THE STATUS OF THE DOWITCHERS WITH A DESCRIPTION OF A NEW SUBSPECIES FROM ALBERTA AND MANITOBA.

BY WILLIAM ROWAN.

Plates II and III.

Introduction.

THE status of the dowitchers occurring across the length and breadth of the North American continent has been a matter of dispute practically since the time that the long-billed bird, *Limnodromus scolopaceus,* was first described by Say in 1823 under the name of *Limosa scolopacea.* Various authors have endeavored from time to time to settle the matter by special investigation. In spite of these attempts, current literature is still full of doubts as to whether there is only one very variable dowitcher, whether there are two subspecies or whether there are actually two full species.

It is the purpose of this paper to re-examine the entire question in light of the recent discovery of two fresh breeding grounds, from both of which skins are available, in Alberta and Manitoba: to describe and name a new subspecies (*hendersoni*): and to substantiate the validity of both the previously recognized forms, *griseus* and *scolopaceus.*

The importance of breeding skins to an investigation of this sort requires no emphasis. Three breeding areas are now certainly known. The first to be discovered, within the Arctic Circle, from the Anderson River westward, has been recognized since MacFarlane (MacFarlane, 1908; Poynting, 1895–6) first collected birds and eggs in 1864. Since then various collectors have obtained eggs, downy young and adult skins from this general region. Without exception, as far as I am aware, these have all been identified as *scolopaceus* by the collectors themselves and by others who have examined them. Some of these skins are included in the present investigation.

The second breeding area was finally established in 1925 when, on

June 2, Mr. A. D. Henderson collected a set of three eggs and kindly got me two adult birds from near Fort Assiniboine, Alberta.

The previous June, Henderson had encountered two dowitchers with downy young on the same grounds. I had simultaneously collected a male some fifty miles further south and east, microscopic sections of whose testes proved him to be in full breeding condition. Time limits precluded a further hunt and neither eggs nor more birds were discovered. On July 4, the same year (1924), Mrs. W. Cassells and Mr. Charles Snell, at Sylvan Lake, Alta., had a dowitcher under observation that behaved exactly like a Killdeer with young. They were, however, unsuccessful in finding chicks. Prior to this, eggs had been taken by Walter Raine in "the muskegs in northern Alberta" on June 3, 1906 and the bird identified by him as *griseus* (Macoun, 1909). This record seems to have been accepted by very few ornithologists, but in light of present knowledge it must be considered authentic. Since Henderson's discovery in 1925, more eggs have been taken. Harlow and I found a set each on Henderson's grounds in 1926 (Rowan, 1927) while that indefatigable collector, T. E. Randall, has taken several sets in the Rochester, Alta., district, including a set of five eggs (Randall, 1930). Since 1924 we have collected some thirty birds from the heart of this breeding territory. For dowitchers they present remarkable uniformity, but are neither *griseus* nor *scolopaceus*. They form the basis of the new race (*hendersoni*) described below.

The third breeding ground was discovered by P. A. Taverner at Churchill, on the west shores of Hudson Bay in Manitoba, in June, 1930. Field evidence of breeding is substantiated by a young bird still partially in down. This, and the series of seven adults collected at the same time, have been generously loaned me by Mr. Taverner for the purpose of the present undertaking. This invaluable material representing, as it does, the first known breeding specimens ever procured from the eastern half of the continent, has provided something of a surprise, for the skins are identical with the Alberta ones.

In addition to my indebtedness to Messrs. Henderson and Taverner in the matter of breeding skins, I should like to express my thanks to the U. S. Biological Survey, Messrs. P. A. Taverner,

A. C. Bent, H. B. Conover, J. H. Fleming, Dr. L. B. Bishop, and Major Allan Brooks for the loan of skins from their collections specially picked for one reason or another for examination in Edmonton and comparison with my own series. Many of these skins are in my possession at the moment and, together with my own, figure in the accompanying tables.

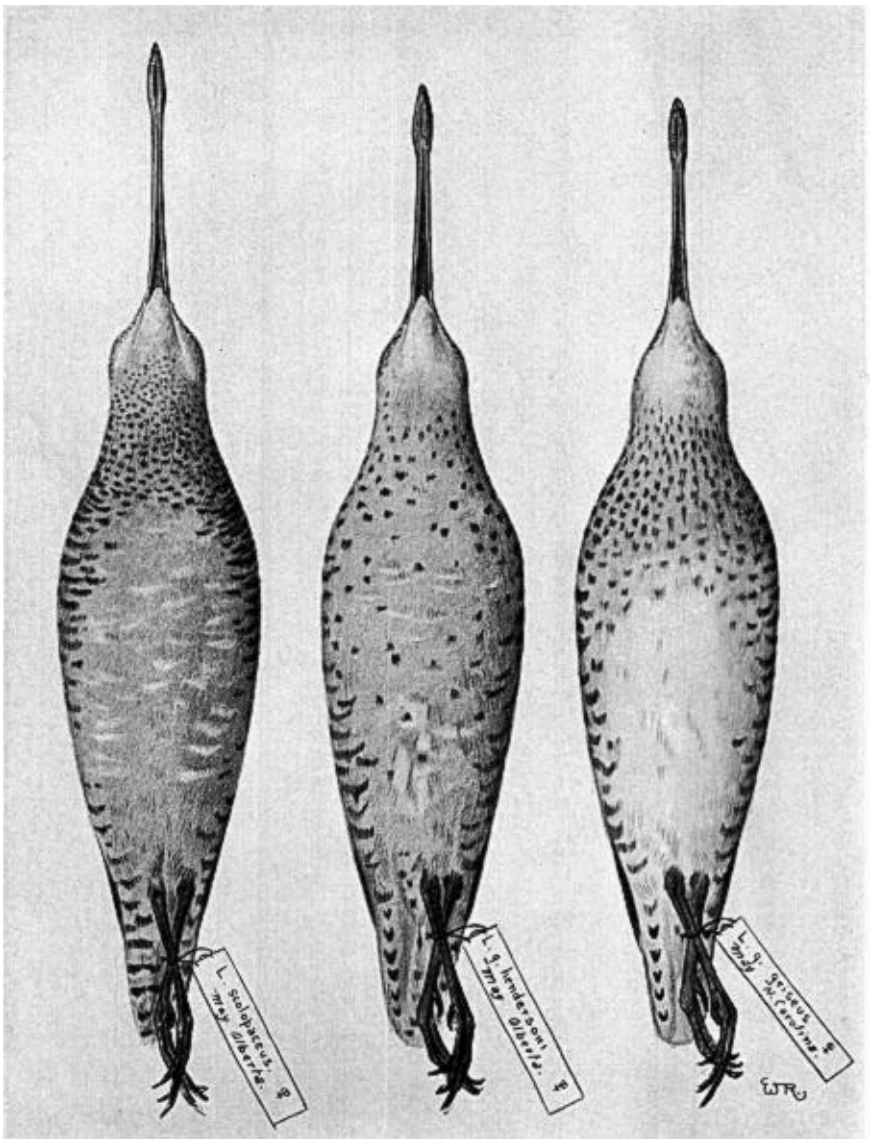
Thanks to the courtesy of Dr. Frank M. Chapman and Messrs. Outram Bangs and P. A. Taverner, I was further able to examine the collections in the American Museum, New York, and the Museum of Comparative Zoölogy, Cambridge and the National Museum, Ottawa respectively, in May, 1928. Mr. J. H. Fleming also kindly invited me to examine the dowitchers in his private collection at Toronto. These proved of particular interest.

