

First record of Cave Swallows breeding in Arizona

A 600-kilometer extension of the breeding range

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THE KNOWN BREEDING RANGE of the Cave Swallow (*Hirundo fulva*) on the North American continent includes only southeastern New Mexico and southwestern Texas in the United States; and eastern Chihuahua, Coahuila, western Nuevo León, eastern Durango, Zacatecas, San Luis Potosí, western Tamaulipas, central Chiapas, Quintana Roo, and Yucatán in Mexico (Amadon and Eckelberry 1955, Baker 1962, A.O.U. 1983).

Prior to the report by Martin (1974) of Cave Swallows nesting in concrete highway culverts in Texas, all known breeding sites of the Cave Swallow in the United States were located in the twilight zone of limestone caves and sinkholes (Selander and Baker 1957, Reddell 1967). Cave Swallows were known to nest on buildings in Mexico (Amadon and Eckelberry 1955, Whitaker 1959, Baker 1962). Selander and Baker (1957) suggested that Cave Swallows at the northern limits of their breeding range were restricted by competition with the Cliff Swallow (*Hirundo pyrrhonota*) to nesting in caves and sinkholes. Recent reports have Cave Swallows nesting with Cliff Swallows and with Barn Swallows (*Hirundo rustica*). Whitaker (1959) reported Cave Swallows nesting with Barn Swallows in Coahuila. Baker (1962) reported that the Cave Swallow was less frequently observed, but where both Cave and Barn swallows occurred in villages in eastern Chihuahua and Durango, Coahuila, Zacatecas, San Luis Potosí, western Tamaulipas, and Nuevo León they often used the same buildings. One instance of Cave, Cliff and Barn swallows nesting together in a building in Zacatecas was reported by Baker (1962). Wauer and Davis (1972) reported Cave and Cliff swallows nesting in the same cave in Big Bend National Park, Texas.

Martin (1974) reported large numbers of Cave Swallows nesting in highway culverts in association with Barn and Cliff swallows in south-central Texas. The association of Cave and Barn swallows at nest sites is apparently much more frequent than the association of Cave and Cliff swallows in the United States (Martin 1974) and Mexico (Baker 1962).

Cave Swallows were first reported in the United States by Scott (1890), who collected two vagrant adult males of the Cuban race on March 22 and 25, 1890, at Garden Key, Dry Tortugas, Florida. The next report in the United States was by Bishop (1910), who took one male on April 23 and one female on April 24, 1910, at Kerrville, Kerr County, Texas. The first account of breeding in the United States was by Thayer (1915), who reported Cave Swallows nesting in a cave near Japonica, Kerr County, Texas, after his collector (F. B. Armstrong) took a series of birds and eggs in June 1914. Selander and Baker (1957) described 19 caves and sinkholes used by Cave Swallows in Texas. Eleven additional caves and sinkholes inhabited by the species in Texas were listed by Reddell (1967, 1971), and another cave was described by Wauer and Davis (1972). Martin (1974) greatly increased the number of known breeding localities for the Cave Swallow when he reported them nesting in concrete highway culverts in Texas. Martin and Martin (1978) mapped the locations of 31 natural and about 50 highway culvert nesting sites in Texas. They reported Cave Swallows nesting in caves and sinkholes in ten counties, and nesting in culverts in 20 counties, in southwestern Texas.

The first official report of Cave Swallows in New Mexico was by Kincaid and Prasil (1956). Prasil found a colony in

Goat Cave, about eight miles southwest of the entrance to Carlsbad Caverns, Eddy County, in June 1952. An earlier record of Cave Swallows in New Mexico involved two specimens collected at a huge hole in the mountainside at Slaughter Canyon in the Guadalupe Mountains, eight miles southwest of Whites City, Eddy County, on July 23, 1930. The two 1930 Slaughter Canyon birds were prepared as skins, identified as Cliff Swallows, then recognized as Cave Swallows and reported by Johnston (1960). These two birds were probably from Goat Cave or from colonies in one of the three other caves in Slaughter Canyon mentioned by Ligon (1961). Cave Swallows in New Mexico have been reported nesting only in caves (including Carlsbad Caverns) in the foothills of the Guadalupe Mountains in the southeastern corner of the state (Kincaid and Prasil 1956, Johnston 1960, Ligon 1961, Baker 1962, Martin and Martin 1978). No instances of nesting in highway culverts or other man-made structures in New Mexico have been reported.

