

of the pine tree where they waited to be fed. After being fed they sat on the limb close together. They followed this pattern of activity of flying down to the ground and then back to the tree for several days. As they gained strength, they flew around the house and perched on the limbs of an avocado tree. Here the adult fed them and often both adults would sit on the bare limb with the three young. On May 2 the young were fully fledged and flying around with the adults.—C. V. DUFF, *Hollywood, California, April 10, 1951.*

Fishing Efficiency of the Black Skimmer.—In the past fifteen years the writer has from time to time taken detailed notes on the fishing activities of several species of birds in the delta region of the Rio Grande in Cameron County, Texas. Some of the data concerning the Black Skimmer (*Rynchops nigra*) were examined recently and found to contain material that might be of general interest. Consequently, the following notes are offered in the hope that they may be of use to others making more specialized studies.

The Black Skimmer obtains its food by "skimming." The bill is held open at an angle of about 40°. Most of the mandible is immersed in the water as the bird flies along at almost exactly 18 miles per hour. The wings almost touch the water on the down stroke and the spray thrown up by the "plowing" mandible may spread over an area greater than that of the bird itself. While skimming in shallow water, mud ripples or other obstacles are frequently hit with such force that the head of the bird is jerked back rather abruptly. A less decided jerk is observed when the mandible strikes a fish. When this occurs, the bill is snapped shut and the catch is instantly raised out of the water. Very tiny minnows may be swallowed at once but the bird flies for some time with most "fingerlings." When fish of five or six inches are caught, the bird carries them (frequently pursued momentarily by other skimmers) to the shore and manipulates them on the ground until they can be properly oriented for swallowing.

The efficiency of the skimming was found to vary greatly. Birds were observed to visit a given spot repeatedly in the course of an hour although no fish were caught on any visit. When negative results were obtained after seven to ten minutes skimming, the birds usually departed; however, others might replace them at the poor location almost immediately. On the other hand, when good fishing was discovered at a place, the birds would skim for much longer periods and usually fished in the area until they had caught all the food they wanted. However, after catching one or two fish, birds sometimes left places where, at the time, there was a good school of fingerlings. No reason for such action was apparent. At times a new arrival at a good location would leave before making a catch or discovering the quality of the place. It was not discovered whether or not the same birds frequented the same places daily, but from comparative numbers present on different days it was thought quite likely that a pattern was followed by the birds and that places which proved to be good one day were visited again and again even though fish were absent most of the time. Apparently most of the places visited on any one day are unproductive.

Study areas were selected where the Skimmers worked parallel to the line of travel which could be followed by the observer. Data were recorded by an assistant while I watched with binoculars.

The maximum efficiency was observed on July 11, 1937, at the north cayo of Laguna Atascosa, 16 miles northeast of Harlingen. A small inlet which had been dry for some weeks had just been flooded to a depth of several inches by slowly rising water. The inlet was so small that the observer could keep the whole study area in the field of view at one time, and the birds could be watched so closely that it is believed that there was no chance of missing even the smallest catch. Here one fish was caught for each 6½ minutes of skimming time.

The maximum observed results for some other species were as follows: a White Pelican caught three fish in one minute; a Reddish Egret caught fifteen small minnows in three minutes, while a Least Tern fishing at the same place at the same time required four minutes to catch one fish, although several other fruitless dives were made.

While the foregoing notes were based on somewhat scattered observations, they did extend over a period of years and it is thought that the results should indicate roughly the relative efficiency of the species. If that be true, it follows that the Black Skimmer is much less efficient at fishing than wading and swimming birds such as the Reddish Egret and White Pelican and that it compares more favorably with diving birds such as the Least Tern.—L. IRBY DAVIS, *Harlingen, Texas, January 29, 1951.*