Historical.

Before describing the series of dowitcher skins to be discussed below, a brief review of the pertinent literature seems *a propos.*

Ridgway (1880) made the first comprehensive attempt to determine the correct status of the two forms. His material consisted of a series of 75 specimens in the National Museum, mostly from western localities, and skins from the Atlantic coast borrowed from G. N. and N. T. Lawrence. In his summary he makes this comment —"(3) That size and proportionate length of bill, legs, etc. is much more variable in both forms than is the coloration, *scolopaceus* averaging decidedly larger, however, than *griseus*." His conclusion was that the two races were quite certainly separable but adds "I cannot regard the two forms as specifically distinct, since intermediate specimens do undoubtedly occur, although they are exceedingly rare." He makes no comment on sexual differences and disregards them entirely in his tabulations. No supposed intergrades are described.

Nelson (1887) has the following to say (p. 101)—"Having occasion in the preparation of this article to compare my Alaska series with the specimens from various parts of the country in the National Museum collection, I find there is not the slightest difficulty in distinguishing the two birds except in very rare instances." He then proceeds to describe the differences. One item is particularly worth quoting—"The dorsal colors of breeding *griseus* average



FEMALE DOWITCHERS, ALL IN NEW FULL PLUMAGE; VENTRAL ASPECT. LEFT, *L. scolopaceus:* CENTRE, *L. g. hendersoni,* SUBSP. NOV.: RIGHT, *L. g. griseus.* 45/100 ACTUAL SIZE. DRAWN BY WM. ROWAN.

darker than in *scolopaceus*, and the light edgings of the feathers are less distinctly marked." He concludes his account thus—"The deep color of lower surface and restricted amount of maculations form the main characters of this bird (*scolopaceus*) as distinguished from *griseus* and not the comparative length of the beak, which was formerly erroneously supposed to be the main difference, but which in fact is only of very slight if of any value in separating the birds." He totally disregards *sexual* differences in bill-length and describes no intermediates.

These two accounts both agree on one salient point—it is perfectly easy, by color alone, to recognize and separate two races. Both verdicts are quite decisive, yet doubt continued to exist and some years later Howe (1901) undertook a fresh inquiry.

His conclusion is in full agreement with the above, but he had discovered the sexual differences and was so profoundly impressed with them that he states—"I have examined over 250 specimens of the genus *Macrorhamphus* with the result that I find that *adults* of the two species, in summer or winter plumage, are to be determined almost invariably by the criterion of *bill* measurement *alone*, and if in breeding plumage to be even more easily separated." Neither Ridgway nor Nelson appears to have detected the very important fact of sexual difference and to this must be attributed their skepticism about the diagnostic value of bill measurements.

Even among recent authors sexual differences are not always recognized but without such recognition no diagnosis of any value can be arrived at. Separation of the sexes is fundamental. Thus Forbush (1925) states ". . . the Long-billed Dowitcher seems to be identical with it [*griseus*] except in size." "Identical except in size" is a perfectly correct description of males *versus* females of any of the forms of dowitcher but is absolutely wrong in reference to race *versus* race.

Field Aspects.

Few observers have been privileged to see two races of dowitcher side by side in life. The fact that in these circumstances they are readily distinguishable was first pointed out by N. T. Lawrence (1880) with special reference to *griseus* and *scolopaceus* on the eastern seaboard. In Alberta various ornithologists, visiting and resident, have seen *scolopaceus* and *hendersoni* together. The

differences between them are so striking that at least on two occasions it has been necessary to collect *hendersoni* to demonstrate that it was actually a dowitcher. The long-billed bird is dark on the back (though as pointed out by various authors, not as dark as *griseus*): the inland, in contrast, is nearly as pale as a spring knot.

It would seem reasonable to expect the verdict of competent field observers to prove acceptable to students of cabinet specimens in which the arrangement of the feathers can never be as perfect as in the living bird, yet this unfortunately is seldom the case. A quite startling appearance in the flesh may be obscured or even completely lost in the made-up skin.

