

No. 4 (female) bands, but these were not available. Before the supply of No. 5 bands was exhausted, 100 godwits were banded, leg-streamered, color-marked with orange paint, and then released.

That evening flocks of godwits with marked birds among them were observed flying over the bogs west of St. George Village. By the next day all but a few had left. The New Zealand recovery is the only one to date.—(*Paper No. 40—Pacific Ocean Biological Survey Program.*) ROBERT L. DELONG, *Pacific Ocean Biological Survey Program, Smithsonian Institution, Washington, D.C.* AND MAX C. THOMPSON, *Southwestern College, Winfield, Kansas, 26 April 1968.*

**“Ploughing” for fish by the Greater Yellowlegs.**—A feeding method employed by the Greater Yellowlegs (*Totanus melanoleucus*), but not by the Lesser Yellowlegs (*Totanus flavipes*), is “ploughing” the water in pursuit of fish. Rowan (*Brit. Birds*, 23:2–17, 1929) described it thus: “The species never probes and is frequently to be seen running through the water and skimming the surface with its bill . . . the bill being pushed along steadily forwards.” (p. 15). According to Witherby (*Handbook of British birds*, vol. 4:336, 1940) similar behavior is exhibited by the Greenshank (*Totanus nebularia*), and Lacey (*Brit. Birds*, 37:217, 1944) said further of the Greenshank, that “On five occasions . . . its whole head and body were under water, so that all that was seen was its tail moving along, sometimes at considerable speed.”

I first observed and photographed ploughing behavior by the Greater Yellowlegs in 1964 at the Cheyenne Bottoms of central Kansas. There, at 6:00 AM on 5 September, two birds were walking in a shallow, turbid channel bordered by extensive sedge flats. Repeatedly they ran forward, cutting the water with the lower mandible for periods of one to seven seconds. The birds were attracted to surface ripples produced by concentrations of fish; they ran toward and ploughed through these ripples when they appeared. The birds changed direction at times while ploughing, but the usual movement was a straight forward rush. I saw no food being taken. Lesser Yellowlegs feeding nearby kept closer to the sedges and walked about, making repeated single stabs at the water's surface.

On 6 September a lone bird fed near the middle of a roadside ditch containing muddy water between one and two inches deep. A number of times the bird ran forward with its bill open, the lower jaw submerged and the upper jaw above water (Fig. 1A). It also fed by drawing the opened bill to one side and back again through the water. On the next day a bird was feeding in the same spot, running after fish whose presence was revealed by surface ripples. This bird ploughed briefly several times, but eventually caught a fish by simply picking it up. The fish was about as long as the bird's bill and quite flat-bodied. After about seven attempts, the bird finally swallowed it with a single flick of the head.

I again observed Greater Yellowlegs ploughing in clear, shallow water at the southern end of Assateague Island, Virginia, on 29 September 1966. The site was a channel with exposed mud bars supporting some short sedge and other herbaceous plants. Two Greater Yellowlegs were accompanied by about twenty Lesser Yellowlegs. The latter walked on the mud bars and in the water, pecking or briefly probing. By contrast, the Greater Yellowlegs kept largely to the water and walked or ran, at times abruptly changing direction. Although I was unable to see fish or surface disturbance during much of their feeding, the birds sometimes ran 10 or 15 feet in a straight line to a spot where they made a stab or a short ploughing motion in the water. At times the

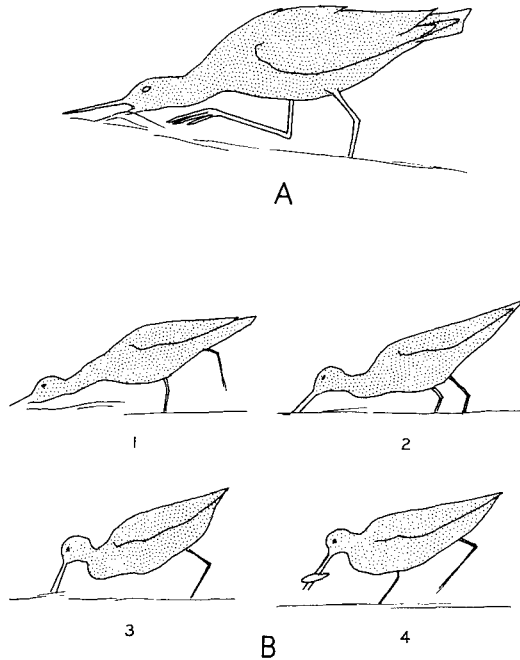


FIG. 1. A.—Greater Yellowlegs ploughing the water while running (drawn from photograph). B.—Greater Yellowlegs catching a fish by ploughing (drawn from successive motion picture frames taken at 30 frames per second).

fish were evidently all about the wading bird, which alternately raised its head, looking down, and stabbed periodically at the water or swept its slightly opened bill sideways. Both of the Greater Yellowlegs engaged in ploughing, covering distances of up to 10 feet with the bill or much of the head submerged. One bird caught a small fish while ploughing (Fig. 1B) whereupon it ceased ploughing and swallowed the fish. The path of ploughing was sometimes straight; at other times the birds turned at right angles toward a mudbar, and once completely reversed direction within less than a second. Changes in direction occurred most often when the head was submerged as if the bird were following groups of fish by sight.

Ploughing by the Greater Yellowlegs shows some resemblances to skimming by the Black Skimmer (*Rynchops nigra*). Both feeding methods sample the food source by cutting the water in simple patterns, relying on chance contact with prey. Both species may also use visible evidence of fish concentrations to direct the ploughing or skimming. Both cut the water with open jaws, at times throwing up a wake from the bill or head. The skimmer doubles its head under its body upon striking prey or an obstacle; I did not observe this in the Greater Yellowlegs. Pursuit of individual fish by a bird with its head underwater is not known in the Black Skimmer.—RICHARD L. ZUSI, *Division of Birds, U.S. National Museum, Smithsonian Institution, Washington, D.C. 20560, 3 November 1967.*