

Interactions Between Nesting Pileated Woodpeckers and Wood Ducks

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ABSTRACT—We observed interactions between a nesting pair of Pileated Woodpeckers (*Dryocopus pileatus*) and what appeared to be four pairs of Wood Ducks (*Aix sponsa*). Wood Ducks regularly approached and attempted to enter an active Pileated Woodpecker nest cavity that contained three fully feathered young Pileated Woodpeckers. The male Pileated Woodpecker often perched on a snag near their nest cavity to guard the entrance from Wood Ducks. Female Wood Ducks attempted to enter the Pileated Woodpecker nest cavity on at least 12 occasions and typically were intercepted by the male Pileated Woodpecker before they reached the lip of the nest cavity. On two occasions the male Pileated Woodpecker entered his nest cavity and forcibly evicted female Wood Ducks that had slipped into the cavity. These incidents suggest that large cavities in snags may be in high

demand by Wood Ducks during the nesting season. Our observations suggest that some Pileated Woodpeckers may be able to resist attempts by Wood Ducks to usurp nest cavities during the breeding season. *Received 27 Oct. 2000, accepted 25 Apr. 2001.*

Pileated Woodpeckers (*Dryocopus pileatus*) are unique among North American woodpeckers because they are the only extant species that excavates large (>45 cm deep) cavities for nest and roost sites (Conner 1974, Bull and Jackson 1995). Their large cavities are used by a wide variety of both small and large birds and mammals that are primary and secondary cavity users throughout the species range (Hoyt 1948, Hoyt 1957, Conner 1978, Evans and Conner 1979, McClelland 1979, Bonar 2000). Historically, Ivory-billed Woodpeckers (*Campephilus principalis*) also provided large cavities (Tanner 1942) for secondary cavity users in the southern U.S., particularly in hardwood forests within and adjacent to wet-

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lands. Ivory-billed Woodpeckers, however, probably now are extinct (U.S. Fish and Wildlife Service 1980, Lammertink and Estrada 1995).

Demand for large cavities has the potential to cause secondary cavity users to compete with Pileated Woodpeckers for the cavities the woodpeckers excavate. Conner (1973) observed an interaction where an Eastern Screech-Owl (*Otus asio*) displaced a pair of Pileated Woodpeckers that were attempting to nest in a snag in Virginia. Pileated Woodpeckers appear to tolerate the presence of some potential cavity competitors, particularly smaller species, and there are reports of Northern Flickers (*Colaptes auratus*), Red-breasted Nuthatches (*Sitta canadensis*), and Mountain Chickadees (*Poecile gambeli*) simultaneously nesting in the same snags as Pileated Woodpeckers, but in different cavities (Hoyt 1948, McClelland and McClelland 1999). However, a Pileated Woodpecker was observed driving a Northern Flicker away from its nest cavity (J. T. Tanner in Hoyt 1957). Pileated Woodpeckers also have been reported to remove young and nest material of Eastern Bluebirds (*Sialia sialis*) from a cavity the woodpeckers used during a previous breeding season, further enlarge the cavity chamber, and subsequently use the cavity for a second nesting season (Baird et al. 1875).

The Wood Duck (*Aix sponsa*), a large secondary cavity user, requires large cavities for nesting (Bellrose et al. 1964, Ryan et al. 1998) and regularly uses Pileated Woodpecker cavities (Kilham 1979, Bull and Jackson 1995). Bellrose et al. (1964) and Ryan et al. (1998) noted that Wood Ducks achieve higher nest success in cavities that are high above the ground, likely because of lower predation risk. Pileated Woodpecker cavities typically are 10-20 m above the ground (Conner et al. 1975) and thus may be highly attractive to Wood Ducks as potential nest sites. Wood Ducks also are known to nest in Red-cockaded Woodpecker (*Picoides borealis*) cavities that have been enlarged by Pileated Woodpeckers (Conner et al. 1997). Observations of potentially competitive interactions between Pileated Woodpeckers and other cavity users are rare, likely because of the wariness of the large woodpeckers around their nest site (RNC pers. obs.).

