

Survey of a Major Swallow Roost in Pembroke

by

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After the breeding period, many species of swallows typically congregate each night in communal roosts. These gatherings may be very large in size and contain several species. Such roosting aggregations can occur on the wintering grounds; a single roost of over one million swallows was noted on a reed marsh in the Transvaal (Ingram 1974). Roosts are also found along migration routes and Bent (1942) has documented sizeable flocks of most North American swallows, particularly the Tree Swallow (*Tachycineta bicolor*), Bank Swallow (*Riparia riparia*) and Purple Martin (*Progne subis*). A major roost for migrants is located at the confluence of the Muskrat and Ottawa Rivers in the City of Pembroke. Much concern has been raised over the conservation of this site (Hackman 1983; Clark 1984). Information on swallow roosts is sparse, so we are providing some details of the Pembroke roost with emphasis on results from a survey to determine the number of swallows present during the period

of peak usage in August. This was a joint effort of the Canadian Wildlife Service and local naturalists.

The roosting site is on a point which becomes a small island during high water, extending off the north shore of the Muskrat River mouth (Fig. 1). It has a sandy substrate which supports a stand of Black Willow (*Salix nigra*) that is about 10 to 15 m in height and 0.5 ha in area; the birds roost in the canopy. Many of the trees bear scars from ice scouring and there is relatively little understorey. The roosting swallows can be best observed from the marina breakwater on the opposite bank of the river (Fig. 1).

Local residents remember swallows nesting in former boat houses along the Pembroke waterfront since the early 1960s. The present roost was occupied within the last 15 years (J. Murphy, pers. comm.) and numbers of birds have apparently never been larger than in 1983. Each year the swallows start arriving in early July and the flock

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is thought to peak in size during the second week of August. Numbers decline thereafter, dropping with the passage of each successive weather front until the roost is abandoned in early September.

Our survey was carried out during the evening roosting period of 10 August 1983. The method used was 1) to determine the various flight corridors followed by the birds in either approaching or departing from the roost; 2) to take timed counts of the birds crossing visual transects across these corridors; and 3) to extrapolate from these samples to get an

overall estimate of the number of birds using the roost. Viewing transects were established perpendicular to the flight directions (Fig. 1). During the observation period, counts were made for one minute every five minutes. The number of birds using each route was calculated by averaging results from each successive pair of counts, multiplying by the number of minutes separating the two, and summing over the entire period of the survey. In some cases, the 1-minute counts were made more often than every 5 minutes. The evening flight was counted using five teams of two people (transects

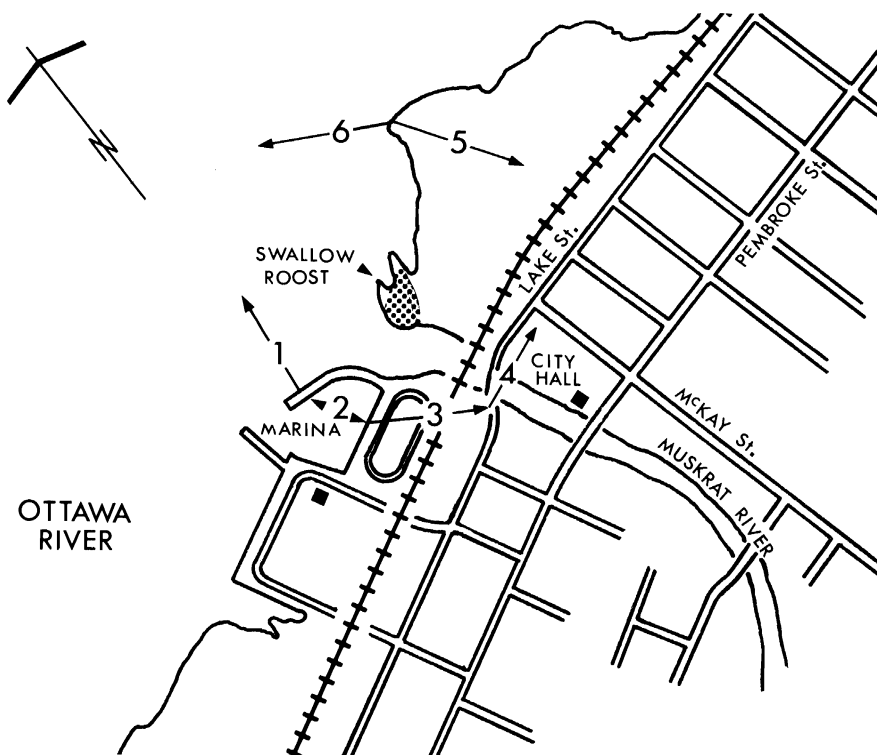


Figure 1. Map of Pembroke Showing Location of Swallow Roost and Viewing Transects



