

nature of a disturbance of their normal physiology rather than the result of actual disease. The latter has been suggested by the repeated observations that some tern chicks will survive apparently identically deleterious conditions and events which are fatal to others.

In spite of this high chick mortality preceded by a seasonal egg laying much below what a colony of the size of the one at Tern Island this year averages, the output of chicks both exceeded that of the preceding year and equalled what it had been estimated should be the yield of the Cape group as a whole adequate for the maintenance of the group's population at its usual level.

It is believed that the Cape group will maintain its integrity and prosperity in spite of detrimental changes in the ecology of the rookeries, provided these do not occur simultaneously at all adequately large and suitable nesting sites, also that they are neither permanent nor of human causation. At the same time, in view of the irremediable destruction by the elements of several nesting sites and the deterioration of others which has resulted from over-vegetation, predation and the inroads of man, the events of the 1943 nesting indicate the importance of maintaining sanctuary at Tern Island by carefully controlled reclamation work and wardenship.

North Eastham, Cape Cod,
Massachusetts.

FIFTEEN YEARS BANDING AT FARGO, NORTH DAKOTA

BY O. A. STEVENS

THE writer began banding in 1925 but only 13 birds were taken that year (including one nest of seven young flickers) (*Colaptes auratus*), so the fall of 1926 was really the first active trapping. An unusually good run of juncos (*Junco hyemalis*) and Harris's Sparrows (*Zonotrichia querula*) in 1928 brought the total for the year to 1,365, since when it has ranged from 1,100 to a high of 2,434 in 1937, but dropped to an unexpected low of 870 in 1941. The period 1926-40 makes a convenient one to summarize.

The station has been exclusively a small bird station and has been operated largely during migration periods. About a dozen funnel traps and one or two of the Potter type have been in fairly regular use. In 1931, a Brenckle six-celled water trap was added, a second in 1933 and two more in 1937. These have materially increased the numbers of species captured. To the end of 1940, a total of 22,640 birds of 103 species had been banded.

Trapping has been carried on chiefly in the horticultural gardens of the Agricultural College. This is a favorable place in that there are

many fruit bearing bushes and the location is at the edge of the city with open fields immediately beyond it. To the north and west there are no groves of trees for about two miles and then only scattered ones. On the east, the city extends to the Red River of the North, about two miles distant.

Some unfavorable features of the location are that changes in the plantings are made rather frequently and that most of the trees and shrubs are grown in rows, widely spaced and cleanly cultivated. The soil is very sticky and operations must be suspended in wet weather. Usually this is not a serious matter during fall migration when 60 to 80 percent of the total number of birds are taken, but little can be done in the spring until the middle of April or first of May, when the first group of birds has largely gone.

In recent years there has been a tendency to replace shrubs in the garden by annual plants. One of the first good locations was in the edge of a patch of so-called high-bush cranberry (*Viburnum trilobum*) but these bushes were removed several years ago. A short, but very large, buckthorn hedge was a popular place for many kinds of birds. This has been removed and a new one at a place less suitable for trapping is believed to draw away the birds to some extent.

One very successful water trap location is practically surrounded by fruit-bearing trees and shrubs, a very large wild crab apple, several hawthorn (*Crataegus*) and Juneberry (*Amelanchier*). Another trap was among buffaloberry (*Shepherdia argentea*), Juneberry and chokecherry (*Prunus virginiana*). These bushes are attractive to insect eating as well as fruit-eating birds.

Table I shows the numbers of species most commonly banded each year. Various factors affect the results, but these numbers should give some idea of the variations in numbers of individuals present from year to year.

NOTES ON INDIVIDUAL SPECIES

Mourning Dove. (*Zenaidura macroura*.) Some effort has been made to trap these but with very little success. Five were taken in a water trap, October 12, 1941, and an occasional one in drop and trip-door traps. In 1934, many pairs nested in the trees about the station and 71 nestlings were banded. One of these, banded July 14, was killed about 50 miles south of Mexico City on November 18 following. This is the only return from a total of 106 birds.

Flicker. (*Colaptes auratus*.) Banded, 70. One banded September 13, 1936, was recovered at Bradley, Ark., February 28, 1937.

Screech Owl. (*Otus asio*.) One was caught by hand and banded November 5, 1932. A few days later it was caught and kept in the greenhouse until late March to catch mice.