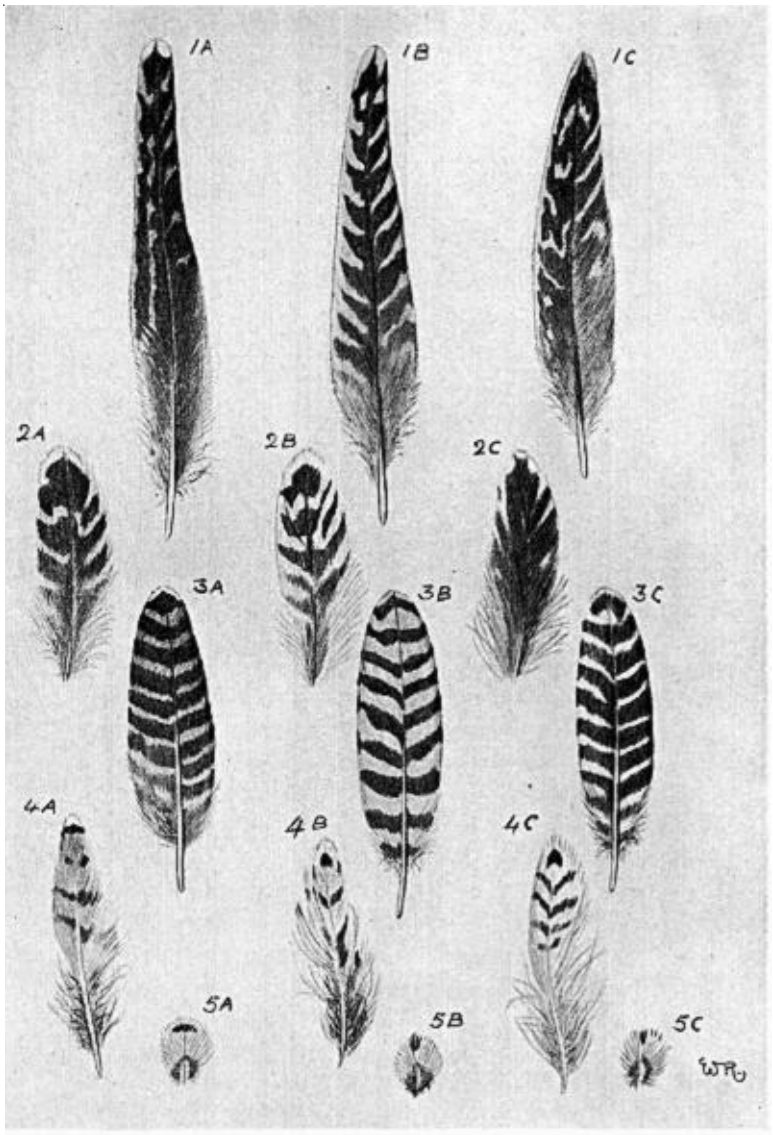
Plumages.

There is yet another difficulty in assessing the dowitchers. They have numerous plumages and protracted molts. A spring bird half in winter and half in summer plumage is a curious mixture and requires very careful examination before its real characters can be deciphered. It may easily be laid aside as "intermediate" even by an experienced student. One such skin is particularly referred to below. The fact that the middle rectrices differ from the remainder and are molted by themselves is apparently unknown to most ornithologists. They are wanting in many spring-taken specimens and as they only, of the rectrices, show racial differences, the knowledge that they may be missing is obviously of primary importance.

Even Ridgway (1919) in his monumental work 'The Birds of Middle and North America' makes no reference at all, either under *griseus* or *scolopaceus*, to the first winter plumage of young birds, yet they possess distinct juvenal and first winter plumages. The latter makes its appearance in quite early fall skins. It is essential that all the plumages should be recognized and their possible combinations taken into consideration for conclusive determination. Bent (1927) gives an excellent account of plumage changes, as does also Witherby (1920).

Distribution.

Perhaps the richest source of confusion has been the lack of information as to breeding grounds. Two more breeding areas



TYPICAL DOWITCHER FEATHERS. SERIES A, *L. scolopaceus:* B, *L. g. hendersoni:* C, *L. g. griseus.* 1. TERTIAL: 2. SCAPULAR: 3. CENTRAL RECTRIX: 4. UNDER-TAIL COVERT: 5. BREAST FEATHER. 7/10 ACTUAL SIZE. DRAWN BY WM. ROWAN.

are now known and the skins secured from them have thrown a flood of light on the entire dowitcher problem. There seems little question that the bird (*hendersoni*) from these areas has provided the main stumbling block to a solution. Its occurrence during migration in the interior and on both coasts (though more rarely on the Atlantic) in company of *griseus* and *scolopaceus* probably accounts for many supposed intermediates. Its comparatively short bill and the presence, in some specimens, of white on the belly, appear to account for its identification as *griseus*, while its more normal uniform coloration has led to its being taken for short-billed *scolopaceus*. Several skins from the interior and the west coast that have figured in literature as *griseus* (Horsbrugh, 1918: Taverner, 1919: Bent, 1927) have been examined and have proved indubitably to be *hendersoni*.

Summary.

Confusion of the various races of dowitcher seems to rest on several factors. They may be enumerated as follows,—

Ignorance or disregard of the sexual differences in bill-length in all races. These are particularly striking in *scolopaceus*.

Lack of acquaintance with more than one race in life.

Incomplete knowledge of the plumage sequences or disregard of the mixed plumages so frequent in the early spring and fall.

Lack of specimens from breeding localities. Hitherto only breeding skins from Alaska have been available. They are all typical *scolopaceus*. A large race with small bill is now known to breed in the interior of Canada. It has not been previously recognized and its wide distribution, together with the above factors, has led to the belief that *griseus*, actually confined to the east coast, occurs right across the continent.

As far as the present writer is concerned, he fell foul of all these obstacles simultaneously on his first acquaintance with the dowitcher. I met and collected my first birds on ground common to two races, a fact unknown to me at the time. I was unaware of the sexual differences in the species nor did I appreciate its multiplicity of plumages. I decided that there was but one bird and that it was extremely variable. My hasty verdict has appeared, as a quotation from a letter (undated in the quotation, but actually

several years old) in Bent's 'Life Histories' (1927). Long before the book matured, however, I had arrived at a correct interpretation of the facts and elsewhere in the same volume (p. 107) I am accredited with my later, diametrically opposite, views, the ones that I am herewith reiterating and amplifying. This view has been consistently strengthened as more information has been gleaned and scores of additional skins have been handled.

