SOUTHWARD MIGRATION OF ADULT SHOREBIRDS ON THE WEST COAST OF JAMES BAY, ONTARIO

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WHILE the writers were making the 100-mile trip by canoe from Fort Albany to Moosonee between July 15 and 25, 1942, opportunity was afforded to witness the southward migration of adult shorebirds of many species. Observations were made at three principal stations—at the mouth of the Albany River on July 15; at the mouth of the Nettichi River, which is about 20 miles south of the Albany from the 16th to the 20th; and fifty miles south of the Nettichi River where we camped at Big Piskwanish from July 20 to 25. The trip was completed to Moosonee on the afternoon of the 25th.

The first marked flight was observed on July 17. From then on to the conclusion of the trip, shorebird movement was conspicuous. The period covered by our observations was too brief to reveal the duration of the flight of any one species. Most were recorded daily throughout the period, but specific ratios varied from day to day. One day would be characterized by tremendous flocks of Knots, but their numbers would be diminished the next day and Pectoral Sandpipers, or Hudsonian Curlews, or Semipalmated Sandpipers would predominate.

While most of these flights moved in a southerly direction, some curious reverses were noted. One instance occurred on the morning of July 22, which was cloudy with slight fog. A tremendous northward movement of shorebirds was taking place, consisting of Hudsonian Curlews and Knots, with good numbers of Greater Yellow-legs, Pectoral Sandpipers, Semipalmated Sandpipers and Sanderlings and an occasional flock of Turnstones. The line of flight was, as usual, at the edge of the tide and as the tide receded so did the line of flight. This northward movement continued unabated till midday, when the flight suddenly reversed. The sudden change of direction appeared to coincide with the change of the tide which commenced to come in again about noon.

Another flight was observed on the evening of July 24 at dusk, when the tide was high. We witnessed an enormous flock of shorebirds, stretched out for a distance of a mile or more as a dense, long cloud moving in a northerly direction. Though they were too far out to be identified, through binoculars, we could see that small, medium-sized, and large shorebirds were in the flock.

An interesting feature of the shorebird migration during the period of our observations was that all specimens obtained and all that we

satisfactorily observed were adult birds. No young of the year were noted whatever. All of the specimens collected were very fat and in good physical condition though plumage replacement was rarely complete.

The annotated list, which follows, comprises a total of fifteen species.

BLACK-BELLIED PLOVER, *Squatarola squatarola.*—No marked flight of this species was noted, but a few were seen and heard from each camp.

RUDDY TURNSTONE, *Arenaria interpres morinella.*—These were first seen on July 22 from our camp at Big Piskwanish. Singles and small flocks were moving southward that day among the vastly larger flocks of other species. From that date on, a few migrating Turnstones were noted but no heavy flight took place.

HUDSONIAN CURLEW, *Numenius phaeopus hudsonicus.*—On the afternoon and evening of July 17, we observed from our camp at Nettichi River the first major southward movement of shorebirds. Many Hudsonian Curlews took part in this flight. From that date to the conclusion of our observations, the migration of curlews continued unabated. Migrating flocks rarely numbered over fifty individuals, but on several occasions flock followed flock in endless succession for a period of three to four hours. These flights generally took place in late afternoon and evening but pronounced movements also occurred in mid-morning. When feeding, they frequented the grass marsh and the tidal flats. These stops for rest and feeding took place from noon to late afternoon and again in the evening toward sun-down.

Fifteen specimens were taken from these flocks from July 21 to 24, inclusive. All were adults in very worn breeding plumage and all specimens of both sexes showed bare brooding patches. The postnuptial molt had just commenced in these birds and a few new feathers can be found on their heads, necks, and backs. Although these specimens were taken entirely at random, there was a heavy preponderance of males over females; the latter were represented by only two of the fifteen specimens. All of the birds taken had the feet and legs grayish-blue (Dark Glaucous-Gray of Ridgway's 'Color Key'). This is of interest since Sutton in 'The Birds of Southampton Island' (Mem. Carnegie Mus., 12, part 2: 121, 1932) records an adult with green legs and feet.

GREATER YELLOW-LEGS, *Totanus melanoleucus.*—This species was first noted on July 15 on Albany Island at the mouth of the Albany River where about thirty were feeding with a number of Lesser Yellow-legs scattered over the brackish pools. From there to the Moose River we encountered them in large numbers.

This species preferred to feed in the brackish pools beyond high-tide line and was seldom seen on the exposed muddy tide flats. Seven specimens, four males and three females, were taken from July 16 to 22. In plumage they were more advanced in the post-nuptial molt than Hudsonian Curlews taken on the same date.

LESSER YELLOW-LEGS, *Totanus flavipes.*—This was not so abundant during the period of our observations as the Greater Yellow-legs but was seen daily from July 15 to the conclusion of the trip. Two specimens, a male and female, were collected.

AMERICAN KNOT, *Calidris canutus rufus.*—The first Knots were observed at Big Piskwanish on July 20 when large flocks were seen on the tide flats. From then until our trip was concluded, huge flocks of Knots were a feature of the migration. Some of these flocks contained from two hundred to five hundred birds. Knots were frequently seen in company with other shorebirds and appeared to be partial to joining flocks of Hudsonian Curlews. Six males and five females were taken. They are still largely in nuptial plumage but exhibit varying degrees of molt. The replacement is largely on the crown, back, and scapulars. Two females show the greatest advancement in this respect.

