Only one of the three hatched chicks survived, possibly because of frequent human disturbance in the colony. This juvenile was able to fly by 2 July. It remained on territory with the three adults until at least 11 July when Shugart left the Island. All three adults were still feeding the juvenile at this time. Female 2 regularly was chased off the territory by the male from 29 June on, but she returned and fed the juvenile or loafed when the male was not present.

The number of double nests was 13 (0.07%) as compared to 1,690 single nests for the two years at the Calcite Colony and one year at Hat Island. If we assume that the mating pattern is under genetic control and the birds are not resource limited, polygyny could increase a male's productivity and thus confer a selective advantage. This appears unlikely at this time as hatching success was only 29.4% (five of 17 eggs) for undisturbed double nests. Two of the five chicks lived to the flying stage. This low hatching success apparently resulted from three eggs not being fertilized and the remaining eight eggs addling during incubation.

It is conceivable that environmental circumstances (e.g. inadequate nesting space, shortage of males, contamination by toxic chemicals, or death of a neighboring male during pair formation) might influence the frequency of polygynous matings. However, none of these potential effects were apparent in these colonies during 1975 or 1976.

The occurrence of mating strategies other than monogamy in this gull population probably indicates that variability exists in the genetic determiners of the mating pattern; however, the alternate options are not favored by natural selection at this time.—Gary W. Shugart and William E. Southern, *Dept. of Biological Sciences, Northern Illinois University, DeKalb, Ill. 60115.* Received 18 December 1976, accepted 3 May 1977.

The Role of Flock Feeding in Olivaceous Cormorants.—Cormorants of several species engage in flock feeding. Formation of feeding flocks was briefly noted in Cape (*Phalacrocorax capensis*) and Guanay (*P. bougainvillii*) by Murphy (1936), Great (*P. carbo*) by van Dobben (1952), and Brandt's (*P. penicillatus*) cormorants by Hubbs et al. (1970). Serventy (1938) found that of four Australian species studied, only Little Black Cormorants (*P. sulcirostris*) utilized feeding flocks. Bartholomew (1942) gave the only detailed account of flock feeding in the Double-crested Cormorant (*P. auritus*). We noted the feeding behavior of Olivaceous Cormorants (*P. olivaceus*) in Texas between 13 March 1976 and 8 February 1977. Study sites were varied, and included coastal and inland marshes, ponds, lakes, bays, and a power plant cooling pond. Group feeding was noted only on marsh ponds characterized by shallow ($\leq$50 cm) water levels. Flocks were small ($\bar{x}$ = 6.1, range = 3-8, n = 10), and flocking was seldom utilized as a feeding method. During 50 hrs of observation at a site where an individual's sequential activities could often be followed (Galveston Island), flock feeding accounted for only 3% of total feeding time. Depending upon several factors (e.g., adult vs. immature, weather conditions, food availability, ability of observer to follow an individual), a cormorant seldom flock-fed more than once per day (Table 1); most birds never joined these feeding groups. Nelson (1903) and Weller (1967) also noted the formation of feeding flocks in Olivaceous Cormorants, but did not describe their sightings in detail.

Groups formed when a solitary feeder encountered a concentration of fish during low tide ($\leq$ 50 cm water level). The surface splashing of prey in shallow water trying to escape a cormorant apparently attracted nearby birds. Flocks formed in less than one min by birds that were perched on posts within 50 m of the initial (solitary) feeder; not all birds within the immediate vicinity of the newly formed flock would join. Dives (and pauses between dives) were more frequent compared to solitary feeders (Table 1). A group would dive frequently until the fish dispersed (approx. 30 sec), then swim about, diving infrequently, until another prey concentration was encountered (usually 30-60 sec). This behavior continued for short periods of time (Table 1), after which the group broke. The majority of cormorants then flew to perches. One or two individuals would normally continue feeding alone, suggesting that these individuals (both adults and/or immatures) were less successful than the others during flock feeding.

The overall decrease in the duration of feeding by individuals within flocks as compared to solitary feeding is probably due to an increased capture rate per unit time by many flocking cormorants; percent capture success was similar regardless of feeding method (Table 1). Therefore, while engaged in flock feeding,

TABLE 1.

Comparison of solitary and flock feeding Olivaceous Cormorants.

	Solitary feeder[1]	Feeding flock[2]
Mean feeding duration (sec)	758	300[3]
No. times utilized/day	5–8	0–2
Mean dive time (sec)	6.3	3.0[4]
Mean pause time (sec)	3.0	1.5[4]
Capture success (%)	15	15

[1]Based on 33 individuals and 1,348 dives.
[2]Based on 10 flocks and approximately 2,500 dives.
[3]$P < 0.01$.
[4]$P < 0.001$, t-test.

cormorants are apparently more efficient than a solitary feeder. However, as foraging flocks were seldom and sporadically utilized ($\leq$ 2 times/day, accounting for about 3% total foraging time), there may be little net energetic difference between flock feeding (frequently diving for short periods) and solitary feeding (infrequently diving for longer periods) for Olivaceous Cormorants.

