

cens). The shift from suckers during the laying period to perch when the chicks were being raised probably reflects the diminishing availability of suckers to the Herring Gull. The migration and spawning of suckers in creeks took place mostly in May and early June 1971.

BREEDING RANGE

The author (1970a) reported Herring Gulls breeding in Alberta at Bistcho Lake (59°43' N; 118°40' W) and at Lower Therien Lake (53°54' N; 111°23' W) in 1967 and 1969, respectively. In 1972, I observed one pair of Herring Gulls nesting on Dog Island (55°19' N; 114°49' W) in Lesser Slave Lake; six pairs on two reefs (54°51' N; 112°00' W) in Lac La Biche; and one pair, as in 1969, at Lower Therien Lake in Alberta. In Saskatchewan, Herring Gulls were observed nesting at Primrose Lake (54°58' N; 109°42' W) in 1967 and at Cumberland Lake (54°07' N; 102°18' W) in 1970 (Vermeer 1970b, 1971). In Manitoba, Herring Gulls were observed nesting at Pelican Lake (52°25' N; 100°20' W) and at the southern half (50°49' N; 98°37' W) of Lake Manitoba (Vermeer 1970a). Figure 1 shows the southern boundary of the breeding range of Herring Gulls in the Canadian prairie provinces, as observed by the author; this is considerably south of the breeding range of Herring Gulls as shown by Godfrey (1966). It can be seen from figure 1 that the breeding range of the Herring Gulls coincides with the distribution of the larger lakes in the Canadian prairie provinces. Many lakes in this region are commercially fished and many streams associated with those lakes are used by fish to spawn. Commercial fishing and the spawning of

fish in shallow streams may assist the Herring Gulls to scavenge on dead, diseased, and incapacitated fish. The restriction of Herring Gulls to this large lake region may therefore be related to their scavenging habits.

The author thanks J. S. Nelson for his assistance with the identification of fish.

LITERATURE CITED

- AMERICAN ORNITHOLOGISTS' UNION. 1957. The A.O.U. Check-list of North American birds. A.O.U., Baltimore. 691 p.
- GODFREY, W. E. 1966. The birds of Canada. Bull. 203. Biol. Ser. 73. Nat. Mus. Can. 428 p.
- MENDALL, L. M. 1935. The relationship of certain sea-birds to the fishing industry of the State of Maine. Bull. Dept. Sea and Shore Fish. Maine. 27 p.
- PIMLOTT, D. H. 1952. The economic status of the Herring Gulls of the Grand Manan Archipelago. New Brunswick, 1949. Wildl. Mgmt. Bull. No. 5. 76 p.
- VERMEER, K. 1970a. Breeding records of Herring Gulls in Alberta and California Gulls in Manitoba. Can. Field-Nat. 84:182.
- VERMEER, K. 1970b. Colonies of Double-crested Cormorants and White Pelicans in Saskatchewan. Can. Field-Nat. 84:39-42.
- VERMEER, K. 1971. A survey of mercury residues in aquatic birds eggs in the Canadian prairie provinces. Trans. N. Amer. Wildl. Nat. Resources Conf. 36:128-150.

Accepted for publication 14 November 1972.

CATTLE EGRETS IN NORTHERN MÉXICO

DALE A. ZIMMERMAN

Department of Biological Science
Western New Mexico University
Silver City, New Mexico 88061

In sparsely vegetated desert country 9 miles W of Bermejillo, Durango, México, Marian Zimmerman, Allan Zimmerman, and I observed from our automobile two Cattle Egrets (*Bubulcus ibis*) on 24 November 1971. The birds foraged within 10-30 m of the roadway, evidently for grasshoppers, in a plant association dominated by creosote-bush (*Larrea*), scattered yuccas, various cacti, and other xerophytes. We saw no domestic animals in the vicinity. Later in the day, we encountered five Cattle Egrets foraging together among low mesquites, acacias, agaves, and ocotillos on the desert 2 miles W of Paila (ca. 17 miles N of Parras), Coahuila. These birds actively pursued grasshoppers; one fed in a shallow ditch about 4 m from the road, providing excellent views. Shortly after dawn on 25 November, 3 miles farther W, we found what appeared to be the same five Cattle Egrets roosting together in the top of a low, thorny leguminous shrub, asleep in the heavy fog. We saw no others during the remainder of the day as we worked in the desert between this point and Torreon, and we did not locate the birds the following day.