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Swallows returning to roost, Pembroke, Ontario.

1, 2, 3, 5, 6) and a single observer (transect 4) covering all known flight routes. The observations were made from 2000 to 2100 h although a few birds had arrived before 2000 h. Viewing conditions were good as weather was partially overcast, mild (20°C), and calm. The following morning, a similar survey was made of the departing birds. This count, however, was not considered accurate as many birds were seen leaving the roost and crossing one transect, only to reverse their directions and move downstream past another transect where they were counted again. It was also hoped to quantify the proportion of the various swallow species using the roost. This proved impossible as different species flew to the roost at different altitudes; a representative sample could not be obtained under these conditions.

During the evening flight, swallows approached the roost primarily along the Ottawa River, with the highest numbers coming from the east (69%); few birds came overland. Approximately 115,000 swallows were observed entering the roost. This total was more than double our casual estimate of the flock and points to the difficulties of estimating numbers of small birds that pass by steadily. There are apparently no published records of accurately censused swallow roosts of this size in Canada, although there are several undocumented reports. C. Goodwin (pers. comm.) noted that an estimated 250,000 Tree Swallows (mostly) were recorded in Matchedash Bay in Georgian Bay and that smaller flocks of approximately 20,000 individuals were noted on Lake Chemung near Peterborough and in Holland

Marsh. G. Bennett (pers. comm.) was also aware of a record of more than 100,000 swallows in the Chignecto National Wildlife area near Amherst, Nova Scotia.

Behaviour of the birds around the roost differed between the evening and early morning periods. In the evening, the birds arrived at the roost over a period in excess of one hour, with the highest rate of arrival occurring 10 to 20 minutes after sunset (2019 h). The incoming birds formed a large dense swarm over the roost and restricted their movements to the area around the roost delineated by the viewing transects. The birds flew about excitedly, often chasing each other and constantly vocalizing; feeding activity was relatively rarely observed. Just after sunset as the rate of incoming birds reached its peak, the flock gradually started to settle in the roosting trees. For a while, birds were constantly landing in and taking off from the roost. Only with approaching darkness did the flock descend rapidly into the trees. In the morning, the birds initially left the roost in small groups to forage over the water just as the day began to brighten. As the sun rose (0557 h) the swallows moved off the roost in spectacular large waves. The exodus from the roost was mostly completed over a half-hour period (0545 to 0615 h).

Although the proportion of the various species could not be determined, it was evident that Tree Swallows vastly predominated; Barn Swallows (*Hirundo rustica*), Purple Martins and the occasional Bank Swallow were also noted. This contrasts to a

previous visit (20 July 1983) when Barn Swallows and Bank Swallows were the most common species. Clearly, usage of the roost shifts with time according to the migrational phenologies of the various species. Moreover, all individuals of a given species are likely not present at one time and the total number using this site each summer is probably much larger than the peak numbers recorded on any given day. The size and diversity of species of the Pembroke flock make it unique among recorded swallow roosts and provides one of the major spectacles of swallow migration in Canada.

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Literature Cited

- Bent, A.C.* 1942. Life Histories of North American Flycatchers, Larks, Swallows, and their Allies. U.S. Natl. Mus. Bull. 179. 555 pp.
- Clark, W.R.* 1984. Canada's Capistrano. Nature Canada 13 (1): 14-15.
- Hackman, A.* 1983. Swallows flock to Pembroke in Earth watch. Seasons 23 (4): 5-9.
- Ingram, C.* 1974. The Migration of the Swallow. H.F. & G. Witherby Ltd. London. 86 pp.