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Ace is the place: Black-chinned Hummingbirds (*Archilochus alexandri*) have high nesting success and productivity inside a hardware store

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ABSTRACT—Black-chinned Hummingbirds (*Archilochus alexandri*) began nesting inside a hardware store near El Paso, Texas, in the spring of 2015. At least 12

nesting attempts occurred inside the store through 2020, and all but 1 of them fledged young (91.7% nesting success). Nests were followed closely in 2019 and 2020, when 7 nesting attempts produced 13 fledglings. One female raised 4 broods between mid-April and early September 2020; this female laid eggs for her second, third, and fourth attempts while young from each previous attempt were still in the nest. The high nesting success and productivity that we observed probably resulted from nesting indoors, where the

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2 major causes of nest failure in this species, predation and extreme weather, were absent. Old nests remained intact for multiple years inside the store, which probably facilitated multiple brooding because females often reused old nests rather than built new ones for subsequent attempts. *Received 23 September 2020. Accepted 22 February 2021.*

Key words: multiple brooding, nest reuse, novel nest sites, Texas, urban birds.

El colibrí *Archilochis alexandri* tiene un alto éxito de anidación y productividad en una ferretería

RESUMEN (Spanish): El colibrí *Archilochus alexandri* comenzó a anidar en el interior de una ferretería cerca de El Paso, Texas, en la primavera de 2015. Al menos 12 intentos de anidación han ocurrido dentro de la tienda hasta 2020 y todos menos 1 emanciparon polluelos (éxito de anidación de 91.7%). Los nidos fueron cercanamente estudiados en 2019 y 2020, cuando 7 intentos de anidación produjeron 13 polluelos. Una hembra crio 4 nidadas entre mediados de abril e inicios de septiembre de 2020; esta hembra puso huevos de su segundo, tercero y cuarto intentos mientras seguía criando en el nido a los polluelos de su nidada previa. El alto éxito de anidación y productividad que observamos probablemente resultó de la anidación en interiores, donde las 2 causas mayores de pérdida de nidos, depredación y estado del tiempo extremo, estuvieron ausentes. Los viejos nidos permanecieron intactos a lo largo de múltiples años al interior de la ferretería, lo cual probablemente facilitó múltiples nidadas porque las hembras frecuentemente reusaron nidos viejos en vez de construir nuevos en intentos subsecuentes.

Palabras clave: anidación múltiple, aves urbanas, reuso de nidos, sitios de anidación novedosos, Texas.

Black-chinned Hummingbirds (*Archilochus alexandri*) are summer residents of riparian habitats from southern British Columbia south through the western United States to extreme northern Mexico. Females typically build their nests 2–8 m above ground in trees or shrubs (Smith et al. 2009, 2014; Greeney et al. 2015, Baltosser and Russell 2020). Nests with eggs or young have been reported from late March through mid-August (Merriam 1896, Brown 1992, Baltosser and Russell 2020). Females often produce 2 broods per year and occasionally produce 3 broods (Baltosser and Russell 2020). Some females re-nest so rapidly that they begin incubating at a new nest before young from the previous nest have fledged (Cogswell 1949, Batchelder et al. 2012). Nesting success ranges from 15% to 65%, and predation and poor weather are the main causes of nest failure (Stiles 1973, Baltosser 1986, Kozma and Mathews 1997, Smith et al. 2009, 2014; Rappole and Kirwan 2013).

Black-chinned Hummingbirds first nested inside a hardware store near El Paso, Texas, in 2015. Over the next 5 years, 1 or 2 females nested inside the store each year. Nests were followed closely only in 2019 and 2020. Here, we describe nest sites and provide information on timing of nesting, reuse of old nests, nesting success, and productivity, with a focus on the 2 years in which we had complete information for all nesting attempts (an attempt being defined as laying at least 1 egg). We are not aware of previous reports of wild Black-chinned Hummingbirds nesting inside a building. Indeed, nesting inside buildings seldom has been reported in any hummingbird. We found published accounts of such nests for only 3 species: Sooty-capped Hermit (*Phaethornis augusti*; Veree 2016), Coppery Metaltail (*Metallura theresiae*; Gonzalez 2020), and Blue-throated Mountain-gem (*Lampornis clemenciae*; Willard 1911, Ray 1925). Moreover, our study is the first to document a Black-chinned Hummingbird producing young from 4 nesting attempts in a single nesting season and the first to report nesting success that exceeds 90%.