Although we found no herons at the above localities

during our visits a month later, we saw scattered groups and a flock of approximately 80 Cattle Egrets on 31 December 1971, in dry fields and semi-desert grassland W of Torreon, Coahuila. During December 1972 we again recorded Cattle Egrets in Coahuila as follows: 50 with cattle near Torreon, 16 December; 1 feeding on grasshoppers in a vacant lot in Viesca (ca. 40 mi. W of Parras), 18 December; and 4 in a field at Arteaga, 21 December.

On 16 December 1972, in the state of Chihuahua, we saw groups of 6 and 8 birds 42 mi. S of Chihuahua City, plus a single individual at a pond 8 mi. N of the Durango state line along Highway 49. In Nuevo Leon we recorded a flock of 15 near Rayones, 22 December, and 1 bird 18 mi. N of Dr. Arroyo on 31 December. In San Luis Potosí we noted the species daily in late December 1972, including 2 in dry fields 5 mi. S of El Salto Falls, 25 December; another 20 mi. S of Antiguo Morelos; and 3 near Valles, 26 December.

There was no opportunity to secure specimens at the time of the above citations. However, during the past two decades we have seen thousands of Cattle Egrets on three continents, and we have studied and photographed them on numerous occasions. In our cited Mexican observations the characteristic posture, head shape, soft-part colors, and buffy feathers on the crowns and chests of certain individual birds all were seen clearly.

Bubulcus ibis continues to spread in southern Middle America (Leck and Hilty 1970; Orians and Paulson 1969) and in western South America (Post 1970). A decade ago, Wolfe (1961) recorded Cattle Egrets in

Tabasco and Tamaulipas, México. Denham (1959) reported the species from Cozumel Island, Quintana Roo. Alden (1969:55) stated that the first Cattle Egret found in western México was seen south of Culiacán, Sinaloa, 22 March 1964. However, Dickerman (1964) recorded that V. Heig saw two and collected one north of Acapulco, Guerrero, 12 March 1964. Hubbard (1966) found them in the Pacific lowlands of Chiapas in 1965. Hubbs (1968) documented their presence in Baja California in 1964 and 1967, and cited a personal communication from E. N. Harrison to the effect that this species was "becoming rather common near the west coast of México." Dickerman (1964) found them breeding in Veracruz and wrote that the birds were widespread in the lowlands of the southern part of that state and Tabasco. He further wrote that they were "spreading into the more arid interior of the country . . ." citing records from Chiapas, Campeche, Yucatán, Puebla, Morelos, and México. We have seen the species regularly in southern Tamaulipas in spring, fall, and winter since 1970 (maximum: 60 birds near El Limon, 29 March 1971) and we suspect that they breed there.

I am not aware of previous reports of Cattle Egrets from inland localities in the northern part of the Republic. The temporary presence of these herons west of the Sierra Madre Oriental in Nuevo Leon, and in the deserts of Coahuila, Chihuahua, and Durango, suggests the possibility of transcontinental movement. (We found no Cattle Egrets in these states during several days of field work in late March and early

April 1972.) Perhaps the Californian and northwest Mexican records of the species are not entirely the result of northward movement along the Pacific Coast as some of us had heretofore assumed.

