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Population Studies of Eagles at Caledon State Park

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PERFORMANCE REPORT

STATE: Virginia PROJECT NUMBER: W-74-R-1

PROJECT TYPE: Research and/or Survey STUDY NUMBER: XXI-D

PROJECT TITLE: Non-Game JOBS NUMBER: 1,2,3,4,5

PERIOD COVERED: February 1, 1983 - June 30, 1983

STUDY TITLE: Population Studies of Eagles at Caledon State Park

D-1
OBJECTIVE: To determine seasonal diurnal concentration areas for bald eagles on the Caledon State Park property and the adjoining Cedar Grove Farm.

D-2
OBJECTIVE: To locate primary and secondary foraging areas on Caledon State Park property and the adjoining Cedar Grove Farm.

D-3
OBJECTIVE: To locate and to characterize bald eagle roosting areas on Caledon State Park property and the adjoining Cedar Grove Farm.

D-4
OBJECTIVE: To determine seasonal utilization by bald eagles of the Potomac River shoreline on Caledon, Cedar Grove, and the areas immediately upstream and downstream.

D-5
OBJECTIVE: To identify, where possible, marked and/or banded eagles at Caledon and Cedar Grove Farm in order to determine the origin of this unusual population of birds.

SUMMARY:

Shoreline censuses were conducted weekly along a 40 km route on the Potomac River. Peak eagle counts were obtained along the Caledon-Cedar Grove area. Counts from different 5-km sections were compared. Roost concentrations were located at four points on the park. Studies of foraging behavior were initiated.

SHORELINE SURVEYS AND SEASONAL UTILIZATION:

The Potomac River shoreline of Caledon State Park and the adjoining properties appear to be among the more environmentally sensitive areas on the river.

In order to determine the nature and extent of the seasonal influx of bald eagles into this property and the extent of shoreline use a 40 km



FIGURE 1. Bald Eagle Census Route, Caledon Park Area. (Park outlined in broken lines)

