

Both of these investigations should be extended before definite conclusions can be reached, but they are offered as a stimulus to other banders to make a similar analysis of their data and perhaps in this way contribute to a better understanding of the behavior of certain species of birds.

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## A THIRTY-YEAR SUMMARY OF THE NESTING OF THE BARN OWL ON MARTHAS VINEYARD, MASSACHUSETTS

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### *Introduction*

The island of Marthas Vineyard is particularly suited as a habitat for all kinds of avian predators. Most of them, including the Barn Owl (*Tyto alba*), are more abundant there than on the adjacent mainland. There are several reasons for this. One is the slightly milder climate in winter due to the influence of the surrounding ocean, and particularly of the Gulf Stream a few miles to the south. Thus, average winter temperatures are higher, and the ground is

covered with snow for less time during the winter months. Further, the population of mice, shrews, and moles is as large as anywhere, but there are very few species of small mammal predators. Weasels, Red Squirrels, Skunks, Red and Gray Foxes, and Bobcats were exterminated by the Indians, were trapped out by the white settlers of the island, or have never been present. Lastly, there are many old pigeon lofts, barns, and sheds available as nest sites in the farming country that makes up much of the island's area. Therefore, the mild climate, abundant food supply, and convenient nesting locations combine to produce a particularly desirable habitat for Barn Owls.

Barn Owls have been a regular feature of the island's bird population for many years. The first record is of one caught in a trap in October, 1918; and the first nest and eggs were found by George D. Eustis in 1928. Mr. Eustis also banded and photographed Barn Owls on the island for the first time on July 3, 1932. The then recording secretary of the State Department of Agriculture, Alice B. Harrington, wrote him on February 15, 1933, that these were the first Barn Owls ever banded by a member of the N.E.B.B.A. Unfortunately, the claim cannot be made that these were the first Barn Owls banded in Massachusetts. At least one other was banded on June 28, 1932, only five days earlier, as can be seen in one of the tables presented below.

Speaking of the tables, this brings me to the plan for the rest of this paper. The first part is a year-by-year summary beginning in 1932 and running through 1963. The number of broods, the dates, the size of the broods, and the bander or observer are all presented in Table 1. The text parallels this table with remarks that attempt to hang some meat on the bones that the table provides.

The second part of the paper concerns the recoveries of banded Barn Owls. The data on all the recoveries of Barn Owls banded in Massachusetts, including Marthas Vineyard, are presented in Table 2. The recoveries from the whole Commonwealth are included because the total number is not large. It is also hoped that being able to compare them all will add a little more interest and perspective to the subject.

#### *Thirty-Year Summary of Nesting.*

As shown in Table 1, 1932 was the first year any Barn Owls were banded on the island. Exactly how long before this time the owls may have been using the site where Mr. Eustis found them is not known. But they were present by 1928, at least, at which time they were first found nesting. Since no details are now known about broods raised before 1932, Table 1 begins with that year. Nothing is known about nesting at the Eustis site during 1934 or 1935 or after 1937. Owls may have nested there after the latter year, however, since the present owner of the property has said that when he arrived about 1940 he frequently saw Barn Owls at the site.

Beginning in 1938 and continuing through 1953, all the owls mentioned in Table 1 were raised at what will be called the "Baldwin site", with two exceptions. These two cases are the broods of

TABLE 1. BARN OWLS KNOWN TO HAVE BEEN RAISED ON MARTHAS VINEYARD BY YEARS.

