

A WINTER ROOST OF LONG-EARED OWLS

by John W. Andrews, Lexington

Introduction

During the winter of 1980-81 a remarkable roost of approximately 21 Long-eared Owls (Asio otus) assembled at the Dunback Meadow Conservation Area (see reference 1) in Lexington. Because the Long-eared Owl is seldom seen by birders, the roost attracted considerable attention. During January and February approximately 400 persons visited the highly accessible site to see these owls, and most were curious about the reasons for the unusual assemblage. Some returned several times, and three (myself together with Don and Lillian Stokes) undertook a study of the roost to learn as much as possible about the behavior of the owls. We soon found that we were recording information that had never been reported in the ornithological literature. The following summarizes our findings.

Basic facts about the Long-eared Owl

The Long-eared Owl is a medium-sized owl* which hunts open fields by night, often by coursing back and forth at low altitude. Its primary prey species is the Meadow Vole (Microtus pennsylvanicus), which constitutes 75 to 95 per cent of the winter diet (refs. 2 and 3). A Long-eared Owl must catch two or three of these meadow mice per night in order to survive.

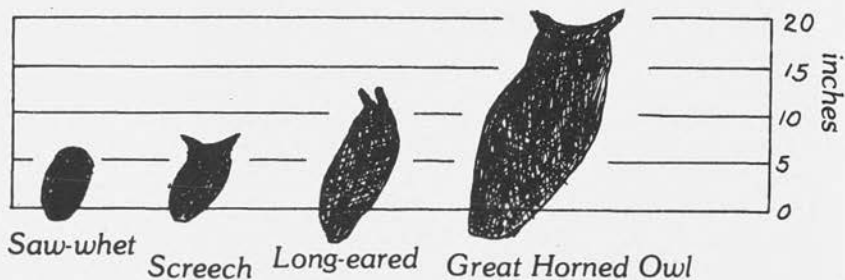
Wintering Long-eared Owls in Massachusetts roost almost exclusively in coniferous woodlots. Communal winter roosts often occur in which individuals retire in close proximity during the day and fan out at night to hunt nearby fields. Bent (ref. 4) reports one such roost in Pennsylvania that contained over 50 birds, but 6 to 20 individuals seem to be more common.

Communal roosting is not typical of birds of prey, but it has been reported for the Short-eared Owl (Asio flammeus) and the Marsh Hawk (Circus cyaneus). These two species, like the Long-eared Owl, specialize in hunting small rodents in open areas. The prey species exhibit pronounced yearly fluctuations in population density. Furthermore, prey vulnerability can change rapidly with depth of snow or flooding of meadows. One theoretical explanation for the existence of communal roosts is that

* A Long-eared Owl typically weighs about 245 grams (with females heavier than males on average). In comparison, a Screech Owl (Otus asio) weighs about 172 grams and a Great Horned Owl (Bubo virginianus) about 1,500 grams.

they facilitate communication between individuals concerning the location of vulnerable prey populations (ref. 5). It seems likely that this is the evolutionary basis for the roosting behavior of the Long-eared Owl, but no one has verified this hypothesis.

Size Comparison



Census techniques and results

The pine grove at Dunback Meadow was visited several times by myself and others during November and early December without a Long-eared Owl being noted. But on December 14th I was delighted to discover three of these birds roosting in one of the pines. Their presence was not especially surprising since Long-eared Owls have been found at the site on several other occasions between October and March. However over the next few weeks the number of owls at the roost increased steadily. Census results are shown in Figure 1. The most striking feature of this plot is the rapidity with which the roost built up and stabilized its ultimate maximum size. The build-up occurred without any indication of a significant area-wide invasion of Long-eared Owls in eastern Massachusetts.

The roost seemed to act as a powerful magnet that drew birds despite a quite low overall population density of owls. The rapidity of the increase seemed to be much too rapid to be attributed to birds independently finding the pine grove and remaining due to its attractive physical attributes. It is much more likely that owls were attracted to the site by the presence of other owls.

Another interesting aspect of this plot is that the roost did not break up gradually, with owls drifting away over a period of time. Instead, they seem to have left in groups of about 7 birds, giving a stepped appearance to the declining portion of the curve.