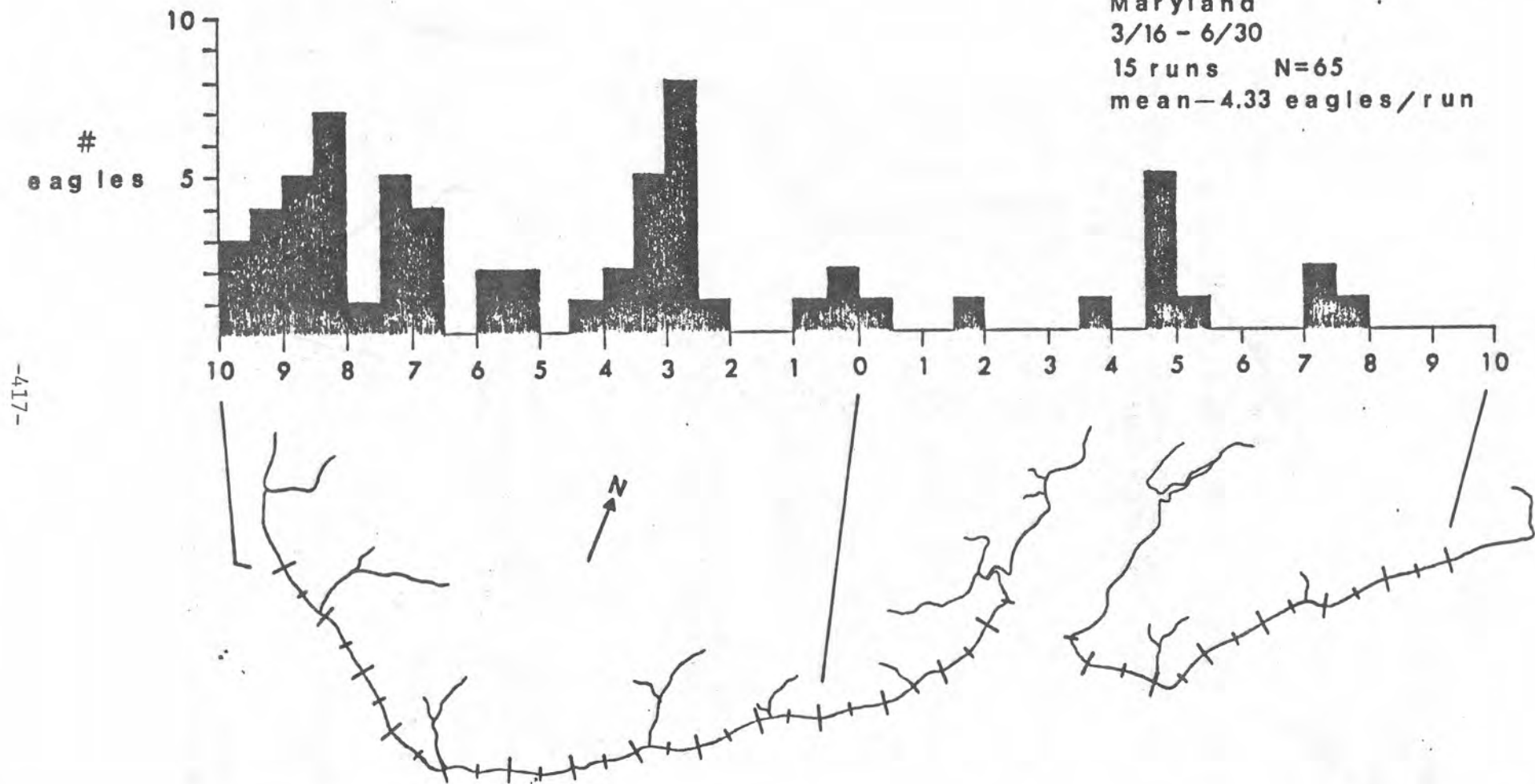


FIGURE 2. Eagles Observed on Caledon Census Route, Maryland Shoreline. (Park outlined in broken lines)

