

A COMPARISON OF PAST AND PRESENT OSPREY BREEDING POPULATIONS IN COASTAL VIRGINIA

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In the years since the development and application of chlorinated hydrocarbon pesticides, many Osprey (*Pandion haliaetus*) populations have suffered large reductions in productivity and many regions have experienced serious population declines (e.g., Ames, 1966; Ames and Mersereau, 1964; Peterson, 1969; Postupalsky, 1969; Henny and Ogden, 1970; Kennedy, 1971). Many estimates of present day Osprey population size and productivity are known for various regions (for a review, see Via, 1975), but relatively few comparisons are available between the size of current Osprey populations and the size of the population that existed prior to the pesticide era (beginning circa 1947). The few existing studies show that Osprey populations in the northeastern United States have suffered drastic declines from their pre-1947 level (Connecticut and New York: Ames and Mersereau, 1964, and Peterson, 1969; New Jersey: Schmid, 1966), whereas essentially no decline in the Osprey breeding population has occurred over the past six or so decades in parts of Maryland (Reese, 1969) and North Carolina (Henny and Noltemeier, 1975). This paper compares past (pre-1947) Osprey breeding populations in the several areas in coastal Virginia for which early reports exist with the 1975 breeding populations at those same localities.

METHODS

The breeding population of Ospreys in Virginia was estimated in 1975 by survey techniques outlined in Kennedy's (1971) study of the Virginia population during 1970-71. Briefly, all sites mentioned in this study (except Hog Island, Mockhorn Island, and Owens Pond) were visited three to five times by boat during the breeding season. Three aerial surveys were made over Hog Island and Mockhorn Island; one aerial survey was made over Owens Pond. Because one of us (MAB) has been monitoring the Osprey population in Virginia since 1970, we feel confident that the present location of virtually all Osprey nests was known for each of the localities discussed below (with the possible exception of the Owens Pond area). All population data for 1975 are from M. A. Byrd (unpubl. data). A nest, if accessible, was classified as active if there was known egg production; if the nest was inaccessible, it was classified as active if either adult was observed in an incubation position on the nest during one or more visits to the site.

RESULTS

In 1975, on Hog Island (in Northampton County on the Eastern Shore of Virginia) no active Osprey nests were found. On nearby Mockhorn Island, there were 10 active nests (fledging 9 young)

in 1975; an additional pair at a nest on a navigational aid near Mockhorn Island fledged one young. Between 25 and 29 May 1875, H. B. Bailey visited Hog Island and Mockhorn Island; Bailey (1876) reported that "about fifty pairs [of Ospreys] were breeding on Hog Island", and "several pairs were also found on Mockhorn Island, in the heronry."

In 1975, nine active nests were in the vicinity of Gwynn's Island (in Mathews County); 12 young were fledged from 6 of the nests. None of those nests active in 1975 was actually on Gwynn's Island; all were on duckblinds and navigational aids in Milford Haven, a small cove south of the island. On 7 May 1890, M. C. White (1891) and his companions collected 25 clutches of Osprey eggs on Gwynn's Island; White gives no indication that all nests on the island were visited then.

In 1975, Goodwin's Island at the mouth of the York River in York County had three active (but inaccessible) nests and an additional nest on a nearby navigational aid produced two fledglings. At nearby Bay Tree Neck, no active Osprey nests were found in 1975. On 6 May 1934, F. M. Jones (1936) saw "several nests" out on Goodwin's Island from where he stood on the mainland; a local resident reported that Ospreys were "very plentiful" on Goodwin's Island. At Bay Tree Neck, he saw 3 nests on duckblinds out in the water, and 28 nests in trees along a half-mile section of shore; he also said "there were no doubt many [nests] in the thick pine growth close by which I did not investigate for lack of time." He climbed to 11 of the 28 nests, and found that 9 of the 11 nests contained eggs; the other 2 nests were empty. If a similar proportion (9/11) of all 31 nests were active, then at least 25 Osprey nests were active at Bay Tree Neck in 1934.

In 1975, nine active Osprey nests fledged 12 young in the Ingram Bay area at the mouth of the Great Wicomico River in Northumberland County. In the nearby Owens Pond area about 6-8 Osprey nests were active in 1975. Five nests were active in the Smith's Point area at the mouth of the Little Wicomico River. From 16 through 24 June 1934, W. B. Tyrell (1934) visited Osprey nests in this section of Virginia's Northern Neck. In Ingram Bay, Tyrell located 4 active nests on duckblinds and "several" (2 of which were visited and found to be active) on the shore. He located 12 nests around Owens Pond the status of which was unknown because they were not examined, and at least 42 active nests (including 2 which had been abandoned) were found in the Smith's Point area. All in all, Tyrell found over 76 nests (54 of which were visited to determine their status). Tyrell's data are summarized in Table 1.