LITERATURE CITED

- ALDEN, P. 1969. Finding the birds in western México. Univ. Arizona Press.
- DENHAM, R. 1959. Cattle Egret (*Bulbucus ibis*) on Cozumel Island, Quintana Roo, México. *Auk* 76: 359-360.
- DICKERMAN, R. W. 1964. Cattle Egrets nesting in México. *Wilson Bull.* 76:290.
- HUBBARD, J. P. 1966. The Cattle Egret on the Pacific coast of Chiapas, México. *Wilson Bull.* 78:121.
- HUBBS, C. L. 1968. Dispersal of Cattle Egret and Little Blue Heron into northeastern Baja California, México. *Condor* 70:92-93.
- LECK, C., AND S. HILTY. 1970. New and interesting records from the Chiriquí Highlands of Panamá. *Condor* 72:105.
- ORIAN, G. H., AND D. R. PAULSON. 1969. Notes on Costa Rican birds. *Condor* 71:426-431.
- POST, P. W. 1970. First report of Cattle Egret in Chile and range extensions in Peru. *Auk* 87:361.
- WOLFE, L. R. 1961. Cattle Egret in México. *Auk* 78:640-641.

Accepted for publication 20 December 1972.

SOME FACTORS AFFECTING FORAGING BEHAVIOR OF PLAIN TITMICE

STEVEN DAVIS, BETTY S. DAVIS, AND JOHN DAVIS

Hastings Reservation
University of California
Carmel Valley, California 93924

Between 6 January and 25 February 1968, we investigated the effects of certain factors on the foraging behavior of two Plain Titmice (*Parus inornatus*) at the Hastings Reservation, 2.5 miles E of Jamesburg, Monterey County, California. Using a feeding tray and whole sunflower seeds, special attention was paid to position of tray, seed size and pattern, and preference among seeds dyed different colors.

MATERIALS AND METHODS

A wooden tray measuring 61 × 14 cm, with a rim 1.27 cm high, was nailed horizontally to two wooden posts, with the tray surface 1.32 m above the ground and with its nearest edge about 1.22 m from an observer inside a screened porch. The feeding surface was divided into five equal parts by penciled lines. For color preference tests, sunflower seeds were dyed red, yellow, green, or blue with food colors dissolved in boiling water. They were drained on paper towels and oven-dried. Undyed (natural) seeds used as controls were immersed in plain boiling water and dried in the same way. Untreated seeds were used in all experiments save those involving color. To eliminate possible effects of seed size, only seeds measuring 14-15 mm long were used except in the trials of size preference.

THE BIRDS

The two titmice involved could be differentiated readily since one (Bird A) was noticeably larger than the other (Bird B). A was dominant over B; in 16 encounters, A chased B 14 times and was chased by B twice. Of the 1145 trips to the feeding tray made by the two, A made 810 (71%) and B made only 335 (29%). As a result, samples of choices made by B in particular tests were often too small to support meaningful statistical analysis. Since A dominated B, the latter's foraging behavior was undoubtedly influenced more by the presence of the other bird than was A's. Further, since A took many more seeds than did B, the influence of A's foraging on the availability of seeds to B was much greater than the reverse. For these reasons, A provided more reliable information although in most cases both birds showed similar preferences in choice tests.

RESULTS

Effect of tray position. Initially, the tray was placed with its short axis parallel to the porch; section 1 was nearest the observer and section 5 farthest from him. Five untreated seeds were placed in each section and the "order of removal" was noted. If all the seeds in one section were removed first by the two birds, that section would have a score of 15 (1 + 2 + 3 + 4 + 5); if all were removed from one section last, the score would be 115 (21 + 22 + 23 + 24 + 25). Three trials were made and the average scores were: section 1, 113.3; section 2, 90; section 3, 64; section 4, 42.3; and section 5, 15. This is a highly significant deviation from a random distribution ($\chi^2 = 90.65$; $P < 0.001$). The birds were, without exception, first taking the seeds farthest from the observer and then, with few exceptions, working their way toward him. For both birds there was a very high rank correlation