eagles

Virginia
3/16 - 6/30
20 runs N=175
mean - 8.75 eagles/run

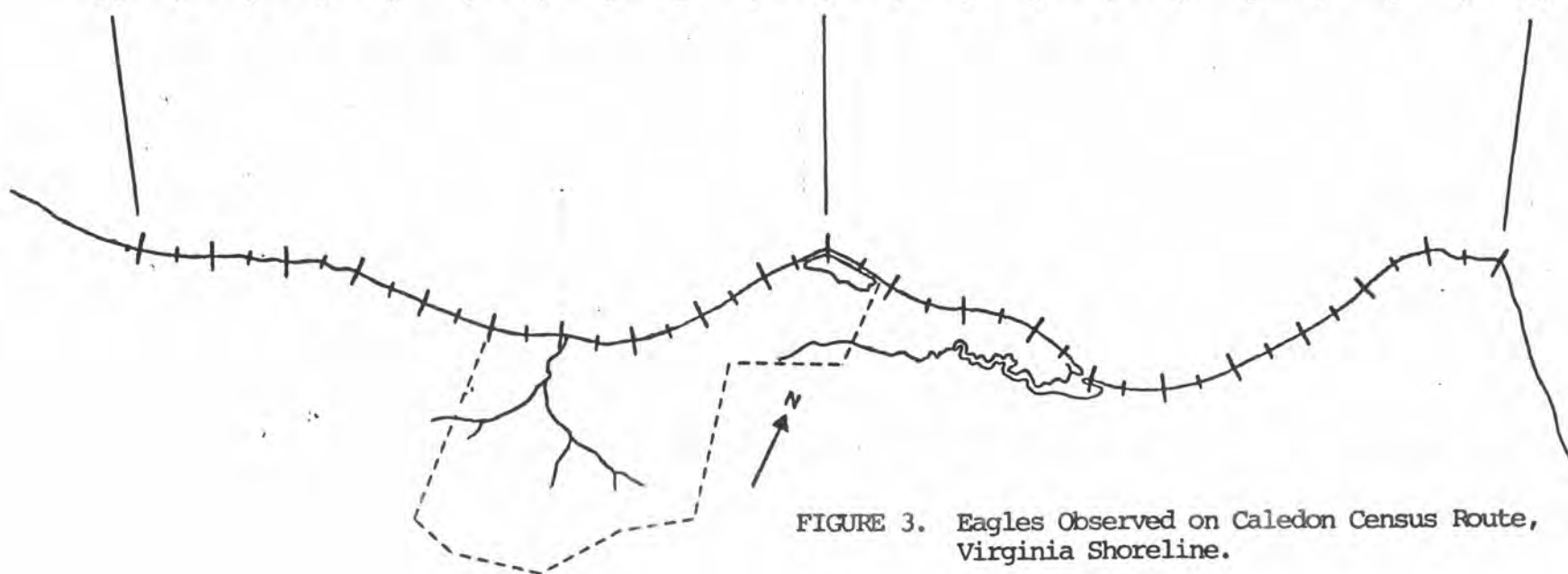
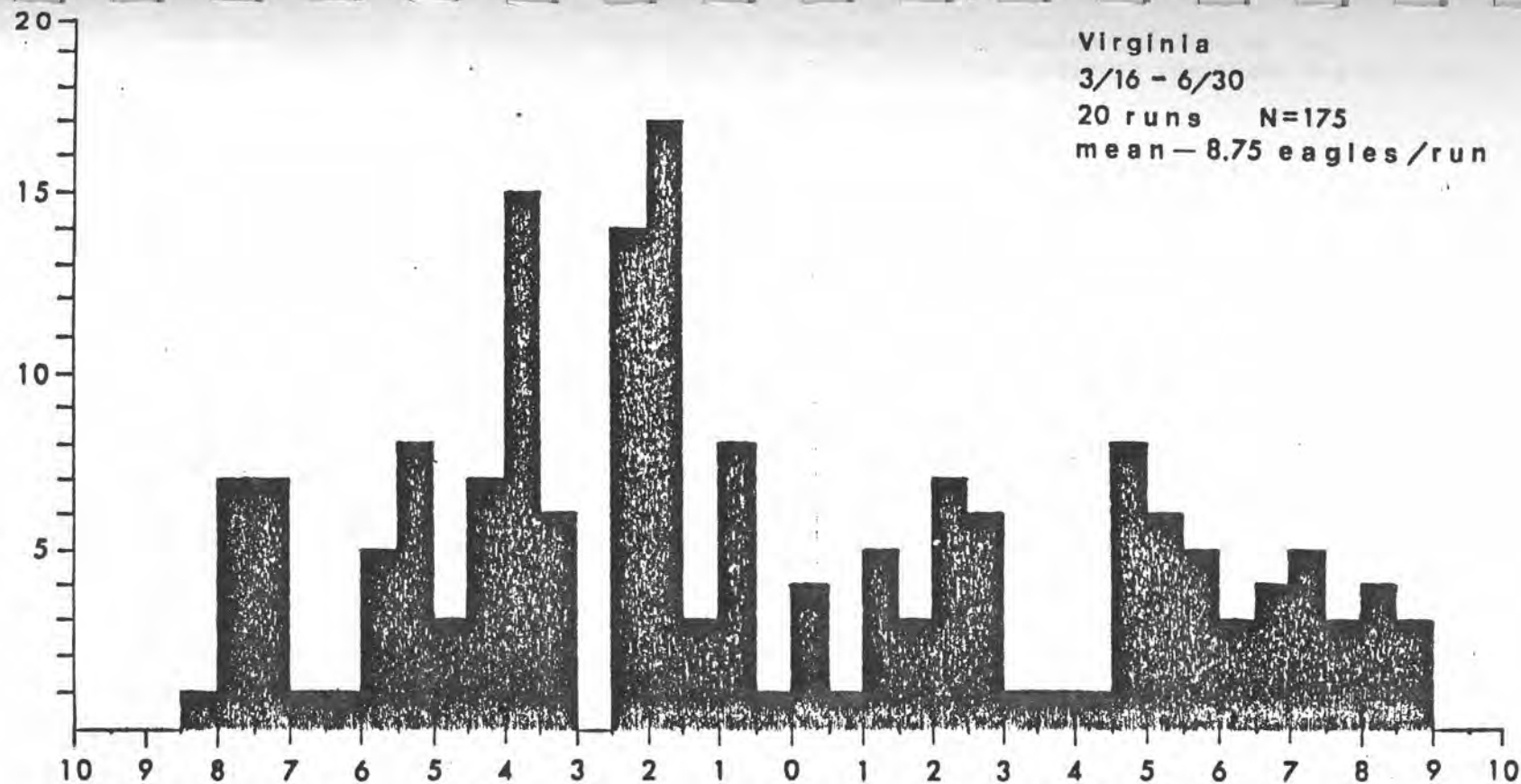


