

## M E M O

TO: Supts. CAHA, CALO; and other interested parties

RE: Shorebird use at CAHA & CALO in fall migration, and related problems

DATE: 1 December 1973

FROM: P.A. Buckley, Research Zoologist, and F.G. Buckley, Collaborating  
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From the 1st to the 5th September, we surveyed shorebird (and to some extent, seabird) distribution in the CAHA/CALO area. The bulk of our work was done via 4-wheel drive vehicles, although we also went by boat to Portsmouth Id., by chartered fishing vessel out of Oregon Inlet to the Gulf Stream, and in the CAHA Lake Amphibious plane, overflow the entirety of CAHA and CALO, including a brief foray out to the vicinity of Diamond Shoals Light Tower. Because the duration was relatively brief, the survey was just that, not an in-depth, quantitative analysis. But from our 20+ years of experience with this group, we know we can generalize with great confidence on our findings.

We wish to acknowledge with extreme gratitude logistic and other, essential assistance from the following CAHA personnel: R. Barbee, R. Cheesman, N. Thorne, L. Whitehead, G. Jordan, and for his remarkable piloting skills, B. Ashworth.

## . OBSERVATIONS

(I) Gulf Stream: It is off the Outer Banks of North Carolina that the Gulf Stream makes its closest approach to any point on "mainland" North America, sometimes to within three miles of shore. As many species of birds with an essentially tropical distribution penetrate temperate latitudes in the Stream, in particular the rare and little-known Bridled Tern which has been recently reported from the Stream off Hatteras, we were particularly anxious to get out there at this time of year. A group of ornithologists from the Washington and Norfolk areas had chartered a fishing boat to leave from Manteo on the 2nd, which we joined. As predicted, upon approaching the edge of the stream at ca. 30 miles ESE of Oregon Inlet, the first Bridled Terns appeared, and we were able to confirm the identification. In the course of the day about 11 were seen, as well as numerous seabirds not thought to occur with any regularity off the Outer Banks before recent pelagic work began there last year. Included were several Audubon's Shearwaters, normally found only in tropical waters.

On the 5th, returning from CALO in the Lake, good visibility allowed us to detour at Cape Point and head out towards the Texas Tower on Diamond

Shoals. We were surprised but pleased to find that the Lake's ability to fly slowly and at low altitudes enabled us to not only find but to identify many seabirds, including another 8 Bridled Terns, some resting on a buoy near the Light Tower; most surprising was our observation of some 18+ sea turtles, probably Loggerhead, swimming on the surface of the water and observed at the Light Tower but also up to the surf at Rodanthe, where we again reached shore returning to Manteo. The Gulf Stream, clearly visible from the air as a sharp indigo-blue area neatly delimited from the green local waters, was that day only some 6-8 miles off Cape Point, probably visible from the Lighthouse. This might explain the presence of the sea turtles in such numbers.

We plan to publish on the occurrence of the Bridled Terns, as this is a major range extension for the species. In fact, the presence of a number of sub-adult, juvenile or other obviously non-breeding individuals (probably from Bahamas colonies, although collecting will be necessary to determine the racial origins of these birds) suggests that this species might spend a good deal of its pre-breeding time in the Gulf Stream. Just how far north in the Stream they go, and what if any seasonal changes in their abundance exist, remain to be elucidated. The same can be said of many of the pelagic birds now known to be regular, at least in summer and early autumn, off the Outer Banks.

The significance of Cape Point as a resting/staging area for terns in the Gulf Stream was discussed in the report of our June trip (MEMO, 9 July 73). However, during this trip practically no birds whatever were seen there, due to the extremely heavy dredging activity, as well as its destruction of pool/pond/flats habitat there.

(II) Inlet Use: (A) Oregon Inlet: owing to the length of the beach and adjacent flats on the north (prograding) side of the Inlet, this is a major site for migrating shore and water birds on the Outer Banks. About 20 species of shorebirds (i.e. oystercatchers, plovers, sandpipers, avocets, stilts and phalaropes) were seen on the flats and in the adjacent marshes in the short time we were there. Significant were counts of over 100 Willets in one flock, and some 25 Marbled Godwits in one flock-- the latter is a rather rare, large shorebird on the Atlantic Coast, and it can now be found regularly on the Oregon Inlet flats. Many observers come some distances to look for it there.