Chimney Swift. (*Chaetura pelagica*.) Two which came down a fireplace chimney were banded, of which one was found dead two years later. A third bird flew in through an open window and was banded.

TABLE I.
NUMBER OF THE PRINCIPAL SPECIES BANDED EACH YEAR.

	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
House Wren	0	18	1	10	10	8	13	17	27	12	11	24	24	19	7
Catbird	0	0	3	8	8	11	5	33	42	33	44	46	36	71	65
Brown Thrasher	0	0	2	25	30	23	38	22	30	10	16	26	22	29	65
Robin	1	8	18	39	69	33	135	194	248	241	227	276	241	233	296
Olive-backed Thrush	0	0	1	1	0	2	2	10	19	21	20	26	20	32	21
Gray-checked Thrush	0	2	0	1	2	0	0	1	4	7	1	5	3	9	17
Golden-crowned Kinglet	0	0	0	0	0	0	2	0	7	3	9	16	21	27	0
(No water traps in use until 1931)															
Ruby-crowned Kinglet	0	0	0	0	0	0	7	5	23	24	14	31	52	34	9
Tennessee Warbler	0	0	0	0	0	1	1	2	4	7	4	8	14	42	45
Orange-crowned Warbler	0	0	0	0	0	0	17	12	13	32	6	39	57	53	34
Yellow Warbler	0	0	0	0	0	0	4	19	37	15	18	15	11	32	20
Myrtle Warbler	0	0	0	0	2	3	37	0	9	36	20	99	173	77	2
Yellow-throat	0	0	0	0	0	0	1	15	11	23	33	26	30	36	16
Wilson's Warbler	0	0	0	0	0	0	3	11	5	16	10	6	7	13	43
Baltimore Oriole	0	17	19	17	34	18	19	24	40	19	9	17	0	8	23
Bronzed Grackle	0	17	19	17	34	18	61	38	35	11	16	7	9	11	18
Cowbird	0	17	19	17	34	18	17	4	2	12	6	24	5	8	16
Juncos	38	165	283	189	191	103	155	142	245	255	300	391	235	121	231
Tree Sparrow	3	6	2	15	14	23	63	24	140	96	80	79	60	61	33
Chipping Sparrow	0	5	4	7	1	11	1	39	50	85	28	82	36	80	72
Clay-colored Sparrow	4	39	42	11	30	187	108	132	82	41	39	25	5	13	20
Harris's Sparrow	44	240	519	367	397	324	583	541	387	426	283	472	215	277	189
White-crowned Sparrow	25*	63*	21*	6	3	11	3	15	13	9	4	18	14	2	19
Gambel's Sparrow	0	0	47	35	21	42	82	107	43	77	29	44	24	7	17
White-throated Sparrow	6	56	214	207	170	227	267	189	86	249	200	356	208	160	169
Lincoln's Sparrow	21	46	81	35	19	139	99	115	71	103	64	107	33	21	31
Song Sparrow	69	74	72	48	16	48	55	68	69	46	27	10	3	5	7

*Gambel's not separated until after start of 1928.

Hairy Woodpecker. (*Dryobates villosus*.) Nine were banded with no returns, but three winter returns have been secured from birds banded in 1941 and 1942.

Downy Woodpecker. (*Dryobates pubescens*.) Banded, 29; two returns.

Barn Swallow. (*Hirundo erythrogaster*.) Banded, 51; mostly by Gale Monson near Argusville, about 15 miles northwest of Fargo, where one return was secured.

Blue Jay. (*Cyanocitta cristata*.) Six banded September 18, 1937, and one more September 21. One was recovered at Sebeka, Minnesota, March 28, 1940.

Least Flycatcher. (*Empidonax minimus*.) Since the water traps were introduced, 71 have been banded.

Chickadee. (*Penthestes atricapillus*.) During the 15 years, 73 were banded, all as transients or winter visitants. None returned though they are fed all winter. Usually they leave early in April. In 1943, two were seen during the summer and a return record secured in the fall.

Nuthatch. Of 30 White-breasted (*Sitta carolinensis*), the only return was a female which brought her young to the window feeding station. In the fall of 1941, 13 Red-breasted (*Sitta canadensis*) were banded, 10 in all the other years.

House Wren. (*Troglodytes aedon*.) A few boxes were put up, nestlings and adults banded, but no extended program carried out. Total banded, 204. Three returns of adults were secured at nest boxes.