FIGURE 3. Eagles Observed on Caledon Census Route, Virginia Shoreline.

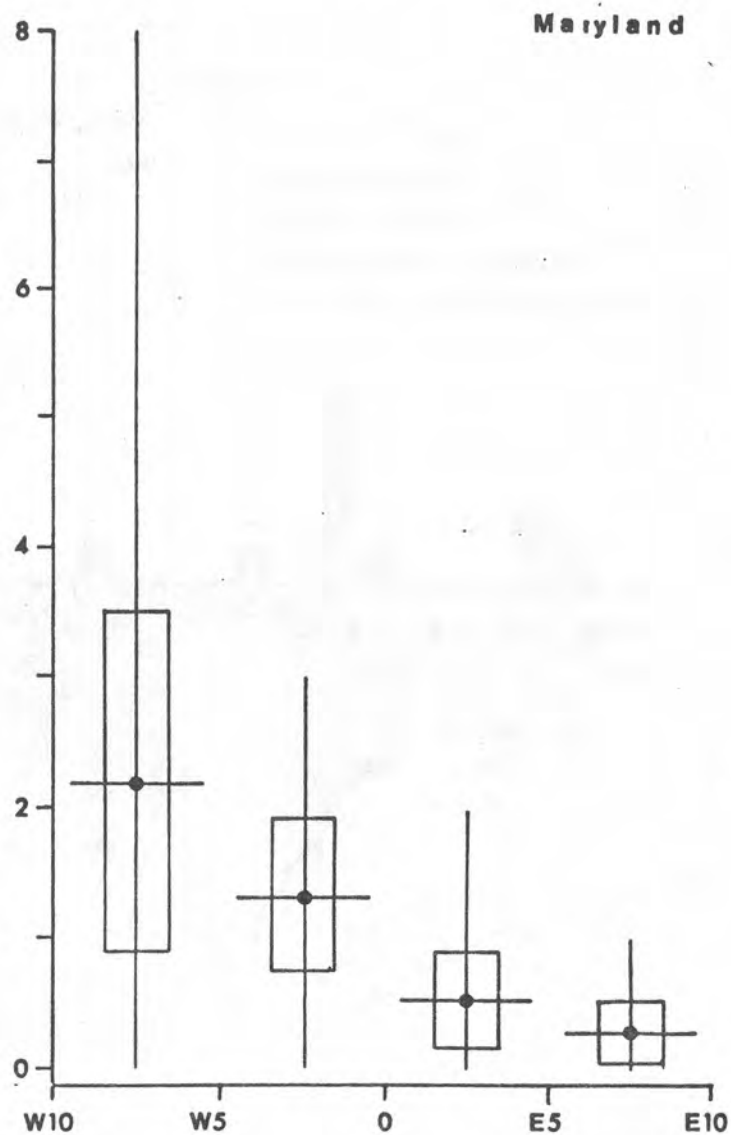
