NOTES ON MACGILLIVRAY'S SEASIDE SPARROW

BY IVAN R. TOMKINS

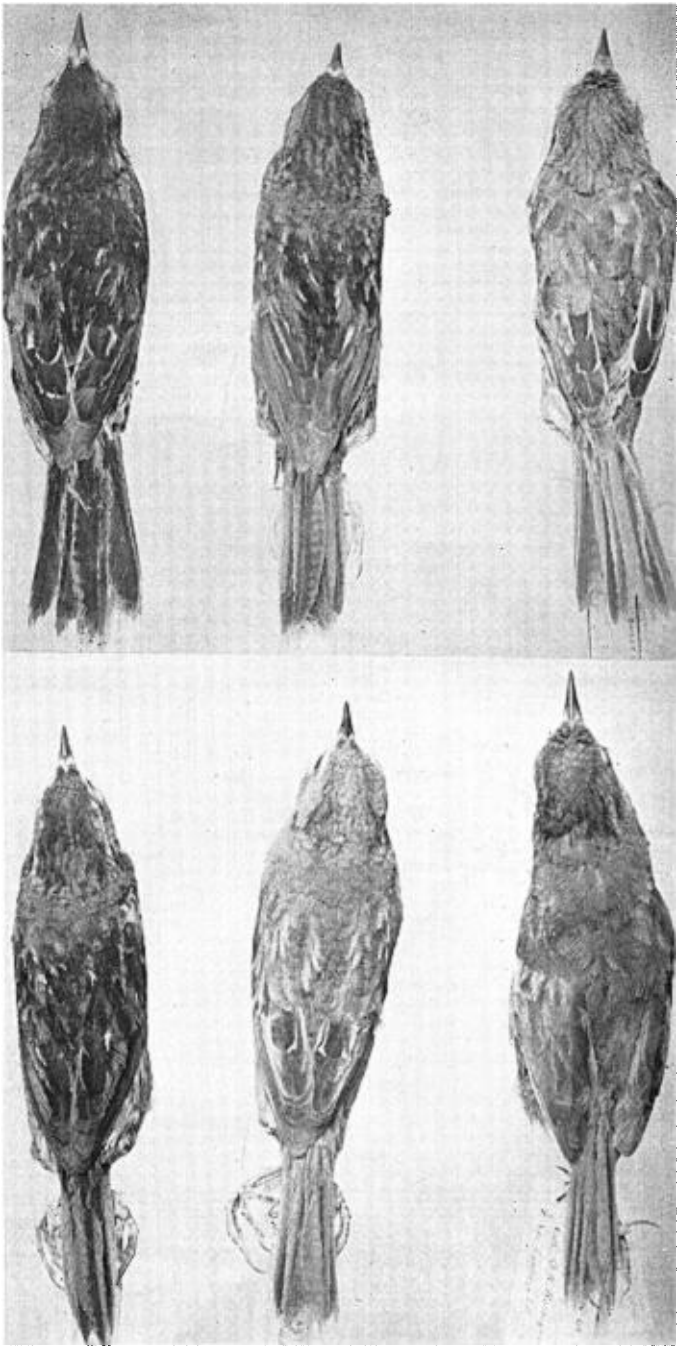
Plates 2, 3

THE genus *Ammospiza* of the current A.O.U. 'Check-list,' including the several species and subspecies of the Seaside Sparrows, and the three subspecies of Sharp-tailed Sparrows, seems to be founded nearly as well on habitat as on taxonomic characters, for all of these birds live in wet marshes. The Seaside Sparrows live in the salt marshes of the Atlantic and Gulf coasts, while the Sharp-tailed Sparrows are somewhat more northerly in breeding range, and one subspecies, Nelson's Sparrow (*A. caudacuta nelsoni*), breeds in a strictly fresh-water habitat in the interior of the continent. All of the genus favor salt marshes in winter. The evidence of a common ancestry is strong, and in the field there are many resemblances in behavior. The great variation in color has brought the Seaside group to the attention of systematists, and many species and subspecies have been named. The differences do not seem very stable; they do not appear to be easily connected with density of cover, nor do they progress geographically in any regular manner, as is the case in some of the other Fringillidae.