THE FIRST AND ONLY confirmed sightings of the Cave Swallow in Arizona have occurred on the University of Arizona campus in Tucson. The first Cave Swallow reported for Arizona was found by Douglas Stotz and photographed (UA 13941) by Douglas Cook at the University of Arizona Main Library on May 11, 1979 (Witzeman *et al.* 1979, Monson and Phillips 1981). Each year from 1979 through 1982 a lone Cave Swallow was observed at the Main Library with Cliff Swallows. The dates of the first and last reported sightings are, respectively, May 11 and June 7, 1979, April 11 and May 27, 1980, April 13, 1981, April 12 and June 10, 1982, and May 17 and July 31, 1983 (Witzeman *et al.* 1979; Rosenberg

et al. 1980, Monson and Phillips 1981, Witzeman 1982a, 1982b; Sherman Suter *pers. comm.*; Huels *pers. obs.*). Two Cave Swallows were present on the University of Arizona campus during the 1983 breeding season. They nested and fledged three young approximately 360 miles (600 km) west of the nearest reported breeding locality in the Guadalupe Mountains of southeastern New Mexico.

The Cave Swallow pair on the University of Arizona campus in 1983 nested near Cliff Swallows in an old Cliff Swallow nest built on the Main Library during an earlier breeding season. Cave Swallows have not been reported nesting in Cliff Swallow nests. They frequently reuse old Cave Swallow nests within a season and in successive breeding seasons (Selander and Baker 1957, Martin *et al.* 1977, Martin and Martin 1978, Martin 1981) and Cliff Swallows frequently use old nests of their own species (Emlen 1952, 1954; Mayhew 1958; Huels *pers. obs.*). The retort-shaped nest used by the Cave Swallows on the University of Arizona campus was identified as a Cliff Swallow nest by comparison with known Cliff Swallow nests on campus and with photographs published by Emlen (1952, 1954) and Mayhew (1958). Cave Swallow nests in the United States and Mexico are described as unroofed cup-shaped structures (see Selander and Baker 1957, Ligon 1961, Martin *et al.* 1977, Martin and Martin 1978 for descriptions and photographs). It seems unlikely that one

or more Cave Swallows could have built a Cliff Swallow-type nest on the University of Arizona Main Library before or during the previous breeding season. However, the cup-shaped nest of the Cave Swallow in Haiti and the Dominican Republic is sometimes enclosed above (Wetmore and Swales 1931) and Cave Swallow nests in Peru are described as large enclosed nests similar to those of Cliff Swallows (Schulenberg and Parker 1981).

The nest used by the Cave Swallows was situated in the outer row of rectangular impressions in an exposed section of concrete waffle slab 15 feet, 9 inches (4.80 m) above the ground-floor walkway on the north side of the west end of the University of Arizona Main Library (Fig. 1). The nest was attached to an inner corner of a rectangular impression measuring 30 × 20 inches (0.76 × 0.51 m) at the open base and 20 inches (0.51 m) deep. The nest was approximately 36 inches (0.91 m) from a recessed fluorescent light in an adjacent square impression and approximately 36 inches (0.91 m) from the nearest old Cliff Swallow nest in an adjacent rectangular impression (Fig. 2). The fluorescent light in Fig. 2 was one of six fluorescent lights recessed in the section of concrete waffle slab in Fig. 1. All six of the fluorescent lights and those on adjacent sections of the building illuminated the area throughout the night. Late at night during their last week in the nest, the young Cave

Swallows were sometimes at the nest entrance as if waiting for an adult to arrive with food. The young Cliff Swallows in the nearest nest fledged nine or ten days before the Cave Swallows. Many other Cliff Swallows fledged before and after the young Cave Swallows.

The two adult and three young Cave Swallows were banded with U.S. Fish and Wildlife Service bands. On July 6, 1983, the adult female (Fig. 3) was mist-netted as she left the nest, given band no. 930-92916, and released. This parent was identified as the female by the presence of a receding brood patch and the absence of a cloacal protuberance. On the same day, the tubular entrance to the nest was removed and three young were taken from the nest, banded (930-92917, -8, -9) and returned to the nest. The nestlings showed no tendency to leave the nest when they were replaced. They remained in the nest from six to seven days after banding. On July 8, 1983, the adult male (Fig. 4) was mist-netted as he left the nest, given band no. 930-92923, and released. This parent was identified as the male by the presence of a 4-mm cloacal protuberance and the absence of a brood patch. The weights and wing chords of the swallows on date of banding were: male 19.7 g and 105 mm, female 18.9 g and 107 mm, nestlings 22.1 g and 79 mm, 22.3 g and 76 mm, 20.6 g and 76 mm. The nestlings were approximately 17 days old. Photographs of each of the five Cave Swallows and their nest site were deposited in the University of Arizona Bird Collection as UA 14519.