Greater numbers of terns should use that area as a resting place, but do not, owing to the extreme disturbance by vehicles and people. Fortunately, they are able to utilize good areas on spoil banks near Old House Channel and on Pea Id. NWR. Pelicans too must shift away from the beach to these less disturbed areas.

We also were disconcerted to notice that vehicles were even being driven across the *Spartina* marsh that now lies under the Bonner Bridge, and that the fencing around the experimental marsh area has been largely destroyed.

Vehicular, and to some extent pedestrian, traffic in this area is excessive in that there is no fishing, there are no areas accessible beyond the marsh by vehicle, and except for birds --- which concentrate in this immediate area --- there would seem little reason for people to wander through here. Swimming is also not possible.

We should also add that the marsh area under the bridge is now of good size, seems to be growing and provides extremely important habitat for very many birds, at all seasons of the year. In addition of course it has very many benefits for young fishes, for invertebrates, etc., and is the only marsh of any consequence at any of the three inlets we will consider in this report.

(B) Hatteras Inlet: just as it was during the breeding season, Hatteras Inlet, on both its north and south sides, was essentially devoid of birds. This is due to several factors: (1) the inlet's topography of deep water close to shore and almost no flats, in marked contrast to the other two inlets; (2) the extremely heavy vehicular and pedestrian (from vehicles and boats) traffic, as this is apparently an excellent fishing area; (3) the existence immediately nearby of several spoil islands, isolated to all but some portion of boat traffic, that provide excellent roosting and probably less than adequate feeding areas, judging from the paucity of shorebirds seen there.

(C) Ocracoke Island: (1) The Great Flats south of the village of Ocracoke proved to be as important for migrating shore and water birds as they did for breeding birds. Indeed, by providing habitat not available at the reasonably similar but less isolated Oregon Inlet (such as the extensive *Salicornia* flats, the sand flats themselves away from the water's edge, and the rich brown mud/marl that so many shorebirds favor), it is probably more valuable in this regard than Oregon Inlet. Certainly, the hundreds of terns roosting at Ocracoke Inlet (up to 8 or more species, including a possible Sooty, a tropical species reported by other observers that weekend) were in marked contrast to that group's almost complete absence at Oregon Inlet. And all these groups not only rested but fed actively in the area.

In the few days we made observations in this area, we recorded some 25 species of shorebirds: a respectable total for a whole fall's migration, let alone one place on one day. Included were several exceedingly rare birds: 5-6 Buff-breasted Sandpipers seen exclusively in the *Salicornia* portion of the Flats, and very rare on the Atlantic Coast; and a Long-billed Curlew, perhaps the rarest native American shorebird, and the largest, once occurring all along the Atlantic Coast, but extirpated in the latter part of the last century. It seems to be slowly regaining its (winter) range on the Atlantic Coast, although it was seen in Virginia for the first time this century only a few years ago, and we had never seen it in the East in our 20+ years' experience prior to this bird.

It was while studying the Buff-breasted Sandpipers and their exclusive predilection for the dry, sandy *Salicornia* portion of the flats, that we became aware of a peculiar effect of man's impact on the Flats, later confirmed spectacularly when we flew over the area in the Lake. It is that on the peculiarly spongy, water-retaining sands so characteristic of the deceptive and often treacherous Great Flats, vehicular tracks do not disappear as they would on dirt or on the beachfront. They remain, indelible records of off-the-road traffic that then collect standing water, whether from rain or from tidal surges/overwash on the extremely gradually sloping Flats. And in these myriads of wet depressions the *Salicornia* takes hold and grows at an abnormal density and in certainly abnormal patterns: parallel rows of automobile tracks going off in the distance, crossing and crisscrossing each other in a crazy-quilt pattern: hardly a natural beach by anyone's imagination. The effect is remarkably similar, at least casually, to vehicular tracks on Arctic tundra that have the same effect, and which seem, under the peculiar conditions of permafrost, to remain indefinitely. Just how long these artificial *Salicornia* "gardens" will persist is unknown to us, as is the effect of this strange vegetational modification on the area's ecology. It deserves serious and prolonged investigation.