Methods

Study area and site history

All observations occurred inside the Myers Ace Hardware store in Canutillo, El Paso County, Texas, USA, ~100 m east of the Rio Grande River. Canutillo (31°55'N, 106°36'W, elevation 1,150 m, population ~6,400) is a suburb on the northwestern outskirts of El Paso. Summers are hot and dry; annual precipitation averages ~25 cm. Black-chinned Hummingbirds were first noticed inside the store in the spring of 2015. Store employees subsequently removed a pane of glass (18 × 25 cm) from a door that allowed the hummingbirds to come and go regardless of whether the store was open for business.

No adult males have been seen in the store. Females gathered nest material, mostly spider webbing, inside the store but foraged primarily outdoors (although 2 hummingbird feeders inside the store are used by females and fledglings each year; see Fig. 1). Incidental observations by NM confirmed that 1 or 2 females nested each year from 2015 to 2018, but complete data on timing of nesting events, number of attempts, and productivity were not obtained in those years. At the start

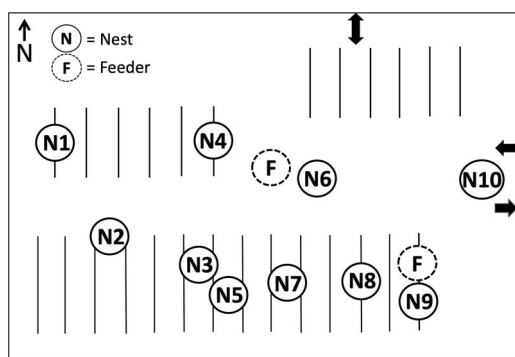


Figure 1. Schematic drawing of the interior of the Myers Ace Hardware store, El Paso County, Texas, showing the relative locations of 10 Black-chinned Hummingbird nests and 2 hummingbird feeders. Vertical lines denote aisles, single arrows denote customer entry and exit, and double arrow denotes window through which hummingbirds accessed the store. Drawing is not to scale; the store interior measures 56.7 m \times 38.4 m.

of the 2019 nesting season, 8 nests that had been built in previous years were present, and by the end of the 2020 nesting season, 10 nests existed in the store (Fig. 1).

Monitoring

After females were first seen in the store in early spring of 2019 and 2020, we recorded information on their activities (e.g., nest building, incubation, feeding nestlings and fledglings) at least once a day throughout the nesting season. Nest contents were unknown in most cases until nestlings were large enough to be visible above the nest rim. Occasionally in 2020, TJ examined nest contents with a GoPro camera mounted on a telescoping pole while the female was away from the nest; no birds were captured. Two females nested in 2019, and direct observations of the bird that nested twice confirmed that she laid eggs in her second nest shortly after the young from her first nest had fledged. The only female that nested in 2020 could be identified unequivocally by unique markings on her throat. We measured nest heights (floor to nest rim, to nearest cm) with a tape measure during the nesting seasons in 2019 and 2020. Nests are identified by numbered locations in the store (Fig. 1), but the numbers are not in chronological order (i.e., the nest at location #1 was not the first

built in the store, nor was the nest at location #10 the last to be built).

Results

2015–2018

Black-chinned Hummingbirds first nested in the store in 2015, when a female built a nest at location #8 and fledged 2 young. During the next 3 years, NM monitored nesting activity and determined that at least 1 female nested each year and that 2 females nested in at least 1 year, for a minimum total of 5 nesting attempts. Four of these nests were successful (i.e., produced at least 1 fledgling), and 1 nest failed, as evidenced by what looked like 2 mummified young in the nest at location #2 in 2020. Females placed their nests on 4 substrates at heights from 3.18 to 4.70 m above the building's floor (Fig. 1 and 2, Table 1). Nests remained intact for multiple years, and females sometimes reused old nests after adding only a small amount of new material. The cumulative estimate of nesting success for these 4 years was 80%.

