

in the vegetation the heron immediately moved toward the manatee. The heron peered at openings created in the vegetation by the manatee, and made several feeding strikes. It could not be determined how many strikes were made or if any were successful.

On 13 February 1978, similar behavior was seen on another hyacinth raft 400 m from the original observation site. On this occasion, a Little Blue Heron was noted catching small fish at manatee-created openings by hopping and striking, or by using the stand-and-wait method described by Meyerriecks (Nutt. Ornithol. Club No. 2, 1960). The heron made 27 strikes, 21 of which were successful (78%) during 48 min. By contrast, another Little Blue Heron, not associated with a manatee, was observed at the same time on a hyacinth raft 100 m away using only the stand-and-wait method. It made 16 strikes within 45 min, 7 of which were successful (44%). A Little Blue Heron was briefly observed investigating manatee-created disturbances in the same area on 14 and 17 February 1978, but on both occasions the manatee departed after 5 min and no feeding strikes by the heron were seen.

Feeding in association with manatees may have increased the heron's feeding success. The disturbance caused by the manatee surfacing and grasping plants may have flushed out fish or invertebrates associated with the hyacinths. Kushlan (1978b) reported that Little Blue Herons in commensal association with White Ibis preyed on small fish flushed by the movements of the ibis. Strike rates were higher for herons feeding commensally with ibis than for herons feeding alone, but strike success rate was the same in both situations, suggesting that prey was more available, but not more vulnerable to the commensally associating herons.

While manatees are not abundant in Florida, a number frequently feed at these hyacinth rafts on the St. Johns River and thus present a localized opportunity for commensal feeding by the herons, particularly since Little Blue Herons are noted for specialized and opportunistic feeding behaviors (Kushlan, 1978a).

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Comparison of the nest-site distraction displays of Black-capped Chickadee and White-breasted Nuthatch.—It is the purpose of this paper to describe an unusual distraction display at the nest-site by the Black-capped Chickadee (*Parus atricapillus*) and to compare it to the very similar display of the White-breasted Nuthatch (*Sitta carolinensis*). Observations reveal that these nest-site distraction displays are neither "injury feigning" (formerly ascribed to chickadees) nor "death feigning" (apparently a lapsus, ascribed to or at least implied for nuthatches). Works on other parids and sittids were reviewed to learn the general characteristics of nest-site distraction displays reported in these closely related families. Verification, re-description and some undescribed aspects of the nest-site displays of both chickadees and nuthatches are reported.

Observations were made on nesting nuthatches over a five-year period (1976–1980). All the distraction displays were made to red (*Tamiasciurus hudsonicus*) and gray (*Sciurus carolinensis*) squirrels and eastern chipmunks (*Tamias striatus*). All observed displays (with one possible exception) occurred within 2 m of a nest cavity situated about 5 m above ground in a red oak (*Quercus rubra*) outside my window, in Stevens Point, Portage Co., Wisconsin.

The cavity was first used by the nuthatches, but in the fall of 1979 a family of six young red squirrels were reared in the cavity, and after they departed a pregnant gray squirrel found winter shelter inside. That same squirrel reared its young (seen 28 May 1980) in a leaf nest nearby, and occasionally encountered the nesting pair of nuthatches. The opening of the nest hole was about 4–5 cm across. Nesting chickadees (one clutch and brood) were observed in the spring of 1980, at a nest box set 1.5 m above the ground.

Distraction displays were induced by a young, live fox snake (*Elaphe vulpina*) and stuffed skins of gray squirrel, red squirrel, least chipmunk (*Eutamias minimus*), southern flying squirrel (*Glaucomys volans*), long-tailed weasel (*Mustela frenata*) and white-footed mouse (*Peromyscus leucopus*). To induce a distraction display the snake or mammal was hoisted up along the tree trunk toward the nesting site by means of nylon fishing line and a simple screw-eye placed above the nest cavity. Ordinarily I did not hide myself; the stuffed mammal induced the distraction displays so long as I was at a distance from the nest.

Having observed often the nest-site distraction display in the White-breasted Nuthatch I was struck by its close resemblance to a nest-site display (26 May 1980) by Black-capped Chickadees (the body horizontal, perched on a branch) made to a House Wren (*Troglodytes aedon*) and subsequently to an eastern chipmunk (18:30). The latter display was full, meaning that the wings were fully extended.

The nest-site display by the parent chickadees was induced six times by using a stuffed red squirrel, gray squirrel and white-footed mouse (four times). The display was a threat, often preceding or following aerial attacks by the parents. For example, both parents flew at the stuffed gray squirrel until it fell to the ground. One chickadee flew down to a branch about 1.5 m above the ground and presented the squirrel a full display. The bird leaned forward with wings extended until it slightly lost its balance, and one wing fell against a leaf. The chickadee moved its head from side-to-side displaying the white auricular patches. White feathers were evident in the widely flared tail.

Occasionally, a bird displayed alone, but sometimes both sexes displayed. Exactly as in nuthatches, the wings were more or less extended, the bird usually faced the predator, swaying from side-to-side, twisting its body right and left, the head held forward and downward and the tail flared.

