

NOTES

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BREEDING STATUS OF BOAT-TAILED GRACKLES AT ST. VINCENT ISLAND, FRANKLIN COUNTY, FLORIDA

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The dark-eyed form of the Boat-tailed Grackle (*Quiscalus major westoni*) reaches the western limit of its breeding range on St. Vincent Island, Franklin County, Florida (the pale-eyed subspecies *Q. m. alabamensis* nests sporadically in northwest Florida, after a gap of about 200 km in the species breeding range; Stevenson 1981, Stevenson and Anderson 1994). The status of the extreme western populations of *Q. m. westoni* has never been assessed. We confirmed breeding activity by Boat-tailed Grackles at six localities on St. Vincent Island in 1995-1997 and censused populations at two of these localities in 1995 and 1996. Finally, we also measured nest-site characteristics of Boat-tailed Grackle nests.

We conducted complete nest searches of Boat-tailed Grackles at the two major localities (Oyster Pond, Dry Bar East) in 1995-1996, and at Dry Bar Central in 1995 and Lake-3 in 1996 (Fig. 1). We visited nests three to four times from late March to early May; the timing of our nest visits was similar in both years at the two major localities. Our complete counts of nests represent the number of breeding females at these sites during the first breeding cycle (Post 1995, Post et al. 1996). At other localities or in other years, we estimated colony size by the maximum number of females that we counted at each site each year. We recorded clutch size for complete nests and calculated the date of clutch initiation. The estimated date of clutch initiation was equal to the date the clutch was collected minus clutch size plus one day. Additional days were subtracted from this date according to the estimation of Boat-tailed Grackle incubation time elapsed: fresh = 0, slight = 2, advanced = 10, unknown = 7 (half of incubation period of 13 days; Post et al. 1996). We also backdated nests discovered during the nestling stage by estimating the age of young from a nestling period of 13-14 days (Bancroft 1984, Post et al. 1996).

Boat-tailed Grackles on St. Vincent Island nested only in marshes over standing water. At Oyster Pond, we located 26 nests (three colonies) in 1995 and 14 nests (one colony) in 1996, and at Dry Bar East, 16 nests (one colony) in 1995 and 14 nests (one colony) in 1996. We located 9 nests (one colony) at Dry Bar Central in 1995 and 10 nests (two colonies) at Lake-3 in 1996. Mean colony size was 9.9 ± 3.9 nests (range: 5-16; $n = 9$), which agrees closely with mean colony size described by Post (1995). We confirmed breeding at Lake-3 in 1995, Dry Bar Central in 1996, and Mallard Slough (Taylor Lake) in 1997, but our counts of nests at these sites were incomplete. We also observed female grackles throughout the breeding season at an active alligator (*Alligator mississippiensis*) hole at Dry Bar West in 1995-1997; our maximum count was 9 females (1995). We also watched females building nests in 1995 and bringing food to young in 1996 at this site. At Lake-5, we observed female grackles in 1995, but did not detect any breeding evidence. Taken together, complete counts of nests at four localities (Oyster Pond, Dry

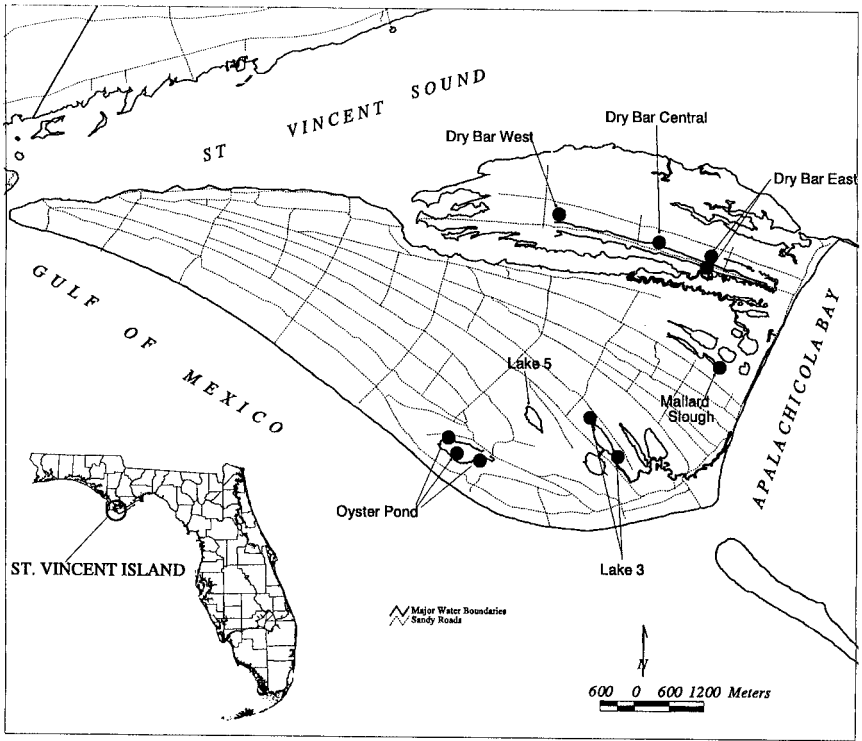


Figure 1. Map of six confirmed Boat-tailed Grackle breeding localities on St. Vincent Island, Franklin County, Florida from 1995-1997. Approximate location of individual colony sites is denoted by large dark circles.

Bar East, Dry Bar Central, Lake-3), a late count of nests at Mallard Slough, and a maximum count of females at Dry Bar West suggest that the total breeding population on St. Vincent Island is about 70 female grackles.