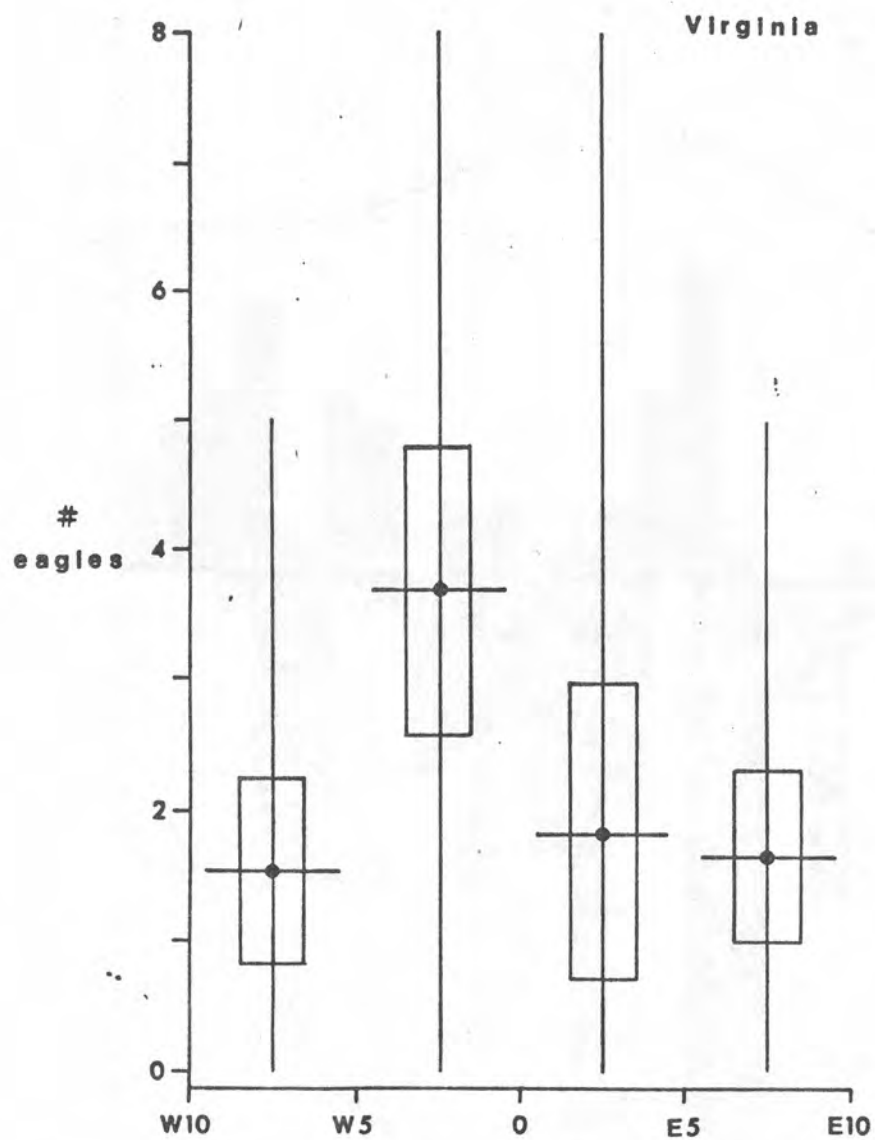
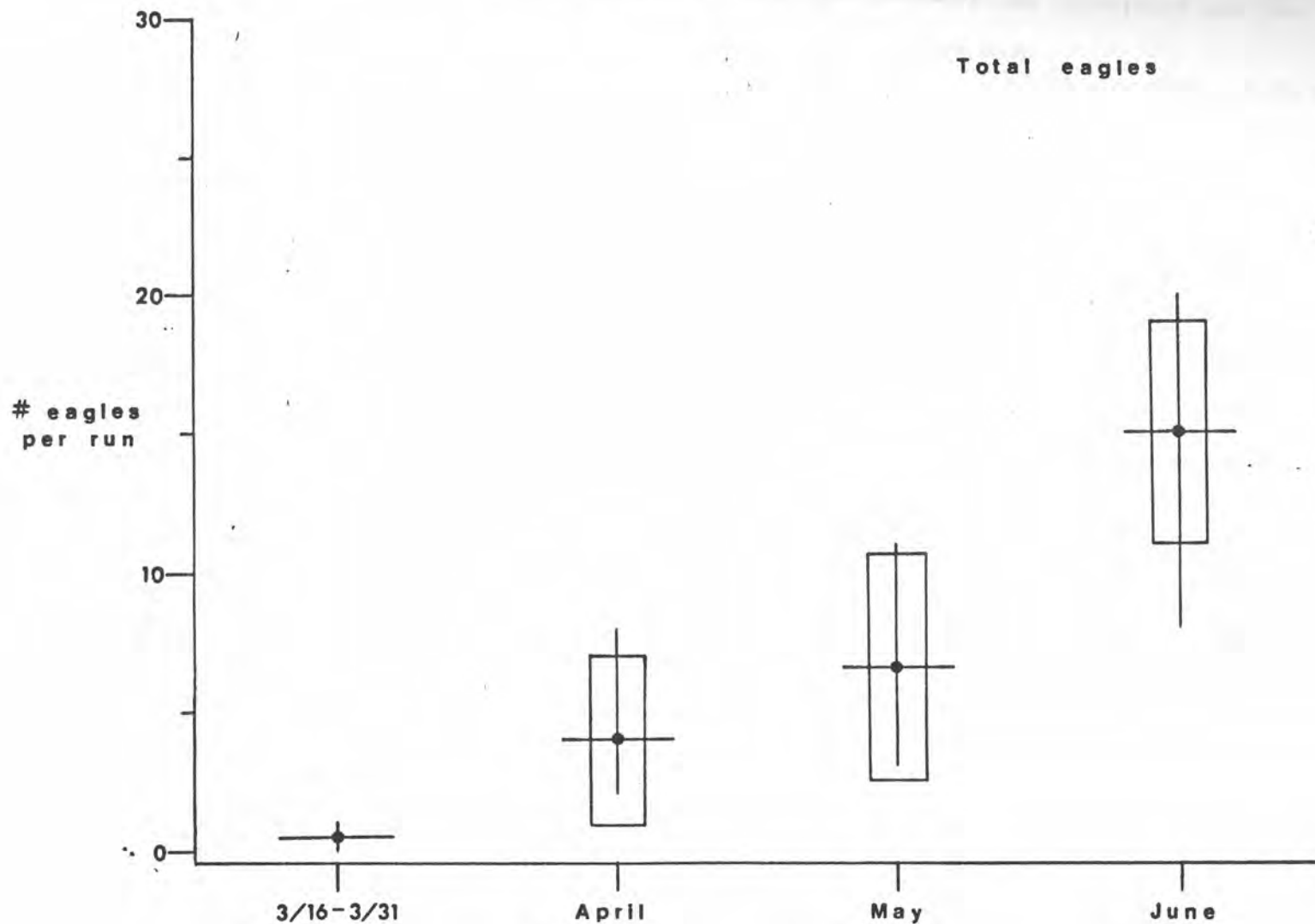


