

the colony (3–4 min) may be evidence that the snake had eaten one or more chicks earlier in the day and had remained inactive, under cover, until observed.

I did not see adult birds attack the rattlesnake. Avoidance of venomous snakes by adult birds has been documented (Smith, *Science* 187:759–760, 1975; Caldwell and Rubinoff, *Auk* 100:195–198, 1983). Other intruders elicit flushing and are often relentlessly attacked by Caspian Terns (e.g., Herring Gulls [*L. argentatus*], Turkey Vultures [*Cathartes aura*], Great Blue Herons [*Ardea herodias*], and researchers [pers. obs.]). Mobbing of nonvenomous snakes has been reported in some species. Blem (Wilson Bull. 91:135–137, 1979) observed nesting Bank Swallows (*Riparia riparia*) mobbing black rat snakes (*Elaphe obsoleta*), but did not mention contact with the snake by the birds. Francesca Cuthbert (pers. comm.) noted Common Terns (*S. hirundo*) contact-mobbing common garter snakes (*Thamnophis sirtalis*), and in one case a snake was killed. In contrast, Fetterolf (Can. Field-Nat. 93:317–318, 1979) reported that adult Ring-billed Gulls (*L. delawarensis*) stood near their nests and displayed no anti-predator behavior while a common garter snake (*T. sirtalis*) ingested two gull chicks.

Responses to western diamondback rattlesnakes by adult Caspian Terns probably increased detectability of the snake for all colony members. Active defense of offspring, however, was not increased, nor was the response of offspring effective. Parents responded to the rattlesnake according to risks to themselves despite the vulnerability of their young. Hovering without attack may be a common response of colonial nesting birds reacting to potentially lethal terrestrial predators.

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**Acorn Woodpecker mutilates nestling Red-breasted Sapsuckers.**—On 22 June 1980 I observed an interaction between Acorn Woodpeckers (*Melanerpes formicivorus*) and nesting Red-breasted Sapsuckers (*Sphyrapicus ruber daggetti*) along Bear Valley Creek at the Bear Valley Headquarters of the Point Reyes National Seashore, Marin County, California. The Red-breasted Sapsuckers were nesting approximately 8 m up in a madrono (*Arbutus menziesii*) snag in a coast live oak (*Quercus agrifolia*), tanbark oak (*Lithocarpus densiflorus*), and California bay laurel (*Umbellularia californica*) woodland just upslope from a red alder (*Alnus rubra*) thicket bordering Bear Valley Creek. The nest tree was used to a limited degree as an acorn storage site by Acorn Woodpeckers. The nest at this location was unusual as the breeding range of Red-breasted Sapsucker has previously been reported in the northern Coast Range of California south only to the middle of Mendocino County (Grinnell and Miller, *Pacific Coast Avifauna* No. 27, 1944). More recent evidence indicates that it breeds regularly south to northern Sonoma County (Shuford, unpubl.), making the nesting at Bear Valley an isolated occurrence even farther south.

I first observed an adult sapsucker approach the nest hole with food. The bird hitched up to the hole and poked its head inside several times, each time emerging with insects still in its bill. It then flew away with the food and I moved farther from the nest site. A sapsucker returned and I again witnessed a feeding attempt before the bird flew off. I then moved to a spot 20–25 m from the tree and concealed myself on the ground amidst vegetation where I felt the sapsucker(s) would be unable to detect my presence. Once more a sapsucker returned and repeated the previous two performances, again flying off with a bill full of food.

A male Acorn Woodpecker then flew onto the snag and went straight to a fresh irregular hole, about one-half the size of the sapsucker nest hole and approximately 90° around the side of the tree and about 15 cm below the entrance to the sapsucker nest hole, and began drilling at the edge of it. Once or twice during its three trips to the snag the sapsucker(s) had also hitched close to this irregular hole as if investigating it, although it never attempted to put its head inside. The Acorn Woodpecker pecked hard on the edge of the hole, then pecked inside and finally pulled something part of the way out that on closer scrutiny proved to be the wing of a nestling sapsucker. The woodpecker pecked vigorously and pulled at the wing, which began to bleed. After much pecking and pulling, the Acorn Woodpecker ripped off a piece of flesh approximately 2–3 cm long and flew off with it. About a minute later a male Acorn Woodpecker landed on the nest tree and was joined by another male that clung to the side of the tree while the first bird pecked at the protruding wing. They both soon flew off while the stubby wing was still in sight at the hole.