Mean clutch size of Boat-tailed Grackles on St. Vincent Island was 2.71 ± 0.46 (range: 2-3; $n = 28$), which is very similar to mean clutch size in marshes of peninsular Florida and South Carolina (Post 1995, Post et al. 1996). Mean date of clutch initiation was 15 April \pm 11 days ($n = 63$) and was significantly different by year (1995: 8 April \pm 9 days [$n = 33$]; 1996: 22 April \pm 9 days [$n = 30$]; t -test = 5.73, $df = 61$, $P < 0.001$). The two-week delay in breeding in 1996 was probably attributable to a cold winter and early spring. Mean date of clutch initiation (both years) for the first breeding cycle on St. Vincent Island was about two weeks later than in peninsular Florida or South Carolina (Post 1995, Post et al. 1996), and about one week later than Louisiana (McIlhenny 1937).

Boat-tailed Grackles nested primarily in cattails (*Typha* spp.) and sawgrass (*Cladium jamaicense*) on St. Vincent Island (94 of 102 nests, 92%). All nests at Oyster Pond were in cattails, and almost all nests at Dry Bar and Lake-3 were in sawgrass. The remaining nests were in black needlerush (*Juncus roemerianus*). Nests built in cattails and sawgrass differed in five of six nest-site characteristics: height of eggs above ground, nest outside depth, water depth, distance to open water, and distance to near-

est-neighbor nest (within colony) (Table 1). Nest height did not change as the season progressed (linear regression, $R = 0.00$, $P > 0.05$, $n = 54$), although the maximum height of vegetation did (linear regression, $R = 0.30$, $P < 0.05$).

Fewer females nested at Oyster Pond in 1996 compared to 1995 which probably was attributable to a decrease in preferred nesting habitat. Grackles nested farther away from open water in 1996 than in 1995 ($t = 7.79$, $P < 0.001$) because of the effects prescribed-burns had on the distribution and growth of cattails along the edge of open water. Two years of vegetative growth had accumulated along the edge when Oyster Pond was prescribed-burned in January 1995, when all cattails were burned except along open water. Oyster Pond was prescribe-burned again in February 1996, when approximately 25% of the cattails burned but this included the older growth along the edge of open water. In 1997, Oyster Pond was not prescribe-burned and Boat-tailed Grackles again nested along the edge of open water where two years of vegetation had accumulated. Boat-tailed Grackles prefer nesting in cattails where older vegetation has accumulated, especially early in the breeding season (Post 1995, Post et al. 1996).

Oyster Pond is currently being restored from a freshwater impoundment to a natural low-salinity brackish marsh. The use of prescribed burns is one component of the process to reduce cattails and promote a natural vegetative community (Clewell 1981, Moore 1992). While both historical and current populations of Boat-tailed Grackles have nested in cattails at Oyster Pond, reversion or partial reversion to sawgrass will provide favorable habitat. Whereas cattails and sawgrass are numerous at Dry Bar East and Lake-3, all but one grackle nest was found in sawgrass. McIlhenny (1937) stated that Boat-tailed Grackles preferred nesting in sawgrass early in the breeding season in Louisiana. Nests in sawgrass are lower and not as deep or as bulky as they are in cattails (McIlhenny 1937, Post et al. 1996, this study). Thus, nests are probably better hidden in older growth of sawgrass, at least early in the breeding season (McIlhenny 1937, McNair pers. obs.). Compared with nests in sawgrass, nests in cattails also were placed over deeper water and farther away from open water and from nearest conspecific nests. These nest-site differences may reflect different responses to predators in the two habitat types (Dunham 1990). Predation is the primary source of mortality to nests (Post 1995), although ground predators may be deterred by alligators that occupy the nesting areas (Post and Seals 1993, Post 1995, Post et al. 1996). Boat-tailed Grackle (*Q. m.*

Table 1. Characteristics of Boat-tailed Grackle nests in cattails and sawgrass at St. Vincent Island, Franklin County, Florida, 1995-1996.

Parameter	Nest-Sites		T-test	P
	Cattail	Sawgrass		
	Mean \pm SD (<i>n</i>)	Mean \pm SD (<i>n</i>)		
Distance to open water (m)	7.23 \pm 7.84 (29)	0.57 \pm 0.3 (42)	5.53	< 0.001
Water depth (cm)	58.93 \pm 19.22 (30)	33.64 \pm 13.21 (42)	6.62	< 0.001
Height of eggs above water (cm)	61.47 \pm 11.68 (30)	52.38 \pm 17.95 (42)	2.43	< 0.05
Nest outside depth (cm)	19.80 \pm 3.16 (30)	15.69 \pm 3.17 (42)	5.44	< 0.001
Maximum height of vegetation (cm)	132.03 \pm 18.26 (30)	123.71 \pm 23.34 (42)	1.63	> 0.05
Distance to nearest neighbor (m)	4.11 \pm 2.33 (19)	2.33 \pm 1.78 (39)	3.22	< 0.01

westoni) populations at marshes on St. Vincent Island are stable, and as long as alligators remain, grackles should continue nesting at the western limit of their breeding range in Florida.

In summary, the total breeding population of Boat-tailed Grackles (*Q. m. westoni*) on St. Vincent Island is about 70 females. Grackles nested only in marshes where breeding was confirmed at six localities. Most nest-site characteristics in cattails and sawgrass were different; most differences probably reflect differences in vegetation structure, and may be related to selection for predator avoidance behavior. Eventual reversion of Oyster Pond, one of two major breeding localities, from a manipulated freshwater cattail impoundment to a natural brackish marsh dominated by sawgrass could benefit Boat-tailed Grackle populations on St. Vincent Island.

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