NOTES

LEAST BELL'S VIREO NESTS IN THE SIERRA SAN PEDRO MÁRTIR, BAJA CALIFORNIA

ANGELA TAMAYO-VÁZQUEZ, ANNY PERALTA-GARCÍA, DAVID F. PÉREZ-CAÑAS, and JORGE H. VALDEZ-VILLAVICENCIO, Conservación de Fauna del Noroeste, Jorge Mazón No. 291, Ampliación Punta Banda II, Ensenada, Baja California, Mexico, CP 22897; angela@faunadelnoroeste.org; annyperaltagarcia@yahoo.com.mx; david.perez@faunadelnoroeste.org; j_h_valdez@yahoo.com.mx

ANDREW McGINN FORDE, Forde Biological Consultants, 10664 Presilla Road, Camarillo, California 93012; andrew@fordebio.com

ABSTRACT: Surveys for the Least Bell's Vireo (*Vireo bellii pusillus*) during 18 field trips to four localities near the west base of the Sierra San Pedro Mártir in Baja California, Mexico, yielded detection of 42 individual vireos and 41 nests, 15 in various stages of use and 26 old. Arroyo willow (*Salix lasiolepis*) was the plant most frequently found supporting these nests, and the big sagebrush (*Artemisia tridentata*) was second, even though it has not been reported previously as a site of Least Bell's Vireo nests. Other plants newly identified as supporting nests of this vireo were the single-whorl burrobrush (*Ambrosia monogyra*), hoary coffeeberry (*Frangula californica tomentella*), and holly-leaf cherry (*Prunus ilicifolia*). Rancho Meling, where we found the most vireos, has long been known as a site for the species, but ranchos El Potrero and La Costilla represent newly identified sites. Only one of the 15 active nests had been parasitized by the Brown-headed Cowbird (*Molothrus ater).*

The Least Bell's Vireo (*Vireo bellii pusillus*) is a migratory subspecies distributed from California, USA, to Baja California Sur, Mexico (Kus et al. 2022). In the United States, various aspects of its breeding ecology have been well documented since it was listed as endangered by the U.S. Fish and Wildlife Service (USFWS) in 1986, and conservation measures have been implemented to counteract the main threats: loss of riparian habitat used for breeding and brood parasitism by the Brown-headed Cowbird (*Molothrus ater*) (USFWS 2006). Although the subspecies is listed under the same category in Mexico by NOM-059-SEMARNAT (DOF 2010) and similar threats have been noted (Unitt et al. 1995, USFWS 1998), information on its ecology and demography in Mexico remains scarce. Opportunistic observations in Mexico augment the identification of sites of breeding, stops in migration, and wintering along the Baja California peninsula (e.g., Wilbur 1980, Erickson et al. 2008).

During two Least Bell's Vireo workshops in June and July 2024, in addition to occasional field surveys in April and May 2025, we visited four localities in the western foothills of the Sierra San Pedro Mártir, Baja California, Mexico: Rancho Meling (30.972°, −115.744°, elevation 630 m above sea level), Rancho La Costilla (31.042°, −115.731°, 920 m), and Rancho El Molino (30.943°, −115.762°, 570 m), all within the San Telmo watershed, and Rancho El Potrero (30.918°, −115.649°, 900 m) within the Santo Domingo watershed. In the course of 18 visits, we searched for Least Bell's Vireo nests along streams with abundant willows (*Salix* spp.), one of the plants in which the subspecies nests most frequently (Kus et al. 2022), recording birds observed or heard near these sites. Here we summarize our observations of nests of the Least Bell's Vireo in the Sierra San Pedro Mártir, expanding the knowledge of its reproductive ecology in Baja California.

We located 41 nests at three of the four localities surveyed (Table 1). During 12 visits to Rancho Meling, we covered a 2-km stretch of stream and recorded 33 nests.

Table 1 Number of Least Bell's Vireos and Nests Detected in the Sierra San Pedro Mártir, Baja California

Location	Site visits	Least Bell's Vireos detected	Nests located
Rancho Meling	12	29	33
Rancho La Costilla	2	3	4
Rancho El Molino	1	6	0
Rancho El Potrero	3	4	4

Figure 1. Least Bell's Vireo nest parasitized by a Brown-headed Cowbird, located on 6 June 2024 in an arroyo willow (*Salix lasiolepis*) at Rancho Meling, Sierra San Pedro Mártir, Baja California. Note the vireo's four smaller white eggs with a few brown spots and the noticeably larger, heavily mottled cowbird egg.

Photo by Bill Webb

FIGURE 2. Least Bell's Vireo nest containing four unusual eggs, located on 6 June 2024 in a big sagebrush (*Artemisia tridentata*) at Rancho Meling, Sierra San Pedro Mártir, Baja California. Note the four discolored eggs with a distinct air cell visible at the top.

