

is $3.0/.254 = 11.8$ times the chance frequency or $11.8/3.7 = 3.2$ times the least possible frequency of random occurrence.

The seven sets which occur with significant frequency include but six birds: 48-16209, 49-4385, 49-4393, 49-4397, 49-4400, and 49-4407. We conclude that these birds form a flock which may have less firmly attached or satellite members.

Up to this point there seems little need to have introduced the exact probabilities. There are two reasons for doing so. First, if there are a large number of observations on rather few birds, some sets may occur with less than chance frequency and would be excluded from the computation of the significant level. Second, it will often, perhaps always, be necessary to know the ratio by which the occurrence of any set or group of sets exceeds random probability. In the present example the occurrence of the whole group of sets derived from the supposed flock exceeds the probability of the occurrence of all possible sets from a flock of six birds eight-fold.

We have $T = 20$ and $F = 6$ and we wish the probability of drawing a pair ($N = 2$) of the 6 at random from the whole group of 20 birds. This is, in general, ${}_F C_N / {}_T C_N$ and, in the present case, ${}_6 C_2 / {}_{20} C_2 = 15/190 = 0.079$. The proportion found is that $33/52 = 0.63$ of the takings were of one of the 15 possible pairs. (13 of these 15 pairs were actually taken.) This is 8.0 times expectation. The fall from 11.8 to 8.0 times expectation results from counting in 6 pairs from the supposed flock which occurred with less than significant frequency.

Without giving the details, I find that the only set of three birds which occurred with significant frequency was 49-4385, 49-4393, 49-4397.

Two cautions are necessary. The present method can not be used to prove absence of association conclusively. Association of rarely trapped birds will be missed. Also, if the observations stretch over too long a period, changes in flock composition may obscure association which actually exists.

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SOME NOTES ON ACTIVITIES OF THE NORTHERN AND MIGRANT SHRIKES

BY OSCAR MCKINLEY BRYENS

In *The Condor*, Nov.-Dec., 1939, p. 260, Mr. Emerson A. Stoner reports on "Some 'Butcher-bird' Activities of the California Shrike (*Lanius ludovicianus gambeli*)," in which he tells of this species killing captive birds, such as caged canaries and birds in traps at his banding station. I have noted very similar happenings in my bird banding activities, with the Northern Shrike (*Lanius borealis borealis*) and the Migrant Shrike (*Lanius ludovicianus migrans*).

I began bird banding early in summer in 1924, near McMillan, Luce County, Michigan. No station was operated from May 19, 1925 to July 31, 1927 when I was away and not in a place satisfactory for operating a station. Upon returning to McMillan, I began once more to operate a station, continued up to November 2, 1945, except from about October 22, 1927 to March 12, 1928, when I resided in a swamp in the western part of Luce County, and operated a station there. This station in the swamp land was in rather open territory as the timber had been cut and fire had burned over this area; no shrikes were noticed about that station. From June 9 to November 20, 1948 and from June 22 to August 29, 1949, I resided in Luce County one and a half miles west from my former home where most of my banding had been done. I was not troubled any by shrikes at this location in these two periods of time which may be due to the fact that the traps were in woodland and therefore, captive birds were not visible at any great distance, and also that the Northern Shrike (being a winter resident in Luce County) was absent from this region at this time. The Migrant Shrike is very uncommon, as I seldom observed any on more than one or two days in a year, and some years, none at all. With the exception of these two periods in 1948 and 1949, I have resided and operated a station in Three Rivers, St. Joseph County, Michigan, since November 3, 1945. So far, I have not been troubled by any shrikes at this Three Rivers station. I have never found any Northern Shrikes in St. Joseph County, and have found the Migrant Shrike as uncommon here as in Luce County.

Of 12,572 birds that I have banded, 16 were Northern Shrikes and one a Migrant Shrike. In addition to these, I took one Northern Shrike from a trap, and collected one Migrant Shrike which I sent to the museum at Ann Arbor, Michigan. All of these shrikes are from the farm where I resided most of the years that I was in Luce County.

I am giving below, a brief account of how I got these shrikes; the date given is the date banded and trapped, unless otherwise stated.

NORTHERN SHRIKE (*Lanius borealis borealis*)

A258620, Feb. 2, 1931 at 4:14 p.m.: This bird was first noticed as it was flitting about in getting at a trapped Eastern Snow Bunting No. C98305 that was in my Dodson sparrow trap (a funnel type trap much like the government sparrow trap). The Snow Bunting was in the second compartment, and in its efforts to get away from the shrike, had thrust a foot and leg through the side of the trap, and then back in the trap through the mesh below, and was not able to free itself, and therefore was easy prey for the shrike. The Snow Bunting was dead at the time I found it and the shrike had torn open the body so that some of the intestines were hanging out. I took the Snow Bunting out of this trap and put it in a one-cell trap beside where the killing was made, and within a few minutes after I went away, the shrike returned and was trapped.