DISCUSSION

The comparisons of past and present Osprey breeding populations at various sites throughout coastal Virginia are summarized in Table 2. It should be emphasized that these population estimates cover a wide time span and that some decline in the Virginia population may have begun prior to the introduction of pesticides. For example, Bent (1937) suggested that the Osprey population

TABLE 1.

Osprey nests in the area of Smith's Point, Virginia during June 1934 (from Tyrell, 1936)

	Active and contents known	Abandoned	Active but contents unknown	Empty when visited	Not visited	Total no. nests
Owens Pond	0	0	0	2	12	14
Smith's Point	38	2	2	4	10	56
Ingram Bay	6	0	0	0	"several"	6+
Total	44	2	2	6	22+	76+

in eastern Rhode Island and southern Massachusetts was declining about 1900. Population estimates for Owens Pond and Goodwin's Island are not included in Table 2. Jones (1936) reported only "several" Osprey nests on Goodwin's Island without indicating whether or not any were active; Tyrell (1936) reported only that 12 nests (which were not examined in order to determine whether or not they were active) were around Owens Pond. We do not feel

TABLE 2.

Comparison of past and present Osprey breeding populations in coastal Virginia

Location	Minimum pre- 1947 population (no. active nests)	Reference	1975 population (no. active nests)	Minimum decline
Hog Island	"about fifty"	Bailey, 1876	0	100%
Mockhorn Island	"several"	Bailey, 1876	11	0%
Gwynn's Island	25	White, 1891	9	64%
Bay Tree Neck	about 25	Jones, 1936	0	100%
Smith's Point	42	Tyrell, 1936	5	91%
Ingram Bay	6+	Tyrell, 1936	9	0%
Total	about 160		34	79%

that those reports are precise enough to compare them in any meaningful way with the 1975 data on active nests. The minimum decline in the size of the breeding populations in the remaining sites ranges from 0 to 100 percent; the mean decline in the size of the breeding populations is about 79 percent. When all the sites in Table 2 are combined into one sample, where there were about 160 active nests at various times before 1947, there were 34 active nests in 1975. These combined sites had about 4.7 times more active Osprey nests in the earlier (pre-1947) years than in 1975. Apparently, if these areas are indicative, a large (about 80 percent) decline in the Virginia Osprey population has occurred.

This decline is intermediate between the drastic (often greater than 90 percent) declines reported for the northeastern United States (Ames and Mersereau, 1964; Schmid, 1966; Peterson, 1969) and the lack of decline reported for North Carolina (Henny and Noltemeier, 1975) and Maryland (Reese, 1969). It is estimated that about 625 pairs of Ospreys nested in Virginia in 1975 (M. A. Byrd, unpubl. data); thus, we would estimate that in earlier years there might have been as many as 2,900-3,000 pairs of Ospreys breeding in Virginia.

Tyrell's (1936) study is the only pre-1947 report that is useful in estimating early Osprey reproductive productivity in Virginia. Ames and Mersereau (1964) and Peterson (1969) used Tyrell's data to infer that the normal rate of nestling production in Ospreys was 2.3 young per pair per year. That estimate is probably too high, for even if one considers only the 34 non-manipulated nests (i.e., Tyrell collected several clutches of eggs from Ospreys that later relaid smaller replacement clutches) that produced chicks (total = 75 chicks), the maximum productivity which might be calculated is about 2.2 nestlings per pair per year. Since other nests in Tyrell's study failed completely, even the estimate of 2.2 nestlings per pair per year is too high (Henny and Ogden, 1970). Postupalsky (1969) used Tyrell's data to estimate an annual productivity of 1.60 young per occupied nest with a known outcome. Although several of Tyrell's nests contained newly hatched chicks, some of which might have died of natural causes before fledging, other nests still contained unhatched eggs, some of which probably would have yielded fledglings. Thus, pre-1947 productivity, at least in the Smith's Point region of Virginia, was probably about 1.60 young per occupied nest.

The 1975 productivity for 288 active nests on the west side of Chesapeake Bay in Virginia was 1.17 young per active nest; 58 active nests on the ocean side of Virginia's Eastern Shore produced an average of 0.86 young per active nest (M. A. Byrd, unpubl. data). The 1975 productivity for the entire Eastern Shore of Virginia has not been calculated due to insufficient data. The 1975 mean productivity for all 346 nests mentioned above was 1.12 young per active nest. That figure is slightly less than the 1.22-1.30 young per nest needed to balance mortality if a stable population size is to be maintained (Henny and Wight, 1969).

SUMMARY

It is estimated that the Osprey breeding population in coastal Virginia, based on several sample localities, might once have been (before 1947) about 4.7 times larger than it was in 1975. The 79 percent decline in the Virginia Osprey population reported here for several selected areas is intermediate between the drastic declines reported for the northeastern United States and the absence of decline recorded in North Carolina and Maryland.

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