2019

Two females made 3 nesting attempts in 2019. Female A was first seen in the store on 17 April. The next day she began to refurbish an existing nest at location #3 and gathered material such as spider webbing from inside the store. Female A was incubating at nest location #3 by 21 April 2019. Eggs from this attempt hatched on or shortly before 8 May, and the first and second chicks from this attempt fledged on 28 and 30 May, respectively. On 3 June, female A began adding material to the nest at location #8, which was 15.24 m east of nest #3 (Fig. 1), and she continued to do so for the next 2 d. On 6 June, she was incubating at nest #8 and also feeding both fledglings from her first nesting attempt. Eggs from the second attempt hatched by 25 June, and the chicks fledged on 17 and 19 July. Female B was first seen in the store on 7 July, at which time she began building a new nest at location #4, which was 17.62 m northwest of where female A was nesting concurrently (Fig. 1). On 11 July, female B was incubating at nest #4. Female B's eggs hatched on or about 28 July, at which time female A was still feeding fledglings from her second attempt. Female A and her



Figure 2. Female Black-chinned Hummingbirds built their nests on 4 substrates, each near the ceiling of the Myers Ace Hardware store: (a) metal cable at acute angle, (b) vee section of fluorescent light support chain, (c) spot light housing, and (d) metal conduit pipe.

fledglings were not seen in the store after 1 August. Female B's chicks fledged from nest #4 on 19 and 21 August. Thus, all 3 nesting attempts in 2019 were successful, and each of the 6 eggs laid

resulted in a fledgling. Hummingbirds were not seen in the store after 21 September. The cumulative estimate of nesting success increased to 87.5% for the period from 2015 to 2019.

2020

Only 1 female nested in the store in 2020. As noted above, she was identifiable by the unique pattern of markings on her throat. She first appeared in the store on 11 April. The next day she was adding material to an existing nest at location #10, which was situated on a piece of metal conduit pipe directly above the store's main entrance (Fig. 2d). A second female was seen in the store on 22 April and was pursued by the resident female. This same bird, presumably, was seen off and on through 2 May but did not attempt to nest. The resident female was incubating a presumed full clutch at nest #10 on 25 April, and

Table 1. Characteristics of 10 Black-chinned Hummingbird nests built inside the Myers Ace Hardware store, El Paso County, Texas, 2015–2020. See Fig. 1 for nest locations.

Nest location	Substrate	Nest height (m)
1	Metal cable at acute angle	3.22
2	Metal cable at acute angle	4.29
3	Vee section of light support chain	4.70
4	Metal cable at acute angle	3.18
5	Vee section of light support chain	4.70
6	Ceiling spot light	3.35
7	Vee section of light support chain	4.70
8	Vee section of light support chain	4.70
9	Vee section of light support chain	4.70
10	Horizontal metal conduit pipe	4.22

the eggs hatched on or about 13 May. From 19 to 21 May, the female fed her 2 chicks at nest #10 and also added material to nests at locations #3 and #7. Also on 21 May, she began constructing a new nest at location #5. By 25 May, when the nestlings from her first attempt were about 12 d old, the female was incubating her second clutch for the season at nest location #3, which was 23.41 m west-southwest of nest #10 (Fig. 1). The chicks from her first attempt fledged on or about 31 May, and the female provisioned them inside the store through at least 7 June. By 12 June, the fledglings from the female's first attempt were no longer seen in the store, and at least one chick from her second attempt had hatched. On 19 June, the female fed a single visible chick at nest #3 and also began to add material to the nest at location #10, the same nest she used for her first attempt of the season. The single chick fledged from nest #3 on 3 July, by which time the female was incubating at nest location #10 for her third nesting attempt of the season. Also on that date, TJ determined that nest #3 contained an unhatched and presumably inviable egg. The female was seen feeding her single fledgling on 7 July in between bouts of incubation at nest #10. By 17 July, 2 chicks were visible in nest #10, and the single fledgling from the previous nesting attempt was no longer seen in the store. The female fed the 2 nestlings on 28 July and also began incubating at the new nest she had built at location #5, which was 20.85 m southwest of nest #10 (Fig. 1), and which constituted her fourth nesting attempt for the season. Both chicks fledged from nest #10 on 1 August, while the female continued to incubate at nest #5. On 8 August, TJ examined the contents at nest #5 while the female was off feeding fledglings and observed 2 eggs. Also on that date, the female visited the nest at location #7 and appeared to tamp the nest cup with her feet. On 14 August, the female again visited the nest at location #7; fledglings from her third nesting attempt were no longer present in the store. On 17 August, TJ re-examined the nest at location #5 and determined that it contained two small nestlings. We subsequently saw the female feed these nestlings many times, but we never saw her at other nests after 14 August. The 2 young from nest #5 fledged on 5 and 6 September and were fed by the female inside the store until they left permanently on 16 and 18 September. The female was last seen in the store on the morning of