FIGURE 4. # eagles seen within each 5km section of shoreline
3/16-6/30

The horizontal lines indicate the mean, the vertical lines indicate the range and the bars indicate the 95% confidence interval for the mean.

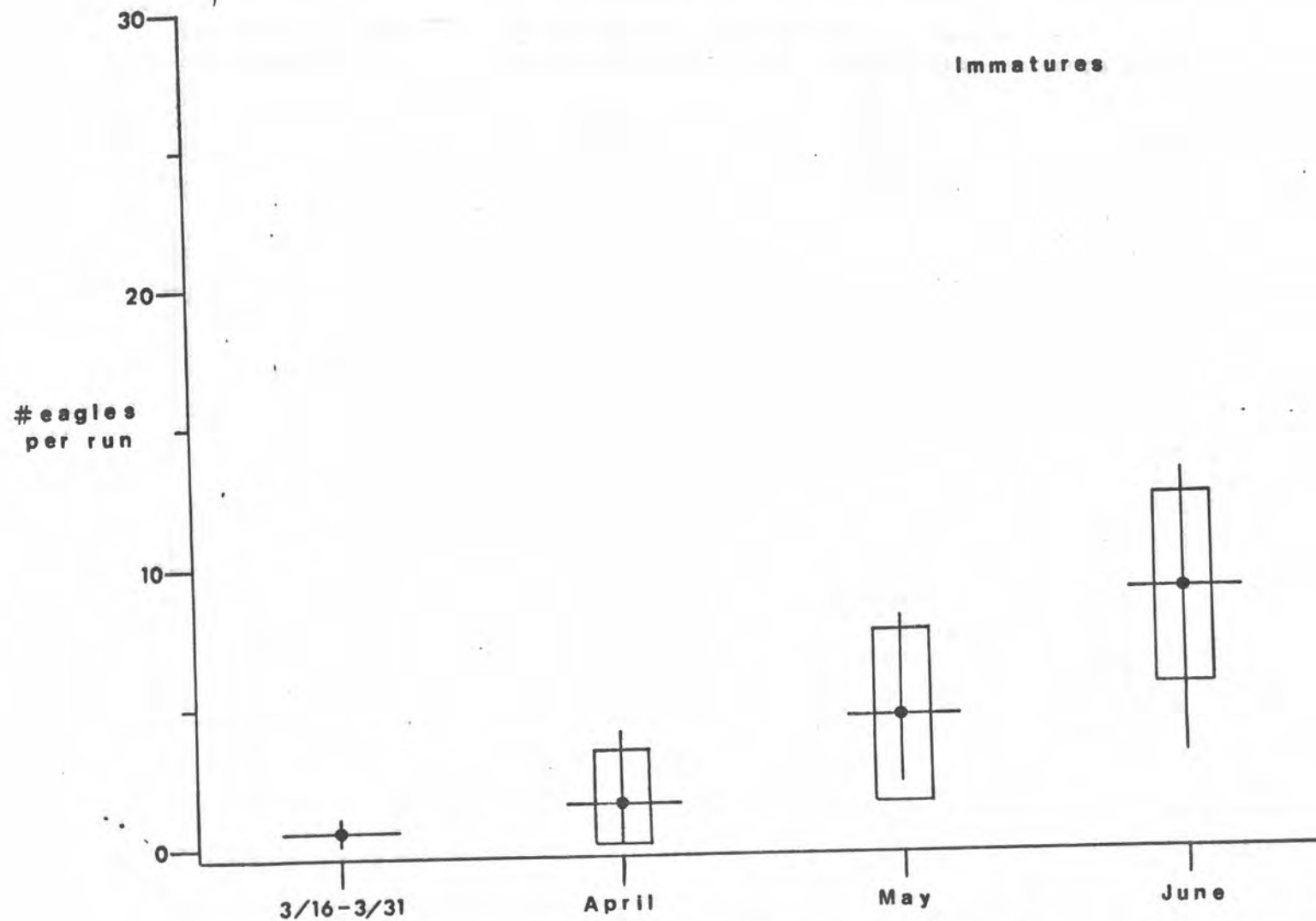
FIGURE 5. Progressive Increase in Total Number of Eagles Observed on the Virginia Shoreline Census.



The horizontal lines indicate the mean, the vertical lines indicate the range and the bars indicate the 95% confidence interval for the mean.

Because of a small sample size, no confidence interval was calculated for the 3/16-3/31 period.