Year	Broods Known	Date Young Were Banded or Observed	Number in Brood.	Bander or Observer.
1932	1.	7/3/32	8 banded.	George D. Eustis
	2.	11/2/32	6 banded.	George D. Eustis
	3.	Date and Brood Size	Lost.	Roger N. Baldwin
1933	1.	6/23, 25/33	6 banded.	George D. Eustis
	2.	Date and Brood Size	Lost.	Roger N. Baldwin
1934	1.	Date and Brood Size	Lost.	Roger N. Baldwin
1935	1.	Date and Brood Size	Lost.	Roger N. Baldwin
1936	1.	5/11/36	4 banded.	George D. Eustis
	2.	Date and Brood Size	Lost.	Roger N. Baldwin
1937	1.	5/18/37 and 6/8/37	6 banded.	George D. Eustis
	2.	Date and Brood Size	Lost.	Roger N. Baldwin
1938	1.	7/3/38	2 banded,	Roger N. Baldwin for Richard H. Pough (1)
		7/3/38	4 seen.	Roger N. Baldwin
	2.	7/30/38	4 banded,	Roger N. Baldwin for Richard H. Pough
1939		8/19/38	4 banded,	John A. Gillespie
		8/19/38	2 seen.	John A. Gillespie
	1.	7/3/39	5 banded.	Roger N. Baldwin for Richard H. Pough
1940	1.	6/3, 12/40	4 banded.	Roger N. Baldwin for Richard H. Pough
	2.	9/15/40	6 banded.	Guy Emerson for Richard H. Pough
1941	1.	7/1/41	4 banded.	Roger N. Baldwin for Richard H. Pough
	2.	8/24/41	3 banded.	R. L. Hopkins for Richard H. Pough
	3.	Date and Brood Size	Lost.	Roger N. Baldwin
1942	1.	7/7/42	2 banded.	Roger N. Baldwin for Richard H. Pough
	2.	Date and Brood Size	Lost.	Roger N. Baldwin
1943	1.	6/1/43	4 banded.	Roger N. Baldwin for Richard H. Pough
1944	1.	6/26/44	4 banded.	Roger N. Baldwin for Richard H. Pough
	2.	10/6/44	4 banded.	Lucinda Vincent for Richard H. Pough
1945	1.	8/2/45	3 banded.	Roger N. Baldwin for Richard H. Pough
1946	1.	8/2/46	3 banded.	Roger N. Baldwin for Richard H. Pough
1947	1.	5/3/47	7 seen.	Ludlow Griscom
	2.	9/22/47	6 banded.	Lucinda Vincent for Richard H. Pough
1948	1.	6/26/48	5 banded.	Roger N. Baldwin for Richard H. Pough
1949	1.	9/15/49	4 banded.	Roger N. Baldwin for Richard H. Pough
1950	1.	7/12/50	6 banded.	Lucinda Vincent for Richard H. Pough
1951	1.	7/2/51	5 banded.	Roger N. Baldwin for Richard H. Pough
1952	1.	6/26/52	4 banded.	Roger N. Baldwin for Richard H. Pough
1953	1.	9/13/53	4 banded.	Roger N. Baldwin

TABLE 1 (continued)

Year	Broods Known	Date Young were Banded or Observed	Number in Brood	Bander or Observer.
1954	1.	4/7/54	1 seen.	Mrs. Seth Wakeman, Sr.
	2.	6/17/54	6 seen.	Roger N. Baldwin, Allan R. Keith
	3.	7/8/54	3 seen.	Allan R. Keith
	4.	8/18/54	3 banded.	Roger N. Baldwin
	5.	8/26, 29/54	6 banded.	Allan R. Keith for Roger N. Baldwin
1955	6.	8/29/54	2 seen.	Allan R. Keith, F. Fischer
	1.	5/7/55	5 seen.	Lucinda Vincent
	2.	7/?/55	5 seen.	F. Fischer
	3.	9/9/55	2 seen.	Allan R. Keith
	4.	10/6/55	3 banded.	Lucinda Vincent for Roger N. Baldwin
1956	1.	Date and Brood Size	Lost.	F. Fischer
1957	1.	7/25/57	2 seen.	Allan R. Keith, F. Fischer
	2.	8/3/57	3 seen.	Allan R. Keith
1958	1.	Date and Brood Size	Lost.	F. Fischer
1959	1.	6/22/59	4 seen.	Allan R. Keith, F. Fischer
	2.	6/22/59	3 seen.	Allan R. Keith
	3.	7/17/59	4 seen.	Allan R. Keith
1960	1.	7/8/60	4 banded.	Allan R. Keith, F. Fischer
	2.	7/8/60	3 banded.	Allan R. Keith
	3.	8/22/60	6 seen.	Edward L. Chalif, Roger N. Baldwin, Allan R. Keith
1961	None Known.			
1962	None Known.			
1963	None Known.			

(1) i.e. Mr. Baldwin did the actual banding but on Mr. Pough's permit.

1941 and 1942 for which the data have been lost and which were raised at a place called Graystone. These broods are known only from a reference to them in *Birds of Marthas Vineyard*. It is not known how long before 1938 the Baldwin site was occupied. Mr. Baldwin has stated that the site was occupied in 1932 when he first saw it, but it was probably used for some years before that as he implied in *Birds of Marthas Vineyard*. He also has said that the site was used at least once every year until 1938 when the first owls were banded there. It is on this basis that a brood for which the data have been lost is shown in Table 1 as having been observed by Mr. Baldwin in each year from 1932 through 1937.

