

present fall, however, but one bird was noted, a male seen along the Wakarusa River, in a locality where the species is usually fairly common; and none were seen in the territory recently occupied by them.

Wintering birds of *Nannus h. hiemalis* seem also to have been almost completely wiped out, none being observed, though careful search was made for them in localities where formerly they were common.

*Cardinalis c. cardinalis* alone among the Fringillidae seemed to have suffered loss, the birds being rare until the first of November when their numbers were augmented by migrants from the north. Large numbers of quail were killed also in this locality, but recovered through favorable weather during the early breeding season. In the western part of Kansas conditions were much more severe, and it is reported that Prairie Hens and quail were almost entirely exterminated, and that even the jack rabbits have almost entirely disappeared.

These observations would seem to emphasize the well known fact that within a single species or subspecies of bird we have divisions or groups, resident or migrant, as the case may be, within certain defined limits; and when one of these local groups is through any cause greatly lessened in numbers, it regains its former abundance mainly through the increase of the survivors, though slight gains may come through the encroachment of others of the same species from unaffected neighboring areas where competition between the members is severe enough to cause them to seek new haunts.

## SOME NOTES ON THE NESTING OF THE SHORT-EARED OWL

By ARETAS A. SAUNDERS

WITH ONE PHOTO BY THE AUTHOR

**D**URING the nesting season of 1912 I spent most of my spare time on an area lying about half a mile southeast of the town of Chouteau, Montana.

This area consisted of open grassy meadows crossed by a small creek, cottonwood groves along the edges of the creek, and a large area of brush land, overgrown with shrubby cinquefoil, wild rose bushes, and a few scattered willows, buffalo-berry bushes and other shrubs. This brush area formed the nesting ground for a good many birds. Mallards, Sharp-tailed Grouse, Clay-colored Sparrows and a colony of Brewer Blackbirds nested in or beneath the cinquefoils, and in the thickest part of the brush I found the nest of a pair of Marsh Hawks. During the latter part of May and early in June I frequently saw a Short-eared Owl (*Asio flammeus*) sitting in the top of a dead willow bush that was near the Marsh Hawk's nest. I began to suspect that this bird, too, had a nest in the vicinity, but when I searched near the bush, the bird merely flew to a tall dead cottonwood on the border of the creek and sat watching me, giving no sign to show whether his nest was near or not.

Finally, on the evening of June 10, I extended my search to a new part of the brush area, a good 150 yards from the willow bush and still farther from the cottonwood tree. I soon noticed that the owl had left his perch and was hovering overhead watching me. As I went farther in that direction he circled lower over my head and called anxiously a low, short, hoarse note that sounded to me

like "quap". He repeated this note several times and finally dropped to the ground about a hundred feet away from me, flapping his wings and calling a high squealing note as though badly hurt. Later on I watched this performance every time I approached the nest, and have since seen it in other individuals of this species. It is one of the most peculiar and novel methods of feigning wounded that I have seen in any bird. The bird circles at a height of about fifty feet, then drops straight down close to the intruder, until within two or three feet of the ground, then sails low over the grass and brush in the opposite direction from the nest, until a hundred feet or more away when he lights on the ground facing the intruder, squealing as though in great pain, and with wings widespreading and flapping. If followed he will wait till one gets within about twenty-five feet, then slowly and carefully folds his wings one at a time, rises and sails a little farther away and repeats the wing flapping and squealing. If one is not watching him when he first drops to the ground, he frequently calls attention to himself by flapping his wings against his sides or breast as he drops, producing a sudden, loud and startling noise that is very surprising in a bird whose flight is ordinarily

perfectly silent. This performance compels the attention so strongly that it seems that it must be quite successful in luring away a coyote or other natural enemy that might venture too close to the nest or young.

When I first saw this performance on the evening in question it immediately gave me a clue to the location of the nest; so I went in the opposite direction from that in which the bird tried to lead me, and soon flushed his mate from the nest. As soon as I had found the nest, the first bird, I presume the male, ceased his attempts to lead me away, and he and his mate circled low about my head, clicking their bills and frequently calling "quap" and occasionally prolonging this



Fig. 38. YOUNG SHORT-EARED OWL ABOUT 22 DAYS OLD; PHOTO TAKEN NEAR CHOUTEAU, MONTANA, JUNE 28, 1912

note to a scream, slurred downward, like that of many of the hawks, but of a curious hoarse quality. The nest was flat on the ground, underneath and surrounded by cinquefoil bushes, and contained nine young. There really was no nest but merely a bunch of young birds huddled together, and if there ever had been a nest, the young had tramped it out so thoroughly that it was now unrecognizable as such. The young were in various stages of development, the youngest being downy and blind while the oldest was well feathered, with yellow eyes wide opened, and showing fear of me by clicking his bill and hissing in much the same manner as a cat hisses at a dog. The young were so close together that I had to separate them to count them.