In order to provide an accurate count of roosting birds, a diagram was made that indicated the locations of the

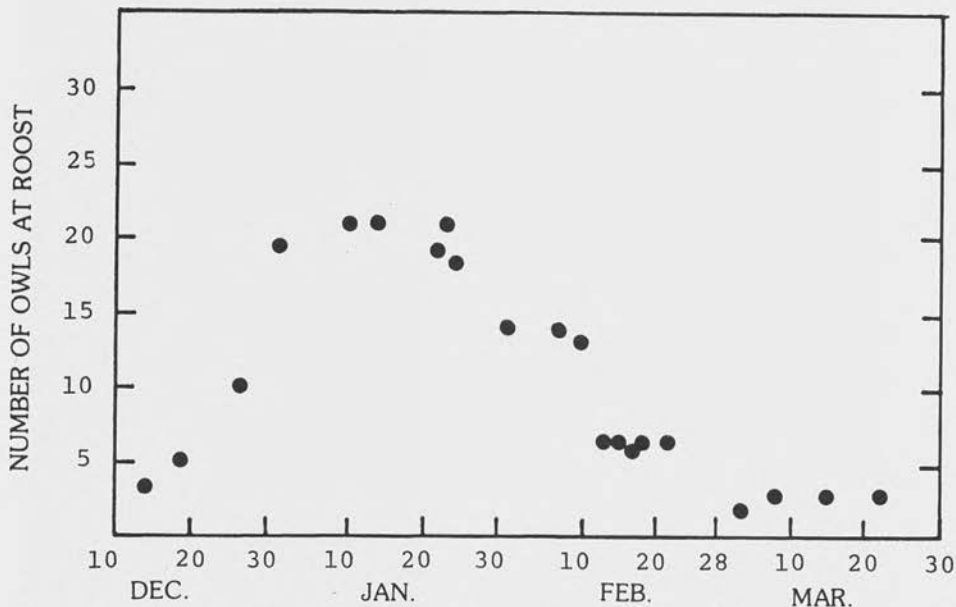


Figure 1. Number of Long-eared Owls counted at the roost at Dunback Meadow, Lexington, during the winter of 1980-81.

trees in the principal roost area. The owls in each tree were then counted and summed. This allowed each tree to be scrutinized from several viewing angles without missing a tree or counting the same tree twice. After censusing the principal roost area, trees in adjacent areas were searched for owls that were roosting apart from the main group. The consistent results of this census technique increased our confidence in its accuracy.

Perch selection

Long-eared Owls are well known for their tendency to return to the same tree (often the same perch) day after day. Peitzmeier reported (ref. 6) that Long-eared Owls in Germany roosted in fixed tree groups consisting of two or three closely spaced trees. Other seemingly equivalent trees nearby were ignored. He called the chosen tree groups *Schlafbaumgruppen* (schlaf=sleep, baum=tree, gruppen=groups). This aspect of Long-eared Owl behavior was quite evident in the Lexington roost. In censuses conducted on 14 separate days after January 24th, 91 per cent of all owl perches were in a group of four trees located within a circle of less than 7 meters in diameter. In fact, 68 per cent of the perches were in two favored trees located about 3 meters apart. Occasionally as many as 10 owls were found in the same tree.

Peitzmeier also reported that the owls preferred trees located 3 to 10 meters from the southern edge of a grove.

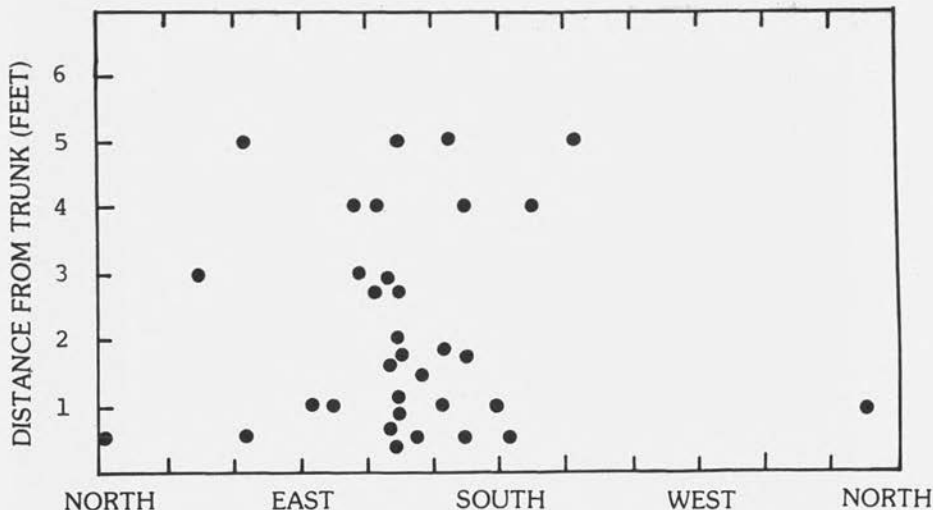


Figure 2. Position within tree at which Long-eared Owls perched. Data was gathered on five separate days in February and March. Perches tended to be near the trunk on the south or southeast side of the tree.