Photo by Angela Tamayo

These included six nests with four vireo eggs, including one parasitized by a Brown-headed Cowbird, two nests with one vireo egg, one nest with four nestlings being fed by both parents, one nest still under construction, one completed but empty nest, and 22 old nests that were likely built in previous years. The parasitized nest was built in an arroyo willow (*Salix lasiolepis*) at 2 m in height and 0.5 m from the center of the plant; it contained four vireo eggs and one cowbird egg (Figure 1), and both parents were observed incubating the eggs. Additionally, we detected a nest built in a big sagebrush (*Artemisia tridentata*) that contained four light, discolored eggs with a distinct air cell visible at the top (Figure 2). During our first visit on 6 June 2024, both parents visited the nest. On 7 July 2024, however, the nest was empty and we found no remains of eggshells. Because the air cell normally draws down during development, these eggs may have been infertile or may not have developed after fertilization (L. Allen pers. comm.). On 9 June 2024 we encountered a similar situation in a nest located in a hoary coffeeberry (*Frangula californica tomentella*) in which four eggs were observed during our first visit to the site and one month later the nest had been abandoned and contained only three infertile eggs.

While locating nests at Rancho Meling, we recorded a total of 24 adults (19 singing males and five females) and five juveniles. Over two surveys at Rancho La

FIGURE 3. Least Bell's Vireo nest visited by an adult, located in June 2024 in a big sagebrush (*Artemisia tridentata)* at Rancho Meling, Sierra San Pedro Mártir, Baja California.

Photo by Dylan Zubieta

Costilla, we covered a 2-km stretch of stream and located four nests: one under construction, one completed but empty nest that a pair visited repeatedly, and two old nests. We detected three adults near the nests (two singing males and one female) and observed one male using bark from a coast live oak (*Quercus agrifolia* var. *agrifolia*) as nesting material. At Rancho El Molino, we searched a 0.5-km stretch of stream during a brief visit on 7 May 2025. We did not find any nests, but detected six vireos (including singing males). We visited Rancho El Potrero on three occasions and searched a 1-km stretch of stream. We found four nests: two under construction and two old nests, one of which was in a holly-leaf cherry (*Prunus ilicifolia*) growing on a rocky outcrop, 4 m above the stream. During our survey, we detected a total of four singing males.

The 41 nests were built in nine plant species: 25 in arroyo willow (61%), seven in big sagebrush (17%) (Figure 3), two each in single-whorl burrobrush (*Ambrosia monogyra*) and desert wild grape (*Vitis girdiana*), and one each in mule fat (*Baccharis salicifolia*), hoary coffeeberry, holly-leaf cherry, coast live oak, and blue elderberry (*Sambucus nigra cerulea*). The mean nest height was 1.26 ± standard deviation 0.58 m (range 0.5–3.2 m, $n = 40$ nests), the nests' mean distance from the center of the

substrate plant was 0.69 ± 0.87 m (range 0–3.23 m, n = 31 nests), and the supporting plant's mean height was 3.11 ± 1.97 m (range 1.5–7 m, n = 9 nests). The sample sizes vary because measurements were not available for all nests. Nesting materials included plant matter, spider webs, spider egg sacs, shed lizard skin, toilet paper, and plastic bags. In addition, we found feathers and wool lining the nest cup in six of the nests.

Our results confirm that Rancho Meling continues to be an active breeding site, used since at least 1980 (Wilbur 1980, USFWS 1998). To our knowledge, Rancho El Potrero and Rancho La Costilla represent newly reported breeding sites for this subspecies. We also documented that the Least Bell's Vireo is affected by brood parasitism by the Brown-headed Cowbird at Rancho Meling. In addition, personal observations and a record on the citizen-science platform iNaturalist confirm that Brown-headed Cowbirds also occur at Rancho El Potrero (Juan Viramontes, mexico. inaturalist.org/observations/278900495), indicating they may also present a threat at this locality. In June 2025, Forde found six additional nests (four of which contained eggs) at this site. We suggest continuing long-term nest monitoring in these localities to determine rates of brood parasitism, which have been considered the most effective way to estimate the level of threat the Brown-headed Cowbird poses to species of conservation concern (Clark and Ferree 2025).

The detection of nonviable eggs suggests that additional factors may limit nesting success in the areas we surveyed. Although the causes of infertility remain uncertain, they may be related to factors such as the age or condition of the breeding pair. The timing of nesting can also be a factor, as more infertile eggs are laid at the beginning and end of the breeding season when hormone levels are lower (L. Allen pers. comm.).

The arroyo willow, mule fat, coast live oak, desert wild grape, and blue elderberry have been previously documented as host plants for Least Bell's Vireo nests (Hendricks and Rieger 1989, Rourke and Kus 2008, Lynn and Kus 2024, Clark and Ferree 2025). We found no previous records, however, of the single-whorl burrobrush, hoary coffeeberry, holly-leaf cherry, or big sagebrush as nest substrates, despite the last being the second most frequently used in our study area. This difference may reflect local adaptations or differences in substrate availability at these sites within the Sierra San Pedro Mártir. Because the plants in which Least Bell's Vireos nest vary geographically and locally (Kus et al. 2022), our observations serve as a baseline for future regional monitoring efforts.

The nest heights we measured are similar to those reported for southern California, ranging from 0.7 to 1.6 m (Kus et al. 2022). The nests' position relative to the center of the substrate and plant height differed, but this result should be interpreted with caution because of the small sample size.

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