PECTORAL SANDPIPER, *Erolia melanotos.*—This species was first observed on July 17, when small flocks joined the southward flight. They became progressively more conspicuous during the period of our observations. On July 23 and 24, many flocks numbering several hundreds were seen. Pectoral Sandpipers migrated in association with the Hudsonian Godwits. Sometimes a pure flock of each species would be seen in close association, flying in convoy style, and on other occasions mixed flocks were noted. They also flew with Hudsonian Curlews and among huge flocks of Semipalmated Sandpipers.

Six specimens were collected. Most of these birds were still in the nuptial plumage and two of the males still had the skin of the throat and breast loose, flabby, and fat as in the breeding season; some specimens, however, show considerable replacement in the back and chest feathers.

WHITE-RUMPED SANDPIPER, *Erolia fuscicollis.*

BAIRD'S SANDPIPER, *Erolia bairdii.*—White-rumped and Baird's Sandpipers were noted only on rare occasions and then usually one or two in company with larger groups of Semipalmated Sandpipers or Sanderlings.

LEAST SANDPIPER, *Erolia minutilla.*—No pronounced flight of Least Sandpipers was seen. An occasional small flock was noted on the wing

but the species was more frequently encountered on the brackish pools above the tide line where pairs and individuals were quietly feeding. They still behaved rather like breeding birds and it was believed that a full-scale migration had not yet begun.

RED-BACKED SANDPIPER, *Erolia alpina sakhalina*.—This species was noted in small numbers nearly every day, moving in a more or less desultory fashion, and it was evident that a big movement had not yet got under way.

SEMIPALMATED SANDPIPER, *Ereunetes pusillus*.—This species was migrating in great numbers throughout the entire period of our observations. It was the most abundant species taking part in the migration and some of the larger flocks were estimated to contain up to four or five thousand birds. Flocks often contained small numbers of other shorebirds. A common associate of this species was the Sanderling.

HUDSONIAN GODWIT, *Limosa haemastica*.—Two of these were seen on July 20 at Big Piskwanish. On the 23rd, a number of flocks totalling at least 1000 birds passed our camp during a period of about an hour and a half in mid-day. The day was calm with low-hanging fog. On the 24th, about 200 migrating Godwits were seen. The day was very cold with a fine misty rain falling and little wind. On the 25th, one was seen at Big Piskwanish in the morning and in the afternoon one was observed flying south about twenty miles south of Big Piskwanish and approximately four miles offshore.

The Godwits travelled in flocks of from 5 to 125, with most of the flocks numbering between 60 and 70. They flew in broad flat V's and crescent-shaped lines with very little wavering or changing of formation. Their flight was remarkably swift and direct. The wing beats were rather shallow but powerful, and the sound of the rush of wings was plainly audible as a flock passed over at their usual altitude of about 200 feet. The flight call was a modulated trill which we found virtually impossible to distinguish from the flight notes of the Hudsonian Curlew. They were perhaps less noisy than flying curlews. The specimens obtained, six males and four females, showed a range from badly worn breeding plumage to almost complete winter plumage.

It was something of a surprise to encounter this species in such large numbers since it has been considered to be on the verge of extinction. The fall migration route of the Hudsonian Godwit is rather imperfectly known. Preble (Biol. Invest. Hudson Bay Region, N. A. Fauna, no. 22, 1902) found them migrating north of York Factory

on Hudson Bay. They are later found on some of the islands in the Gulf of St. Lawrence, but the route followed from the west coast of Hudson Bay to the Gulf was a matter of conjecture. The discovery of migrating flocks far down the west coast of James Bay coupled with records from Rupert House indicate that the main flight follows down the west coast of Hudson and James bays to the southern extremity and then presumably moves overland in an east-southeasterly direction across the narrow part of the Ungava Peninsula to the Gulf of St. Lawrence.

All specimens obtained had dusky-brown feet and legs, with the soles of the feet paler and greenish-gray. The bills of those specimens most advanced in the post-nuptial molt were pale rosy-pink, dusky on the ridge and virtually black at the tip. Two males, however, which were still largely in nuptial plumage but with the molt commenced, had still a trace of the orange coloration on the bill characteristic of spring. The irides were dark brown. In was interesting to observe how quickly the bright coloring of the bill in this species faded. In little more than half an hour the rosy blush had faded to a livid white.

SANDERLING, *Crocethia alba*.—The Sanderling was noted throughout the trip as an abundant migrant. At Big Piskwanish they passed our camp in flocks containing several hundred individuals. They frequented the tide flats exclusively and none was seen in the salt marsh. This species associated most frequently with the dense flocks of Semipalmated Sandpipers.

Five males and one female obtained between July 20 and 24 are all in worn breeding plumage with traces of the post-nuptial molt, most pronouncedly evident on the back.

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A COLOR ABNORMALITY IN THE SLATE-COLORED JUNCO

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MOST of our knowledge concerning developmental physiology has been derived from the observation of abnormal specimens. In most cases, the abnormalities have been experimentally induced, for only in such instances is it possible to draw any conclusions as to the causal factors for the deviation. On the other hand, the description of nat-