After 1953, at least three broods were raised on the same nesting platform each year at the Baldwin site through 1955. At that time a nearby building was renovated as a summer house, and the owls have only returned to breed once since. That time was the brood numbered 3 in 1959.

In 1954, six different broods were known, three of which (numbers 1, 2, and 4) were at the Baldwin site as mentioned above. One other brood (number 5) was at a new site that had never been used before, and yearly checks have failed to produce any evidence of breeding there since. The other two sites are of much greater importance.

The first of these will be called the "Fischer site". It was discovered from talking to Mr. F. Fischer that at least one brood had been raised there per year for about fifteen years previously, though no specific records had been kept. A special enclosed nesting platform had been constructed; and though the building was in constant use, the owls were not disturbed. Young were raised there every year from 1954 through 1960, though the precise dates are lost for three of those years and the brood sizes are lost for two. Mr. Fischer is mentioned as observer in Table 1 for each brood known to have been raised at this site.

The remaining brood of 1954 to be accounted for (number 3) was at a location which will be referred to as the "Lambert's Cove site." Following a rumor that owls had been seen there in the past, it was discovered that they had nested there for many years. Although it is impossible to reconstruct the exact history of the site before 1954, one clue suggests that it was in use as early as 1937. This clue is in the form of a photograph of the building where the nest is located taken by Mr. George Eustis. In fact, there is a suggestion, from the caption Mr. Eustis gave the picture, that some of the six owls banded on either May 18 or June 8, 1937, were banded at this site, despite the fact that the banding schedule Mr. Eustis submitted reports otherwise. In any case, in 1954 the property had not changed hands since 1937, and the owner said that the owls had been there almost every year since that time. After 1954, the site was not used until 1959 and 1960 (brood number 2 in both years).

All the known broods mentioned in Table 1 that have been raised since 1954 have now been accounted for in the discussions of individual sites above with two exceptions. These are the brood numbered 3 in 1960 and the one numbered 2 in 1957. The former was the first at a new site which has not been active since. The 1957 brood falls into the same category but is somewhat unique. The owls nested in a beach house that had been badly damaged by a hurricane the previous fall. The house was on sand dunes less than thirty yards from the ocean surf to one side and about fifteen yards from the edge of a large fresh-water pond on the other. There is no tree as much as ten feet high for half a mile in any direction from the site.

The winter of 1960-1961 was a disastrous one for the Marthas Vineyard Barn Owl population. The snowfall was the heaviest and the average temperatures were the lowest in very many years. In the early months of 1961, more than ten owls were picked up dead in barns where they had sought warmth and shelter or along the roadside. Apparently it was impossible for them to find enough food to survive.

No Barn Owls have been seen alive on the island of Marthas Vineyard since early 1961. However, some have probably passed through on migration, and some may even be nesting at locations that are currently unknown. The chances appear to be good that they will return as a pair raised a brood only a few miles away at Chatham on Cape Cod in the summer of 1961, and as recently as March, 1963, the species was seen on Nantucket.

By way of conclusion to this summary of Barn Owl nesting from 1932 through 1960, it may be of interest to present some figures drawn from Table 1.

Total juvenile Barn Owls banded	135.
Juvenile Barn Owls seen but not banded	59.
Total Barn Owls known to have been raised	194.
Total broods of known size	44.
Average size of broods of known size	4.4
Range of size of known broods	1 to 11
Additional broods known but of unknown size	10.
Average number of known Barn Owls raised per year	6.7

Using these statistics as a base, the rest of this first part of this paper will be an attempt to arrive at a reasonable estimate of the total number of Barn Owls raised on Marthas Vineyard in the twenty-nine year period from 1932 through 1960. If the ten known broods for which there are no details had the same average size as the broods for which details exist, a total of 238 young were raised, giving an average of 8.2 per year for the period. Beyond this, it is clear from what has been said above in the discussions of individual nesting sites that many other broods have certainly been raised since 1932 that are not included in Table 1. To mention just the two best cases, at least an average of one brood per year was probably raised at the Lambert's Cove site from 1938 through 1953 and at the Fischer site from 1940 through 1953. These two sites alone may have produced a total of thirty more broods, or possibly 130 young owls, about which no precise information survives.

Assuming that these figures are fairly accurate, there are several other factors bearing on our knowledge of the Marthas Vineyard Barn Owls that deserve mention. The first is that the owls do not lay their eggs all at once but lay one every other day or so. Forbush estimated the incubation period to be from 21 to 24 days and sometimes longer, and more recently Nice has estimated about 30 days. The combination of a staggered laying pattern and a long and perhaps variable incubation period means that the oldest member of a brood may have left the nest before the youngest is fully out of down. Thus, in some broods for which there are details but in which we know of four or fewer young, one or more older juveniles may have flown before the date on which their fellows were banded or observed.