During 20 h of observation over seven separate days between 24 April and 5 May 1996, we observed Wood Ducks (four male and four female Wood Ducks were present) attempting to usurp a Pileated Woodpecker nest cavity that contained three woodpecker nestlings. The cavity was located in a 60-cm dbh, 25-m loblolly pine (*Pinus taeda*) snag within a nearly pure stand of loblolly pines on the Stephen F. Austin Experimental Forest (31° 29' N, 94° 47' W) in southern Nacogdoches County, Texas. Most major limbs were still present on the snag and the nest cavity had been excavated about 10 m above the ground, where the bole was 52 cm in diameter. The Pileated Woodpecker nest tree was 450 m from relatively permanent water in a small stream. Other ephemeral streams were about 300 m from the nest tree.

During our observations female Wood Ducks typically perched with their mates in the vicinity (50 m) of the Pileated Woodpecker nest tree, and flew toward the woodpecker nest cavity as the Pileated Woodpeckers left to obtain food to provision their nestlings. In 10 of 11 instances, as a female Wood Duck approached the nest cavity, the male Pileated Woodpecker intercepted the Wood Duck within 1 m of the cavity entrance, before it could enter the cavity. When intercepting female Wood Ducks, the male Pileated Woodpecker often vocalized a short duration "kuk, kuk, kuk, kuk, kuk" (High call, Kilham 1959; "Wok" call, Short 1982) that decreased in volume and frequency as the call ended. This vocalization usually is associated with excitement or alarm (Kilham 1959). During one instance, both the male and female woodpecker simultaneously intercepted a female Wood Duck and prevented her from entering the cavity. On two other occasions the male Pileated Woodpecker, while inside the nest cavity, pecked at an approaching female Wood Duck as it flew to within 5-10 cm of the entrance.

During 4 h of our observations, the male Pileated Woodpecker perched in the same position on a snag about 20 m distant from his nest cavity and attentively followed the aerial movements of Wood Duck pairs. It was from this perch that he typically flew to intercept an approaching Wood Duck. During the 2-wk period when we observed the nest cavity, at-

tempts to usurp the cavity appeared to intensify and the male Pileated Woodpecker often guarded the nest from inside the nest cavity.

On two occasions a female Wood Duck successfully entered the Pileated Woodpecker nest cavity while it contained three Pileated Woodpecker nestlings. We did not see the Wood Duck enter the cavity in the first instance. We had been observing the cavity for approximately 1 h on 26 April 1996 without seeing any adult Pileated Woodpeckers around the nest cavity. Five Wood Ducks were perched in live pines within 40 m of the cavity tree. When the male Pileated Woodpecker returned to the nest cavity to feed the three nestlings, it appeared very agitated while perching at the cavity entrance. The male fanned its tail feathers and erected its red crest feathers and repeatedly peered into the cavity by quickly inserting its head and withdrawing it. After 5 min of peering into the cavity, the male Pileated Woodpecker entered the cavity and we heard what we interpreted as sounds of him pecking something in the cavity, with his bill occasionally striking the side of the nest chamber. After 5-10 s of scuffling and pecking sounds from within the cavity, a female Wood Duck emerged at the entrance and flew away. The female Wood Duck had been in the Pileated Woodpecker cavity with three fully feathered Pileated Woodpecker nestlings for at least 1 h prior to the male woodpecker's return.

On the morning of 27 April 1996, a female Wood Duck again successfully entered the Pileated Woodpecker nest cavity as we watched. She flew inside the cavity so quickly that the male Pileated Woodpecker, perched on his "guard snag," was unable to intercept the Wood Duck before she entered the cavity. This time the male Pileated Woodpecker entered the nest cavity within 2 s of the Wood Duck's entrance and we again heard scuffling and pecking sounds for about 10 s before the Wood Duck emerged and flew away. The male Pileated remained in the cavity for several minutes before he emerged and flew to his guard position on the nearby snag.

Between 2 and 4 May 1996, the three young Pileated Woodpeckers successfully fledged from the nest cavity. On 5 May 1996, four pairs of Wood Ducks were still in the vicinity of the Pileated Woodpecker cavity.

One female Wood Duck repeatedly flew to the cavity entrance and perched on the entrance lip for approximately 1 min while she peered into the cavity every 3-4 s. A male Wood Duck remained perched above the cavity on a lateral branch of the cavity tree while the female examined the cavity. After 20 min of repeated brief visits to peer into the cavity, the female Wood Duck entered and remained in the cavity for 1 h, after which our observation ceased.

These incidents suggest that large cavities in snags on our study area may be in high demand by Wood Ducks during the nesting season. Our observations suggest that some Pileated Woodpeckers may be able to resist attempts by Wood Ducks to usurp nest cavities during the breeding season.

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