

Florida's Brown Pelican Population: Christmas Bird Count Analyses

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*"... a stable population at the present
time . . . could be drastically altered
by a number of factors . . ."*

Animal populations fluctuate, and data on any species' status at a given time are difficult to collect. Only long term studies of productivity and mortality provide the information necessary to determine whether a given population is stable or not. The status of many avian populations is presently being subjected to considerable publicity, especially in the popular press and especially in view of the "pesticide controversy." The Brown Pelican (*Pelecanus occidentalis*) occupies a special position in this discussion. This species is presently being studied intensively in much of its North American range, and particularly in Florida the population status is well known for the past six years. However, as Schreiber and Risebrough (1972) noted, it is difficult to relate the present population levels to those of a decade or more ago.

The Christmas Bird Counts conducted annually under the auspices of the National Audubon Society provide some data on wintering populations of many species of birds. Careful analysis and interpretation of those data are necessary, however. Recently, Bystrak (1971) presented a method of analysis which allows comparison of recent and historic Counts.

The present study is an analysis of Christmas Bird Count data for the Brown Pelican in Florida over the past 30 years.

METHODS

We calculated the index of birds per ten party-hours from Christmas Bird Counts of 1943 through 1972 (*Audubon Field Notes*, 11-23; *American Birds*, 25-27). Data used were obtained from Count locations as noted in Figure 1. For standardization, any Count with fewer than 10 individuals per year was omitted from analysis. We divided the coastal Counts into five regions (Figure 1) based on the results of a color marking study (Schreiber and Williams, in press) which

indicates that pelicans wintering in Florida are relatively confined to certain regions of the coast. Count data were combined within these regions to obtain the indices presented in Figures 2 and 3.

Table 1 tabulates the number of Counts analyzed per year by region. It is obvious that the number of Counts has increased dramatically in recent years. The low number of Counts in the 1940s and early 1950s undoubtedly accounts for much of the variability in our index during that time. However, since the early 1950s the number of Counts is sufficient to allow use of the index of birds per ten party-hours as an accurate indication of the population trend of wintering pelicans in Florida over the past two decades.

RESULTS AND DISCUSSION

Florida Panhandle: Through the 1940s and early 1950s pelicans were common in this region. However, in 1947 and 1950 few birds were observed. Beginning in 1953 and through 1957 a steady drop in numbers occurred and since 1958 fewer than one bird per ten party-hours has been recorded. One pelican was seen in the region in 1966 and one in 1968 but none were observed in 1962, 1963, 1964, and 1972. In 1971 the fifteen birds counted is the maximum number of pelicans seen in 1958-1972.

Our index precisely corresponds in time with the known decline of pelicans in Texas and Louisiana (Schreiber and Risebrough, 1972). The last known nesting by native Louisiana pelicans was in 1961 when about 100 pairs bred successfully. This is less than two percent of the known breeding population in the region in the 1930s. In 1971 and 1972 breeding was recorded for about 20 pairs of pelicans, imported as nestlings from Florida to Louisiana in 1968 and 1969.

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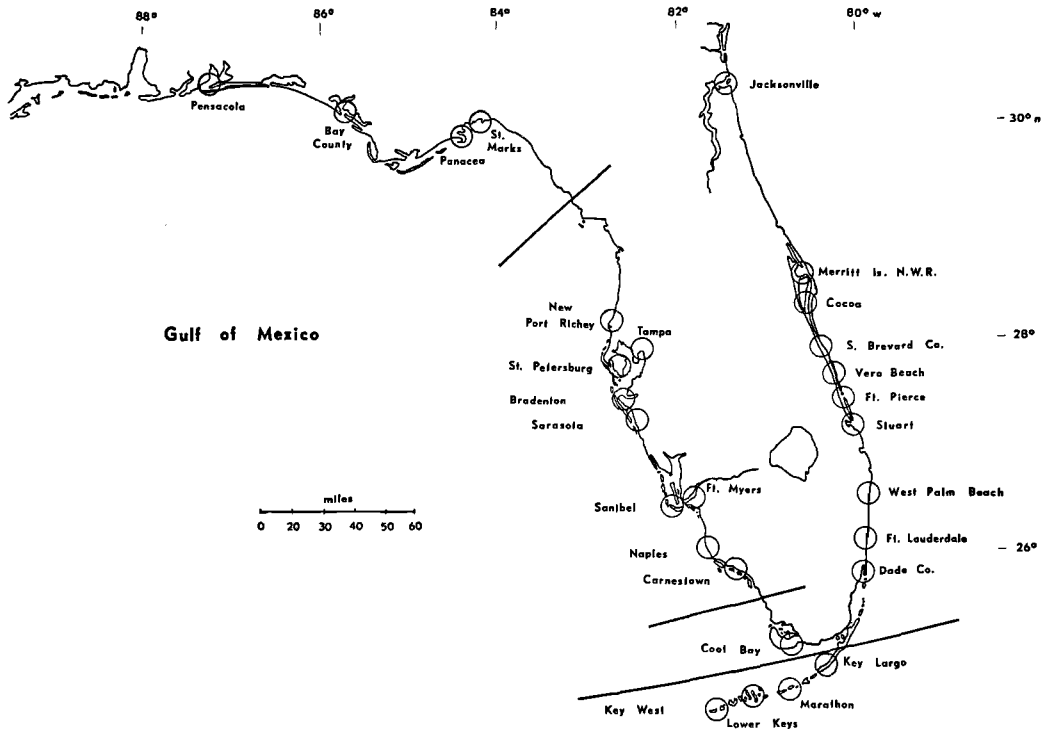