According to the A. O. U. 'Check-list' there are three species, one of which has been divided into seven subspecies, making nine different forms to consider. The darkest (*A. nigrescens*) is found on the east coast of Florida, and the lightest (*A. mirabilis*) lives—or did live until recently—in the area about Cape Sable, close to the southern tip of Florida. The seven subspecies of *A. maritima* are spread from southern New England along the coast to Texas, and dark and light forms are distributed in a rather haphazard fashion. There are also differences of color in the same local group. Since the publication of the last 'Check-list' in 1931, the description of other subspecies of *A. maritima* threatens further complication of the situation.

Probably these erratically distributed color forms are at least partly mutational and brought out from a varied genetic makeup, assisted of course, by conditions incident to the habitat. Perhaps these changes are actively in process now, rather than fixed, comparatively speaking, from earlier times.

The questions of mixing, of homing in spring, of advances and recessions in range (possibly due to fluctuations in numbers) over a period of years, all tie in with the solution of the phylogeny or the lineal descent and differentiation of the group. The effect of tropical hurricanes on such a bird can only be theorized on so far, but they



SEASIDE SPARROWS (SEE EXPLANATION OF PLATE)

might affect the range of some of the subspecies in such a way that, over a period of years, our present system of identifying breeding birds by type locality would not be true identification at all. Where such variations occur, one cannot but wonder if those patterns of behavior we call 'territory holding' and kindred habits, are stable throughout the group, and the same in all parts of the range. At first thought, it would seem that these patterns are fundamental, and not subject to very much variation. They seem to be a product of what the bird is, times its habitat throughout the period it has occupied that habitat. Yet we do know that some birds are quite different in habits in different parts of the range. Conceivably, a change in certain behavior patterns might prevent the mixing of two stocks, and produce a division into two species, as the word 'species' is commonly used.

This account of the Seaside Sparrow relates mostly to one small area and hence is based entirely on observations of one subspecies so far as breeding behavior is concerned. It contains much theory yet unproven, and leaves many loose ends untied; but an honest attempt at interpretation, with some record of the things on which it is based, is more desirable than none at all; and no attempt is made to establish a complete set of behavior scales. Previous accounts in the literature refer mostly to systematic position, and but a few brief notes touch on life-history matters.

Wherever in this account, the terms 'dark form' and 'light form' are used, it must not be considered that these are more than expressions used to give simple meaning to certain wide divergences. Actually, there are many colors and combinations of colors in the Seaside group, colors which are not constant throughout the local group. Generally in this paper, the term 'dark form' is intended to give meaning to the dark-backed type of bird which has been known so long as *macgillivraii,* and to distinguish it from the lighter-backed birds living in the same areas with it, as well as on northward to New England, and southward through South Carolina and Georgia.

This subject has been somewhat touched upon elsewhere (Tomkins, 1937), but a certain amount of repetition is necessary to make the present paper clear. An understanding of the tangled history and confused relationships is necessary, in order to give a basis for consideration of life-history matters.

HISTORY

The breeding Seaside Sparrow of the South Carolina and Georgia coast is currently known as Macgillivray's Seaside Sparrow (*Ammospiza maritima macgillivraii*).

Gilbert R. Rossignol found it nesting on Cabbage Island, Chatham County, Georgia, on May 10, 1907, for the first time in this local area. [Cabbage Island is a low salt-marsh island just north of Wassaw (or Warsaw) Sound, and about eight miles south of the Savannah River entrance.] Seaside Sparrows were found nesting at St. Marys, Camden County, Georgia—at the southern edge of the State—in 1877 by William Brewster (1890), and in 1904 Arnow (1906) collected two birds and a nest. Except these, there seem to be no records of nesting Seaside Sparrows on the coast of Georgia before Rossignol's discovery, nor on the coast of South Carolina, at least as far north as Charleston, from the time of Audubon (who did not certainly state that the bird he described as Macgillivray's Finch was a local breeder), until 1924, when Chamberlain and Sprunt (Sprunt, 1924) found a nesting colony a few miles south of that city. Wayne, who spent a fruitful life a few miles north of Charleston, never found the species nesting there. I am sure that Wayne did not get very close to any Seaside colony, or his keen ear would have picked up the song, and he would have investigated further.

After Rossignol found the birds nesting on Cabbage Island, he had much correspondence with Wayne who, believing this to be typical *maritima* or a new race, reiterated many times in his letters to Rossignol: "This is not *macgillivraii* no matter *who* may say it is." In Wayne's collection are a number of specimens very dark on the back, fulfilling his conception of *macgillivraii,* but all of these were migrants at Mount Pleasant and vicinity, where he collected them.