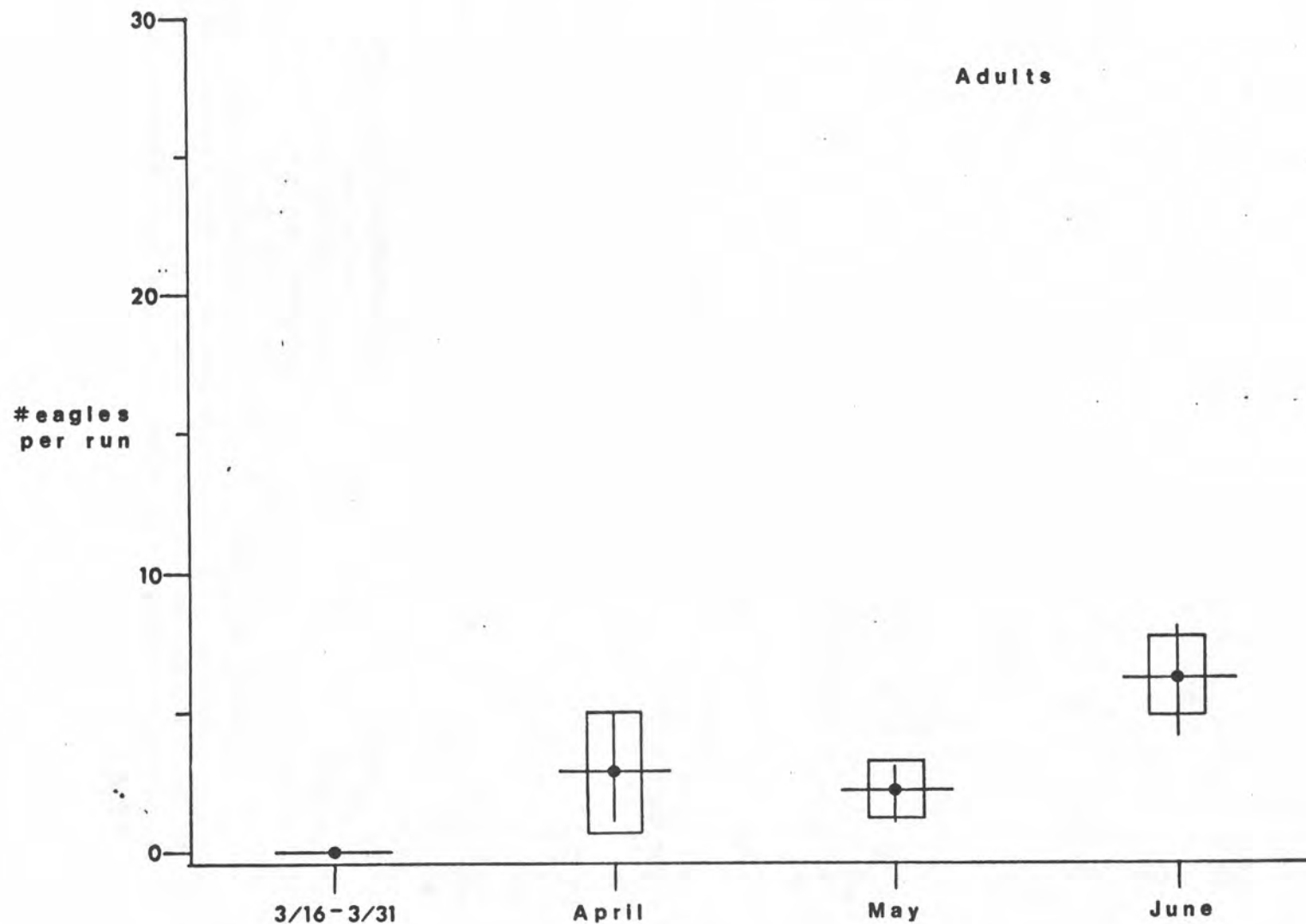
FIGURE 6. Progressive Increase in Number of Immature Eagles Observed on the Virginia Shoreline Census.



The horizontal lines indicate the mean, the vertical lines indicate the range and the bars indicate the 95% confidence interval for the mean.

Because of a small sample size, no confidence interval was calculated for the 3/16-3/31 period.

FIGURE 7. Progressive Increase in Number of Adult Eagles Observed on the Virginia Shoreline Census.



The horizontal lines indicate the mean, the vertical lines indicate the range and the bars indicate the 95% confidence interval for the mean.

Because of a small sample size, no confidence interval was calculated for the 3/16-3/31 period.

shoreline census route was established in the Caledon/Cedar Grove area (Figure 1). On the Virginia side of the river, the census route includes all of the Caledon and Cedar Grove shoreline (10 km) as well as a 5 km section of shoreline immediately to the east of Cedar Grove and a 5 km section of shoreline immediately to the west of Caledon. On the Maryland side of the river, the route includes a 20 km section of river shoreline which is directly across from the Virginia portion of the census route. The route is censused from a boat cruising parallel to the shoreline, approximately 50-100 m offshore. Between 15 March and 30 May, adverse weather conditions and logistical problems limited coverage to one or two census runs per week. Since 15 June, the area has been censused three times per week.

The total number of eagles observed within each 0.5 km section of shoreline between 15 March and 30 June for the Maryland and Virginia sides of the river are shown in Figures 2 and 3, respectively. When the average number of eagles seen within each 5.0 km interval are compared (Figure 4), the importance of the Caledon property (W5-0) is readily apparent.

The number of eagles utilizing the Caledon shoreline is significantly greater than the number of eagles utilizing sections Va.-W10-W5, Va.-E5-E10, Md.-W5-0, Md.-0-E5 or Md.-E5-E10. Although the mean number of eagles sighted at Caledon is greater than the mean number sighted at Cedar Grove (Va.-0-E5) and the westernmost section in Maryland (Md.-W10-W5), this difference is significant.

