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## OBSERVATIONS ON THE NESTING BIOLOGY OF THE LONG-BILLED CURLEW

Dennis M. Forsythe<sup>1</sup>

ABSTRACT.— Observations were made on four nesting attempts by Long-billed Curlews (*Numenius americanus*) in 1965 and 1966 in Box Elder and Cache Counties, Utah. The location, nest composition, and number of eggs of each nest are presented. In one instance eggs were laid at intervals of forty-eight hours or less. Data on weight and measurement and color of eggs are given. Data for the only two completed nests indicates incubation periods of twenty-seven and twenty-eight days respectively. The distraction display of the incubating family is described for the first time.

Both Palmer (1967) and Graul (1971) emphasized the lack of information on the breeding biology of the long-billed curlew (*Numenius americanus*). For this reason the following nesting data are presented on four pairs of curlews gathered during the 1965 and 1966 breeding seasons in Box Elder County and Cache County, Utah.

On 15 May 1965, Jack Andersen discovered a curlew nest in a grass pasture, elevation 4500 ft, situated on a bench representing the shoreline of old Lake Bonneville, two miles N of Mendon, Cache County. The nest consisted of a grass-lined depression with an inside diameter of 190 mm, which was located in a clump of grass (Gramineae) and sedge (Cyperaceae). When found, it contained two eggs whose color and pattern were as described by Reed (1965:125) and Bent (1929:101). At 17:45 on 17 May, I visited the nest and found three eggs which I color-marked. Between 17 May and 23 May, when the nest was destroyed by a farm tractor, no additional eggs were laid. Palmer (1967:183-184) gives a clutch-size of four for this species. The above data indicate the greatest interval possible between the addition of the second and third egg was 48 hours which is somewhat greater than Graul's (1971:193) observation. Also the eggs had been rotated in the nest at least once between 17 May and 22 May. On three daytime visits out of five I found a bird of undetermined sex incubating. On 17 May when I flushed a bird from the nest, it silently flew low over the ground with its tail spread, both wing tips touching the ground and neck perpendicular to the ground. No other curlews were seen in the vicinity of this nest during any visit.

K. L. Shirly found a second nest in the salt flats, elevation 4000 ft, adjacent to the Bear River, eight miles W of Brigham City, Box Elder County, at 0600 on 1 May 1966. The nest cup, constructed of desert saltgrass (*Distichlis stricta*), was located in a clump of dead saltgrass and samphire (*Salicornia rubra*). The nest contained three eggs of normal color and pattern. On 7 May at 0600, K. L. Shirly and I visited the nest and found the female incubating. This species is noticeably sexually dimorphic in size, especially the length of the

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exposed culmen (unpublished data). When we approached the curlew, it flushed from the nest in a manner similar to that described above. When 50 meters from the nest, the curlew stopped, then dragged one wing on the ground, then the other, then both. On occasion it would jump off the ground, then run along the ground with neck outstretched and bill touching the ground. This behavior lasted about one minute until the male appeared and circled over our heads giving the *Ki-keck* call (Forsythe 1970:215). The female answered with the *Curluoo* call (Forsythe 1970:215). They were joined by two males giving the *Ki-keck* call. The four birds proceeded in mobbing behavior as described by LaFave (1954:48). This lasted until we left the area 15 minutes later. When I visited the nest on 24 May, it had been destroyed by unknown causes leaving no trace of nest or eggs. No adult birds were observed in the vicinity.

I found a third nest of this species at 1600 on 3 May 1966 in an irrigated grass pasture, 4000 ft elevation, 3.3 miles W of Logan Post Office, Cache County. The nest, containing four eggs, was composed of various grasses and situated on a slight rise in the field. Both sexes incubated but only the female gave diversionary displays when flushed from the nest. These displays were similar to those already described except the bird looked back at the observer with its neck perpendicular to the ground. The eggs hatched between 0700 on 21 May and 1600 on 23 May. If we assume that they hatched at the earlier time and that eggs were laid at two-day intervals, the incubation period would be around 28 days.

K. L. Shirley and I found the last nest at 0700 on 7 May 1966 in the salt flats next to the Bear River, 10 miles W of Brigham City, Box Elder County. The location and placement of this nest were similar to those described for the 1 May nest. The nest contained four eggs. On 24 May at 0600 as I got out of the car about 150 meters south of the nest, the male was sitting on a fence post 30 meters from me. As I approached the nest, the male gave several *Curluoo* calls. The female, neck outstretched with body low and bill parallel to the ground, walked slowly off the nest toward the north. When I approached, the female flushed and gave the diversionary display with both wings. Then the male along with several other curlews mobbed me giving the *Ki-keck* and *Arc Display* calls (Forsythe 1970:214). I returned to the nest and found one egg pipped. I marked the eggs and removed them to the laboratory where they were weighed and measured (Table 1). The eggs were a darker green than described by Reed (1965:125). The first egg hatched at 1300, the second at 2025 on 25 May, and the third at 0625 on 26 May. The fourth egg was preserved before hatching and deposited in the vertebrate collection of Utah State University. The egg measurements were similar to those given by Bent (1929:101). All eggs decreased in weight during hatching (Table 1). Other aspects of the hatching process have been described by Forsythe (1967:340). Using a two-day interval between the laying of each egg, and assuming that the fourth egg would have hatched on 26 May, gives an incubation period for this nest of 27 days.

TABLE 1. Weights (g) and measurements (mm) of long-billed curlew eggs.

	Hours prior to hatching			
	36	24	12	0
Egg 1				
Weight		69.0	67.1	56.6
Length	74			
Width	56			
Egg 2				
Weight		68.9	67.1	55.6
Length	74			
Width	51			
Egg 3				
Weight	71.1	68.6		57.6
Length	71			
Width	59			
Egg 4				
Weight	X <sup>2</sup>			
Length	78			
Width	48			

<sup>2</sup>Egg 4 was preserved before it could hatch.

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