The origin of the conception of *macgillivraii* as a dark-backed bird was with Chapman (1899). For a long time this name had been regarded as synonymous with *maritima,* until Chapman called attention to the fact that there were Seaside Sparrows to be found along the South Atlantic coast, which were neither *maritima, fisheri* nor *peninsulae.* A juvenal specimen in the U. S. National Museum was believed to be Audubon's type of *macgillivraii.* This bird was much darker than typical juvenals of *maritima,* so was easily connected with the unnamed dark birds. At that time there were no recent breeding specimens from South Carolina, as far as the literature tells us, so this was regarded as representing the local race of that State.

It is quite possible that Audubon described his species (*macgillivraii*) from a migrant. But type localities make quite enough trouble without being transplanted on such a supposition. Again, in Audubon's time, the dark form may have bred in the Charleston area. Certainly none of them has been found recently in the local breeding colonies.

When Rossignol collected a series which was not like these dark birds, Wayne thought for a time that here was a new race similar to the northern *maritima,* yet separated from it by the dark birds which bred in some unknown place north of Mount Pleasant. He intended to name it for Rossignol, as is plain from the letters he wrote to Rossignol, but he apparently abandoned the idea of naming a new race. I have the impression that he corresponded with other prominent ornithologists of that day, and began to realize that the information available was far too incomplete.

It may be that Wayne read Dr. Louis B. Bishop's letter to Rossignol, dated May 30, 1916, in which he wrote, "Breeding on Pea Island, North Carolina, there are two types of coloration, one with the dark centers to the feathers, and generally very dark, which corresponds with Mr. Wayne's *macgillivraii* specimen. The other is much like your birds [i. e. the Cabbage Island specimens], but darker, having the yellowish wash to the plumage and no black centers to the pattern above. This color phase I have taken on Pea Island in winter, but not the dark phase. Possibly your birds may be the same as this yellowish phase of *macgillivraii,* many specimens of which are hard to distinguish from Connecticut birds. The strange thing is, if this is so, that apparently only this phase breeds in Georgia. Add to this complication the fact that breeding birds from Texas are dark—very dark—while winter birds are pale and green, and Mr. Wayne has just lent me a bird he took at Mt. Pleasant in April (?) (I write from memory) which is indistinguishable from birds breeding in Texas." In Dr. Bishop's collection are a number of the dark-backed birds, which he collected on Pea Island, North Carolina. These agree with Wayne's conception of *macgillivraii,* and are definitely distinct from the Georgia birds and those breeding at Charleston.

Then Oberholser (1931) described a new subspecies, naming it *waynei.* One of Rossignol's specimens was designated the type, and the type locality was given as Chatham County, Georgia. He also states that specimens of this form had usually been identified as *macgillivraii,* "but even a superficial comparison suffices to show that they are not the same." He seems not to have discovered that the breeding birds of the Charleston area and Cabbage Island are very nearly, if not quite, identical, when in satisfactory series, and much different from the dark-backed birds which for a long time had been called *macgillivraii.*

Two things about Oberholser's *waynei* deserve attention here. The type locality can be specified in greater detail by adding "Cabbage

Island" to "Chatham County, Georgia." Second, the whereabouts of the type specimen should be a matter of record. According to information furnished the Charleston Museum in 1934, the type is still in Dr. Oberholser's private collection.

Because the Cabbage Island birds and those from Charleston are indistinguishable, and because the type locality of *macgillivraii* was fixed as Charleston by Audubon's original description, that name must be used instead of *waynei.* This of course is based on the supposition that the South Carolina and Georgia birds are distinguishable from *maritima,* which is by no means proved yet.

This leaves the dark bird from North Carolina nameless, and the matter might be simply settled by designating a name for it, if it were a constant color form, but much of the evidence now available indicates that it is but a mutational form with all manner of intergradations between it and the lighter form that breeds throughout the same area.

LOCALE

The coast of Georgia and South Carolina is edged with barrier islands, fronting on the ocean, and behind them are hundreds of miles of salt and brackish rivers winding between other islands that are low and mostly composed of the silt that has been deposited in the lagoons back of the barrier islands. Of the area covered by these flat marshy islands, a large portion may be flooded at times with a few inches of water, when the cumulation of spring tide and northeast wind raises the normal high-water level. Through the islands meander many creeks, often heading in salt ponds well back in the center of the salt-marsh meadows. It is in turn the extra-high tides that furnish the scavenging effect necessary to keep the salt-marsh creeks open for the normal ingress and egress of the tides.