Finally, we were both surprised and pleased to see that production of young Black Skimmers was still underway as late as early September. Several pre-flying young were seen running about on the Flats. We hope this was due to the area's ability of sustaining several broods per year, and not to their parents' having been washed out or disturbed by people or dogs, as we saw evidence of in June.

(2) The North Great Flats north and east of the road into the village of Ocracoke, or, opposite the town garbage dump, are not apparent or generally accessible to the average person. Nonetheless, on our overflight on the 5th we were able to evaluate them more fully, and were exceedingly impressed. They are a natural extension of the Great Flats, interrupted by the paved road running the length of the island. They seem to be fully as productive of shorebirds as the Great Flats, perhaps moreso in view of their isolation. In addition to broad mudflats teeming with shorebirds, including several more Marbled Godwits, they have extensive *Salicornia* flats that seem less disturbed by vehicular tracks than those to the south. They might provide an excellent natural control area for investigation of the track phenomenon. Extending north/east as far as Old Hummock Creek for at least a mile north of the ferry slip in the village, the North Great Flats are excellent habitat for shorebirds, and due to the relative obscurity of the roads leading into them, as well as the possible condition of those roads for ordinary two-wheel drive vehicles, they seem in less danger than the Great Flats. However, owing to the absence of sand dunes, it is unlikely that they have many, if any, breeding terns or skimmers. Adjacent marshes, however, ought to harbor significant Willet and possibly Forster's Tern populations.

(3) Near Hatteras Inlet this fall was a small temporary rainwater (probably; possibly also some tidal water) pool alongside the road near the ferry slip. The water was fresh to the taste, and one day was quite low, the exposed mud holding several species of fresh-water preferring shorebirds (including Stilt Sandpiper and Long-billed Dowitcher, both rather uncommon). A few days later the rains had covered all the mud and there were still shorebirds feeding in the pool, although now the small sandpipers had been replaced by the larger dowitchers and Stilts. Even a few Glossy Ibis had moved in. This sort of temporary, shallow, mud-filled rainwater/tidal pool is uncommon now on managed beaches; the many shorebirds that prefer, or are almost exclusively restricted to, such habitat are now forced into the few remaining areas available, such as Bodie Id. Lighthouse Pond, and Pea Id. NWR impoundments (see below).

Before artificial management of beaches, these ponds were far more frequent, as a consequence of low relief and many depressions, reduced vegetation, and rainwater/high tide/overwash water accumulations. They can still be seen in great numbers, full of hundreds and thousands of shorebirds, on Core Banks. They are now very rare in CAHA, but when they do appear hold species that would otherwise not stop in migration. They are usually of too short duration to allow wintering habitat, although a large natural area will have, at any one time, enough such pools with water or mud in them to sustain a considerable shorebird population.

(III) Portsmouth Island and the Core Banks: this trip was the first time we were able actually to set foot on this area, although we had overflowed it once before. We concentrated our efforts on the extensive bars/flats between Portsmouth Id. and the ocean, extending from Ocracoke Inlet to New Drum Inlet. [We overflowed the area all the way to Fort Macon, but could not make land trips at this time. Consequently we restrict our comments, generally, to the area north of New Drum Inlet.]

These flats, between the two inlets, are the most impressive shorebird flats we have seen on the entire Atlantic Coast from the Outer Banks to New England, with only two possible exceptions: Monomoy Id. on Cape Cod, and the Smith/Ship Shoal/Myrtle Is. complex near Cape Charles, Va. All three of these areas are inaccessible, natural beaches: not a happenstance. The flats have many virtues as shorebird habitat, among them: a wide variety of mud/sand situations, shallow, deep, and variously saline water, tidal and essentially stable. At virtually every location where there was some standing water/pools, there were hundreds of shorebirds and terns/gulls/skimbers, resting as well as feeding actively, all on the back (sound) side, as they normally are. In particular these concentrations were spectacular at the sites of recently-closed inlets such as Swash, Whalebone and Old Drum (running weakly at that time). It is here that feeding conditions resulting from rapid water flow are best; and with the total absence of human disturbance, birds were using the natural barrier beach in ways we have rarely ever seen before on this continent. The wide variety of habitat available also allowed easy movement to different areas with tidal changes, thus not forcing birds to resort to extensive periods of non-feeding roosting in marshes/on beaches during high tides: a valuable asset.