Material

In all, nearly 500 dowitcher skins have been examined. At the time of writing over 100 representative specimens from a variety of sources and localities are available. Specific details of these, as well as of some of the other skins that have previously passed through my hands and on which full notes have been made and preserved, will be found on the accompanying tables (A–F).[1] They fall naturally into three groups which will be referred to below as (1) Long-billed, *L. scolopaceus;* (2) Inland, *L. g. hendersoni;* (3) Eastern, *L. g. griseus.*

[1] Variations in length of bill, wing and tarsus have been indicated on the tables. Variations in plumage have been referred to periodically in the text. It should, however, be pointed out that variations are of different kinds and of varying values. The blue back of the adult male merlin, for instance, varies in tone, both in *richardsoni* and *columbarius* (as well as in other merlins) the darkest of the former being as deep as the palest of the latter. This is always considered to demonstrate intergradation and sub-specific relationship. But the blue of other male hawks varies and it may, in fact, be considered an inherently variable character in male hawks that have blue backs. If *richardsoni* and *columbarius* were entirely unrelated each would still retain its range of blues but suspicions of intergrading would not exist. As a matter of fact, there is little question that this is the correct interpretation to apply to the merlins since the blue of *richardsoni* is a different blue from that of *columbarius.* Extremes may match each other, but only in *depth of tone.* This, so it seems to me, is the view that should be applied to many dowitcher variations, e.g. bill-length. The bill of each race varies about a given mean (as do other wader bills). Where there is a great discrepancy in mean, as between *scolopaceus* and *griseus,* there is no overlapping whatever (when considered sex by sex). Or again, the narrowest of the white tail-bars of *hendersoni* may match the widest in *griseus* or *scolopaceus* but the fact is by no means necessarily indicative of intergrading. A given specimen may show extreme variation in one character and yet remain quite obviously typical *hendersoni.* A Solitary Sandpiper showing particularly narrow bars on its rectrices does not thereby become an intergrade with the dowitchers. The mean widths of bar on the tail feathers in *griseus* and *hendersoni* are absolutely distinct and cannot be confused. Each shows a range of variation quite usual in barred tail feathers of shore birds. That the extremes overlap is an accident, not an indication of subspecific relationship.

(1) **Long-billed Dowitcher,** *Limnodromus scolopaceus* (Say.) (Pl. II).

This group comprises 33 adult skins in breeding, or mainly breeding, plumage from various parts of the continent, including June skins from Alaska (collected at the nest) with a large majority from Alberta: three adults in winter plumage and six birds of the year, all from Alberta.

The outstanding characteristic is the relatively enormous bill. For females the average length is 7.26 cm.: for males, 6.22 cm. The *shortest* female *scolopaceus* bill (6.8 cm.) exceeds by .2 cm. the *longest* female bill of the other two groups. In full-grown females, therefore, a bill of 6.8 cm. or over may possibly constitute a self-sufficient diagnostic character, distinctive of females of the long-billed group. Of the males, one only has a bill of less than 6 cm. while of the remaining males in the other two groups (52 skins) only one exceeds 6 cm. The bill comes very close to being a good criterion in this sex also, but not quite. As a standard by itself, applied to any series of dowitcher skins, the expected error would probably not exceed 5%. The contrast in size of bill between the two sexes is far more marked in *scolopaceus* than in either of the races of *griseus*.

The Long-billed group is further distinguished by the following characters. The breast and belly are more or less uniform salmon with many of the feathers tipped in spring with whitish (Pl. II). The tips get largely, if not entirely, worn as the season progresses, giving August birds a somewhat richer color. Spotting is confined to the throat region where it is, however, relatively heavy. The spots tend to be broader than they are long (Pl. III, fig. 5a). They overflow to the sides of the breast where they enlarge greatly to form distinct bars. In August skins, the spotting is reduced, probably by both abrasion and molt. The lateral bars also suffer reduction, but some persist. In summer plumage the black feathers of the back are crossed with narrow bars of a deep, rich buff, partially edged with the same and tipped with white. The general impression in life is that of a distinctly dark bird. In this respect there is but little difference between the spring and the August skin although in the latter the white tips are mostly gone and the back averages darker on the whole. The tertials are black with narrow, irregular bars and markings of deep buff though the

depth of color varies greatly and in extreme cases is almost white. However, the typical thing is a narrow streak of rather dark color (Pl. III, fig. 1a). The under tail coverts vary from buff to whitish but are almost invariably barred with black terminally rather than spotted (Pl. III, fig. 4a). The central rectrices are mainly black with narrow bars of deep buff (Pl. III, fig. 3a).

There is no striking difference in wing-length between females (nor males) of this group and the other two, but in view of their enormous bills it comes as a distinct surprise to find that their wing-lengths are somewhat exceeded by the small-billed inland birds (see tables). The tarsus of Long-billed females on the average well exceeds that of the remaining females but in the males the difference is slighter.

(2) **Inland Dowitcher,** *L. griseus hendersoni,* subsp. nov. (Pl. II).

This group is represented by a very different bird. To fully appreciate the difference the two forms should be seen together in life in the same flock. In summer plumage the veriest tyro can distinguish them almost as far away as they can be seen.

The series comprises some 40 skins from California, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario (Toronto), and South Carolina, but the majority are breeding skins from Alberta and Fort Churchill, Manitoba.

The outstanding features of the Inland group are the following. The bills are conspicuously shorter than in the Long-billed class, while the actual difference between the two sexes is greatly reduced. The average length of bill for the females (18 specimens) is 6.16 cm. as against 5.69 cm. of the males (34 skins). The former is but little below the average of Long-billed *males.*

In wing-length this group exceeds even the Long-bills.

The spotting is generally comparatively scanty and not concentrated on the throat (Plate II). There is in some skins a suggestion of a band of spotting along the extreme anterior limits of the breast, but the spots average larger than those on the throat of the Long-bills (Pl. III, 5b) and are always more scattered. In the best marked skins spotting is sparsely distributed all over the breast and belly. The breast shows no barring on the sides although bars occur sparingly farther back.

The general color on the under side is nearly as deep as in the Long-bills but has a yellowish tinge. In a specimen freshly out of its winter plumage these breast feathers are more generously tipped with whitish than in the case of the Long-bills and there is in some skins (either sex) an admixture of white feathers on the belly. In the majority they are wanting and their presence might conceivably indicate a bird of the previous year (said to be the case with *scolopaceus*) though this is probably unlikely, a fully white belly being typical of *L. g. griseus*. White feathers occur on some birds that have undoubtedly bred. Thus one female, with about the maximum amount of white on the belly had a shelled egg in the oviduct when collected.