23 September. In total, she produced 7 fledglings from 4 nesting attempts in 2020. After her first attempt, she began incubating for each of her subsequent attempts before chicks from the previous attempt had fledged. The cumulative estimate of nesting success was 91.7% for the 12 nests for which we had data from 2015 to 2020.

Discussion

Thirteen of the 14 eggs laid in 7 nesting attempts in 2019 and 2020 resulted in a fledgling. Prior to our work, Black-chinned Hummingbirds were not known to successfully raise, or even to attempt, 4 broods in the same nesting season (Baltosser and Russell 2020). The female that nested in 2020 raised 7 fledglings in 4 attempts, which is extraordinary production. The 2020 nesting season ended in mid-September, in contrast to most other studies in which nesting ended between late June and late July (Pitelka 1951, Stiles 1973, Brown 1992, Baltosser and Russell 2020). Indeed, the latest published report of an active nest involved a female that produced young from 3 nests in 1 year, the last of which fledged on 20 August (Cogswell 1949); reports of nesting into late August apparently are unpublished (see Baltosser and Russell 2020).

We are not aware of previous instances of wild Black-chinned Hummingbirds nesting inside buildings. Williamson (2001) reported odd nest substrates such as wind chimes, chains, and loops of rope; similarly, our birds built some nests on chains (Fig. 2b). Because nests in the store were protected from the weather, they persisted intact for several years. Reuse of old nests by Black-chinned Hummingbirds is thought to be uncommon (<25% of nests) and to involve construction of a new nest atop an old one (Baltosser and Russell 2020). Five of 7 attempts (71%) in 2019 and 2020 were in old nests, always with only a small amount of new material added to the nest that was reused. This suggests that Black-chinned Hummingbirds readily reuse nests with little additional modification provided that the nests are intact. Reuse of old nests might make it easier for females to raise multiple broods because they would not have to build a new nest for each subsequent attempt.

Nesting success for 12 attempts was 91.7%, which is substantially higher than that measured in other studies of this species (e.g., Stiles 1973, Kozma and Matthews 1997, Smith et al. 2009, 2014; Baltosser and Russell 2020). We believe that the high nesting success of females in our study resulted from nesting indoors, where the 2 major causes of nest failure, predation and extreme weather (Stiles 1973, Baltosser 1986, Smith et al. 2009, 2014; Baltosser and Russell 2020), were absent. Baltosser (1986) noted that nesting success in hummingbirds ranges from 20% to 89%. He also posited that the “exceptionally high” success of 89% that Carpenter (1976) measured at Andean Hillstar (*Oreotrochilus estella*) nests in Peru resulted from the birds nesting in “enclosed and inaccessible rocky areas, including caves,” which presumably protected nests from predators and bad weather (Baltosser 1986: p. 365). Our results suggest that Black-chinned Hummingbirds that nest inside a building have higher nesting success and productivity than do those that nest in more natural settings. It would be interesting to band adults and nestlings to determine whether the same birds nest in the store from year to year, and whether young produced in the store are recruited to nest there as adults.

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