He speculated that this assisted them in taking advantage of the winter sun in the southern sky. The Lexington roost was actually located closer to the western side of the grove, but there was a break in the woodlot canopy immediately south of the favored roost trees. This break allowed the southern sunlight to strike the roost trees.

On several days the positions of owls were recorded in terms of distance from top of tree, distance from trunk, and bearing from true north. This data (Figure 2) revealed that 70 per cent of the perches were on branches extending to the south and southeast. The owls certainly seem to recognize the warm side of a tree!

Behavior upon return to roost

We were aware that significant social interactions are often associated with birds returning to a roost and we resolved to observe these as carefully as possible. From vantage points outside the pine grove, it proved extremely difficult to see the owls returning. The most fruitful method for observing the arrival was for an observer to take up position inside the pine grove under the known roost trees some minutes before the arrival of the owls. In this manner, arriving owls could be seen outlined against the sky and their vocalizations could be heard.

During the first morning of observation, the observers were overwhelmed with the variety of activities. They found it impossible to take coherent and complete notes. As a result, we sat down and carefully defined a list of

observables to be recorded. We decided that the following discrete events could be observed with some reliability: owl circling over the roost trees, owl landing in a tree, owl changing perch within a tree, owl changing trees, and owl emitting any one of several distinct vocalizations. To facilitate note-taking, a shorthand notation was devised in which a specific letter symbol indicated a single occurrence of each observable. Intensity of vocalization was indicated by underlining the symbol for the particular vocalization. For each occurrence, the time was noted. In order to analyze this data, plots were made in which the occurrence of each observable was plotted versus time before sunrise. This plotting soon revealed trends and correlations in the timing of activities.

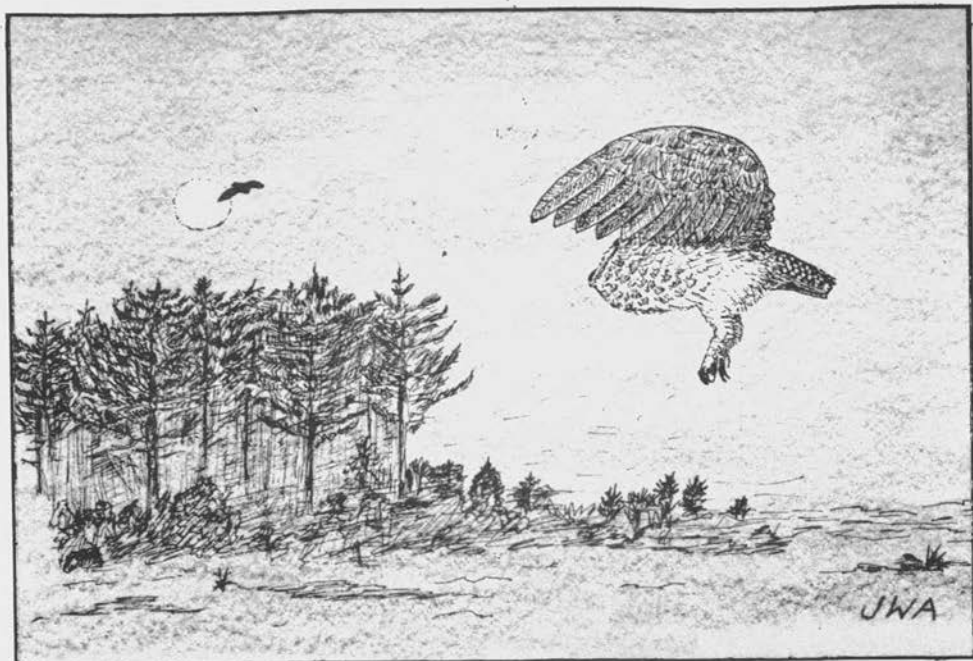
The following narrative from January 24th describes a typical arrival sequence:

We arrived at the roost about an hour and a half before sunrise. At intervals, one or two owls could be heard calling some distance from the roost. The vocalizations consisted of somewhat wheezy catlike mews. One call was composed of two short mews: "whee-whēēh." Another consisted of a short barklike mew followed by a more drawn out mew: "whih-wheerrrrrh." These calls were heard at 10-minute intervals or more and did not seem to elicit an answer from other owls.

