

naturally protected from bush fires, provides some assurance for the continued welfare of the species. There is, however, some natural mortality from insecure nest foundations, native cats, and other ground animals of predatory disposition.

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## Roosting Flights of Starlings

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Set out below are details of counts made of Starlings (*Sturnus vulgaris*) returning eastwards at evening to roosts from their feeding and nesting places at Karori, a suburb in the hills west of Wellington city, New Zealand.

These observations were made by me in the years 1946 to 1948 and in 1951 to 1954. During the former period the Starlings were watched leaving a plantation of pines for their roosts. These Starlings gathered there after feeding all day in the neighbouring paddocks and they numbered in all some fifty birds. Those watched in 1951 to 1954 were flying over a sports field along a main flyway to their roosts. Half of the Starlings which left Karori in the evening flew over this spot. In both cases the roosts were several miles away. The object of the study was to see what time these birds in the Wellington area returned to their roosts in spring, winter and summer. They leave for their roosts just about sunset in winter and spring but their behaviour appears to be aberrant in summer, as the following notes will show.

August 3, 1946. Most birds went to roost between 1715 and 1726. Sunset 1727.

August 24, 1946. I saw flocks and single birds leaving for roosting places before sundown but none after sundown. Sunset 1746.

October 29, 1946. At about 1900 a flock of under ten birds left for their roosting place. Sunset 1857.

May 23, 1947. Starlings noted quitting pines where they had gathered in a party for their roosts just before sundown. Sunset 1707.

June 21, 1947. Saw birds going to roost in a compact flock at 1630. The sky was overcast and the light dull. Sunset 1658.

July 12, 1947. Saw groups of Starlings going to roost from pines at 1705. Sunset 1708.

August 2, 1947. The Starlings were noticed quitting the plantation for their roosting area between 1712 and 1729. Most went between 1712 and 1716. Sunset 1726.

July 4, 1948. Saw complete exodus from pine trees for roosting place at 1700. Sunset 1703.

September 13, 1951. Bird seen at 1750 still singing in front of hole in roof of old house, ceasing this activity at 1752. Two birds left this house for roost at 1752. A third bird went into this hole at 1755. Sunset 1807.

September 16, 1951. Saw about 250 returning to roosting area shortly before 1755. They were in parties of 10, 25 and, in one case, 50 birds. Often there were two flying together. I heard Starlings singing at 1750. There was a tendency for birds to stay about houses containing suitable nesting sites after the sun had set. Some birds did not apparently go to the roost. Sunset 1810.

October 12, 1951. About 130 counted returning to roost between 1825 and 1835. Parties of 10 to 25 first seen, later two birds together or single birds. At sunset a bird was seen singing in front of a hole in the roof of a house. Sunset 1837.

October 20, 1951. Between 1835 and 1855, 320 birds seen returning to roost. Nine parties seen of 10 to 25 birds. Main body flew overhead between 1840 and 1845. Odd single birds flew overhead at 1835, 1840 and 1851. The rest of the Starlings seen were in parties of three or five. Sunset 1846.

November 21, 1951. Between 1920 and 1930 about 15 seen returning to roost. Sunset 1925.

November 27, 1951. Between 1920 and 1930 about 30 recorded returning to roosting area. Sunset 1932.

December 3, 1951. Watch kept to sunset from about 1915. No birds seen returning to roost. Sunset 1939.

December 6, 1951. Watch kept to sunset from 1930. Fifteen birds seen flying to roost either independently or several together about 1935. Sunset 1942.

January 2, 1952. Watch kept to sunset from about 1930. At 1955 two parties of about 100 and 50 birds each seen returning to roosting area. On succeeding nights no parties seen at this time except for a flock of 50 birds at 2000 on January 8. Sunset 1958.

January 11, 1952. Watch kept to sunset from about 1930. At 1935, 25 seen going to roost. Sunset 1957.

Mid-January, 1952. Birds watched for from 1920 to 2005. On one day I witnessed a party of five birds flying towards a roosting place at 1955, and a day or so later I saw 43 birds between these hours. Sunset times for this period 1956.

January 20, 1952. Watch started an hour before sunset from 1855 to 1910. I counted 72 birds, including a party of 50. I saw no birds between 1900 and 1910. Sunset 1954.

January 22, 1952. Further watch kept from 1825 to 1900; 539 birds counted going to roost mainly between 1840 and 1850. Most of the Starlings were in parties but occasionally I saw single birds or two birds together passing overhead. Sunset 1952.

December 30, 1952. Watch kept from 1825 to 1915; 135 birds going to roost mainly between 1835 and 1845. Sunset 1958.

January 2, 1953. Eleven Starlings flying to roosting place at 1915; 1920 one seen, and from then on to 1940, when I ceased observations for the night, no birds seen. Sunset 1958.

January 4, 1953. Watch kept from 1755 to 1820. No Starlings seen going to roost. Sunset 1958.

June 27, 1953. Watch kept from 1640 to 1700; 570 counted going to roost between 1640 and 1655, and thereafter to 1700 no birds seen. Sunset 1700.

June 28, 1953. Further observations made between 1620 and 1640; 70 birds counted going to roost. Sunset 1700.

November 21, 1953. Count taken between 1900 and 1930 of 120 birds. The Starlings crossed over the observation point steadily throughout the whole thirty minutes. There were several parties of between 6 and 14 birds, whilst the remainder were either in pairs, trios or by themselves. Sunset 1926.

December 27, 1953. Studies were continued on this date between 1810 and 1930. Three birds went to the roosting place at 1835 and 24 birds in two and threes between 1900 and 1920. Sunset 1957.

December 31, 1953. Counted 86 birds flying to roost between 1925 and 1957. Sunset 1958.

January 12, 1954. No Starlings seen flying to roosting places between 1917 and sunset at 1957.

January 22, 1954. From 1830 to 1915, 250 seen flying to roost, mostly between 1840 and 1855. Sunset 1952.

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