Most authors have stated that flock feeding enhances a cormorant's capture success. Van Dobben (1952) felt flock feeding was a method used by Great Cormorants to drive fish from beneath grass clumps in shallow water. Bartholomew (1942) felt that Double-crested Cormorants were able to "herd" prey in deep, open bay waters, thereby concentrating fish and increasing capture success. In our study, however, Olivaceous Cormorants apparently fed in flocks only in response to brief periods of stimulation caused by the splashing of a school of fish. Cormorants may form feeding flocks as a response to the schooling characteristics of fish, then, rather than in a direct effort to drive or concentrate prey.

Thompson et al. (1974) suggested that while flocking in birds might result in an increased rate of food capture, this increase may be a less important consequence of flocking than reducing the chance of failure. He felt that in environments with variable food supplies, minimizing chance would seem to be a more appropriate measure of fitness than maximizing efficiency. Even though our data showed that Olivaceous Cormorants apparently increased their capture efficiency while flock feeding, the use of such flocks was restricted to opportunistic periods based on prey characteristics. The tidal-influenced and shallow nature of many of our study areas may have accounted for these observations, of course, and may not be true over this species' wide neotropical range.

Flock feeding is thus a widespread phenomenon in cormorants, varying inter- and intraspecifically. Our observations and those of Bartholomew (1942), van Dobben (1952), and Thompson et al. (1974) show that comparisons between flock feeders and solitary feeders, taken over a wide range of habitats, are needed for other species of *Phalacrocorax*. The selection pressures causing the development of flock feeding in cormorants may then be more fully assessed.

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Nightlighting as a Method for Capturing Common Nighthawks and other Caprimulgids.—Nightlighting has been used to capture many species of birds (Labisky, *Ill. Nat. Hist. Surv. Biol. Notes*, No. 40, 1959), but few published accounts of nightlighting caprimulgids exist. We have found no reference to nightlighting Common Nighthawks (*Chordeiles minor*) in the literature, but Sprunt (*U. S. Natl. Mus., Bull.* 176, 147-162, 1940) reported catching several Chuck-will's-widows (*Caprimulgus carolinensis*) by nightlighting. According to the U. S. Fish and Wildlife Service files, the 23 Common Nighthawks we banded in 1969 constituted an annual all-time high for one permit in the banding of caprimulgids in North America (J. M. Sheppard, 1974 pers. comm.). Of these, 20 (14 males and 6 females) were adults captured by the method described below.

We concentrated our efforts on gravel roads adjacent to irrigated cropland near Shepherd, in semiarid, southcentral Montana. Observations of nighthawks on the roads were made on seven nights during the summer of 1969. All of the captures were made on 28 and 29 June 1969.

We located nighthawks by driving slowly, 15-20 mph, along the backroads at night, between 2200 and 0100, with headlights on high beam. When a nighthawk was seen, generally 10 to 20 yd from the vehicle and on the edge of the road, we stopped, leaving the headlights on, and one of us quietly left the vehicle and stalked the bird while shining a 6-volt flashlight beam on it. The netter approached slowly, being careful not to come between the headlights and the bird, and captured it with a 12- by 14-in fish landing net on a 6-inch handle. Better results were obtained when the motor was left running to muffle the sounds of the approach. Birds seen but not captured were usually ones that flushed before we saw them on the ground. With nightlighting, we captured 23 nighthawks (including two recaptures and one injury) of the 41 we saw on the roads.

Common Nighthawks seemed most prone to roost on the roads after a rainstorm. The banding area received 4.13 inches of rain in the four days prior to the successful banding. All other road-roosting nighthawks were seen during or immediately after a rainstorm, except on 26 July 1969, when five nighthawks were seen close together on dry ground. The field adjacent to the road was being irrigated, however. We also noted that road-killed nighthawks were generally found during rainy periods.

M. A. Jenkinson and R. M. Mengel (1974 pers. comm.) tried to capture Chuck-will's-widows and Whip-poor-wills (*Caprimulgus vociferus*) by nightlighting in Kansas. Their techniques were similar to ours, but they used a small spotlight, held by one person who remained in the car while the other attempted to capture the nightlighted bird. (In our operation, the netter carried both the net and the light.) They also used a net 30 inches in diameter on both a 7- and 12-ft pole and removed the bulb from the car's dome light or covered it with red cellophane. They noted, as we did, that birds shined too long tended to "recover" and fly away. They captured only three birds (all Whip-poor-wills) from over 75 attempts. They felt that, contrary to what many ornithologists believe, nightlighting caprimulgids was very inefficient.

We do not know if our success in capturing Common Nighthawks was due to local, opportune conditions or if there are specific differences in vulnerability