The feathers of the back offer an even greater contrast to the first group. In life, when side by side with Long-bills, the Inland birds look so pale as to suggest an entirely different species. Both the barring and the edging of the feathers are wider, as well as paler, than in the first group (Pl. III, fig. 2b). The bars on the tertials are similarly wider and paler (Pl. III, fig. 1b). The two central rectrices are black but are crossed by considerably wider bands of buffish than in the long-bills. The color of these bars is never deep and may, in fact, be white (Pl. III, fig. 3b). The under-tail coverts may be mixed white and buffish, but they are never as richly colored as those of the long-bills and tend to be terminally spotted with black rather than barred (Pl. III, fig. 4b). The upper tail-coverts are whiter than those of group (1) with the terminal bar of blackish replaced by a circular spot.

One August skin has been examined. It shows the dark, worn condition of *scolopaceus* in comparable plumage, but there is *no barring on the sides of the breast.* The rectrices, moreover, and its measurements, are typical of *hendersoni.*

(3) **Eastern Dowitcher,** *L. griseus griseus* (Gmel.) (Pl. II).

This group is represented by a series of 33 skins from Florida, Virginia, Georgia, Massachusetts, North and South Carolina, New Brunswick, Nova Scotia and Ontario (Toronto). All available skins from the interior and the Pacific coast have been indisputably of the Inland group. One solitary skin suggested doubt when first handled (coll. H. B. Bishop, No. 33372, male, Los Angeles County,

Calif., Apr. 9, 1923), the suggestion of the present group being due to the preponderance of winter feathers on the throat and breast with their delicate grey streaking. On examining the back, the broad, pale bars and margins of the incoming tertials and dorsal feathers generally confirmed its inland status, as did also its measurements.

The chief characteristics of the eastern group are the following. The bill in both sexes averages shorter than in the corresponding sexes of either groups 1 or 2. Averages—female (15 skins) 5.79 cm., male (18 skins) 5.44 cm., the former (female) being somewhat above the average of the *males* of the inland group. In tarsus measurements these birds average below either of the other groups, while the same is probably correct for the wing-lengths (see note, table G). They constitute, in fact, the smallest of the dowitchers.

But the most striking difference between this group and the others is the coloring. On the ventral surface (Pl. II) the reddish is virtually confined to the throat and breast, the belly being white save for a few odd buffy feathers on a single skin. Such coloring as there is, is paler than in the other groups. The spots are more or less crowded on the lower throat and breast and tend to be longer than they are wide (Pl. III, fig. 5c) except on the sides where they widen out on all skins and resemble the bars of the long-bills on a lesser scale.

The throat and breast region of some of these birds so closely resembles the appearance of the same areas on any typical spring sanderling skin that when a sheet of paper with a circular opening is laid on a specimen of each so as to cover everything but this zone it is quite impossible to guess which skin is which. There is not even a remote suggestion of similarity to a sanderling in either of the other groups.

Seen from the dorsal surface they average darker than even the Long-bills. Their black appearance is commented on by both Nelson (quoted above) and Howe (1901). This holds good even in fresh spring skins in which some of the tertials are so sparsely barred as to appear almost completely black. One exceptional skin (coll. L. B. Bishop, No. 7186, male, Pea Is., N. Carolina, May 7, 1902), is as brightly colored as any inland specimen, but its ventral surface is unmistakably eastern, while all its measurements

are small, even for an eastern. It is in new plumage and seems to be a good intermediate between *griseus* and *hendersoni.*

The central rectrices are narrowly barred with white (some tinged with buffish) and on the whole are much blacker than those of the Inland group (Pl. III, figs. 3b and 3c). The under-tail coverts are white (with occasional buffish tinge) and have a terminal spot in place of the bar of the Longbills (Pl. III, fig. 4c). The upper tail coverts resemble those of the inland group.

Juveniles.

No juvenile eastern skins are available in our present series, but I have notes on three skins from Nova Scotia loaned me by Mr. Taverner three years ago. They tally with Witherby's (1920) account of the juvenile plumage in *griseus.* Without skins at hand it is impossible to make a precise comparison with our five inland juvenile specimens, but there is no noticeable difference between these skins and the written accounts. The agreement must be quite close. There are, however, three well marked differences between them and the juveniles of the Long-bills. The bill (by sexes) is much shorter in *hendersoni:* the buff edgings of the feathers on the back are broader and paler than in *scolopaceus,* but the crown is darker: the throat and breast are finely speckled in *hendersoni* rather than streaked. One of these skins is Taverner's Churchill specimen. Ours agree with it in all respects except that they lack the down on the head and the bills have attained their full lengths.

Distribution.

L. scolopaceus. Known to breed from the Anderson River (where it is scarce) westward to Point Barrow and south to the mouth of the Yukon River and Hooper Bay. Most abundant on migration in the interior (in Canada, at all events) and on the west coast,—British Columbia, Washington and California (Dawson, 1923, p. 1227). Comparatively infrequent on the Atlantic coast. Preble (1902) records it as abundant near Fort Churchill, Manitoba, on July 31. Collected specimens were identified by Howe as *scolopaceus.* If the identification is correct it distinctly suggests that the known breeding range may ultimately be extended considerably further east. Howe's measurements, however, lead one

to suspect that these were actually *hendersoni*, probably taken for *scolopaceus* on the strength of their ventral coloring. *Hendersoni* only were seen or obtained by Taverner at Ft. Churchill in July and August, 1930.

L. g. hendersoni. Known to breed in central and northern Alberta from Lake Athabasca south, casually probably to about latitude 53, and at Fort Churchill, Manitoba. Spring taken skins from the intervening territory of Saskatchewan suggest that it will probably, sooner or later, be shown to breed in the northern half of that Province. Specimens on migration have been identified from British Columbia, California, all the prairie provinces of Canada, Ontario, and South Carolina. Preble (1908) records a specimen of *griseus* from Fort Rae on Great Slave Lake. If this is actually *hendersoni*, the record would extend its known range northward by some 250 miles. Arnold (1927) has a colored plate (Pl. XXXII) of a dowitcher from the British Museum collection, taken in England, that shows the pale back, the sparse but scattered spotting on breast and belly, and the uniform ventral coloring so unmistakably, that there seems no doubt that *hendersoni* has occurred at least once in the British Isles.