The dominant plant of the wet creek edges and much of the wetter marsh is *Spartina alterniflora* Loisel. In the wide salt-marsh meadows this is sometimes displaced by large areas of black rush (*Juncus roemerianus* Scheele). In parts a little drier there are grasses that are but half-knee high, resembling Bermuda grass, but mostly an associes of *Paspalum vaginatum* Swartz, and *Sporobolus virginicus* (L.) Kunth. In drier parts there are large stands, sometimes ten feet high, of *Spartina cynosuroides.* Farther back is the groundsel tree (*Baccharis halimifolia*) which in turn gives way to the bayberry (*Myrica*) and other vegetation of the sandhills and dunes.

On most of these marsh islands there is a small hammock or so, with palmettos or pines, and there is often a small line of dunes or an

MACGILLIVRAY'S SEASIDE SPARROW IN CHARACTERISTIC POSES

oystershell ridge at the soundward side of the islands bordering on the inlets. On such low islands as these is the domain of the Seaside Sparrow. Not on all of any island, nor on all the islands, but in certain parts of many of them.

The area I know best, and where most of the observations have been made, is within a few miles of the Savannah River, northward into South Carolina and southward into Georgia. Besides this area, some attention has been given to Seaside Sparrow habitat in Glynn County, Georgia, during the spring seasons of 1930 and 1938. A few visits were made to nesting colonies of this species on Amelia Island, Nassau County, and in the marshes north of the St. John's River, Florida. Though the last two places show plainly the changes attendant on less tidal range, the bird's habitat and habits showed no departure from those observed in the Savannah area.

HABITAT AND NESTING

Of the many things necessary to provide suitable habitat, but two are plainly enough marked to be set down here. First, an adequate feeding ground is necessary, and second, suitable nesting cover must be had within easy flight of the feeding grounds.

Many, perhaps most, of the Fringillidae (the sparrows, towhees, etc.) find these two major requirements of habitat implanted on each other or mixed together in the same area. Under such conditions has developed the now well-known territory-holding behavior, of some generality among the group, though not as yet well charted for other than a few species.

The Seaside Sparrows of this locality often live where the two requirements are not always together or even meeting, but also where the feeding grounds and the nesting place are separated by a short distance. This way of living is of importance, and has introduced differences of behavior which will be set down later on.

For several years my experience with the species in nesting season was in the wide flat salt-marsh meadows where there was ample nest protection close to the desired feeding grounds. But in May 1933, on a trip to Cabbage Island, in the company of Gilbert Rossignol, Arthur H. Howell and Thomas D. Burleigh, we found the birds nesting in the head-high tops of the groundsel trees (*Baccharis halimifolia*) that rimmed the sand-shell ridge back of the outer beach. The birds did not feed near the nests at all, but commuted back and forth from the nest locality to the wet banks of the salt creeks some two hundred yards back in the island. After the significance of this mode of life began to be plain, some puzzling things were clarified.

Mr. S. A. Grimes has told me of his experiences with Scott's Seaside Sparrow (*A. m. peninsulae*). He found them nesting along a narrow ridge or low dike in bushes, and flying out into the marsh to feed. Though he made photographs from a blind, he noticed no appearance of territorial jealousy, and in one place found two nests a measured six feet apart. The reason for such a division of habitat is the flowing of the desired feeding grounds by the tides, making them unsuitable for nesting purposes.

The food requirements are far stronger than nesting needs in determining habitat limitations. For nests may be built in many different situations, may be composed of such material as is at hand, and vary from eight inches above the marsh mud in *Sporobolus-Paspalum* to three feet in *Spartina* or *Juncus,* and up to five feet in *Baccharis.* But because suitable food is not nearby, these birds have not been found nesting beyond commuting distance from the wet banks of the salt creeks (where *S. alterniflora* grows ranker), the ponds that head the creeks in the salt meadows, and the grass patches (*S. alterniflora*) of the outer beaches that are flowed by each tide.

In a number of places under observation over several seasons, changes of terrain due to the erosion of tides and storm, have brought coincident shifting of the Seaside Sparrow populations according to the feeding-ground limitations outlined above.

