

OBSERVATIONS ON A PAIR OF GRAY HAWKS IN SOUTHERN ARIZONA

By CURT STENSRUDE

This study deals with courtship, copulation, vocalizations, territoriality, and other behavior of the Gray Hawk (*Buteo nitidus*). This hawk, a common breeding bird from northern México to South America, is decidedly rare in the United States, where it breeds along well-wooded stream bottoms in southern Arizona. My observations were made from February 23 to May 24, 1963, on a pair of birds that nested along Rillito Creek in the southern foothills of the Santa Catalina Mountains near Tucson, Arizona, at an elevation of about 2400 feet. The area in which this study was carried out falls wholly within the Lower Sonoran Life Zone.

Permanent field records were made concerning many aspects of behavior of the birds in the field. Observations, aided by the use of a 15× spotting scope, were my only source of accurate information. The majority of field data was gathered on alternate days for a period of approximately three months, a total of 36 observation days. Early in the study the pair was most active at about 8 or 9 a.m. In late spring and early summer the birds were most active during the early morning hours and their activity was lower in the warmer portions of the day. Consequently, most observations were made between 7 and 11 a.m. Weather conditions also affected the birds' activity. They were less active on windy and cloudy days, possibly because of the restricted activity of their favorite prey, the Clark spiny lizard (*Sceloporus clarkii*), an arboreal species which frequents mesquite forests in southern Arizona.

The nest area of the hawks was located in a riparian shrub habitat dominated by cottonwoods adjacent to a farming area. The nest was about 70 feet up in an 80-foot live cottonwood (*Populus fremonti*). The floor of the cottonwood grove was covered with wild mustard of the genus *Sisymbrium*. Throughout the area adjacent to the dry wash were stands of mesquite trees (*Prosopis juliflora*) over which much of the hawks' hunting took place. Surrounding the study area were housing areas, approaching the nest as close as one-quarter of a mile on the south and west.

GENERAL BEHAVIOR

Foraging.—In flight the Gray Hawk gives one the impression of being rapid and quick moving since the frequency of wing beats is high. Usually a series of wing beats is followed by a short glide very suggestive of accipitrine flight. The Gray Hawk is often seen to circle and soar at low height in comparison with other buteos. The short wings of this small buteo endow it with amazing skill in avoiding obstacles as it darts among the trees in pursuit of avian prey, which ranked second in food preference. On several occasions adult Brown Towhees (*Pipilo fuscus*) and unidentified fledgling birds were carried to the nest, indicating that the Gray Hawk is skillful at catching birds of modest size.

This hawk hunts in two basic ways. Most commonly, it perches well within the side limbs of a thickly foliated tree, watching and listening for prey moving on the ground or in the trees. When the quarry is sighted, the hawk quickly leaves its perch and begins the chase by a long flat descent at constantly accelerating speed toward its prospective prey. All effort is concentrated on the accomplishment of one strike, and if the quarry is missed on the first try the hawk makes no further effort to catch it. This type of hunting when launched from a tree is very similar to the tactics exhibited by accipiters when still hunting. Often this tactic proved

successful in catching the preferred prey, the spiny lizard. These lizards are often plucked off trees without the hawks' seemingly slackening speed. The hawk also uses another method of hunting, that of soaring at a relatively low altitude. This type of hunting is highly successful in securing rodents which inhabit the surrounding farm land.

The hunting range of the observed pair of birds seemed to be limited to mesquite bosques and cultivated fields. On March 25, 27, 28, and 30, a single adult was seen circling over a mesquite bosque a mile and a quarter south of the nesting area. The preferred hunting area seemed to be mesquite forests, where the scaly lizard is commonly found.

Courtship and copulation.—On April 12, 1963, I observed what was probably courtship flight. At 12:40 p.m. a Gray Hawk was sighted in the air, gliding at high altitude. Soon this bird was joined by another Gray Hawk. Both birds then climbed to an estimated height of between 1000 and 1500 feet. They then dived rapidly downward, their flight paths crossing. One bird then climbed upward again and with closed wings, plummeted straight downward at tremendous speed. The duration of this whole event was approximately 20 minutes. Similar behavior was witnessed again at somewhat lower altitude on May 4, 1963.