Catbird. (*Dumetella carolinensis*.) Banded, 396; returns 15. Most of them are caught early in the fall.

Brown Thrasher. (*Toxostoma rufum*.) Banded, 337; returns 21, recoveries, 3, Ark., La., Tex. Nestlings in the area have been banded as far as possible and for a few years, an attempt was made to trap all adults (by a trap near the nest after hatching). Four birds banded in 1929 returned, and a fifth was found dead at Christine, N. D., about 20 miles south of Fargo. No returns have been secured on nestlings.

Robin. (*Turdus migratorius*.) Banded, 2270; 70 local returns, 6 at other points in N. D., 7 out of state. These birds would be ideal for study if they were not so wary about entering traps, especially after being caught once. Rarely has an individual been caught repeatedly. Not many nestlings have been banded. The greatest number of birds have been taken in the fall. In the last few years some attempt has been made to trap for a few days about July 1. Numbers of young birds are then attracted to the garden and they would be locally reared birds.

There has been some indication of return to other localities. Three summer recoveries are from Buffalo, Grand Forks and Larimore, N. D., 50 to 100 miles north and west, but these birds were banded in September and may not have been reared locally. However, one bird, banded as immature on July 11, 1934, was recovered April 21, 1937, at Oriska, N. D., 50 miles west of Fargo. Another, banded June 23, 1934, was recovered May 23, 1937, at Grand Forks, N. D., 80 miles north. These two birds certainly must have changed their locations.

Five out of state recoveries during winter months include two from Louisiana and two from Texas, one from Villa Ocampo, Coahuila, Mexico. One bird recovered at Cedar Falls, Iowa, was probably in migration but another, banded August 21, 1933, and recovered July 18, 1935, at Paynesville, Minnesota, 150 miles southeast, suggests a change in location.

Of the 70 local returns, 29 were station returns; 16 were trapped at neighboring stations (2 stations each 2 blocks distant and one bird about one mile distant); 20 were found dead, 5 were caught by means other than traps. All of the trapped

birds had been banded as adults, but 5 of those found dead were known to be immature when banded. The great majority of the station returns had been banded in April or May, but of the other returns the greater part had been banded in September. It will be noted that considerably more (41) returns were secured through other persons than at the station (29) traps.

Cedar Waxwing. (*Bombycilla cedrorum.*) Banded, 55; one recovery from Smoky Lake, Alberta, Canada.

Starling. (*Sturnus vulgaris.*) A single bird was trapped in 1940.

Warblers. The only recovery is that of a Myrtle Warbler (*Dendroica coronata*), banded October 2, 1932, and recovered at Clarence, La., on December 5, 1932. The rare species include: Parula (*Compsothlypis americana*), taken twice, two birds in one case; Cape May (*Dendroica tigrina*), 15 birds in 3 years; Black-throated Blue (*Dendroica caerulescens*), one in each of two years; Black-throated Green (*Dendroica virens*), one in each of 4 years; Chestnut-sided (*Dendroica pensylvanica*), one in each of 3 years; Chat (*Icteria virens*), 5 birds in 3 years; Canada Warbler (*Wilsonia canadensis*), 6 birds in 4 years. The Magnolia Warbler (*Dendroica magnolia*) has been taken each year since 1933, a total of 30 birds. Ovenbirds (*Seiurus aurocapillus*) and Water-thrushes (*S. noveboracensis*) have been taken nearly every year but never more than 4 birds each year.

Bobolink. (*Dolichonyx oryzivorus.*) A few usually are found in a meadow just beyond the trapping area and one bird was taken.

Red-winged Blackbird. (*Agelaius phoeniceus.*) About 100 were banded in two years as nestlings some distance from the area and the total is 118. One of those banded as a nestling was killed at the same place the next year and one adult trapped at the station was found dead there the next year. Many of this species, as well as Grackles and Cowbirds, roost in the trees above and near the traps during migration, but rarely enter traps at that time.

Bronzed Grackle. (*Quiscalus g. aeneus.*) These reach Fargo the first week of April but it is quite regularly a month later, when nesting activities begin, that any are caught. Out of 313 banded, there have been 38 local returns and 6 recoveries: La. (2), Miss. (1), Mo. (1), Man. (1), Wahpeton, N. D. (1). Of the local returns, 13 were found dead but often without sign of injury. One fine male found in early spring was mounted by a local taxidermist and no sign of injury found.