L. g. griseus. Breeding grounds unknown. As far as the present investigation is concerned, with the exception of one skin from Toronto, all others have come from the Atlantic seaboard. Such supposed *griseus* skins as have been available from the interior and from the west coast (some of which have been recorded by other authors as *griseus*) have all proved to be *hendersoni*. The inference is that the breeding grounds of *griseus* must lie east of Hudson Bay, possibly in the almost unknown interior of Ungava or perhaps even Labrador.

Conclusions.

In spite of the unanimous opinion of those most fitted to speak—the various authors who have made a special study of the dowitchers—that *scolopaceus* is perfectly distinctive and recognizable either by its coloration or its bill or both, there is yet a marked tendency in current literature to doubt its validity. When accepted it is invariably ranked as a subspecies of *L. griseus* on the supposed existence of intermediates that have, as far as I am aware, never

been described. Both Ridgway and Nelson state that they are rare but give no account of them, nor do they state in what respects they are intermediate. Neither of these authors was apparently cognizant of the sexual differences in bill-length and they might well have considered a large-billed male *scolopaceus* to be intermediate between the yet larger billed females of the same race and females of *griseus*. An odd skin of *hendersoni* might equally be considered intermediate on the strength of its ventral coloration, particularly if compared with an August skin of *scolopaceus*, in which the characteristic throat spotting is greatly reduced. Among the hundreds of skins examined in the last few years I have not encountered a single one that suggests intergradation between this group and the other two. Moreover, its far-northern breeding ground appears to be quite isolated. Certainly, although it has now been well known for over half a century, only typical *scolopaceus* are known from it. (Howe's distributional map seems to be based mainly on guess work. At all events it has been proved entirely incorrect by events of the last few years.) Probably most significant of all is the fact that the young can be distinguished from those of *griseus* and *hendersoni*, while young of the last two cannot be told from each other. In short, in keeping with current practice, *scolopaceus* should be accorded the rank of a full species rather than a subspecies.

Enough has already been said to demonstrate the existence of two other easily separable groups of dowitchers. The one—my group 2, *hendersoni*, a large-winged, short-billed and pale-backed inland race—has now been tied down to two breeding grounds, in Alberta and Manitoba, a thousand miles apart, with similar spring skins known from the intervening territory. It evidently has a huge breeding range and is quite stable. Outside the breeding season it also has a wide distribution, occurring freely on the Pacific and more rarely on the Atlantic coast.

While the nesting grounds of the two above forms are known in part, at least, the breeding territory of the last group, the Eastern, *griseus*, is still unknown. The birds, however, constitute a group as well defined as the Long-billed or the Inland respectively and they no doubt represent the original *griseus*, the type of which came from the coast of New York. It is certainly the *griseus* of Howe "upper

parts black" etc. (1901 p. 159), of Nelson—"the dorsal colors average darker than in *scolopaceus*" etc. (1887, p. 101), and later authors. Its ascertained distribution is virtually restricted to the Atlantic seaboard.

It has been shown above that *scolopaceus* is not only infallibly recognizable as an adult but also as a juvenile. The young of *griseus* and *hendersoni*, on the other hand, appear to be indistinguishable while intermediate adult skins undoubtedly exist. One such has here been described in some detail (*vide supra*). It is *hendersoni* from above (entirely unlike *griseus*) but it is *griseus* from below.

It is therefore, obvious that the inland bird must be named and that it should rightly be considered a subspecies of *griseus*. Its recognition clears up the entire Dowitcher puzzle. It is far more distinctive than scores of accepted subspecies and, in summer plumage, is readily identified in life, either by itself, or, even better, when in company of other Dowitchers. In spite of its enormous breeding range it maintains marked uniformity from end to end. I fail to see the force of such arguments as that of Bent's (1927, p. 107) when he says, in reference to my views on these Inland Dowitchers—"It seems to me that they are strictly intermediate and should not be named." Strictly intermediate they certainly are not, but even if they were, logical pursuit of the argument would entail the elimination of scores of accepted subspecies. Some two dozen races of Song Sparrow, for instance, would have to be revoked since they are intermediate between say, the Desert and Aleutian, or the Desert and Sooty Song Sparrows.

I have named the new dowitcher *L. g. hendersoni* after Mr. A. D. Henderson of Belvedere, Alberta, discoverer of the Alberta breeding grounds, who took endless trouble to procure me the first certain breeding skins obtained and to whose own activities and ever ready hospitality to visiting ornithologists western Canada owes so much of its recent advances in ornithological knowledge.

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TABLE A.

Measurements (centimeters) of MALES of *L. scolopaceus*, Long-billed Dowitcher.

Wing	Culmen	Tarsus	Locality, date and origin of skin
14.2	6.1	3.85	Hooper Bay, Alaska. *Conover, 3694*, 9 June 1924
14.5	6.1	3.9	Hamilton, Ont. *Fleming*, 12 Aug. 1891
13.9	[1]5.8	3.6	Beaverhills Lake, Alta. 18 May 1923
[1]13.5	6.15	3.6	" " " 20 " 1924
14.2	6.3	3.8	" " " 7 " 1923
13.9	6.15	3.6	" " " 19 " 1924
13.8	6.3	3.8	" " " 20 " 1922
[2]14.3	6.4	[1]3.35	" " " 6 Aug. 1925
[2]13.8	6.0	3.55	" " " 16 " 1924
[2]13.9	6.55	3.8	" " " 6 " 1925
[2]13.9	[3]6.6	3.8	" " " 6 " 1925
[2]13.6	6.3	3.65	" " " 6 " 1925
[2]14.1	6.1	3.7	" " " 6 " 1925
14.4	6.0	3.85	Athabasca River, *U. S. Surv. 283339*, 12 May 1920
[3]14.6	6.0	3.8	Big Lake, Alta. *Prov. coll., Edmonton*, 24 May 1912
14.5	6.25	3.9	Sumas Lake, B. C. *Brooks*, 23 Sept. 1887
13.7	6.3	3.7	Chilliwack, B. C. *Brooks*, 8 May 1888
14.5	6.45	[3]4.0	Yukon Delta. *Bent*, 26 June, 1914
14.4	[3]6.6	3.7	Toronto, Ont. *Fleming*, no date: no sex. Typical late summer plumage: probably 1890.
			Juveniles
14.5	6.25	3.7	Beaverhills Lake, Alta, 2 Sept. 1924
14.5	6.25	3.75	" " " 2 " 1924
14.1	6.2	3.55	" " " 8 Aug. 1925
14.1	*6.22*	*3.72*	*Averages, 21 skins*

[1] Minimum.
[2] Somewhat worn. See note, table G.
[3] Maximum.