I now noticed a curious difference in the parent birds. The female, at least the one that had been at the nest with the young, when I found it, had a higher pitched, more squeaky and less harsh voice than the male, when she called "quap." She was also a little more heavily streaked on the breast than was her mate. Consequently I had no difficulty in distinguishing the two birds, and I always found the male on guard in the willow bush or the cottonwood tree, and the

female at the nest with the young as long as they remained in the nest. After they left, both birds were generally on guard, and, when I searched for the young, the female also went through the performance of feigning wounded that I have described above.

On the next morning, June the 11th, in order to get a basis for studying the development and relative ages of the young birds, I examined each one carefully, recording points in the development of the plumage and making measurements as well as I could, of the total length, wing, and bill of each bird. I hoped later to supplement this by further observations, and get a fairly complete record of the growth and development; but owing to the habit the young have, of leaving the nest long before they are able to fly, my studies were not nearly so complete as I had wished them to be. I obtained the approximate ages of the young by estimating that of the youngest bird, and obtaining the differences in ages between the others, by watching their development. The youngest bird I judged to be three days old. It may have been as much as four or five, or as little as two, but the chances are more in favor of three as correct than the other figures. I numbered the birds in my note-book from 1 to 9, beginning with the youngest, and I finally constructed the following table showing the comparative ages and measurements of each bird. These measurements cannot be considered to have the scientific exactness of figures taken by measuring bird skins, because it is difficult to measure a living bird exactly in the field.

No.	Age (days),	Length (inches),	Wing (inches),	Bill (inches).
1.	3	3.35	0.70	0.25
2.	5	4.50	1.00	0.30
3.	7	5.50	1.40	0.37
4.	9	6.50	1.75	4.42
5.	10	6.80	1.95	0.50
6.	12	7.25	2.25	0.48
7.	14	7.50	3.10	0.56
8.	14	7.70	3.18	0.54
9.	14	7.75	3.40	0.52

These figures show among other things, that incubation did not begin until the third egg was laid, and that eggs were laid irregularly after that, at periods of from one to two days.

Aside from this table, I obtained but one other measurement to show the growth. This was on July 1, when I found no. 6 at a considerable distance from the nest, when approximately 31 days old. I had nothing to measure the bird with then, but determined that its wing measured about  $8\frac{1}{2}$  inches, by comparing its length with that of my hand, and measuring my hand later. With these measurements I attempted to construct curves to show the growth graphically, but found the data hardly sufficient to make these of much value. However they did show that the period of fastest growth was between the approximate ages of four and eight days.

My observations on the development of the plumage were as follows. On June 11, when the birds were measured, no. 1 was downy all over, with no sign of feathers. The eyes were closed. The down was of a light cream color. No. 2 had sheathed feathers appearing on the shoulders, wings, back of neck and breast, but nowhere else. The feathers were all tightly sheathed, and the eyes were still closed. No. 3 had feathers coming through on the back, legs and facial disc, while the feathers of the shoulders, wings, back of neck and breast were just beginning to break the sheaths at the tips. The eyes were beginning to open a little. No. 4 had feathers coming through everywhere, and the sheaths breaking on all of them except the wing and tail quills, and the feathers of the facial disc. The eyes were farther opened, but only appeared dull blue through the

slits, and the bird did not appear to see anything. No. 5 was a little more thickly feathered, with eyes wide open. This bird showed fear of me and clicked his bill when I handled him. No. 6 was still farther developed, with the wing quills just beginning to unsheath at the tips. Nos. 7 and 8 were little different from No. 6 save that there was less natal down adhering to the plumage. No. 9 was farther developed. The feathers of the back were unsheathed for half their length, but the wing-quills still only at the tips. The feathers of the facial disc were still tightly sheathed. The bill was rather light colored in the younger birds with a white spot on the front of the upper mandible, just above the tip. As they grew older the bill became darker, and the white spot disappeared, being entirely lacking in the three older birds.