All three of the nestling Cave Swallows fledged. One young fledged between 2300 hrs on July 11, and 0800 hrs on July 12, 1983 and the last two nestlings fledged between 0630 hrs and 0830 hrs on July 13, 1983 (*contra* Witzeman 1983). None of the young spent nights at the nest after fledging. Neither of the adults roosted at the nest during the three nights before or after the last young fledged. The last sighting of young Cave Swallows occurred on July 17, when two young were found perched among Cliff Swallows on the University of Arizona Main Library. An adult was seen last in 1983 on July 31.

The known fledging dates of the Cave Swallows in Arizona can be used to estimate the date the first egg was laid, if one assumes that the length of the incubation and nestling periods of the Arizona nest conform to the central tendencies of those reported by Martin *et al.* (1977) for Cave Swallows in Texas. Martin *et al.* stated



Figure 1. Part of the University of Arizona Main Library showing the exposed section of concrete waffle slab that sheltered the Cliff Swallow nest used by the Cave Swallows. All photos/T. R. Huels.

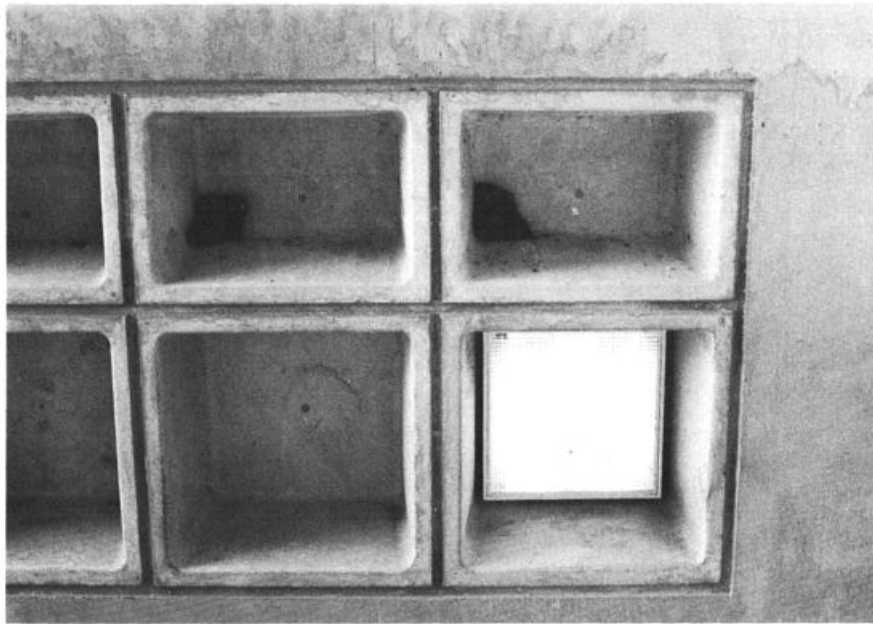


Figure 2. Two Cliff Swallow nests and one recessed fluorescent light in the concrete waffle slab. Cave Swallows fledged from the nest on the left and Cliff Swallows from the nest on the right in July 1983.

that "most hatches occurred during the 15th or 16th 24-hour period following laying ($N = 14$; $\bar{x} = 15.79$; range = 15-18)" and that "first nest egress of nestlings of the cave population probably normally occurs at between 22 and 26 days." If one assumes that only three eggs were laid at the rate of one per day, an incubation period of 16 days and a nestling period of 24 days, then the first



Figure 3. Adult female Cave Swallow.

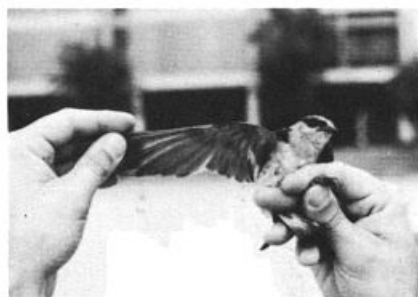


Figure 4. Adult male Cave Swallow.

egg of the first known nesting by Cave Swallows in Arizona was laid on June 1, 1983 and the nest contained eggs or young from June 1 to July 13, 1983.

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