On several occasions I had the opportunity to observe copulation. Birds were seen to copulate only in the early morning hours. The procedure of the pair was as follows: (1) the female would land on a horizontal dead limb within a live cottonwood; (2) a few moments later the male would join her on the dead limb; (3) almost immediately on alighting, the male would mount the female, but only for 2 or 3 seconds.

Territorial behavior and nest defense.—On April 12, 1963, the conflicts which the breeding pair had with an intruding immature Gray Hawk indicated that the pair was definitely defending a territorial boundary. The intrusion of this immature bird probably resulted because of the relative scarcity of suitable habitat for Gray Hawks, since this species defends only the fringes of washes and not the adjacent desert scrub association.

Earlier, on March 31 and April 2, aggressive actions were noted between an adult Gray Hawk and an adult Cooper Hawk (*Accipiter cooperii*). On the latter date an immature Red-tailed Hawk (*Buteo jamaicensis*) was also threatened. On both occasions the intruding birds were driven out of the nesting area. Throughout the investigation, Turkey Vultures (*Cathartes aura*) were seen to soar over the area, but no conflicts ensued between these two species.

On April 25 and 30, the female's part in nest defense was witnessed as she attempted to drive human intruders from the vicinity of the nest. On both occasions, she showed her obvious distress by leaving her observation perch, landing in a nearby tree, and voicing her displeasure with a series of *creeee* screams. The male's part in nest defense seems to be very casual. On those occasions when the female actively defended the nesting area, the male was not seen to participate in any nest defense.

VOCALIZATIONS

Call notes.—In searching the available literature, I found only one reference to the call or vocalization of the Gray Hawk. Stephens (*in* Bendire, *Life Histories of North American Birds*, 1, 1892:252) compares their cry to a loud *creer* repeated four or five times, sounding at a distance much like the scream of a peacock. However, the scream described by Stephens actually includes two distinct vocalizations, each serving a particular function as follows:

PEACOCK CALL.—This is the most frequent call of the Gray Hawk. As the nesting season neared, the peacock sound was uttered more frequently. This call may serve to help strengthen the pair bond, and it probably aids in location of one member of the pair to the other.

CREEEE CALL.—These loud, penetrating vocalizations are heard most frequently when an approaching intruder is encountered. This call is on one pitch and lasts for several seconds. It is uttered with the bill opened wide. This vocalization is used more by the female in defense of nest and territory than by the male.

LOW CALL.—These low-pitched calls of short duration are uttered at about 3-second intervals. The function of this note is unknown since it was heard only a few times. In giving this call, the hawk lifts and points its head and bill straight upward and gives the note, then brings its head back again and repeats the process.

NESTING SUCCESS

On May 24, 1963, the young were checked for growth progress. Two nestlings about one week old comprised the brood. Unlike most raptorial species the Gray Hawk in the downy stage is not white but light gray in color. Both of the young were in a weakened state from a disease diagnosed as frounce, common in young raptors, and caused by the protozoan *Trichomonas gallinae*. Two days later, both died, and a post-mortem revealed the presence of this organism.

In June and August of 1964, the nesting area was rechecked for occupancy. A new nest had been built by the pair about 200 yards from the old nest of the previous season. Two fledglings were found in June, and in August the two young were seen flying about the nesting area.

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SUMMARY

The Gray Hawk (*Buteo nitidus*), a rare bird in the United States, breeds along well-wooded stream bottoms in southern Arizona. This species hunts either from a perch in a thickly foliated tree or by soaring at a low altitude. The pair observed hunted mostly in mesquite bosques and cultivated fields. The favorite food of this hawk is the Clark spiny lizard; it also takes birds, both fledglings and adults.

The Gray Hawk has three call notes. The "peacock call" is heard most frequently and is especially common during the nesting season. The *creeee* call is loud and penetrating and is used in defense of territory. The "low call" is of short duration and is uttered at about 3-second intervals. The function of this latter call is unknown.

Two nestlings, about one week old, were found on May 24, 1963, in a nest built 70 feet up in an 80-foot high cottonwood tree. The young birds had light gray natal down. Both were in a weakened condition due to a protozoan disease called frounce. The nestlings died two days later.

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