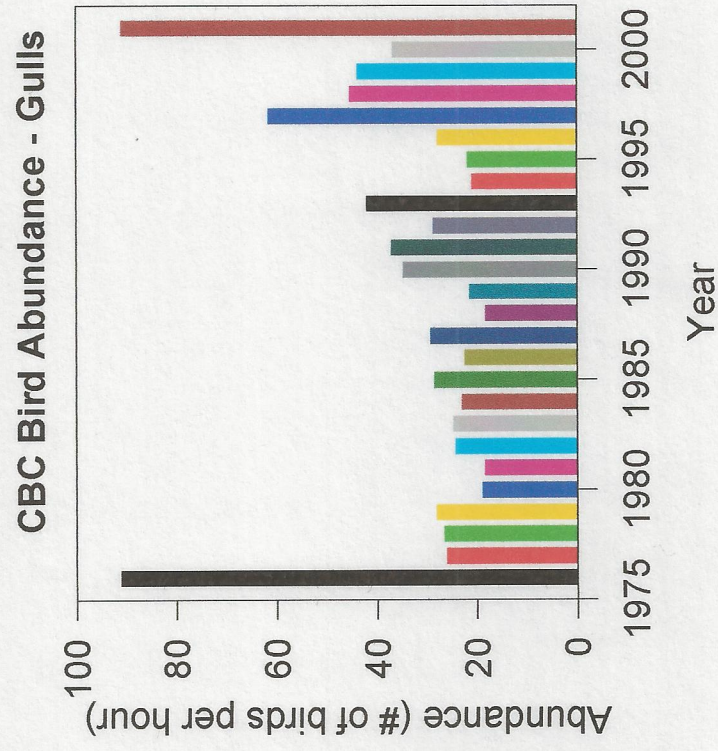


Fig. 8. Gull abundance (counts per hour) in the Elkhorn Slough 1976 – 2001.

Bird Abundance in ESNERR:Davidson Season 2000-2001

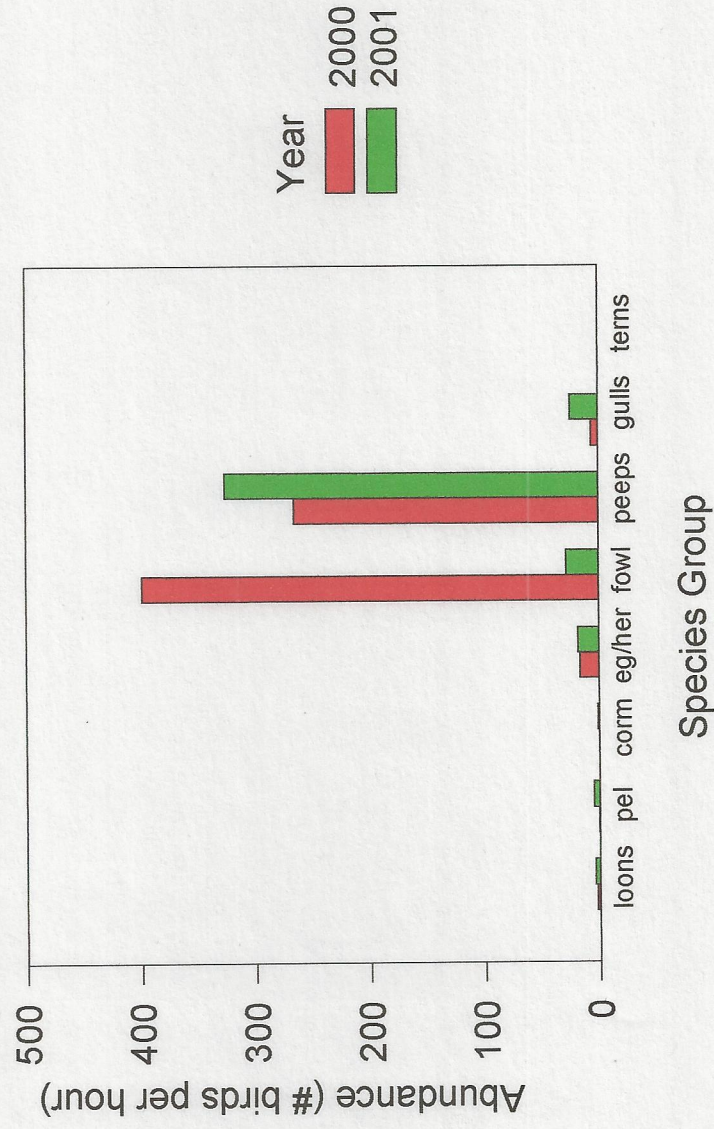


Fig. 10. ESNERR monitoring program abundances by bird group for 2000 and 2001.