B221365, ad., Dec. 11, 1932 at 2:00 p.m.: At about 1:53 p.m. I noticed an object in my receiving cage trap, which upon investigation, was a female English Sparrow (*Passer domesticus*), which had undoubtedly been attacked in the trap by a shrike. It had thrust its head

through the side of the trap and did not get back in before it was seized by the shrike. There were no signs on the snow to show that any animal was around to do the killing. I re-set the trap and put the headless bird in, in hopes of getting the attacker. In a few minutes after I departed from the station, I saw a shrike come from the woods directly to the station and was trapped.

34-249626, ad., Dec. 19, 1934 at 4:30 p.m.: Trapped in my Glenhaven four-cell trap. In this trap, the doors are on opposite sides, (two on one side, and two on opposite). This shrike entered a cell with opening beside the cell in which a male English Sparrow was at this time (unharmed).

35-206186, ad., Feb. 14, 1936 at 11:02 a.m.: Entered Dodson sparrow trap and killed two Hoary Redpolls (*Acanthis hornemanni exilipes*) 35-11825 and 35-11827, that were in the first funnel at this time. This shrike was retaken on Jan. 23, 1937 at 10:52 a.m. at the same location, but in the four-cell trap. In this case, the shrike entered the cell beside the cell in which a female English Sparrow was, and opposite the cell in which a male English Sparrow was. The sparrows were not harmed.

37-242564, in first winter plumage, Nov. 5, 1937 at 12:26 p.m.: In this case, there were two female English Sparrows in the second funnel of the Dodson sparrow trap. About three or four inches from this part of the trap, I had a one-cell trap that I made from the crate that the four-cell was shipped in. This shrike was trapped in this one-cell, and after this, I usually had this trap nearly, if not against, the second funnel of the Dodson trap, which brought results, as may be noted in other captures farther on in this paper. This gives proof that banders having one-cell traps will succeed in getting some enemies by having two one-cells side by side.

37-242565, ad., Dec. 10, 1937 at 3:43 p.m.: Trapped in the same manner as 37-242564. When released, it flew to the linden tree that is by the station where my four-cell trap was at that time, and it did not make any effort to go down after a male English Sparrow that was in the trap then.

38-238088, in first winter plumage, Dec. 24, 1938 at 2:08 p.m.: Entered the cell of the four-cell trap opposite that in which a female English Sparrow was. The cell beside the cell that had the sparrow was out of order, or it might have entered that one.

38-238090, ad., Jan. 16, 1939 at 1:50 p.m.: At this time, a female English Sparrow was in a cell beside, and another in a cell opposite, the cell this shrike entered, of my four-cell trap. After banding the shrike, I put it in a cell with one of the sparrows, but it made no effort to kill it.

38-238091, ad., Jan. 27, 1939 at 12:53 p.m.: Trapped in same manner as 37-242564. A male English Sparrow was in the second funnel of the Dodson trap at this time.

39-237430, ad., Oct. 30, 1939 at 11:40 a.m.: Entered the cell opposite the cell of the four-cell that held a female English Sparrow.

39-237432, ad., Nov. 9, 1939 at 8:27 a.m.: I feel very sure that it is this shrike that killed Black-capped Chickadee (*Penthestes atricapillus atricapillus*), no. 39-24947, without entering the trap. I put the dead

chickadee in the trap (in this case, the receiving cage trap), and re-set it, at 7:54 a.m. and got the shrike 33 minutes later. This shrike was retaken on Mar. 4, 1941 at 9:33 a.m., and this bird and no. 35-206186 are my only returns of shrikes, in fact, the only ones that I recaptured. On the returning date, this shrike entered my Dodson trap and killed one of the two Snow Buntings that were in it at that time.

39-237436, ad., Dec. 8, 1939 at 2:53 p.m.: Entered a cell opposite the cell of the four-cell trap that held a female English Sparrow.

39-237437, ad., Dec. 23, 1939 at 2:30 p.m.: Entered the cell beside the cell of my four-cell trap that held a female English Sparrow.

40-241345, ad., Dec. 11, 1940 at 8:45 a.m.: Trapped in same manner and trap as 37-242564. In this case, a female English Sparrow was in the second funnel of the Dodson trap.

39-218950, ad., Jan. 29, 1944 at 4:17 p.m.: This shrike entered a rat trap that I remodelled by taking out a partition and attaching a trip door. It killed a Common Redpoll (*Acanthis linaria linaria*).

39-218967, ad., Dec. 9, 1944 at 4:13 p.m.: Entered a cell beside the cell of my four-cell trap that held a female English Sparrow.