Secondly, it is by no means certain that Table 1 contains data for every brood that was raised at each known site, even in years when the site was being checked several times. If the young owls flew before June or if laying began after September, the chances are that the brood went unrecorded. This is because the people who have followed the owls most closely have seldom been on the island except in summer. A brief glance at Table 1 will show that though the great majority of dates listed fall between June 1 and September 30, young have been banded as early as May 11 and as late as November 2. In fact, in late December of 1960, three recently-fledged young that had been alive in the second week of the month were found dead

TABLE 2. BARN OWL RECOVERIES

Band Number	Date Banded	Date Retaken	Place Banded	Place Retaken	Years	Time Months	Banding Permit Holder	How Recovered
1. 3661482	6/28/32	10/21/32	Springfield, Massachusetts.	Whitman, Massachusetts.	3	3.8	Samuel A. Eliot, Jr.	Shot.
2. 3674205	7/ 3/32	2/13/36	Chilmark, Martha's Vineyard.	Arlington, New Jersey.	3	7.3	George D. Eustis	Found Dead.
3. 3674207	7/ 3/32	8/21-31/33	Chilmark, Martha's Vineyard.	Schwenksville, Pennsylvania.	1	1.6	George D. Eustis	No Information.
4. 3674406	6/23/33	2/ 7/38	Chilmark, Martha's Vineyard.	Edgartown, Martha's Vineyard.	4	7.5	George D. Eustis	Found Dead.
5. 3674454	6/25/33	11/1-10/33	Chilmark, Martha's Vineyard.	Martha's Vineyard, Mass.	4	4.2	George D. Eustis	Found Dead.
6. 4616776	7/ 8/33	7/21/33	Springfield, Massachusetts.	Springfield, Massachusetts.		.4	Samuel A. Eliot, Jr.	Found in building, Released Alive.
7. 4616777	7/25/33	8/16/33 (letter date.)	Springfield, Massachusetts.	Blandford, Massachusetts.		.7	Samuel A. Eliot, Jr.	Killed by car.
8. 4616785	7/14/34	12/ 5/34	Springfield, Massachusetts.	Gardiner's Is., Long Island N. Y.		4.5	Samuel A. Eliot, Jr.	Caught in Trap.
9. 4616786	7/14/34	10/24/34	Springfield, Massachusetts.	West Springfield, Mass.		3.2	Samuel A. Eliot, Jr.	Trapped and Released Alive.
10. 3674401(2)	5/11/36	9/23/37	Chilmark, Martha's Vineyard.	near Acoaxet, Massachusetts.	1	4.4	George D. Eustis	No Information.
11. 38644785	7/30/38	11/ 8/38	Chilmark, Martha's Vineyard.	Mill's Island, Maryland. (1)		3.3	Richard H. Pough	Caught in Trap.
12. 36636721	8/19/38	11/ 1/41	Chilmark, Martha's Vineyard.	Teaneck, New Jersey.	3	2.4	John A. Gillespie	Found Dead.
13. 38659961	6/ 3/40	2/14/41	Chilmark, Martha's Vineyard.	Gay Head, Martha's Vineyard.		8.4	Richard H. Pough	Found Dead.

TABLE 2. (continued)

Band Number	Date Banded	Date Retaken	Place Banded	Place Retaken	Years Until Recovery	Time Months	Banding Permit Holder	How Recovered
14. 39644632	9/15/40	12/10/40	Chilmark, Marthas Vineyard.	Sharon Hill, Pennsylvania.		2.8	Richard H. Pough	Shot.
15. 37601500	6/26/44	3/ 3/46	Chilmark, Marthas Vineyard.	Portsmouth, Rhode Island.	1	8.2	Richard H. Pough	Found in building.
16. 208389	12/ 8/46	1/20/47	near Barnstable, Massachusetts.	near Barnstable, Massachusetts.		1.4	Mrs. Geo. E. Burbank	Found Dead.
17. 35541193	9/15/49	5/ 8/52	Chilmark, Marthas Vineyard.	Middletown, Rhode Island.	2	7.8	Richard H. Pough	Found Dead.
18. 35541113	7/12/50	8/ 9/50	Chilmark, Marthas Vineyard.	Chilmark, Marthas Vineyard.		.9	Richard H. Pough	Found Dead.
19. 49760277	7/30/50	10/13/56	near Marblehead, Massachusetts.	near Ipswich, Massachusetts.	6	2.5	Hollis V. Hayden, Jr.	Found in building.
20. 53692766	6/16/57	8/ 6/59	Boxford, Massachusetts.	Freehold, New Jersey.	2	1.7	Oscar M. Root	Caught by Hand.
21. 65749023	7/ 8/60	11/14/60	West Tisbury, Marthas Vineyard.	Philadelphia, Pennsylvania.		4.2	Allan R. Keith	Shot.

