

SANDPIPERS WINTERING AT PLYMOUTH, MASSACHUSETTS.

BY J. A. FARLEY.

THE wintering of the hardy Sanderling and the Red-backed Sandpiper was an interesting event in 1917 on Plymouth Beach. We fail to find in a hasty search through the literature other records of the wintering of these two species north of Cape Cod. The winter of 1916-17 was an average one. It was not an open winter; nor was it very severe like the following very bitter season of 1917-18. The weather conditions from week to week through this winter were noted with some care because of their intimate relation to the daily lives of the sandpipers during the same period.

Through the fall of 1916 Sanderlings were on Plymouth Beach as usual and my last note (November 26) reads: "Saw a half-dozen Sanderlings — one poor little fellow was bobbing along less speedily on one leg — only the upper half (i. e., above the heel) of the other leg was left. It was hanging down. Saw one or two Sanderlings that sat down by a bunch of drift as if to rest. There were some Snow Buntings on the beach with the Sanderlings. The day was sunny but quite cold and blowy."

I was not on Plymouth Beach again until January 14, 1917. On the morning of the 12th the temperature ranged from just below zero to 2° above. By evening of the 12th it was 12° above. On the 13th there was a rising temperature and by night it was above freezing and there was rain. It was warmer on the morning of the 14th. "The southeast rain last night and this forenoon has taken off most of the snow. The wind blew heavily, — especially at noon when it rained very hard. In the afternoon there was clearing weather."

I was on the beach between 1 and 2 P. M. and found, as I expected, some Sanderlings. There were at least three. They were at their favorite spot where the water shoals a good deal on the outside and sandspits make out which are exposed when the tide recedes. Other accompaniments to the mid-January scene were a lot of quite tame Black Ducks in the Inner Harbor ready to

feed when the flats had become sufficiently exposed; and Gulls dropping mussels. Snow Buntings were on the beach and in the beach grass.

The week of January 14 was a week of winter weather — cool or cold but no storm. A little snow fell on the night of the 20th so that I found it lying thinly on the sand of the beach on the following morning. “The tide was falling, leaving the shore with a thin veneer of ice. There was ice over everything in fact—from high-water mark down to the gently receding water. And back of the ice lay the fine snow on the sand of the upper beach. Everywhere there were floating bits of ice in the water on the bay side (outer side) of the beach, and farther out there were floes — big and little — going fast out to sea on the swift current running from the Inner Harbor. Seals lay on this floating ice — ‘as cool as you please.’ It was altogether a wintry scene. Yet it was not a cold morning. In the same place as on the 14th where the beach broadens very much at low water saw the usual three Sanderlings, and with them a Red-backed Sandpiper. They seemed to mind not at all the snow on the sand. They were not shy, and to avoid me they would run (up to the last moment) rather than fly. They were thus more fearless than during the fall flight. The Red-backed Sandpiper was quite tame — or fearless. I could get within a few feet of him. At times he waded belly-deep in the ice-cold water, and was busily engaged in picking in the shallow water. I could not see what he was eating, although he may have been probing. The tide finally fell so that there was fresh green eel grass on the beach, but earlier in the forenoon the icy sand seemed to have no food.

“Other forms of life typical of the beach on this January morning were the thousands of ducks in the Inner Harbor where there were practically no flats as yet exposed. Many of the fowl were Black Ducks floating in the water (which grew shallower every minute) over the flats which would finally be exposed. There were many Whistlers — outside among the ice floes and inside the beach and flying around the Spindle in and out of the Inner Harbor. Throughout the forenoon the air was full of their melodious whistling. Noted many handsome, showy, black and white old drakes. There were many, also, of the seal-brown-headed females. There

were also Red-breasted Mergansers. Snow Buntings were on and off the beach with the Horned Larks. There was a flock of Redpolls in the beach grass. Herring and Kittiwake Gulls were dropping mussels and Black-backed Gulls uttered their raucous notes."