Figure 1. Christmas Bird Count localities used in calculating the index of birds per ten party-hours for Brown Pelicans in Florida.

(Joanen and Neal, 1971; Williams, 1972). As yet, these Louisiana breeding birds do not seem to have increased the number of pelicans wintering in northern Florida. This information, the results of a color marking study (Schreiber and Williams, in prep.), and semi-annual aerial surveys of the entire state of Florida (Fogarty, in press) indicate that few pelicans move north after fledging, to spend the winter months in the Panhandle area.

Florida West Coast: Our indices for the late 1940s probably indicate too high a population because of the low number of Counts (1-3) during that time. A relatively stable population of wintering birds is indicated since the mid-1950s. The distinct increase in the 1971 Count index undoubtedly resulted from the warm temperatures in the fall of 1971 when unusually large numbers of pelicans remained in the Tampa Bay area over the winter of 1971-72 (Schreiber, unpub. data).

Coot Bay: This Count has been held since 1950. While some fluctuation has occurred, the index shows a stable wintering population with a low in the early 1960s. A slight increase in numbers occurred in the past six winters,

perhaps related to an increase in birds being fed at the fish-cleaning pier at Flamingo, Everglades National Park.

Florida Keys: Wide fluctuations exist between some years, i.e., 1958 (2 Counts) and 1957 and 1959 (4 Counts each). The apparent increase in pelicans wintering in the region since the early 1950's cannot be explained at this time.

Florida East Coast: Our index indicates a decline in numbers of pelicans wintering in this region from the 1940's through the mid-1950s (although this well may be a factor of small sample size: 1 Count in 1943-1947, 1 or 2 Counts in 1948-1950, 2 or 3 Counts in 1951-1955, 4 Counts in 1955, and 6 to 9 Counts in 1957-1972), a very consistent and slightly increasing population in 1956-1972, with drastic declines in 1968 and 1970 compared to 1967 and 1969. Our index indicates a general stability to the population from the mid-1950s to the present. However, it is interesting to compare this curve, with its wide fluctuations, to the index for the Panhandle region, with its wide fluctuations prior to the decline of that population in the late 1950s.

Table 1. Regional totals of Christmas Bird Counts used in computation of the index: birds per ten party-hours.

	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
Brown Pelicans															
East Coast	1	1	1	1	1	2	1	2	3	2	3	3	3	4	6
Keys	0	0	0	0	0	1	1	1	1	1	2	2	3	3	4
Coot Bay	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
West Coast	1	1	2	2	2	3	3	2	2	3	3	3	3	2	3
Panhandle	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3
West Coast															
Subtotal	3	3	4	4	4	6	7	6	6	7	7	7	7	6	7
Florida Total	4	4	5	5	5	9	9	9	10	10	12	12	13	13	17
	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Brown Pelicans															
East Coast	6	7	7	7	8	7	7	8	8	8	7	8	9	9	9
Keys	2	4	4	4	4	4	4	4	4	4	4	3	3	3	3
Coot Bay	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
West Coast	4	4	4	5	5	6	6	6	6	6	5	6	6	6	8
Panhandle	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
West Coast															
Subtotal	8	8	8	9	9	10	10	10	10	10	9	10	10	10	14
Florida Total	16	19	19	20	20	22	21	21	22	22	20	21	22	22	24

