

The black bear as a seed disperser in Florida.—Although the importance of wildlife in disseminating seeds is well recognized (Martin et al. 1951:19, Thompson and Willson 1979, Foster 1982), black bears (*Ursus americanus*) traditionally have not been considered seed dispersers. However, Rogers and Applegate (1983) recently found that black bears were important seed dispersers in Minnesota and that germination rates of seeds of several plant species were improved by acid and mechanical scarification during digestion. The food habits of the Florida black bear have been described in detail by Maehr and Brady (1984, in press a,b). In this paper, I discuss black bear food habits in Florida with respect to seed dispersal.

During March 1982, nine scats were collected in an Atlantic white cedar (*Chamaecyparis thuyoides*) seep in Ocala National Forest, Lake County, Florida. Associated vegetation included bald cypress (*Taxodium distichum*), cabbage palm (*Sabal palmetto*), needle palm (*Rhapidophyllum hystrix*), and water oak (*Quercus nigra*). In January 1983, seven scats were collected near bee-yards (see Maehr and Brady 1982) in the Golden Gate Estates, Collier County, Florida. Associated vegetation included bald cypress, red maple (*Acer rubrum*), cabbage palm, and saw palmetto (*Serenoa repens*). Visual estimates of scat volumes were made and the volume of each food item was categorized as trace, 1-25, 26-50, 51-75, or 76-100%. Numbers of seeds in the scats from Collier County were estimated to determine germination rates.

All scats collected in the Atlantic white cedar seep in Ocala National Forest were predominantly composed of cabbage palm seeds, with red bay (*Persea borbonia*) and needle palm seeds each occurring twice at a lower percentage of total volume (Table 1). Collier County scats were predominantly composed of Brazilian pepper (*Schinus terebinthifolius*) seeds, with cabbage palm and unidentified monocot leaves each occurring once (Table 1).

TABLE 1. Seeds in Florida black bear scats.

Species	Frequency of percent volume				
	Trace	1-25	26-50	51-75	76-100
OCALA NATIONAL FOREST					
Cabbage palm					9
Red bay		2			
Needle palm		2			
COLLIER COUNTY					
Brazilian pepper					7
Cabbage palm		1			
Unidentified monocot leaves	1				

I found germination of cabbage palm seeds in two scats and red bay seeds also in two scats in the collection from Ocala National Forest. In five of seven scats from Collier County, Brazilian pepper seeds showed evidence of germination, but the few cabbage palm seeds did not. The germination rate of Brazilian

pepper averaged 25.7% of the seeds present (range 0-60.0%, SD = 21.30), or an estimated 200-1000 sprouts per scat. We did not test experimentally whether digestion increased germination of seeds eaten by black bears in Florida. However, if the findings for Minnesota bear foods (Rogers and Applegate 1983) parallel the Florida situation, an increase in germination as the result of passage through the gut probably does occur, in that most of these plant species have seeds that are typically dispersed by animals (Martin et al. 1951).

Since the introduction to Florida of this exotic shrub in the 1800's, Brazilian pepper has spread rapidly and now threatens the integrity of native south Florida ecosystems (Craighead 1971:148) because of its ability to colonize both disturbed and undisturbed sites (Workman 1978). It is of interest that Brazilian pepper is eaten by bears in winter when very few native fruits are available (Ewel et al. 1982:120). Ewel (1978) and Ewel et al. (1982:37) listed raccoons (*Procyon lotor*) and opossums (*Didelphis virginianus*) as important dispersers of *Schinus* in as much as seed clumps are deposited in a nutrient-rich material and are transported away from the parent plants. Because of larger scat volume and potentially extensive daily movements (1-10 km/day), black bears may distribute more seeds further than other mammals. However, the importance of birds in Brazilian pepper seed dispersal should not be overlooked. Because of their large wintering flocks, American Robins (*Turdus migratorius*) probably distribute many small clumps of seed more widely than bears.

It is often assumed that an increased mast supply should improve the quality of wildlife habitat. However, the use by bears of Brazilian pepper drupes in south Florida may confound a situation where losses in bear habitat have occurred due to agricultural and urban growth. In that black bear food consumption reflects temporal and geographical changes in the fruiting phenology of important plant species, the eating of Brazilian pepper drupes by black bears in south Florida is not surprising. Maehr and Brady (1984) found that about 80% of the food volume eaten by bears was plant material and that regional differences reflected the local abundance of plant species. As Brazilian pepper continues to spread and dominate some south Florida plant communities, black bears can be expected to increase their use of this plant. It is unknown to what extent native food plants used by black bear will be affected. Certainly, successional patterns on disturbed sites have already been altered where Brazilian pepper has established. One can only speculate on the consequences in undisturbed plant communities. Further investigations into the nutritive value of Brazilian pepper drupes and competition between Brazilian pepper and native plants are needed to clarify the role this exotic may play in black bear ecology.

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Persistent predation by American Swallow-tailed Kites on Eastern Kingbirds.—Recently, Lohrer and Winegarner (1980, Fla. Field Nat. 8: 47-48) summarized the records of American Swallow-tailed Kites (*Elanoides forficatus*) preying on nestling birds and suggested that such predation may be relatively frequent. Since then, Skutch (1981, Publ. Nuttall Ornithol. Club No. 19, pp. 180 and 227) reported predation on the Clay-colored Robin (*Turdus grayi*) and the Golden Masked Tanager (*Tangara larvata*) in Costa Rica. In this note we add to the list the Eastern Kingbird (*Tyrannus tyrannus*) in Florida, and present observations that indicate Swallow-tailed Kites can be persistent predators at the nests of small birds.

On 12 July 1981 at 1200, 5 km south of Lake Placid, Highlands County, Florida, in a sparsely-populated subdivision, we noticed two American Swallow-tailed Kites being chased from the vicinity of a kingbird nest by an Eastern Kingbird. At a distance of 100 m, we could easily see an object in the talons