On January 28 I was on the beach from 11 A. M. to 3.30 P. M. It was cloudy but not cold. Some fine snow fell. There were perhaps two inches in the beach grass and over the sand and pebbles of the upper beach. But from high-water mark down to the tide which had turned, the snow (or better, slush) was deeper — the result of the last high tide. It lay in patches everywhere, while in the water there were small pieces of floating ice. There were relatively few bare or semi-bare spots on the beach that seemed fit for shore birds. "As usual, I saw the three Sanderlings and the Red-backed Sandpiper. It was good winter weather last week. The 23d was fair and colder than the 22d and the rest of the week was wintry, though not excessively cold. As I got along the beach to the sandspits where it broadens, there were the three Sanderlings. They were on a piece of bare sand where a little inlet following the falling tide ran into the sea. In this icy water they waded belly-deep. After a few minutes they flew down the beach but soon lit. Presently the Red-backed Sandpiper, uttering his note, flew close by me and with a free flight continued down the beach and lit with the Sanderlings. (The Sanderlings show a tendency to keep together, while the Red-back feeds in their neighborhood or not, as it happens.) The three Sanderlings soon flew again still farther down the beach, leaving the Red-back alone. Later he, too, flew in the same direction. But after two or three minutes he came back, flying freely and fairly high above the beach, and with a great circle lit close beside me, (within three or four yards) seeming curious of me. He was very nervous and full of little fitful starts. After two minutes he flew, and making a great sweeping curve high in air dashed off over the breakwater and across the neck, apparently down into the grassy flats on the Inner Harbor side." (It may be said here that beach birds in Plymouth Harbor have a wide range of choice as to feeding *loci* for, as already remarked, a good deal of the outer beach is exposed between tides, particularly where the water shoals, while on the Inner Harbor side there is more or less grassy shore and out in the water are the very extensive

clam flats which remain bare longer than the outside beach. But in very severe weather the Inner Harbor freezes over and the flats are covered as long as the extreme cold lasts.)

"I went to the place on the beach where I saw the Sanderlings and the Red-backed Sandpiper together and found their little foot-prints in the slush. The whole beach up to high-water mark was nearly all snow and slush. As I returned up the beach two hours later from the Spindle, the aspect of things had become decidedly wintry. The incoming tide dashed with a subdued crash against the shore the thousands of pieces of floating ice. There was now nothing but snow up from the advancing water's edge. The bare sand had been covered by the rising water. But away up on the beach where the exposed sand and pebbles had withstood longest the encroaching tide, I naturally looked for the beach birds. Horned Larks were plentiful here and I soon found the Sand rlings. The three flew from the beach ridge — from the line of snow-covered pebbles above high-water mark. Found their tracks here — also those of Horned Larks. Apparently the birds had been at the exposed dry brown seaweed, for the tracks of both species had almost trodden down the snow. I noticed also that empty fresh mussel shells recently dropped by the gulls had been visited by both Sanderlings and Horned Larks. A very little of the "meat" remained in the shells — which may have made it worth the little birds' while."

The week of January 28 was very cold at its end. The thermometer stood at 46° at noon on the 30th and 31st. A little snow fell during the night of the 31st, but melted the next day (February 1) when an easterly fog came in from Cape Cod Bay. Late on February 1 the temperature was 32°. Friday, the 2d, was colder, and in the evening very cold. On the morning of the 3d it was 4° below zero down town in Plymouth, while at the Head of the Beach (our station) it was 2° above. It was the coldest weather of the winter to date. February 4 was the coldest Sunday of the winter so far, and practically all of the Inner Harbor was frozen over, making it hard for the Black Ducks to get food.

"I went down the beach this Sunday morning under favorable conditions, for it was low water and much of the flats on the outside were exposed, making a mixture of a good deal of bare sand

and plenty of slush-snow, together with ice in patches mixed in with water in pools and little estuaries. Where the flats made the beach the broadest, there were many Gulls and also two Sanderlings and farther on the third Sanderling, and still farther on the Red-backed Sandpiper."

On February 5 it snowed hard in the morning and the storm lasted practically all day. In the morning a Black Duck flew in through the driving snow and went up on the hill where later it was started out from under a pine where apparently it had taken shelter from the storm. Early on the 6th it was 16° above zero. The weather cleared beautifully and the day was sunny, with scarcely a cloud. On the morning of the 7th the weather was very raw changing to rain. "February 11. Sharpest weather of winter. Glass showed zero in the morning, and 4° above at 8 A. M., and 10° above at 3.30 P. M. It was 4° below zero at Sampson's store and 10° below early at Bradford's Corner. A bitter wind on the beach, although a sunny day. Ducks were in all day (up on the grassy shore) at the cove where Eel River enters the Inner Harbor. In the sunny lee of a shooting stand I found an Ipswich Sparrow, a Horned Lark and a Song Sparrow. The beach flock of Redpolls were in the beach grass and a few Snow Buntings on the outer beach. There was no sign of Sanderlings or Red-back; but this does not prove anything, for I did not go down the beach as far as the flats—besides the tide was coming in and the beach proper was absolutely all snow and ice."