The variation in the degree to which different sections of shoreline are used by eagles appears to be related to the degree of human presence, the nature of the shoreline vegetation and possibly the profile and depth of the river bottom just offshore. These relationships will be explored more fully in the final report.

Figures 5, 6, and 7 illustrate the gradual increase in the number of eagles sighted along the Virginia portion of the census route through the spring and early summer. Adverse weather conditions often made it impossible to regularly cover the Maryland portion of the census route early in the spring and hence these figures are based on observations made on the Virginia portion of the census route.

For the adults above (Figure 7) and for the adults and immatures combined (Figure 5), the number of individuals sighted in June is significantly greater than the number of individuals sighted in the preceding month. The timing of this influx of eagles into the study area suggests a clue to the possible origin of these individuals. In Florida, bald eagles lay eggs during the month of November, roughly three months earlier than in Virginia. By late May, the young of the year are independent of the adults and both adults and immatures begin to drift northward. The observed influx of birds into the study area beginning in June may reflect an influx of these Florida bald eagles.

The above figures represent extremely conservative estimates of the number of bald eagles present along the rivershore. The main problem preventing a more accurate determination of the number of individuals present is the difficulty of seeing perched immature eagles.

When in flight, adults and immatures are both easy to see. When perched, the striking white head and tail of the adult is usually readily visible but the mottled brown plumage of the immatures is often very difficult to see against a background of vegetation.

By comparing the age ratio of eagles observed in flight with the age ratio of eagles observed while perched, it is possible to estimate the number of perched immatures which were missed (Table 1). Assuming that adult eagles are just as likely to be in flight at any given time as are immature eagles, these figures suggest that the true ratio of adults to immatures in the study area is roughly 1:2. Therefore, based on the number of perched adults sighted, it would appear that approximately 60 perched immature eagles were missed.

TABLE 1. Age ratio of bald eagles observed on eagle shoreline census

	No. Adults	No. Immatures	% Immatures
In Flight	55	102	65.0
Perched	55	41	42.7

FLUSHING DISTANCES:

In order to establish buffer zones around sensitive areas within the park, the distances at which adults and immatures flush in response to experimental disturbances has been recorded (Table II). Whenever an eagle is found perched along the edge of a field or rivershore, the observer first stands in the open, 500-700 m away, for 15 minutes. After the 15-minute period, the observer advances 20 m towards the perched eagle; pauses for 2 minutes and then advances another 20 m. This procedure is repeated until the eagle flushes and the distance from the flush point to the perch is recorded (Table II). During the shoreline census, the distance at which perched eagles flush in response to the approach of the boat has also been recorded (Table II). These figures indicate that bald eagles are more sensitive to the approach of individuals on foot than to the approach of a boat. It would appear that significant buffer zones (probably 500-600 m) should be established around those areas of the park which are actively used by eagles in order to avoid undue disturbance.

TABLE 2. Flushing distances (Mean \pm Standard Error (N))
of eagles observed at Caledon State Park.

Foot	459 \pm 12.2 (3)	374 \pm 92 (4)	410 \pm 52 (7)
Boat	150.5 \pm 31 (12)	159 \pm 18.5 (20)	156 \pm 16.1 (32)

ROOSTING AREAS:

Extensive observations have been made at dawn and dusk to locate roosting areas. Four areas appear to be significant as roosting sites. These are Jones Pond, Caledon Marsh, a small marsh on the west end of Caledon, and a small stock-watering pond on Cedar Grove Farm, the adjoining estate. These roosting aggregations will be monitored for the duration of the project.

FORAGING AREAS:

The primary foraging area on Caledon State Park is the shoreline of the Potomac between Caledon Marsh and Boyd's Hole. Studies of foraging behavior and factors affecting foraging were begun in July and will be reported on in the next progress report.

IDENTIFICATION OF MARKED BIRDS:

Previous observations on this area have been made of birds marked in South Carolina, New York, Massachusetts, and in other parts of Chesapeake Bay. In an effort to identify birds as to origin, an observation blind has been erected on Jones Pond and at the stock pond on Cedar Grove Farm. Observations from these blinds have revealed only one banded or marked bird, this an immature from South Carolina. Observations will be continued from these blinds until eagle populations decline in the fall.

TARGET DATE FOR COMPLETION: January 31, 1984

STATUS OF PROGRESS: On Schedule

RECOMMENDATIONS: Continue with remaining project plans until completion date.

COST THIS SEGMENT: Federal \$15,000.00 : State \$ 5,000.00 : Total \$20,000.00:

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APPROVED BY: Jack W. Raybourne
Chief, Division of Game

DATE: August 1, 1983

R. H. Cross, Jr.
Executive Director