Time limitations imposed by the total unavailability of any vehicles on Portsmouth Id. precluded our ground examination of all but the extreme north end of Core Banks. Nonetheless, on the 5th when we overflowed the whole area, we were able to identify many species of gulls, terns, skimmers, Brown Pelicans, and shorebirds, including up to one dozen Marbled Godwits. Additional observations by some ornithologists from N.C. State University have shown this area to have some of the greatest species diversity of shorebirds on the entire Banks.

Most noticeable was the drastic contrast between areas north and south of New Drum Inlet. In addition to vastly increased vehicle use south of the inlet (with essentially NONE north), the presence of sprawling, untrammelled, frankly ugly fishing camps and drastic changes in the land's topography (arising from large salt marshes on the back side and reduced beach width) naturally divide CALO into two areas, north and south of New Drum Inlet. We were able to note clear differences in birdlife south of the inlet, with a large increase in herons, ibises and marsh birds (although not particularly shorebirds usually found in marsh pools, some quite extensive there) and an almost complete absence of shore- and water-birds. While we were unfortunately unable to examine Core Banks north of New Drum during the breeding season last year, the habitat is strikingly like that of the Ocracoke Great Flats, and coupled with the protection afforded by the island's inaccessibility and lack of vehicles, it ought to support large numbers of breeding gulls, terns, skimmers and shorebirds directly on the beach. This is the situation obtaining on undisturbed islands on the Eastern Shore of Virginia appearing very similar to these, but investigation should be made next June.

(IV) Pea Island National Wildlife Refuge: is a major area providing fresh/brackish water habitat on a vast scale in carefully managed impoundments. From the point of view of shorebirds, Pea Id. offers some of the best NWR habitat we have ever seen, ranging from very deep pools (the Old Pools) to wet fields (Old Fields) to shallow pools (the New Pools) to almost dry and damp grassless flats (New Fields). Consequently some species occur there and almost nowhere else on the Banks, except occasionally or in small numbers. These include, but are not limited to, Avocet (breeding nowhere else on the Atlantic Coast of North America), Black-necked Stilt (except for an isolated population in Delaware, the northernmost end of the species' range), Golden Plover, Baird's and Buff-breasted Sandpipers (in Fall migration only), etc.

The area is also a major roosting site for nearby breeding gulls, terns and skimmers, as well as wintering and migrating birds, that have been forced from their natural roost location at Oregon Inlet, as mentioned earlier. For example, during our brief visit there this fall, we counted 25 Caspian and over 100 Sandwich Terns roosting on Old Fields, as well as 5 Buff-breasted Sandpipers on those *Salicornia* flats again.

Thus Pea Id. is an integral part of the shorebird/waterbird ecosystem on the Outer Banks, and must be considered in all discussions of it.

(V) Bodie Island Lighthouse Pond: presents the same sort of scarce, shallow fresh/brackish water pool habitat that Pea Island does, but somehow seems to do it better or in a richer fashion. That small pond has the greatest species diversity of shorebirds of probably any similar area on the entire Banks, whether on a raw or on a pond-area basis. In our short stay this fall, we and several other observers recorded some 27 species of shorebirds on just this one pool! Among these were several recorded nowhere else on the Banks that week, some quite rare or extremely rare in North Carolina: 5 Hudsonian Godwits, up to 150 Long-billed Dowitchers, 2 Northern and 1 Wilson's Phalarope, 400+ Western Sandpipers, 50+ Avocets, 50 Stilt Sandpipers, etc.

There are other ponds superficially similar to Lighthouse Pond immediately to the north, many visible from Route 12, yet none ever has a fraction of the numbers and diversity of shorebirds it does. Not to be slighted are the immense concentrations of wading birds and waterfowl that also pour into, as well as breed at, that one small pond. Its importance cannot be overrated.

Investigation into the pond's richness is of paramount importance, as well as a complete survey of its other native inhabitants.