TABLE B.

Measurements (centimeters) of FEMALES of *L. scolopaceus*, Long-billed Dowitcher.

Wing	Culmen	Tarsus	Locality, date and origin of skin
14.5	7.2	3.85	Hooper Bay, Alaska. *Conover*, 3693, 9 June 1924
14.6	[1]6.8	3.9	Chilliwack, B. C. *Fleming*, 8 May 1888
[1]14.0	7.05	3.85	Beaverhills Lake, Alta. 14 May 1923
14.9	7.15	4.05	" " " 19 " 1925
14.7	7.4	3.9	" " " 18 " 1923
14.5	7.5	4.3	" " " 13 " 1923
14.2	7.15	[1]3.8	" " " 19 " 1923
15.1	7.4	4.4	" " " 19 " 1925
14.9	6.95	4.6	" " " 21 " 1925
[2]14.2	7.45	4.0	" " " 6 Aug. 1925
[2]14.8	7.4	4.0	" " " 16 " 1924
[2]14.2	6.95	[3]4.65	" " " 16 " 1924
[2]14.3	7.05	4.05	" " " 6 " 1925
[2]14.3	[3]7.8	4.05	" " " 6 " 1925
14.8	7.4	4.35	" " " 6 " 1925[4]
14.3	[1]6.8	3.85	" " " 6 " 1925[4]
[3]15.3	7.6	4.3	" " " 2 Sept. 1924[5]
			Juveniles
14.8	7.3	4.0	Beaverhills Lake, Alta. 24 Aug. 1925
15.2	[3]7.8	4.0	" " " 24 " 1925
14.8	7.1	4.15	" " " 2 Sept. 1924
14.63	*7.26*	*4.10*	*Averages, 20 skins*

[1] Minimum.
[2] Somewhat worn. See note, table G.
[3] Maximum.
[4] Partial winter plumage.
[5] Full winter plumage.

TABLE C.

Measurements (centimeters) of MALES of *L. g. hendersoni*, Inland Dowitcher.

Wing	Culmen	Tarsus	Locality, date and origin of skin
14.5	5.95	[3]3.75	Beaverhills Lake, Alta. 16 May, 1927
14.6	5.7	3.4	Crooked Lake, Sask. *Fleming*, 13 May, 1914
14.3	5.6	3.5	Toronto, Ont. *Fleming*, 23 May, 1895
[3]15.0	[3]6.1	[3]3.75	Beaverhills Lake, Alta. 19 May 1923
14.6	5.8	3.3	" " " 22 " 1922
14.5	5.95	3.75	" " " 16 " 1927
Type			
14.4	5.85	3.65	Devil's Lake, Alta. 19 June, 1924
[1]14.0	5.65	3.55	Churchill, Man. *Nat. Mus. Can. 23974.* 20 June 1930
14.8	5.9	3.6	" " " " " *24026.* 28 " 1930
14.4	5.45	3.4	" " " " " *24137.* 18 July 1930
14.1	5.9	3.5	" " " " " *24150.* 20 " 1930
14.7	5.9	3.6	Fawcett, Alta. 28 May 1929
14.2	5.95	3.6	" " 24 " 1929
14.6	[1]5.3	3.5	" " 30 " 1930
14.8	5.7	3.5	" " 27 " 1929
14.7	5.9	3.5	" " 31 " 1930
14.5	5.7	3.6	Klondike City, Alta. 8 June 1926
14.6	5.45	3.4	" " " 4 " 1926
14.5	5.7	3.6	" " " 8 " 1925
14.9	5.65	3.7	" " " 6 " 1925
14.7	5.8	3.6	Beaverhills Lake, Alta. 16 May, 1927
14.5	5.7	3.55	Mt. Pleasant, S. Carolina, *Bishop 24016*, 3 May 1912
14.2	[1]5.3	3.4	Osoyoos, B. C. *Brooks*, 7 May 1922
14.9	5.75	3.5	Sydney, Victoria, V. I. 26 July, 1912
14.7	5.7	3.45	Los Angeles Cy, Calif. *Bishop 33372.* 9 Apr. 1923
14.7	5.6	3.6	" " " " " *33373.* 25 Apr. 1923
	5.75		Victoria Is., *Nat. Mus. Can.* 15 May
	5.6		Shoal Lake, Man. *Nat. Mus. Can.* May
	5.6		" " " " " " " "
	5.5		Osoyoos Lake, B. C. *Nat. Mus. Can.* early May
	5.65		" " " " " " " " " "
	5.7		" " " " " " " " " "

TABLE C—*Continued.*

Wing	Culmen	Tarsus	Locality, date and origin of skin
			Juveniles
14.6	5.65	3.6	Beaverhills Lake, Alta. 6 Aug. 1925
14.1	5.85	3.4	" " " 16 " 1924
12.7	5.3	3.4	Churchill, Man. *Nat. Mus. Can.* 20 July 1930 Part. downy
14.5	*5.69*	*3.51*	*Averages, 28 skins (culmen, 34 skins)*

[1] Minimum.
[2] Largely winter plumage.
[3] Maximum.
Type skin, donated to the National Museum of Canada.

TABLE D.

Measurements (centimeters) of FEMALES of *L. g. hendersoni*, Inland Dowitcher.

