Winter Birds of a Small Tidal Estuary in Southeastern North Carolina

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There have been few studies of the winter bird life of the small tidal creek estuaries that occur along the southern Atlantic Coast. My home near Wilmington, New Hanover County, N.C., is on the south shore about midway up Pages Creek. This estuary covers approximately 30 acres. The section I observed was 0.4 of a mile long, and 0.25 of a mile wide at the downstream end. At my vantage point it was 0.12 of a mile wide, but narrowed to less than 50 yards upstream. Pages Creek opens to the Atlantic Intracoastal Waterway about 1 mile from Mason Inlet (Fig. 1). The tidal range of 4 feet insures that this estuary is mostly flooded twice daily and that twice daily extensive mud flats and oyster bars are exposed by the ebbing tide (Fig. 2 and 3). The primary vegetation of the marshes is *Spartina alterniflora.* Clams are abundant as are Blue Crabs (*Carcinus maenas*), Fidler Crabs (*Uca prignax*), and shrimp. Mullets (*Mulgie cephalus*), Spots (*Leiostomus xanthurus*), Pinfish (*Lagodon rhomboides*), Summer Flounder (*Paralichthys dentatus*), Bluefish (*Pomatomus saltatrix*), Blowfish (*Sphoeroides maculatus*), and many schools of small fish are among the available food. The focus of this study is the cyclic use of the mud flats and the creek margins at low tide and of the marsh waters at high tide.

METHODS

This study was conducted from January through March in both 1981 and 1982. Observations were made with binoculars and spotting scope from an elevated wooden pier extending into the estuary immediately behind my house. At least 4 or 5 days each week from January thorugh March, identified birds were recorded along with the tidal stage, bird activity, and location within the estuary. The gull flocks tend to use the part of the estuary farthest from my observation point, sometimes making specific identification impossible. Thus, all gulls are lumped, as also are the terns and the two yellowlegs.

To allow for a semi-quantitative evaluation of the resulting data (Table 1), I considered species that averaged more than 5 birds per observation period to be abundant, 1 to 5 birds were considered common, 0.1 to 1 uncommon, and less than 0.1 birds per period were considered sparse or rare.

The tidal cycle was broken into four periods: high ebbing (the first half of the falling tide), low ebbing (the last half of the falling tide), low rising (the first half of the flooding tide), and high rising (the last half of the flooding tide). Determinations were made by reference to local tide tables and from personal knowledge of the estuary.

RESULTS

Twenty-three species of birds in addition to gulls and terns were observed in the Pages Creek estuary ecosytem during the two winters of this study (Table 1). Most abundant was a mixed-species group of gulls, consisting primarily of Herring (*Larus argentatus*) and Ring-billed (*L. delawarensis*) Gulls, which regularly fed in the tidal

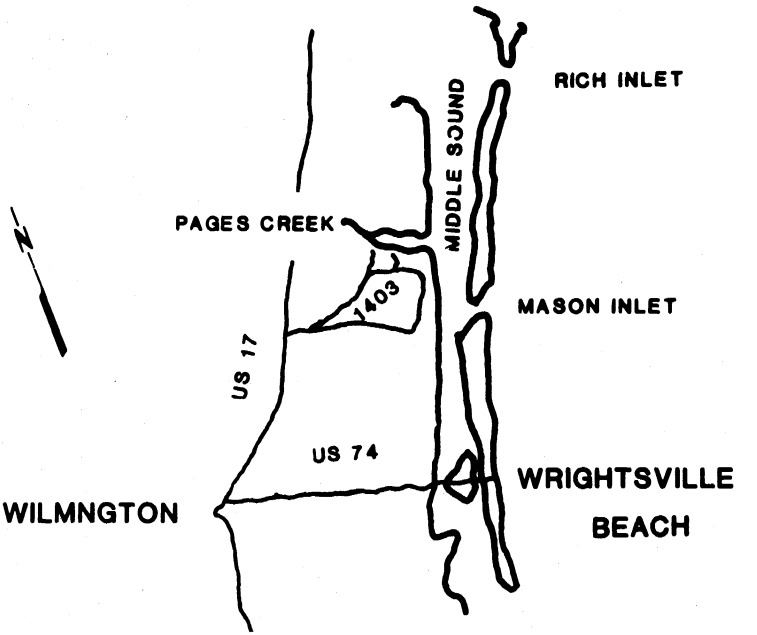

Fig. 1. The study area is about midway the Pages Creek estuary, just west of Middle Sound between Rich Inlet and Mason Inlet, New Hanover County, N.C.

creek that bisects the study area. Dunlin (*Calidris alpina*), Brown Pelicans (*Pelecanus occidentalis*), and Great Blue Herons (*Ardea herodias*) were also common and present regularly thorughout the study. All other species occurred in smaller numbers or at irregular intervals.