The preference is for some fairly thick grass in which to build nests. Granted sufficient density of cover, the preference probably runs in a *Sporobolus/Paspalum–S. alterniflora– Juncus– Baccharis* order. It will be noticed that this is in order of height of the nest host, from lowest to highest. Nests are not built in shrubbery unless other suitably protective plants are not near and of sufficient height to be above the tides.

Another point is that the nests are top-entrance nests, rather than the ground-entrance nests such as that of the Clapper Rail. In *Juncus* the nests are in the tangled mass of rushes far enough below the top to allow good cover, but not deeper. In *Baccharis* the chosen site is just below the thick leaves of the top, and not lower among the bare branches.

The nests are built of the softer grass blades of the vicinity, and when not covered by the natural foliage, are canopied. This canopy was more nearly complete where there were heavily incubated sets of eggs, so probably it is added to as incubation progresses. The growing grasses are woven into the canopy if available. Those nests naturally sheltered by the foliage in the tops of *Baccharis* are without canopy.

None but females have been found showing incubation patches, and some things seem to indicate a partial dissociation of the sexes during incubation, but it is extremely difficult to observe well the life of a species that spends so much of its time below decks, so to speak, in the thick cover it inhabits. The birds pop up at the least disturbance to see what it is all about, the males do their singing well out in sight, and both sexes come out into the open to fly directly to some desired point, yet much of their time is spent either directly on the marsh mud, or in the lower part of the grasses over it.

Other things hampering studies of this species are the heat, the hordes of flies and mosquitoes, and the remoteness of the colonies. No one need go to a Seaside Sparrow colony as I have known them, from April on through August, without expecting to be bitten by thousands of mosquitoes and flies. A stay of two hours to a visit has usually proved to be my own limit.

The nesting season here is very long. Incomplete sets of eggs have been found in late April, and young birds partly fledged have been seen in late August. The greatest number of nests have been found in June and nearly as many in May, but not so many visits have been made in July and August. The natural supposition would be that two or more broods are raised each year. Mr. S. A. Grimes has told me of finding a number of nests with eggs all in about the same stage of incubation, twice or more in a season, indicating that more than one brood has been raised. But lacking further proof, it is uncertain that this is always the case with a long nesting season. With favorable conditions of food and temperature over a long portion of the year, and with a species whose comparatively short migrations indicate that it has nearly optimum conditions for year-round residence, the long-drawn-out nesting season might be expected to approach that of some of the resident tropical species. Much more could be postulated about the effects of this on variation, but present knowledge does not warrant such speculation. It may be said, however, that the more stable New England *A. maritima* has a more sharply limited breeding season.

TERRITORY

My observations all point to a lack of territorial jealousy in the species. Territory is here considered to mean a behavior involving a nesting and feeding area, which is defended by one or both parents against others of their own, or of a highly competitive, species.

"Territory cannot mean just the nest spot when the adults feed in common; this may be 'nest territory,' but it is a very different

matter from a territory in its strict sense to which parents confine themselves during the breeding season. Again, the very essence of a territory lies in its exclusiveness; if a bird's range is not defended, it is not a territory" (Nice, 1933).

It seems that Seaside Sparrows do feed in common, sometimes in pairs, sometimes singly, just prior to the egg-laying time, and most probably at other times also. I have seen five pairs in a sparse patch of *Juncus* some fifty feet across, and could follow their course underneath by the notes, yet failed to notice any particular disagreement. Careful search failed to reveal any nests in this patch, but there were several about one hundred yards away, in the *Sporobolus-Paspalum.*

Neither does the song appear to be a declaration warning other birds away. The singing is done from a grass stalk well out in sight, and it is usual to see a bird leave its perch, fly a couple of hundred yards away over other singing males, there to alight and resume song. The singing is done close by the nest location and also on the feeding grounds. On one occasion two birds sang about fifty feet apart. There was no appearance of competition about it, and the songs were timed quite independently of each other. Then one bird went below in the grass, and after a minute the other flew over, perched nearby, sang for a minute, then went below too, and there was no evidence of other than tolerance for each other. Sometimes a bird is halfheartedly chased by another as it flies over, but there is no determination in it.

The flight song has been described by others, but it is noted that the singing bird, after towering into the air, often does not return to the point from which the song started (and which might be regarded as a focal point of territory), but drops down nearly to the grass tops, then levels off for a point some distance away.