Wing	Culmen	Tarsus	Locality, date and origin of skin
14.5	6.5	3.7	Crooked Lake, Sask. *Fleming*, 13 May 1914
14.9	5.8	[1]3.4	Toronto, Ont. *Fleming*, 16 May 1896
[2]15.2	6.4	3.8	Churchill, Man. *Nat. Mus. Can. 23981.* 21 June 1930
14.4	5.85	3.5	" " " " " *24028.* 28 " 1930
14.8	5.85	3.75	" " " " " *23973.* 20 " 1930
14.7	6.25	3.5	Fawcett, Alta. 27 May 1929
[1]14.3	6.3	3.45	" " 24 " 1929
15.1	6.25	3.9	" " 30 " 1930
14.7	[2]6.6	[2]4.0	" " 1 June 1930
	5.8		Osoyoos Lake, B. C. *Nat. Mus. Can.*, early May
	6.2		" " " " " " " " " "
	6.2		" " " " " " " " " "
	[1]5.7		Shoal Lake, Man. " " " late "
	6.1		" " " " " " " " " "
	6.2		" " " " " " " " " "
	6.2		" " " " " " " " " "
	6.5		" " " " " " " " " "
			Juvenile
14.6	6.3	3.65	Beaverhills Lake, Alta. 24 Aug. 1925
14.7	*6.16*	*3.65*	*Averages, 10 skins (culmen, 18 skins)*

[1] Minimum. [2] Maximum.

TABLE E.

Measurements (centimeters) of MALES of *L. g. griseus*, Eastern Dowitcher.

Wing	Culmen	Tarsus	Locality, date and origin of skin.
14.2	5.5	3.15	Virginia, *U. S. Biol. Surv., 239917.* May 1913
14.2	[1]5.7	[1]3.5	" " " " " *239919.* " 1913
[1]14.7	5.5	3.45	" " " " " *239918.* " 1913
13.5	5.4	3.25	Chatham, Mass. *Bent 10512.* Aug. 1912
13.4	5.55	3.3	Grand Manon, N. B. *Nat. Mus. Can.*, 12 Aug. 1925
14.3	[1]5.7	3.4	" " " " " " " 25 " 1925
[2]13.3	[2]5.2	3.2	" " " " " " " 5 " 1925
14.6	5.45	3.3	" " " " " " " 12 " 1925
14.2	5.6	3.1	" " " " " " " 5 " 1925
14.0	5.45	3.2	" " " " " " " 5 " 1925
14.6	5.5	3.35	Pea Is., N. C. *Bishop 7210.* 9 May 1902
14.4	5.3	3.2	" " " " " *7175.* 6 " 1902
14.0	5.4	[2]3.0	" " " " " *7186.* 7 " 1902
13.5	5.5	3.1	Magdalen Ils. *Nat. Mus. Can.* 3 Aug. 1909
14.3	5.3	[1]3.5	Macintosh Bay, Ga., *Nat. Mus. Can.* 23 Apr. 1890
14.4	5.35	3.2	Cape May, N. J. *Nat. Mus. Can.* May 1872
			Juveniles
13.7	5.3	3.3	Crescent Beach, N. S., *Nat. Mus. Can.* 1 Sept. 1923
14.2	5.25	3.3	" " " " " " " 28 Aug. 1924
14.2	*5.44*	*3.26*	*Averages, 18 skins*

[1] Maximum.
[2] Minimum.

TABLE F.

Measurements (centimeters) of FEMALES of *L. g. griseus*, Eastern Dowitcher.

Wing	Culmen	Tarsus	Locality, date and origin of skin
14.1	5.75	3.2	Nova Scotia. *Nat. Mus. Can. 17533.* Aug. 1920
14.2	5.5	3.5	Marco, Fla. *Fleming.* 8 July 1902
14.4	5.6	3.3	Toronto, Ont. *Fleming.* 22 May 1894
14.1	6.1	3.4	Virginia. *U. S. Biol. Surv. 239920.* May 1913
14.7	5.6	[1]3.1	Three Ils., Grand Manon, N. B. *Nat. Mus. Can.* Aug. 1925

TABLE F—*Continued.*

Wing	Culmen	Tarsus	Locality, date and origin of skin
14.0	5.65	3.3	Three Ils., Grand Manon, N. B. *Nat. Mus. Can.* Aug. 1925
[1]13.4	[1]5.15	3.3	Three Ils., Grand Manon, N. B. *Nat. Mus. Can.* Aug. 1925
13.9	5.35	3.3	Three Ils., Grand Manon, N. B., *Nat. Mus. Can.* Aug. 1925
13.7	5.8	3.25	Three Ils., Grand Manon, N. B. *Nat. Mus. Can.* Aug. 1925
13.9	5.7	3.35	Crescent Beach, N. S. *Nat. Mus. Can.* 24 Aug. 1920
14.5	6.2	3.5	Pea Is., N. C. *Bishop 5697.* 13 May 1901
14.5	5.9	[2]3.9	" " " " " *5764.* 18 " 1901
[2]14.9	6.0	3.5	" " " " " *5787.* 20 " 1901
[2]14.9	6.15	3.5	Copahee Sound, S. C. *Nat. Mus. Can.* 2 May 1912
14.3	[2]6.35	3.4	Cape Hatteras. *Nat. Mus. Can.* 4 March 1900
14.23	*5.79*	*3.39*	*Averages, 15 skins*

[1] Minimum.
[2] Maximum.

TABLE G.

Average measurements,[1] in centimeters, of the three forms of dowitcher.

Name	MALES			FEMALES		
	Wing	Culmen	Tarsus	Wing	Culmen	Tarsus
L. scolopaceus[2]	14.1	6.22	3.72	14.63	7.26	4.10
L. g. hendersoni	14.5	5.69	3.51	14.7	6.16	3.65
L. g. griseus	14.2	5.44	3.26	14.23	5.79	3.39

[1] Measurements have been taken in the usual manner, except that the tarsus length has been taken according to the method illustrated on p. XIII, vol. I, Witherby (1920) instead of the more common, but less precise, one illustrated in Forbush (1925), vol. I, p. XXXI.

[2] Wing-lengths of both sexes of *scolopaceus* should, perhaps, show a trifle higher average owing to the inclusion of an appreciable percentage of late summer adult skins (marked [2], tables A & B) with badly abraded primaries. In each case, however, the measurement has been taken from the tip of the rhachis which seems to persist practically complete since the wing-lengths of the birds indicated are not noticeably below those of the remaining skins on the same lists.