The chickadees displayed even to a live snake placed above the nest box. The female observed the snake, flitting close (0.3 m) to it, the chickadee's body swaying, head moving from side-to-side. There was no sound. The male arrived, sounded a *chick-a-dee-dee*, hovered near the snake, and repeatedly struck it with his bill, driving it away. The female then flew to a nearby pine (*Pinus* sp.) branch (2 m away) and gave a full distraction display, including the wing flutter. This display was not seen by the snake. By lifting the snake toward the female, I drove her from tree-to-tree and induced two more displays. The chickadees did not display to me while I handled the young, but one partially displayed to my 11-year-old son.

When attacking in flight the chickadees usually gave a cry—*fzzz* (probably the *zee* call made to several predators reported by Ficken and Witkin [Auk 94:156–157, 1977] who observed “no noticeable alarm reaction” of any kind toward either red or gray squirrels by birds at feeders). Prior to a full display to the red squirrel one parent bringing food flew to a nearby branch, pecked at and finally ate the larval insect.

Other reports on distraction displays in parids are few, brief and often misleading. Grimes (Auk 53:478–480, 1936) briefly mentioned “injury feigning” in the “Florida Chickadee” (*P. carolinensis*). Pettingill (Bird-Lore 39:277–282, 1937) described a distraction display on Grand Manon in the “Acadian Chickadee” (*P. hudsonicus*). This bird, displaying in the proximity of a red squirrel, spread its wings full, but fell over backward from its perch. The Black-capped Chickadee usually leans forward to display. Odum (Auk 58:314–333, 518–535, 1941;

59:499–531, 1942) considered the display in the Black-capped Chickadee as “injury feigning,” and described it fairly well: “. . . wings were held outstretched and slowly flapped back and forth over the back, the head held straight out and moved slowly from side to side in a grotesque motion.” Odum (1941) mentioned that squeaking by the young was necessary to evoke the display behavior, but my observations proved otherwise.

Hinde (The behavior of the Great Tit (*Parus major*) and some other related species. Behaviour, Suppl. II, 1952) reported a display made in winter to a gray squirrel within its drey by a Great Tit (*P. major*). The display was then repeated at the drey three more times. No such display was ever seen again, even when a squirrel approached a nest with fledglings leaving it. Hinde (1952) also quoted a report by Butler in which a palm squirrel (*Funambulus palmarum*) was “mobbed” at a nest by a female *Machlolophus haplonotus*, “with wings spread and feathers erect.” I have found no reports of nest-site distraction displays in sittids other than those of the White-breasted Nuthatch.

In my study, the White-breasted Nuthatch’s nest-site display was observed on 11 occasions. The display was also induced, 40 times, by hoisting stuffed mammals and a fox snake near the nesthole. The male made displays more often than did the female, and moved about much more actively to different positions to threaten the predator. The female usually stayed nearer the nest. The male twice moved down to the base of the tree trunk to display to a stuffed mouse.

Displays were made as follows: to a stuffed red squirrel (four full, eight partial), flying squirrel (four full, five partial), gray squirrel (three full, one partial), least chipmunk (four full), long-tailed weasel (one full, two partial), white-footed mouse (five full), fox snake (one full, one partial) and an 8-inch (203 mm) stick (none). Previously, nuthatches were known to display only to red and gray squirrels, eastern chipmunks and possibly to other birds (Teale, Audubon 76(6):50–53, 1974). The most display sites on the nest tree used to threaten a predator were five (one of these by the female near the hole).

Generally, only the male called during displays. However, often he did not, especially not for the snake and the mouse. Sometimes he did not call for as long as 10 min, then called incessantly. The call was usually *waawaawaawa*, a call comprised of 4–5 syllables. Once the call was in paired syllables, with an occasional *tutu*.

The similar size, grayish color, black cap and white auricular patches make the unusual and aggressive nest-site distraction displays of these two birds all the more similar. In both species the display is a bold threat to potential nest robbers, especially small mammals such as squirrels. Differing from the nuthatch display (see Stoner, Auk 60:95–96, 1943; Kilham, Auk 85:477–492, 1968) is the flutter of the wing by the chickadee, which seems an attempt to regain balance, but in fact, is usually a component of the display. Furthermore, the chickadee often flies forward to peck at the predator striking it with surprising force. The nuthatch is more likely to make the display while hanging by the feet from a branch or the bark of a vertical tree trunk, whereas the chickadee usually perches on branches. Many display poses of the nuthatch are therefore peculiar. Kilham’s (1968) description of the display is excellent, but one may assume (as did Skutch, p. 143 in *Parent Birds and Their Young*, Univ. Texas Press, Austin, Texas, 1976) that the display is usually made in an upright position. In my observations most displays were made head downward, as in the chickadee display. The nuthatch generally faces the predator and as a last resort will peck its nose. In both the chickadee and nuthatch the display is occasionally made so far away from the predator that probably it goes unnoticed. Generally the white wing spots (set off by black) are prominently displayed by the nuthatch, but these are lacking in the chickadee.

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