It is not to be expected that colony-nesting birds have a territory in the strict sense, and the Seaside Sparrows have developed a semi-colonial nesting habit with feeding grounds within commuting distance, as described under 'Habitat,' where enough food is available so that no jealousy is necessary. This seems a good explanation for the lack of territory holding.

It would seem that territory as a basic pattern, may have developed where considerable numbers of the same (or a competitive) species struggled for individual survival, which in this particular direction centered on food for the nesting pair and their young progeny for a time. If this be true, then a parallel species which did not develop

such a pattern, may not have found a necessity for food jealousy during the nesting season, because their numbers were kept below the crowding point by lack of increase due to some destructive factor or factors. Or it might be, as in the present habitat, that conditions did not allow defense of the nesting and feeding ground, due to the distance between them. There are many destructive factors that might have prevented crowding, either by a periodical reduction or by a fairly constant effect. Storms that recur at intervals, possibly at nesting time, might be one. Disease or parasites might work in combination with other lethal factors. Certainly today the available habitat (if I have interpreted habitat needs correctly) is far from filled, yet we know of more colonies and more birds than ever before.

The Turtle Island colony (Beaufort County, South Carolina) contained from five to twenty-five pairs, over the last few years. On Jones Island (also in Beaufort County) one could walk around a circle one half-mile in radius and see two hundred birds at times; yet many miles of terrain that appeared equally favorable, contained very few (if any) birds. If lack of crowding has been the cause for lack of territory behavior, the condition must have continued for a long time.

Another bit of logical conjecture is whether territory holding was once established and is now decadent, or if the species (possibly all of the genus *Ammospiza*) never has developed such behavior. If there is a latent territory pattern now decadent in the species, then present habitat conditions must have come about after the territory pattern had developed. (In other words, former habitat conditions caused or favored the development of a territory pattern; these habitat conditions changed to those of the present time, and the pattern was no longer operative or needed.) On the other hand we might consider that present habitat conditions (plus a long-time lack of numbers) have been prevalent so long that a territory pattern never developed at all.

Let us suppose that a long time ago, the species already possessed a well-developed territory defense. Then changing conditions, of food perhaps, placed it in a range where the feeding grounds, though ample, were covered by tides each day so that nesting on them was impossible. But nearby a sheltered cover, limited in extent, offered suitable nesting protection above the tidal reach. Under such conditions might not the most strictly territorial of species develop a nesting tolerance, and find it impossible to guard the food areas as well as the nest vicinity? Today some of the range I know ap-

proaches such conditions. Under such a colonial nesting scheme, what part does song play in the life of the Seaside Sparrow? In Texas, where the mean tidal range is not much over one foot, does the same breeding behavior obtain, as in the Savannah River marshes, with a range of seven to ten feet?

Dr. C. W. Townsend, as quoted by Forbush (1929) gives a hint of similar grouping among the Sharp-tailed Sparrows: "The birds appear distinctly social. In some localities several pairs are often found breeding together, while other localities, apparently equally favorable, are deserted." Is it possible that the Sharp-tailed, as well as the Seaside Sparrows, developed their social behavior in lands subject to tidal overflow, and that Nelson's Sparrow (*A. c. nelsoni*) is quite a newcomer, comparatively speaking, to the more even water level of the inland marshes? The need of adequate local studies is apparent.

MIGRATION

The puzzling relationships have complicated the migration records greatly, and until more definite information is available as to what the birds from this locality look like in fresh plumage, and whether and how they differ from *A. maritima,* we may logically doubt many identifications of wintering birds; for certainly if the breeding birds are so little known, then the winter change of plumage, which is well known to be a long-drawn-out affair, may add extra doubts.

It is certain that the local colonies in the Savannah area, begin to be peopled with singing birds by late March, and the first wave appears to be all of males. A week or so later, there are females among them.

From these colonies in the salt-marsh meadows well back from the outer beaches, there is a withdrawal of juvenals as soon as they are fledged, and late August finds very few adults remaining. Probably some of these withdraw only a few miles to the places where *S. alterniflora* grows at its very best, and begins to flower. Juvenals have been found here in the striped plumage until November, but there is no certainty that these are local birds, for Wayne found many migrants in the striped plumage passing through Mount Pleasant, from August on through the autumn.

One juvenal taken near Savannah on August 31, 1933, and apparently stormblown about five miles west of the usual migration band, is very dark-backed, and agrees with the Wayne specimens of *macgillivraii* in that plumage. It must have come from the North Carolina coast, and had migrated several hundred miles when only a short time out of the nest. This, incidentally, is the only speci-

men I have found so far inland, in spite of a careful watch for them. The main migration band follows fairly closely the summer-habitat width.