I waited about 20 min but left as no more activity occurred at the nest site. On my way back to the nest, near a spot along the creek the sapsuckers had frequented while foraging, I saw an adult sapsucker in flight pursuit of an Acorn Woodpecker. Howell (Condor 54: 237–282, 1952) also observed Red-breasted Sapsuckers on breeding territories chasing off other species of woodpeckers. I waited again for about 10 min near the snag for more activity but there was none. Minutes later J. Evens and I inspected the area below the nest tree and found many fresh, moist pin feathers that had already erupted from their sheaths. Further search revealed the freshly dead body of a nestling sapsucker, which was bleeding and mutilated about the wings (specimen #70758 at the California Academy of Sciences). At the time we found the dead nestling on the ground, the wing of the nestling that had been pecked at by the Acorn Woodpecker was still visible at the hole on the side of the nest cavity. Thus, at least two young sapsuckers were involved in this incident. Presumably the nestling on the ground was pulled out of the irregular hole by the Acorn Woodpecker. On 2 July, on the advice of L. Binford, I procured a ladder and climbed to the nest hole to investigate further, and found the nest cavity empty except for a few downy body feathers along with sawdust and woodchips lining the floor of the cavity.

In retrospect it is obvious why the sapsucker(s) kept emerging from the nest hole with insects still in its bill. The nestling sapsuckers were already dead, or at best in a very weakened condition at the time of my observations. At no time did I hear any of the incessant/insistent begging noises typical of nestling sapsuckers (Howell 1952). In addition, I heard no distress calls while the Acorn Woodpecker pecked at the nestling. The freshness of the dead nestling found at the base of the tree, together with the sighting of the bleeding youngster at the hole in the side of the nest cavity, and the repeated sightings of the adult sapsuckers carrying food in the direction of the nest tree on 21 June—the day before its exact location was discovered—support the idea that the young had died or were killed the morning I made my observations.

Why the Acorn Woodpecker first drilled at the edge of the smaller hole and then pulled on the sapsucker wing from this location when presumably it could have reached the young sapsuckers from the original nest entrance is unknown. As Howell (1952) found that sapsucker nest holes are exceptionally small, and that birds invariably have to struggle to enter

and leave, the somewhat larger Acorn Woodpecker may be physically excluded from such holes. Although the origin of the smaller, irregular hole is uncertain, it seems unlikely the adult sapsuckers would have initiated nesting in a cavity with a hole in the side that potential predators could get to. Presumably this irregular hole was drilled by the Acorn Woodpecker(s), perhaps after being chased from the nest entrance by the sapsuckers.

As Acorn Woodpeckers are known to chase heterospecifics away from their granaries, sapsucking trees, acorn-gathering trees, roosts, nest holes, anvils, and hawking perches (MacRoberts, *Condor* 72:196–204, 1970), proximity of the sapsucker nest hole and territory to the territory of the Acorn Woodpecker group presumably nesting nearby might have elicited aggressive behavior from the Acorn Woodpeckers. The sapsucker nest tree was an acorn storage tree of the Acorn Woodpeckers, and this alone may account for their aggression towards the sapsuckers.

Other instances of Acorn Woodpecker aggression against Red-breasted Sapsuckers have been recorded. Grinnell (Univ. Calif. Publ. Zool. No. 5:1–170, 1908) saw an Acorn Woodpecker drive a sapsucker away from its borings in an alder tree and then “go the rounds of the borings” drinking from each. D. DeSante (pers. comm.) saw an Acorn Woodpecker holding a Red-breasted Sapsucker on the ground and pecking it on 16 Dec. 1978 at Tomales Bay State Park, Marin County, California. Direct evidence of nest predation by Acorn Woodpeckers was observed by Bryant (*Condor* 23:33, 1921) who saw one perched on the nest and eating the egg of a Western Wood-Pewee (*Contopus sordidulus*). P. Henderson (pers. comm.) has observed an Acorn Woodpecker drilling on a nest box occupied by Tree Swallows (*Iridoprocne bicolor*) at his home in Guerneville, Sonoma County, California. He later found dead baby Tree Swallows under the nest box, though no direct evidence was found to implicate the Acorn Woodpeckers.

Acorn Woodpeckers commit acts of inter-specific as well as intra-specific aggression. In their communal breeding groups, female Acorn Woodpeckers will destroy other females' eggs (Mumme et al., *Nature* 306:583–584, 1983) and apparently also will kill other females' young in the nest (Stacey and Edwards, *Auk* 100:731–733, 1983).

Acorn Woodpeckers subsist largely on dried and green acorns, flycatching, sapsucking, and, less frequently, on fruit, bird eggs, and lizards (MacRoberts 1970). W. Koenig (pers. comm.) has seen them eat western fence lizards (*Sceloporus occidentalis*) on several occasions. Considering their occasional carnivorous habits it seems likely that Acorn Woodpeckers may rob nests of eggs or young when the opportunity arises. The closely related Red-headed Woodpecker (*Melanerpes erythrocephalus*) frequently preys on the eggs and young of other species of birds, and the Great Spotted Woodpecker (*Picoides major*) sometimes feeds on young birds (Short, *Woodpeckers of the World*, Delaware Mus. Nat. Hist. Monog. Ser. No. 4, 1982).

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