The pelicans counted on the east coast of Florida and on the Florida Keys Christmas Counts originate in two localities: colonies in South Carolina and the East Coast of Florida. In Florida prior to 1968, no data are available on total number of nests or productivity. Since 1968 the number of nests in Florida is known from aerial surveys made during the peak of nesting. On the East Coast there were 2,200 nests in 1968, 1,400 in 1969, 1,930 in 1970, 2,160 in 1971, 2,325 in 1972, and 1,635 in 1973 (Fogarty, *in litt.*). Fluctuations in numbers of nests do not coincide with our index derived from Counts in these regions made approximately six months after the aerial surveys. Productivity data for the nests in the total region do not exist.

Sightings of color-marked pelicans, banded as nestlings in South Carolina, indicate a distinct post-breeding movement southward (Schreiber and Williams, *in prep.*). Thus, the number of pelicans wintering each year along the east coast of Florida may be dependent on the number of pelicans fledged each year in the colonies on the Deveaux Bank and Cape Romain National Wildlife Refuge in South Carolina. Unfortunately, data for that region are conflicting. Beckett (1966) stated that in "former years the (Deveaux Bank) colony numbered over 5,000 pairs" (p. 94) and that "in the early 1960s Deveaux Bank alone

produced 7,000 to 10,000 young per year" (p. 99). Beckett banded 1,344 young in 1964 and 1,120 young in 1965, even though the breeding colony had declined from 2,000 to 600 breeding pairs in that time. The number of young actually fledged is not recorded. Beckett further stated that "I do not believe that more than 1,800 pairs fledged young in the entire state of South Carolina in 1965." Records for the Cape Romain National Wildlife Refuge indicate that 2,000 young fledged there alone in 1965 (McDaniel, *in litt.*). Blus (1970: 867) restated Beckett's estimate of over 5,000 pairs on the Deveaux Bank as "The number of breeding pairs in South Carolina was estimated at over 5,000 in the early 1960s" and states that he (Blus) counted 1,250 pairs in the state in 1969. No other relevant data for South Carolina are presently available.

The number of young fledged in a specific year would not be expected to drastically affect our index, but certainly a 60 per cent decline in productivity, as is indicated in the above data, in less than ten years, should.

Florida West Coast Subtotal: This index was obtained by combining the Panhandle, West Coast, and Coot Bay Counts. A possible decrease in numbers of pelicans in the late 1940s is indicated. Since about 1950 numbers have been very consistent with a possible slight increasing

trend Keeping in mind the effects of the warm fall temperatures in the fall of 1971 and their possible effects on the number of birds in the region, the indices for 1966 through 1972 are amazingly consistent. The total number of nests in this region has fluctuated between 3,100 nests in 1971 and 7,000 nests in 1970 with 4,980 in 1968, 4,125 in 1969, 5,184 in 1972, and 4,000 in 1973 (Fogarty, *in litt.*).

Total Florida: The index of birds per ten party-hours calculated from the Christmas Bird Counts for the coastal regions of Florida for Brown Pelicans for the thirty year period from 1943 through 1972 indicates a possible decline in numbers in the late 1940s (4-5 Counts) but an amazingly stable population since 1950 (9-22 Counts). A slight increase is perhaps indicated in the past five years but this could result from increasing interest in this species' status.

The compilation of data in this study indicates that the Christmas Bird Counts, when analyzed as birds per ten party hours, provide a reliable index to the wintering bird populations of a region, at least for a species as conspicuous and well known as the Brown Pelican. It also clearly indicates the need for data collected in a consistent manner on the annual number of active nests and their level of productivity over long periods of time, and for reliable reporting of the data in the scientific literature. A valuable addition to the Christmas Bird Counts would be reporting of the ages (immature, subadult, adult) of the pelicans sighted.