The first arrival appeared at 80 minutes before sunrise. It circled silently over the roost trees and landed in the top of a pine. After a minute or two another dark form circled the area and came to rest in the same tree as the first. For the next few minutes owls arrived regularly every three minutes or so. Seven arrived in the first twenty minutes and four perched in the top of the same tree. The only sounds to be heard were the beat of a wing against the pine needles as an arrival landed or the faint scratching sound of talons grasping a branch.

About an hour before sunrise the arrival rate suddenly increased. An owl came in about every minute. At this time the first vocalizations began, and a soft twittering filtered down through the pines. It reminded us of a Mourning Dove's (*Zenaida macroura*) whistling wings, though it was somewhat faster. Occasionally the opening notes were chirped, with a tonal quality similar to that of the chirpy notes of an American Woodcock (*Philohela minor*) descending to earth after his courtship flight. The calls were unlike anything we would have expected from an owl.

About 15 minutes after the onset of this gentle twittering, a new activity began. An owl left its perch, made a half-circle over the roost, and pitched back into a tree. A



Owl in Flight at Dunback Meadow

Illustration by J. W. Andrews

few seconds later another owl did the same. In the next 20 minutes there were 22 such perch changes. A perch change was often followed by an intense outbreak of twittering. The new perches tended to be lower and more interior than the old ones. As the owls changed perches, the roost gradually coalesced toward the favored roost trees.

Suddenly, only 20 minutes before sunrise, the perch changing halted. One owl gave a final songlike twitter with much modulation. It sounded remarkably similar to the song of a House Wren. Then quiet reigned once more. The parliament of owls sat silent and unmoving upon their perches as the morning sun rose to warm them.

Figure 3 indicates the timing of the principal behaviors associated with the return to the roost on four separate mornings. Note the strong correlation between the perch changing activity and the twittering.

Don Stokes reviewed the ornithological literature on the Long-eared Owl. He found that practically nothing has been written in English concerning winter roosting behavior. Most investigators of winter roosts have been content merely to analyze pellets by the thousands. Two German papers on winter roosting were found (and trans-

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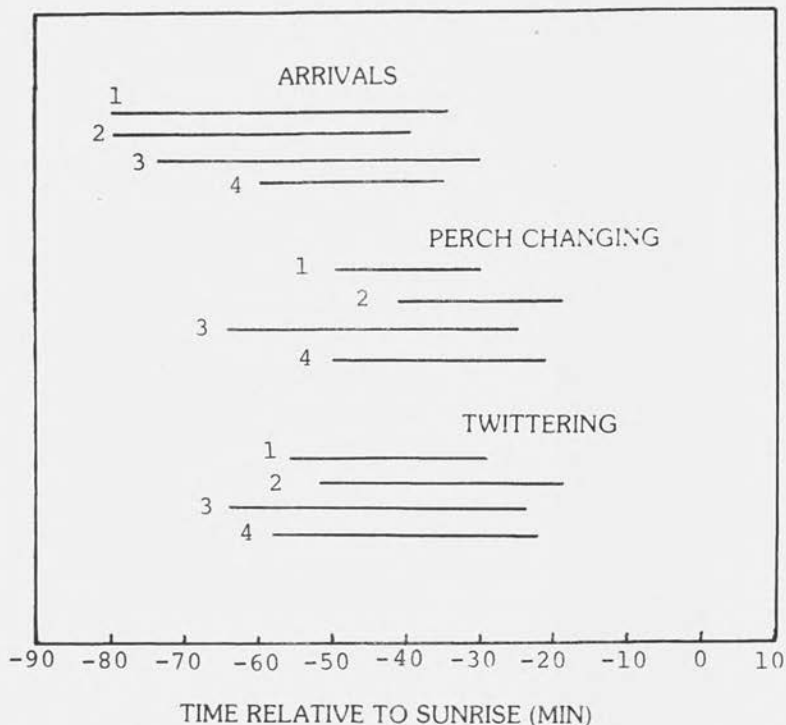


Figure 3. Timing of principal activities associated with arrival at roost. Data was collected on four separate mornings. The sky was clear on all mornings except January 24, which was overcast.

lated) and we have a partial translation of a Danish paper. Thus far it appears that the twittering and perch-changing behavior has never been described.