No. B26 of my collection, an adult male collected Mar. 10, 1934. On this date, a friend Mr. L. S. Varnes was with me and happened to look out at my Dodson trap and noticed a bird trying to get inside. I rushed out and saved one of the two Common Redpolls that were in the trap. At this time I was operating the Dodson trap by having a string to the door of the second funnel and could close it in case I saw any birds inside. I put the dead Redpoll in the second funnel and went back to wait for the shrike to return which it did in a very few minutes. It dashed in after the dead bird, and by my quick operation of the string at the right moment, got taken. From this shrike, I collected many parasites and sent them to Mr. Harold S. Peters, for the Bureau of Entomology. Mr. Peters wrote me that 35 of these were identified as *Philopterus subflavescens* (Geof.). This shrike was in the moulting stage on the chin and throat.

MIGRANT SHRIKE (*Lanius ludovicianus migrans*)

B270336, ad., May 6, 1934 at 6:35 p.m.: A few minutes before this time, I saw a Migrant Shrike try to get a male English Sparrow that was in my receiving cage trap. I killed the sparrow and put it in this trap and re-set it, and got this shrike which makes it seem sure that this bird is the same that I saw there. Some new feathers were partly grown on the throat and malar region.

No. B-6 of my collection. An ad. male collected from a tree near one of my bird banding stations on Apr. 19, 1932. I collected some parasites from this bird and sent them to the Bureau of Entomology, and Mr. Harold S. Peters wrote me that 55 of these were identified as *Philopterus subflavescens* (Geof.).

Readers may note that in many cases, the captive birds were English Sparrows at the time of attack by shrikes. In accounting for this, I have the traps placed so as to get attackers by having two or more one-cell traps side by side. Also, at certain times of the year, efforts are made to control English Sparrows by trapping, and for this, I

hold a bird captive (if possible, a female, to serve as a caller). This is done only in mild weather. Then too I also may hold an English Sparrow captive if weather conditions permit, in an effort to trap shrikes at the time of year they are likely to be found. A small can placed in a trap will make a favorable shelter, unless too cold weather prevails.

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GENERAL NOTES

Age Records of Pileated Woodpeckers.—One of the questions that have been partly answered by bird-banding is the age possibilities of various species of birds. Birds found dead, or those retrapped some years after banding, have shown at least the age to which the species *can* live, and while probably the average age in the wild is considerably below that shown by an occasional published record of long life, nevertheless the massing of figures resulting from study of banding retakes and recoveries will eventually give a fair average age for a species.

It is understandable that there are and probably will be very few age records for certain species. For these, even a single definite record may be considered to have some, if only very slight, significance.

Very few Pileated Woodpeckers (*Ceophlaeus pileatus* (Linnaeus)) have ever been banded. According to Mr. Seth Low, Biologist of the Fish and Wildlife Service, only 40 had been reported banded up to January 1951. Most of these have been nestlings, as there are considerable difficulties in the way of banding adults of this species. With so few banded, it is also understandable that there have been few recoveries. Many Pileateds are shot annually, but most killers of birds of this type just leave the bird lying after a cursory examination, or if they do recognize it as a protected species, are loath to report it. It is possible that some banded Pileateds have been shot and not reported. The chances are very slight, also, that the body of such a bird that had died from natural causes, or from an accident, would be found, in the deep woods and swamps that are their usual habitat.

This paper, however, reports two authentic age records of Pileated Woodpeckers. Altogether there have been six recoveries of banded Pileateds. Two were four months after banding, two were eight months, and these are not significant. The fifth is important. On July 6, 1938, Mr. Harry Pegg banded several nestling Pileateds at Glenevis, Alberta, Canada. In May of 1948, a son of Mrs. Albert Mayer of Cherrill, Alberta, shot one of these birds at a point which Mr. Pegg tells us is approximately 10 miles from the point of banding. Mrs. Mayer reported the band to the Fish and Wildlife Service, and has verified the data in a card to us. This bird was just a month or so short of being 10 years old. Unfortunately we do not know how much longer it might have lived if it had not been shot.

In June of 1941, the writers of this note took a nestling Pileated Woodpecker from a nest in a woodlot near Ithaca, New York, in connection with the life history study of the species by the senior author. The bird, a female known as "Phloeo," was banded with number 37-402707, and was kept in captivity under Federal Permit, the rest of its life. Details of its life in captivity will not be given here, as they have been published elsewhere. The bird died on November 13, 1950, at the age of 9½ years, and this is the sixth "recovery" mentioned above. She was ill only one day, and gross examination indicated kidney trouble. Microscopical examinations are expected to confirm this. She had shown symptoms in the excessive amount of water she had drunk during the last month of her life.

These two age records, one of a bird in captivity, one of a shot bird, do not justify a conclusion that 9 or 10 years is the age Pileated Woodpeckers usually reach. At present, however, these are the only factual records, and it is hoped that there will be other recoveries in the future to add to our data.—J. Southgate Y. Hoyt and Sally F. Hoyt, "Aviana," Etna, New York.