I banded all of these young birds, except no. 1, with bands of the American Bird Banding Association. No. 1 died when about eight days old, when still too young to band. I kept a record of the numbers of these bands, and was consequently able to tell which bird was which, whenever I found them after they had left the nest. On June 28, I found owl no. 2, then approximately 22 days old. This bird had all the feathers well out except the wing quills, and those of the facial disc. The wing quills were unsheathed for about half their length, while those of the facial disc were just beginning to unsheath. On July 1, owl no. 6, then about 31 days old, had the facial disc well unsheathed and dull black in color, while the wing quills were unsheathed for about two-thirds of their length. This bird was still unable to fly.

I kept as careful notes as possible on the character of the food brought these young birds. When I visited the nest in the mornings I usually found food near the nest, but in the evenings it was usually all, or nearly all, gone. On the morning of June 11 there were four mice near the edge of the nest, three of them small rodents of the vole type, dark brown in color, with short tails, and the fourth a mouse of a light yellowish brown color, with white underparts and a long tail. Other mornings I found mice of these two kinds, and once I found the feathers, and part of one wing, of a McCown Longspur. On June 19, the day the last owl left the nest, I found him a few feet away, with several mice, and the hind-quarters of a young cottontail rabbit near him. It was evident that the parents did most, or all, of their hunting at night, gathering a large enough supply to last until the next evening.

There were many ejected pellets near the nest, and in other places in the grass where the young owls remained after they had left the nest. These pellets always contained the fur and bones of small rodents, and I recognized nothing else in them. I believe that the young generally had one whole mouse at a meal, and swallowed it whole. On the evening of June 11 I found owl no. 5 ejecting a pellet. The bird lay on his side, with eyes closed, barely moving all the time that I was near the nest. The pellet was partly out of his throat. It was a full inch in diameter, and the part already ejected was about two inches long. I was not sure at the time that it was entirely natural for the bird to eject a pellet in this manner, and feared the bird might die, but a few days later I visited the nest again, and found this bird well and as lively as the rest.

On the evening of June 11, the same day that I had measured the birds, I found the three oldest birds gone. I supposed for a time that some one had found the nest and taken them for pets, but later found that this was merely a part of the regular program in the life of young Short-eared Owls. On the 14th I again found the oldest remaining bird gone; and on the 16th I found this one in the brush about 20 feet from the nest, and still another one three or four feet

from the nest, also starting to stray away. It was quite apparent that each young owl, when it reached the approximate age of two weeks, strayed off by itself into the brush surrounding the nest, long before it was able to fly. Each bird seems to be in a place by himself, and wanders farther and farther away from the nest each day. I tried the experiment of putting one or two of the young birds that I found back in the nest again, but each time they soon left and could not be found without considerable search the next morning. At first the young were fairly close to the nest, but later were at a considerable distance. On June 28 I found no. 2 about 100 yards away, and on July 1, I found no. 6 at a full 150 yards. The parents evidently cared for all the young, no matter where they wandered, as I often found food or ejected pellets near them; and the parents were usually ready to show me the location of a young bird, by feigning wounded when I approached.

I attempted many times to get photographs of the young birds but did not succeed very well. The young when approached had a habit of flattening themselves down into the grass in a way that I could not make show up well in a picture. I could not make them perch on the bushes at all, and the best pictures I got were taken of owl no. 2 perching on my hand.

On July 1, I found owl no. 6. He was the farthest developed of any of the brood that I had examined. He was quite pugnacious, snapping at my fingers when I attempted to pick him up, and clicking his bill. When I extended my foot toward him, he perched on the toe of my shoe and picked savagely at my shoe lace. I lifted him up into the air in this way, when he spread his wings to keep his balance and tried to climb up to my knee. Once or twice he screamed, a long, hoarse, terrifying scream, a note I had not heard before from either young or parents.

I heard this scream once again on July 22, at a point fully three hundred yards from the nest site. I supposed that it was one of the young owls again, but I searched the grass in vain for him. One of the parents was near, sitting on a fence post, but not feigning wounded as before, and hence not helping me to find the young bird. This point was across an irrigating ditch from the nesting site, so it is quite probable that the young bird could fly a little by that time.

## SYNOPSIS OF THE RECENT CAMPAIGN FOR THE CONSERVATION OF WILD LIFE IN CALIFORNIA

By W. P. TAYLOR

ONE of the most hopeful signs of our generation is the fact that we as a people are growing in a knowledge of our deficiencies.

This is particularly true in the broad domain covered by the phrase "conservation of natural resources," and even more strikingly apparent in that subdivision of the larger subject with which those interested in our native birds and mammals are most intimately concerned.

Sensible of the fact that the Cooper Ornithological Club is in a position peculiarly favorable to its taking an active part in work for conservation, the