Cowbird. (*Molothrus ater.*) These become common about May 1, but it is nearly always May 15-20 before they enter traps. Banded, 116; 10 trapped as returns, 3 of them three years in succession. One was found dead a year after banding.

Baltimore Oriole. (*Icterus galbula.*) Banded, 165; returns, 3.

Orchard Oriole. (*Icterus spurius.*) One banded in 1933.

Scarlet Tanager. (*Piranga erythromelas.*) One banded in 1935 and one in 1939.

Slate-colored Junco. (*Junco hyemalis.*) Banded, 3,054; returns none. The single recovery was a bird caught at Gurdon, Ark., and the band removed! The birds usually trap well in late fall, often poorly in the spring, and, as before mentioned, the main station usually is not in operation until most of them have gone on northward. In 1928, traps were operated all spring in a slightly different location and over 100 birds were released unbanded when a sudden rush exhausted the supply of bands.

Tree Sparrow. (*Spizella arborea.*) Banded, 699; no returns nor recoveries. They are taken chiefly in the fall.

Chipping Sparrow. (*Spizella passerina.*) Banded, 501. Quite a few summer residents are trapped but the main group is of fall migrants. Twelve birds have returned, 5 of them for two different years. One, banded September 17, 1940, was caught in a porch in Moorhead, Minnesota, about two miles from the trapping station, May 6, 1941.

Clay-colored Sparrow. (*Spizella pallida.*) Banded, 676. One bird, banded in September, was trapped the following June and September, and in September the next year. Another, banded in September, returned the following September. They do not nest in the garden but a number of nests have been found within a mile distance and once a bird laid an egg in a trap.

Harris's Sparrow. (*Zonotrichia querula.*) Banded, 5,264. These have been reported in detail in another paper (*Wils. Bull.* 41: 165-174). The birds trap so readily that the numbers taken should be quite an accurate index of their abundance. Ten recoveries: S. D. (3); Kans. (1); Mo. (1); Okla. (4); Tex. (1—Hughes Springs).

White-crowned Sparrow. (*Zonotrichia leucophrys.*) Gambel's Sparrow predominates, 575 being banded, compared with 137 White-crowned. Often a black spot is present in front of the eye and sometimes a poorly defined streak. There are no returns nor recoveries.

White-throated Sparrow. (*Zonotrichia albicollis.*) Banded 2,754. The numbers of these seem to have varied rather less than those of Harris's. Three recoveries are: Southam, N. D.; Miller, Ark.; Redland, Okla. One bird taken from the writer's trap by an assistant on May 18, 1935, had been banded on Apr. 28, 1935, by Merle Jones, Pomeroy, Iowa. Thus, by being away for one day the writer was deprived of seeing his only foreign band to date!

Lincoln's Sparrow. (*Melospiza lincolni.*) Banded, 985; no returns nor recoveries. These trap readily and seem to have varied much in abundance.

Swamp Sparrow. (*Melospiza georgiana.*) A few have been taken nearly every year, usually less than 10, except in 1932 and 1933 when 17 and 24 respectively were banded. Total banded, 103.

Song Sparrow. (*Melospiza melodia.*) Banded, 607; no returns nor recoveries. These have varied greatly in numbers. They rarely nest in the immediate vicinity. In 1936, a family of young was banded in a nest at the river about three miles distance. It has seemed that there are two rather distinct migration periods, a few birds early in spring and late in fall, with the main group separated from these, but the data are not sufficient to demonstrate it.

Fox Sparrow. (*Passerella iliaca.*) Banded, 145. One banded October 2, 1929, was recovered at Ethelbert, Manitoba, April 11, 1930.

Other Sparrows. One or two Vesper sparrows (*Pooecetes gramineus*) are taken nearly every year (total, 25) and one bird returned two years. Red-eyed (*Pipilo e. erythrophthalmus*) (13) and Arctic Towhees (*Pipilo m. arcticus*) (10) are about equally frequent. In July, 1931, 22 Red Crossbills (*Loxia curvirostra*) were banded in our back yard where they were feeding on sunflower seeds. Again in 1934 and 1937, three each were banded. Purple Finches (*Carpodacus purpureus*) (11), Indigo Buntings (*Passerina cyanea*) (3), Rose-breasted Grosbeaks (*Hedymeles ludovicianus*) (4), and Evening Grosbeaks (*Hesperiphona vespertina*) (1), are infrequent.

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