Now Dr. Bishop (see letter previously quoted) says that he did not find the dark birds on Pea Island in winter, but that he did take the light (yellowish) phase. To me this can be explained only on the ground that the birds he took in winter were in reality not the same as the light breeding birds, but that they must have been wintering birds from farther north. In other words, this means that apparently no distinction could be made between the wintering birds and the light birds resident on the island in the breeding season. Surely one would not expect the dark breeding birds to leave Pea Island in the winter (along with the intermediates), and the light ones to stay. Perhaps *macgillivraii* should have been left in synonymy with *maritima.* Part way down the South Carolina coast, Wayne found the dark birds from late July on through the fall, winter and spring, but he found none at all in the breeding season. In my own series, are a few skins approaching the dark form, being much too blackish on the back for any of the local birds north to Charleston at least, and most of them were taken in October.

There are a few old records of *peninsulae* (= *macgillivraii*) from Sapelo Island, midway of the coast of Georgia, in winter (Allen, 1888: 426; and Brewster, 1890: 212). At that time *macgillivraii* was considered synonymous with *maritima,* and the range of *peninsulae* (itself a dark bird) was not yet understood to be on the west coast of Florida. Probably these winter records were correct, and the birds were migrants from the North Carolina coast. But a very similar bird (a breeding specimen) was collected some twenty years or more ago, on Amelia Island, at the northern edge of Florida, along with some other breeding birds of the light form.

After the Allen and Brewster records, the great storm of August 1893, destroyed many things all up and down the coast of Georgia and the Carolinas. For some years after that, there were very few records of nesting Seaside Sparrows from much of the area covered by the storm. Who knows what stock inhabited this area before the storm, and before other storms (there are records of several over the same area), or where the dividing line (vague even now) marked the extension of the dark form? Winter records of *macgillivraii* on the Gulf coast may well be in error.

The Wayne journals, now deposited in the Charleston Museum,

are full of interesting, if brief, comment on these birds. He often writes, "very dark," "intergrade," "with back very curious," "not typical," etc. Many of the specimens to which he referred are in his collection, and doubtless most of the others are in collections elsewhere over this country.

Since this paper was written, my attention has been called to a paper by Donald J. Nicholson, 'Nesting habits of the Seaside Sparrows in Florida' (Wilson Bull., 40: 225–237, 1928). Nicholson's paper is interesting and informative, and confirms rather than disproves the general conception of Macgillivray's Sparrow which I have tried to picture here.

ACKNOWLEDGMENTS

Mr. E. Burnham Chamberlain, Curator of the Science Department of the Charleston Museum, has twice critically read this paper, and has given much assistance otherwise. Mr. Don Eyles gave the botanical determinations; Mr. Gilbert R. Rossignol loaned correspondence with Wayne and others, and allowed access to his egg records; Dr. Louis Bishop loaned birdskins and gave permission to quote his letter to Rossignol, written some twenty-odd years ago; and Mr. S. A. Grimes read the manuscript and gave advice and notes from his experience with several races of Seaside Sparrows in Florida.

To all of these, my heartiest thanks are due. The conclusions here, however, are my own.

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EXPLANATION OF PLATES

PLATE 2

Dorsal views of skins of Seaside Sparrows.

UPPER ROW (left to right): Dusky Seaside Sparrow (*Ammospiza nigrescens*); Wayne's specimen of *Passerherbulus maritimus fisheri;* Cape Sable Seaside Sparrow (*Ammospiza mirabilis*).

LOWER ROW (left to right): Wayne's conception of *Passerherbulus* (= *Ammospiza*) *maritimus macgillivraii;* Wayne's conception of *Passerherbulus* (= *Ammospiza*) *maritimus maritimus,* a migrant in fresh plumage that compares well with typical New England birds; a Seaside Sparrow from Cabbage Island, Georgia, type locality of *Thryospiza maritima waynei,* an authentic breeding bird in worn breeding plumage collected by Gilbert R. Rossignol.

PLATE 3

Macgillivray's Seaside Sparrow (*Ammospiza maritima macgillivraii*) in typical habitat. Upper and lower-right figures show characteristic singing poses.

U. S. Dredge DeWitt Clinton
Savannah, Georgia