Figure 4 shows the relationship between tidal stages and the total numbers of birds of all species present. This graph clearly demonstrates that more birds use Pages Creek estuary on the low ebbing tide than at other stages in the tidal cycle. Some species, however, varied from this pattern, notably the flocks of gulls, which were usually most numerous on the high ebbing tide.

Birds that fed on the exposed mud flats and in the shallow water were the small shorebirds and the American Oystercatchers (*Haematopus palliatus*). The small shorebirds, Dunlin, Short-billed Dowitcher (*Limnodromus griseus*), Black-bellied Plover (*Pluvialis squatarola*), and yellowlegs (*Tringa* sp.) flew in on the ebbing tide to feed. The yellowlegs bobbed about with nervous motions and the Short-billed Dowitcher and Black-bellied Plover moved more slowly in their probing for food. Dunlin darted rapidly along the edge of exposed oyster beds and in the shallow water of the mud flats in their search for food. Oystercatchers fed on the oyster bars. Shorebirds arrived on the low ebbing tide and left as the tide began to flood.

The Great Blue Heron was the most common long-legged wader and was present during the entire tide cycle. Most often it was a solitary figure, head hunched in

Fig. 2. Pages Creek study area at high tide.

Fig. 3. Pages Creek study area at low tide.

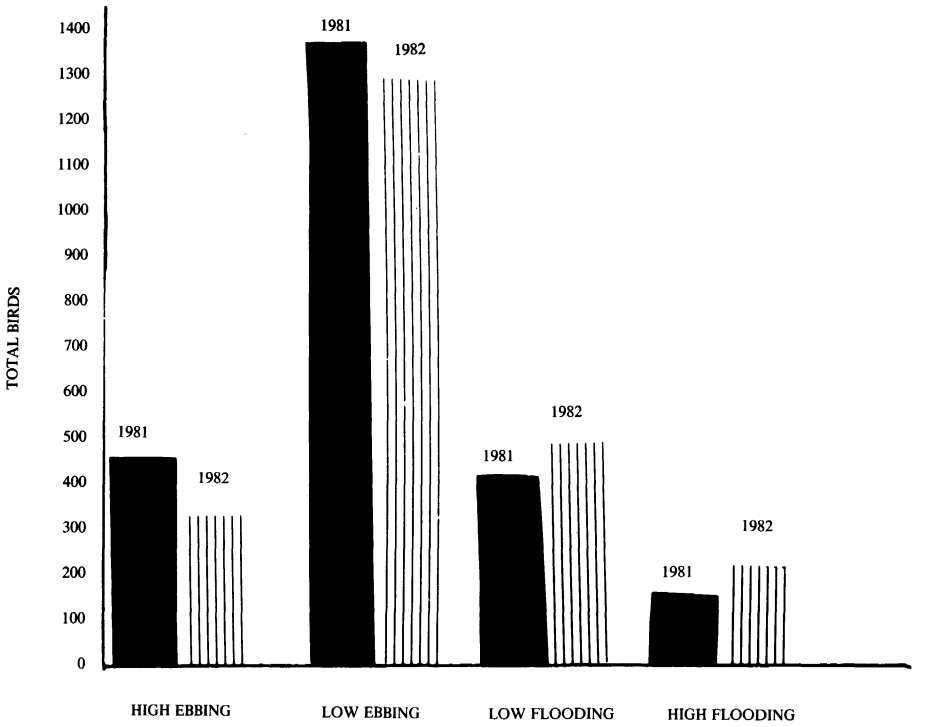

Fig. 4. Abundance of birds in the Pages Creek estuary over the tidal cycle, January through March, 1981 and 1982.

shoulders, backed against the marsh grass. When the mud flats began to show, the heron moved to the oyster bar or the water's edge, to fish and feed.

The Great Egrets (*Casmerodius albus*) sometimes came in flocks, but often just two or three together. These waders also stood against the marsh grass. As the tide ebbed, they changed position to feed and fish. Infrequently, the Great Egrets roosted in the trees by the banks of the creek.

Only one Little Blue Heron (*Egretta caerulea*) was present at a time. It regularly fed along the creek margins in the shallow water and at the edge of the oyster bars as the tide began to ebb.

Green-backed Herons (*Butorides striatus*), Snowy Egrets (*E. thula*), and Tricolored Herons (*E. tricolor*) were sparse. The Green-backed Heron hunted from the water's edge, leaning forward to strike at passing prey. Sometimes it moved farther into the pools of water. The Snowy Egret and the Tricolored Heron fed on the mud flats, darting back and forth in the shallow water.

The White Ibis (*Eudocimus albus*) always came in flocks. When the tide was quite low and the mud flats fully exposed, they fed by probing in the mud. They have not reappeared on Pages Creek since the winter of 1981.