February 12, 13 and 14 were very rough days. The weather was cold. It was 6° below in Plymouth on the morning of the 13th and 10° below in North Carver near by. The last three days of the week were milder. February 18 was beautiful, sunny and mild. "Went to the beach which was broad at low water. On a little spit at the usual place were two Sanderlings and the Red-Back. The three were together and were very fearless and we got close to them. They seemed plump enough after the rough weather of last week. The Red-back picked into a fresh lump of green eel grass. The Sanderlings ran nimbly about, heel-deep in the gentle water, and steadily picked into it, evidently getting food. The beach is practically clear of snow and ice again, but the whole expanse of the Inner Harbor except close down to the Spindle is frozen tight as a drum."

The week of February 18 was much milder than the week of February 11. There was a hard rain on the night of the 23d. Went to the beach on the 25th. The Inner Harbor was still frozen over for the most part, though there was a good deal of open water toward the mouth. "The tide was coming in and the outer beach was getting well covered. Up on the dry, pebbly crown of the beach, found two Sanderlings. I got quite close to them. They stood motionless in the sunlight, and their whole aspect seemed almost to indicate that, having been deprived for a time of their feeding ground by the tide, they were calmly (and quite at their ease) waiting for the water to fall again and give them another chance to go to feeding. By way of contrast: the cold wave and consequent tight condition of things has seemed to affect these little Sandpipers less than the Black Ducks which, having lost their feeding grounds by the freezing of the Inner Harbor, have become very lean and weak and are being fed by people. Two hours later on my way back up the beach I passed these two Sanderlings at the same spot on the beach ridge — still motionless and tame. I went very close to them and they watched me sharply but did not fly."

I did not see the Red-backed Sandpiper on February 25 and never saw him again.

The week of February 25 was rather mild, but on Sunday, March 4, it began snowing in the morning and continued steadily all day and heavily by dark (the wind now being northeast,) and lasted through the night and practically all of the 5th, with a strong gale which made a big surf and drifts that stopped the street cars. But the temperature was not low. Under the hill where Eel River flows into the Inner Harbor the Black Ducks were massed — literally packed — on the snowy surface of the field. This storm caused unusual, snowy conditions in Plymouth and on the Upper Cape. Higher drifts are rarely seen in Barnstable and Sandwich. It did not, however, "clear off cold." On March 10, Mr. T. W. Graves was on the beach in the afternoon at low water. He saw three beach birds — one Sanderling and two duller individuals (Red-backs?).

On March 11, I was on the beach at high tide. It was completely, iced up and there were the beginnings of an ice wall. Saw no beach birds. The snowy conditions following the storm of March 4 and

5 soon passed and the rest of the month was rather even weather, with not a low temperature. On March 25 I found that Piping Plovers had arrived on the beach, but I saw neither Sanderlings nor Red-backs.

April 1 was warm, sunny and springlike. "Many Geese are going over the beach and I find that the numbers of Piping Plovers have increased since March 25. Saw two Sanderlings which may or may not have been the birds of last winter."

52 Cedar St., Malden, Mass.

SEQUESTRATION NOTES.

BY JOSEPH GRINNELL.¹

THERE is every reason to believe that the voices of birds have been subject to a process of evolution which has led from the simplest beginnings to a condition which is rather complicated in the higher present-day species. The first sounds uttered by primitive birds were doubtless entirely of an incidental nature, due to expulsion of air under stress of pain or fear, or simply of physical impact. According to one theory (Witchell, 'The Evolution of Bird-Song,' London, 1896) the first specialization accompanied combat and involved a meaning of defiance or intimidation; from this it was an easy step to notes conveying the idea of alarm to other individuals of the same species.

Whatever the course in the early development of bird voices, it is obvious to any field student that in the higher existing birds an often very elaborate system of cries or calls obtains, with an associated wide range of meaning; as witness the Titmouses and Ruby-crowned Kinglets. Some of the meanings, in certain species, have been demonstrated beyond all question of doubt. The less obvious meanings will have to be worked out by slow process, and exceeding care be taken to avoid mere guess-work.

¹ Contribution from the Museum of Vertebrate Zoölogy of the University of California.