#### *RECOMMENDATIONS & COMMENTS*

(I) Cape Point area: (A) As we suggested following our breeding season survey, this important resting/staging area should be restored to its previous condition, with perhaps a concerted effort made to leave it in a condition where overwashing resulting in shallow, ephemeral pools will occur regularly. Gulf Stream seabirds would then use it regularly.

(B) Once so restored, the area would seem a natural one for boardwalk/tower trails around the pools, in much the manner as is done at Bodie Id. Lighthouse Pond, to allow visitors to observe the shore- and water-birds. Nature walks ought to be conducted in this area also.

(C) A Gulf Stream exhibit would seem a logical one for the Hatteras Lighthouse Visitor Center, stressing in addition to the fishes and invertebrates, the numerous seabirds found there and nowhere else so close to the shore of North America.

(D) Particular attention ought to be paid by the Park Service to examination of the effect of the Gulf Stream, including regular assessment of its inhabitants, on CAHA/CALO. To facilitate this end, we suggest that many amateur as well as professional ornithologists would be delighted (and in fact have already asked us if it could be arranged) to have available open (or head-) party-boats leaving from Hatteras and Oregon Inlets, and going out to the Gulf Stream. At present, exclusive chartering of a 6-man boat inhibits all but the very wealthy from such investigations.

(II) Inlets: (A) Oregon: (1) Restrict vehicles to marked tracks which are the best driving areas anyway. (See 9 July 73 memo on similar recommendations for Ocracoke Great Flats for other considerations).

(2) The entire marsh under Bonner Bridge should be closed to vehicular traffic (sic!). To this end, the simplest means would be to fence it off, leaving gaps/gates only wide enough to allow pedestrian access.

(3) There is good reason to suggest that the fencing be continued slightly west of the track along the sound side of the spit, all the way back to the point where the track crosses under Bonner Bridge at its base. This would fully protect these important shorebird flats from vehicles, but still allow pedestrian access, in the manner noted immediately above. Proce dures (2) and (3) would create a miniature "wildlife refuge" in this valuable area.

(B) Hatteras: No particular recommendations for this area are made, except that investigation of the peculiar "moss flats" immediately behind the dunes not far SW of the Coast Guard Station deserve investigation. We have not seen anything resembling them elsewhere.

Hatteras Inlet, free of any constraints on access and activity, might be a palliative to fisherman whose rights would be infringed upon by suggested changes at Oregon and Ocracoke Inlets.

(C) Ocracoke: (1) Great Flats: (a) As we suggested during the breeding season, the Flats ought to be fenced along the tracks. However, outside the breeding season fencing along the bay/sound side of the track along the edge of the sound would provide sufficient protection to birds using its rich mudflats.

(b) Otherwise, posted notices should restrict vehicles to the tracks only. As much of the sand-mud between the tracks is treacherous anyway, this would save a lot of people a lot of trouble.

(c) The *Salicornia* portion of the Flats should be completely off limits to all vehicular traffic in any event.

(d) Careful attention should be paid to cessation of tern/skimmer breeding activity before any breeding season restrictions are eased in favor of migrating/wintering bird area restrictions.

(2) North Great Flats: Insofar as this area seems exceptionally important to shorebirds in migration, and probably also in winter, and since it has relatively little vehicular traffic at present, we recommend that it be posted to exclude all vehicular traffic. There are large expanses of possibly fragile *Salicornia* flats, which deserve careful study along with those on the Great Flats, in the manner discussed under "Observations."

(III) Portsmouth Id./Core Banks: For the reasons enumerated earlier, we recommend that clear distinction be made between the banks/islands north and south of New Drum Inlet. The former is unspoiled and undisturbed, hence exceedingly valuable. The latter is already under rather heavy public use, and has appreciable settlement and resident vehicles. We recommend that Core Banks north of New Drum Inlet be designated some sort of Natural or Wilderness Area or Preserve: at least Class IV if not Class V, and possibly even as a unit of the National Wilderness Preservation System, although the motorboat restriction might present some problems there, as might Portsmouth Village itself.

What we wish to stress is that this area is unique, and must be kept that way, especially insofar as vehicles are concerned. If the birds breeding on the beaches are as we suspect, it will become even more imperative to keep this area intact and inviolate.