(1) In his article in the *Bulletin of the Massachusetts Audubon Society*, Ludlow Griscom referred to this recovery as having been made at Mill's Island, Ontario. His information was apparently inaccurate, and the conclusions he drew from this supposed recovery can no longer be considered valid.

(2) In addition to this recovery, another owl banded on the same date was found as a resident of Hunt's Point, the Bronx, New York City, by Irving Kasoy in 1938 and 1939. It was a member of a pair that raised young in both of those years.



of starvation at the Lambert's Cove site. This brood is not shown in Table 1 because it was unsuccessful. So it seems reasonable to conclude that a fair number of broods other than those listed in the table were raised at known sites.

Thirdly, there probably were, or still are, active sites as yet undiscovered in the hundred square miles of territory making up the island. In support of this statement it can be said that there are three locations different from all those mentioned above where Barn Owls bred within the last twenty years, but no more is known about these sites than that.

Lastly, it must be remembered that every brood, including some of those listed in Table 1, may not have been completely successful. While it has been assumed in the table of summary figures above that all young banded or observed survived until they left the nest for lack of evidence to the contrary, this may not have been the case. Hawbecker has shown that Barn Owls are cannibalistic. Thus, a few newly-hatched owls may have been eaten by older members of the brood, especially if the brood was large and if the amount of food brought by the parents was inadequate. The number of nestlings lost in this way has certainly been very small. Since there are no predators on the island except an occasional house cat gone wild or a Raccoon that are capable of raiding a nest site, brood success has probably been excellent. The only exceptions might be those broods which died of starvation in the late fall, but there are only three broods listed in Table 1 to which this may have occurred.

In conclusion, taking into consideration both established facts and the best guesses that can be made now as to the number of young raised for which there are no precise details, a reasonable estimate of the total number of young Barn Owls raised since 1932 is 375 to 400 birds.

#### *Barn Owl Recoveries*

As was mentioned in the Introduction, Table 2 lists all the recoveries of Barn Owls banded in Massachusetts. Thirteen, or 61 percent of the total of 21 recovered, were banded on Marthas Vineyard. In some cases recovery dates are inexact or are letter dates because that is the best information available. All banding or recovery locations prefaced by "near" are approximations. The cities or towns listed are those closest to the map coordinates on IBM cards provided by the Banding Office at Patuxent Refuge. Where these locations are inaccurate, the true locations are almost certainly within a ten-mile radius of the places listed.

Several points appear from an examination of Table 2. First, the distance the birds scattered from the points at which they were banded is relatively small. By far the most distant recovery is the one numbered 11 which was found some 400 statute miles in a straight line from where it was banded. Seven of the 13 recoveries of Marthas Vineyard birds were from points within fifty miles, and four of these seven were found elsewhere on the island itself.

Secondly, all those birds not recovered within a few miles of where they were banded were found near the coast. None had flown

any distance inland to speak of, indicating that the migration route for the central Massachusetts (i.e. Springfield) birds as well as the Marthas Vineyard ones is along the Atlantic Coastal Flyway. This comes as no surprise, perhaps, but it is pleasant to see the theory so fully supported.

In the column showing time until recovery, a tenth of a month is equivalent to three days, and some liberty has been taken in rounding to the nearest tenth. The average time until recovery for all twenty-one birds is 16.4 months and for the Marthas Vineyard birds alone is 18.7 months. In other words, though the longest time until recovery is over six years, unless a bander hears of the recovery within two years of the banding date, he is unlikely to hear again about a Barn Owl he has banded.

#### SUMMARY

The first part of the paper is a year-by-year summary of the Barn Owls banded and observed on Marthas Vineyard, Massachusetts. A table presents the factual information, and accompanying remarks describe some more of the history of several nesting sites. The first part of the paper concludes with the estimate that a total of 375 to 400 Barn Owls were raised on the island from 1932 through 1960.

The second part of the paper presents a chart with pertinent data on all the Barn Owl recoveries known from Massachusetts, and some observations are made on this material.

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