Our winter population indices and the surveys of nesting colonies by the Florida Game and Fresh Water Fish Commission indicate a stable population of pelicans in Florida at the present time; however, the following factors could drasti-

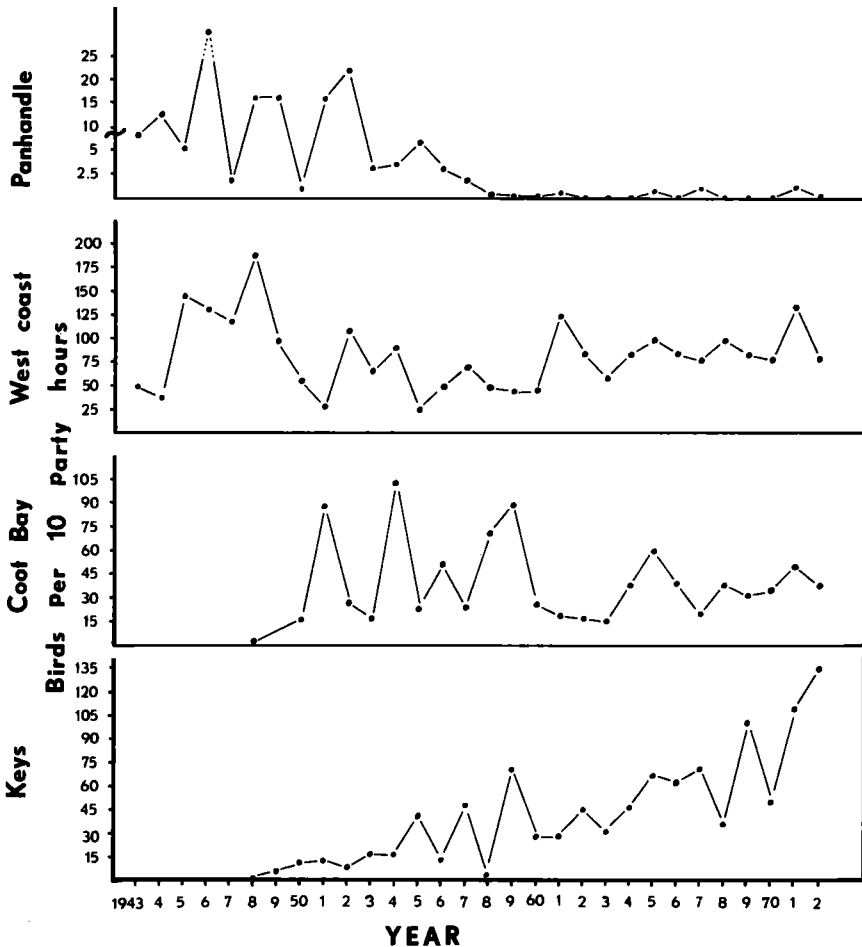


Figure 2. Index of birds per ten party-hours for Brown Pelicans in Florida.

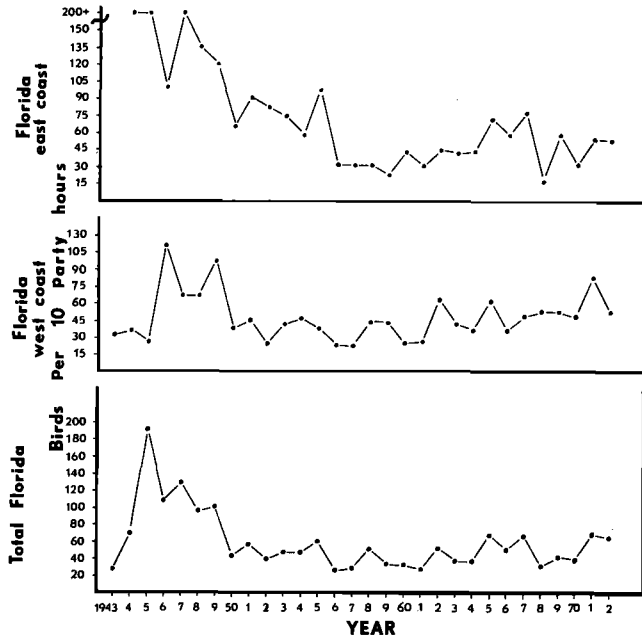


Figure 3. Index of birds per ten party-hours for Brown Pelicans in Florida.

cally alter this stability in a short period of time: DDE contamination and resultant eggshell thinning (Blus, 1970; Blus *et al.*, 1971; Schreiber and Risebrough, 1972); human disturbance in nesting colonies (Schreiber and Risebrough, 1972); mortality of adults and young from ensnarement in fishing hooks and fishing line (Schreiber, unpub. data); disturbance by boat traffic at sand spits and islets used as diurnal and nocturnal roosts; destruction of nesting areas for human "development"; and the various aquatic pollution factors which affect fish populations on which the pelicans are dependent for food. A severe increase in any one of these factors or a small increase in several working synergistically would have drastic and rapid deleterious effects on the Brown Pelican population of Florida.

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