Behavior at roost departure

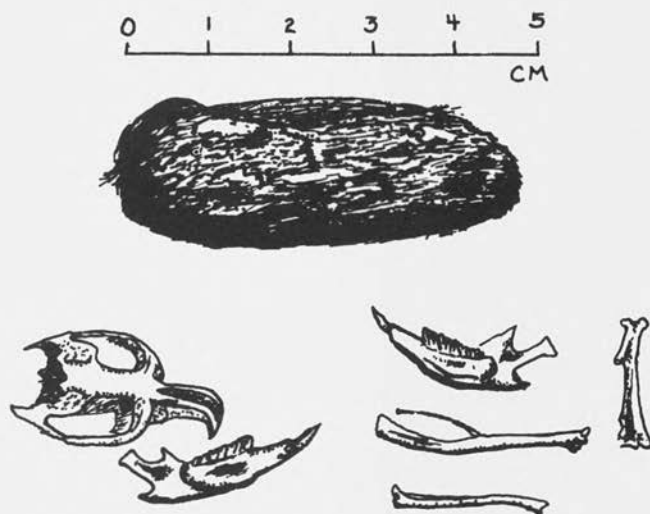
During the day the owls sat motionless, seemingly oblivious to human or avian visitors in their vicinity. Their rare movements were slow and cautious, giving the impression of parrotlike deliberateness. Although they sometimes preened, they could be watched for several hours without a change of perch being observed. But as the light of day began to fade, their demeanor gradually changed. The first evidence of altered behavior was an increase in the amount of preening activity. At this time, one often heard the sound of a cast pellet falling to the forest floor. Occasionally an owl changed its perch by a few feet. A subdued twittering was sometimes heard at this time, but the vocalization was much less intense and prolonged than at roost arrival. The first actual departure from the roost trees occurred without warning 10 to 20 minutes after sunset. Sometimes the early departees from the roost trees flew only 50 to 100 meters and

perched again. These owls seemed to wait until a later departee flew past their position, then the two left the area. Usually all owls departed within an interval of 20 to 35 minutes.

A striking transformation in the overall demeanor of the birds occurred during this period. Once an owl abandoned the roosting perch, its somnolent daytime behavior was cast aside. It became an alert and almost nervous creature. Its head would swivel from side to side, following each faint sound from below. Upon hearing a rustle in the leaves, it would lean forward, concentrating with impatient intensity. It is clear that the Long-eared Owl has two sharply distinct behavioral modes - one somnolent and one active. It is the active mode, the hunting mode of the predator, which is often hidden in darkness and which is least known. Yet once seen, this mode remains in one's mind the most essential characteristic of the owl.

Habitat analysis

Although a few owls were sometimes observed hunting in the meadow adjacent to the pine grove, most flew purposefully away from the roost. On several nights a tabulation was made of the directions of departure. The direction in which a bird left the pine grove was not necessarily the direction in which it ultimately left the area (several times right-angle turns were observed after an owl had left). Hence, only departures observed from outside the pine grove could be used for determination of departure directions. The predominate direction of departure thus



Pellet of Long-eared Owl with Microtus Remains

determined was south (16 of 21 owls present on one night, 7 of 7 owls present on another). A smaller fraction departed to the east and west; there were no departures to the north. A study of the potential hunting habitat in the vicinity of the roost was conducted using land use and vegetative cover maps developed in 1971 by the Map Massachusetts Map Down Project at the University of Massachusetts. This study revealed that the principal areas of unforested open space within 3 miles of the roost were associated with the Metropolitan State Hospital land to the south of the site. To the east of the site lay a large open wetland in Lexington known as the Great Meadows. No comparable open areas were found within 3 miles to the north of the roost. These results suggest that the owls hunted open areas within 3 miles of the roost.

Conclusion

From a behavioral point of view, the roost of Long-eared Owls turned out to be more complex and interesting than we had envisioned. We learned much, yet some of the more important questions about the roosting behavior of this owl remain unanswered. How were migrating owls attracted to the roost (were they recruited on the hunting fields)? Why did the size of the roost stabilize suddenly after rising so rapidly (was it habitat limited, or did migratory movement suddenly cease)? Did the owls recognize each other as individuals? Did the same owls sit together night after night? Did the same owls hunt the same outlying fields? Did the perch groupings represent family relationships? Pair bonds? Social dominance? What is the significance of the various vocalizations (appeasement, aggression, individual recognition)?

We now know enough about the winter roosting behavior of Long-eared Owls to sustain a 30 minute lecture. After that, we are left only with intriguing speculations. A similar state of challenging ignorance exists with respect to the behavior of most common species. (I would wager, for instance, that practically nothing is known of how chickadees select their winter roost perches.) Studies of bird behavior by non-professional enthusiasts can be both scientifically worthwhile and personally rewarding. That may well be the most important lesson taught to us by that solemn parliament of owls at Dunback Meadow.

Acknowledgements

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