

nest cavities occupied by starlings. Red-bellieds often tenaciously defend their nest cavities from intruding starlings, but once starlings have successfully usurped a cavity, victimized red-bellieds usually make no subsequent attempt to retake the cavity while the starlings are nesting in it (D. J. Ingold, pers. comm.). Thus, nest usurpation by Red-bellied Woodpeckers appears to be an uncharacteristic behavioral response to starling nest-site competition.

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FISH CROWS CHASE TREE SWALLOWS

RUSSELL C. TITUS

*Florida Game and Freshwater Fish Commission,
3900 Drain Field Road, Lakeland, Florida 33811*

*Present address: Department of Biology,
Indiana University, Bloomington, Indiana 47405*

On 12 April 1989 at 1331 EST while censusing raptors approximately 3 km east of Okeechobee center, Glades County, Florida, I observed a group of approximately 50 Fish Crows (*Corvus ossifragus*) foraging in a palm hammock and the surrounding improved pasture. A widely scattered flock of Tree Swallows (*Tachycineta bicolor*) also was foraging in the area. A Fish Crow was circling at approximately 150 m elevation, apparently in a thermal. I stopped my vehicle to observe the crow continue soaring higher. The circling crow began to chase a nearby swallow and both birds moved quickly upward in small circles, one of which I estimated to be 3 m in diameter. The crow was remarkably agile, turning abruptly, and approaching to within 0.3 m of the swallow. The swallow responded by flying in a more erratic manner, making acute turns in its flight as the crow approached closely. This interaction continued for an estimated 20 s, but the crow did not succeed in catching the swallow.

Another crow in the same thermal flew directly at a different swallow, but did not follow it. This crow approached only to within 1.6 m of the swallow. I do not know whether the second crow had watched the first crow's attempt, or whether the crows routinely chased swallows or other birds in flight.

A possible function of these chases was that the crows were attempting to prey upon the swallows. Although it is well-known that corvids are opportunistic foragers, the effort to pursue a species as maneuverable as a Tree Swallow does seem unusual. Bent (1946) lists food items of Fish Crows as aquatic organisms, which are mainly picked from the shoreline, bird's eggs, insects, berries, and grain. Taylor (1972) observed a Fish Crow grab a nestling passerine, while hovering by the prey's nest. Kilham (1989) occasionally noted American Crows (*Corvus brachyrhynchos*) diving on American Robins (*Turdus migratorius*) and Killdeer (*Charadrius vociferus*) in open fields. Twice he observed crows carrying adult birds that they may have captured alive, one bird being a Blue Jay (*Cyanocitta cristata*) and the other an unidentified robin-sized bird. American Crows are known to eat nestling and fledgling Blue Jays (McGowan 1990). An Indian House Crow (*Corvus splendens*) was observed carrying a calling Pied Ground Thrush (*Zoothera wardii*) which it later killed (Balasubramanian 1990). Other corvids such as jays occasionally prey on adult birds (Curry 1990, Ehrlich and McLaughlin 1988). I am not aware of other observations of Fish Crows chasing or preying upon swallows, although given that both are seasonally abundant in the same habitats, such interactions would not seem unlikely.

An alternative explanation is that the crows were engaged in play behavior. Play behavior is frequently noted in corvids (Kilham 1989, K. McGowan, pers. comm.). For example, American Crows sometimes attack large mammals that they have no reasonable likelihood of killing (Kilham 1989). Such behaviors could also increase dexterity and coordination used in the capture of normal prey items. Other observers have noted a dexterity in flight similar to that exhibited by the two Fish Crows. Van Vuren (1984) interpreted aerobatic rolls performed by Common Ravens (*Corvus corax*) as play, since the frequency with which they were given did not relate to obvious social factors. Because the Fish Crows were part of a large group, it is likely that they were non-breeding first-year birds (K. McGowan, pers. comm.). If hunting skills develop over an extended period, "playful" attempts to capture difficult prey may improve these skills and increase chances for survival.

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