TABLE 1. Abundance of winter birds of Pages Creek, New Hanover County, N.C.

	Total birds observed		Observed per day			Abundance category
Species	1981	1982	1981	1982	Average	
Gull species	807	1232	12.42	14.37	13.50	Abundant
Hooded Meganser	418	214	6.43	2.49	4.19	Common
Dunlin	152	178	2.34	2.07	2.19	Common
Brown Pelican	78	194	1.20	2.26	1.80	Common
Great Blue Heron	77	85	1.18	0.99	1.07	Common
White Ibis	145	0	2.25	0.00	0.97	Uncommon
American Oystercatcher	40	104	0.62	1.21	0.95	Uncommon
Mallard	16	97	0.25	1.13	0.75	Uncommon
Tern species	34	63	0.52	0.73	0.64	Uncommon
Short-billed Dowitcher	52	39	0.80	0.45	0.60	Uncommon
Great Egret	25	55	0.38	0.64	0.53	Uncommon
Yellowlegs species	50	25	0.77	0.29	0.50	Uncommon
Little Blue Heron	24	9	0.37	0.10	0.22	Uncommon
Osprey	9	4	0.14	1.05	0.09	Sparse
Red-breasted Merganser	6	7	0.09	0.08	0.09	Sparse
Black-crowned Night-Heron	0	7	0.0	0.08	0.05	Sparse
Black-bellied Plover	2	3	0.03	0.04	0.03	Sparse
Snowy Egret	3	0	0.04	0.00	0.02	Sparse
Wood Duck	3	0	0.04	0.00	0.02	Sparse
Green-winged Teal	2	0	0.03	0.00	0.01	Sparse
Tricolored Heron	0	2	0.00	0.02	0.01	Sparse
American Bittern	1	0	0.01	0.00	0.01	Rare
Northern Harrier	1	0	0.01	0.00	0.01	Rare
Green-backed Heron	0	1	0.00	0.01	0.01	Rare

Herring, Ring-billed, and Bonaparte's (*L. philadelphia*) Gulls were present in great numbers throughout the study. Laughing Gulls (*L. atricilla*) did not appear until mid-March. Approaching storms produced hundreds of gulls in the creek area. They came in on all tides: Herring and Bonaparte's Gulls on the high ebbing tide; Ring-billed Gulls more frequently on the low tides. They fed from the oyster bars, from a swimming position, and by probing in the mud.

Forster's Terns (*Sterna forsteri*) appeared in small numbers with the gulls. They hovered and dove for their food. They fed most commonly on the low tides. Common

Terns (*S. hirundo*) were absent most of the winter. Two early spring migrants appeared in March.

Brown Pelicans came in small numbers—sometimes a single bird, or as many as six. They flew high and dove into the water to feed. The pelicans sometimes flew in formation and dove together. They loafed on the oyster bars or preened themselves on the pilings beside the dock.

The Osprey (*Pandion haliaetus*) arrived punctually each year about 1 March. This bird flies very high above the creek, hovers, and then dives for its food. The Ospreys nested in a bare tree across the creek from my house.

The most numerous ducks of Pages Creek were the Hooded Mergansers (*Lophodytes cucullatus*). They came in numbers from a few to groups of 30 to 50. Red-breasted Mergansers (*Mergus serrator*) were sparse. Mergansers dove for their food, completely submerging and coming to the surface some distance from this point. They came most frequently on the high and low ebbing tides.

Several Mallards (*Anas platyrhynchos*) were present during the entire tidal cycle but most frequently on the low ebbing tide. They fed on vegetation by up-ending in shallow water. They may have been feral birds.

Rare visitors were a Green-winged Teal (*A. crecca*) and three Wood Ducks (*Aix sponsa*), all present on the high tides.

Another rare visitor was an American Bittern (*Botaurus lentiginosus*) seen sitting in a frozen position in the marsh grass with its bill pointed skyward.

The Northern Harrier (*Circus cyaneus*) was seen once hovering over the marsh grass, but the marshes within the study area apparently are not extensive enough to attract this species regularly.

CONCLUSIONS

In winter, birds are most numerous on Pages Creek on the low ebbing tide (Table 1). The abundance of birds in the study area varies according to the food resources available at the different stages of the tide cycle. The greatest numbers of birds are present during the low ebbing tides because the low water exposes extensive mud flats and oyster beds. Although some shorebirds and long-legged waders retreat to the marshes and shallow waters at the edges of the creek when the flooding tide covers the mud flats and oysters beds, most leave the estuary. Bird activity reaches its low point during the high flooding tide, but as the high tide begins to ebb, gulls and other species that dive for fish or feed from the surface of the water become numerous in the estuary.

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