(IV) Pea Id. NWR: The refuge is managed by the BSF&W, and is thus practically speaking out of our hands for management purposes. But, it is within the statutory boundaries of CAHA, and as we have tried to point out, is an integral and key part of the avian ecosystem on the Outer Banks.

Consequently, we recommend that its management plans on a broad scale should conform to one for the entire Outer Banks, including most importantly, sound-side spoil banks. [We discussed spoil bank significance to Outer Banks breeding birds in our 9 July 73 memo.]

(V) Bodie Island Lighthouse Pond: (1) We suggest that very careful study be made of avian use patterns across all seasons at this extraordinary pond. Further, inventory and ecological categorization of all organisms, as well as its particular abiotic idiosyncracies, be made of the pond. Comparison should be made to adjacent ponds.

(2) Once these data are available, we suggest that a careful management plan be drawn up that manipulates/preserves the conditions necessary for this pond to be able to maintain optimal avian carrying capacity. In particular, water level and salinity need careful control.

(3) To facilitate observation of sections of the pond not visible from the single observation tower and the short boardwalk, we suggest that another tower be constructed at the end of a boardwalk leading from the first tower to the SW edge of the pond along the dike containing it. In addition, a small parking area along the main Road (Route 12) with a low tower would allow observation in the morning, when avian feeding activity is at its peak but when the sun is directly in the eyes of persons on the existing tower.

(4) A shorebird exhibit of heightened scientific content ought to be in the visitor center at the Lighthouse.

#### *SOME GENERAL COMMENTS AND CONCLUSIONS*

(1) Rarities, especially among shorebirds, were mentioned in this report not merely for their own sake but to make a point not too well-known outside certain ornithological circles: the better an area is for common birds, the more it will attract rare, unusual, vagrant species. The occurrence of these vagrants can be used effectively to gauge an area's importance to native birds, given certain limitations of course. Perhaps even more to the point is the duration of any bird's stay in a given area: the better it is, the longer they stay, seasonal factors considered. In the present case, for example, the Long-billed Curlew on the Ocracoke Great Flats was there for at least two months, possibly longer, fine testimony to the health of those Flats for shorebirds.

(2) Spoil banks were not investigated this trip, as our past experience indicates they have diminished significance to migrants, at least in terms of feeding: we admit we have not examined them as resting places. Nonetheless, they are vital to the breeding sea- and waterbirds of the Outer Banks, as we documented last summer. We are still planning to organize a small, informal conference of interested parties on the general topic of SPOIL BANK BIOLOGY, hopefully on Ocracoke in the first week of June 1974 when we can take participants out to occupied spoil banks of various types. We have also not investigated their value to wintering waterbirds, which should be done.

(3) This report constitutes the second part (Part I, breeding; Part II, [fall] migration) of a projected 3-part (Part III, wintering) survey of shore- and water-bird use of the Outer Banks. We hope to be able to complete the third part in the next few months.

(4) We wish to stress that it is imperative that a survey of colonially nesting shore-, sea- and water-birds on CAHA/CALO should be done annually, and should be budgeted for in the respective parks. While there might not always be Service personnel qualified for this task, there will never be a shortage of highly qualified amateur ornithologists who would be willing to undertake such an annual survey for the sheer pleasure of getting afield on the Banks --- especially at CALO --- at this time of year. We could supply several names as possible candidates.

But in any event, the Outer Banks hold such a significant percentage of colonially breeding birds in these groups on the Atlantic Coast --- at least one of them, Brown Pelican, officially endangered, and several possibly in danger, such as Least Tern --- that an annual inventory is an important responsibility in our management of these lands.

(5) We cannot stress enough the value of Core Banks north of New Drum Inlet, particularly when considered part of an integral unit with the south end of Ocracoke Id., as the Ocracoke Inlet area.

(6) Finally, we wish to make the point again, that insofar as these birds are concerned, the entire Outer Banks must be considered one integral unit/ecosystem, and any management plans for specific parts of that unit ought to be considered in the light of an overall management plan for the entire Outer Banks, regardless of whose jurisdiction individual segments might come under.

Respectfully submitted,

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