NOTES

BREEDING OF THE GUADALUPE MURRELET IN SOUTHERN CALIFORNIA

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ABSTRACT: After having been observed regularly at Seal Cove, San Clemente Island, California, since 1994, the Guadalupe Murrelet (*Synthliboramphus hypoleucus*) was confirmed nesting successfully in an artificial nest on a rocky ledge above the cove in 2022. The incubating adults' identity and the two chicks' departure from the nest were confirmed by a trail camera. Another Guadalupe Murrelet nest at Santa Barbara Island in 2021 was only the second confirmed there. Though the populations of the Guadalupe Murrelet at San Clemente and Santa Barbara islands are apparently small, they are important in representing the only confirmed sites of the species' nesting away from Guadalupe and the San Benito islands.

The Guadalupe Murrelet (*Synthliboramphus hypoleucus*) is the rarest alcid in the world, with a global population of <5000 pairs concentrated at two island groups off the Pacific coast of central Baja California, Mexico: three islets and the main island at Isla Guadalupe (~90% of population) and at least two of the three islets at Islas San Benito (<10%) (Keitt 2005, Wolf et al. 2005, Bedolla-Guzmán et al. 2019, Whitworth et al. 2021, Méndez-Sánchez et al. 2022). In California, we confirmed the Guadalupe Murrelet breeding at Santa Barbara Island in 2021 and San Clemente Island in 2022. With these, the Guadalupe Murrelet has now been documented breeding at just four locations (Figure 1), although breeding is suspected also at islas San Martín and San Jerónimo, Baja California (Whitworth et al. 2021). The Guadalupe Murrelet nest at San Clemente Island was the first ever recorded for this island, while that at Santa Barbara Island represented the first breeding recorded there since 1977–1978 (Winnett et al. 1979).

The first record of a Guadalupe Murrelet at San Clemente Island was of a road-killed carcass (San Diego Natural History Museum 39944) found about 800 m inland on the island's upper plateau after "apparently being attracted to lights at night and struck by a car" on 29 July 1976 (Carter et al. 2009:27). Given the time of year, this record could plausibly be explained as an individual from islas Guadalupe or San Benito dispersing northward after the breeding season (Nettleship and Kirwan 2015). However, three Guadalupe Murrelets captured at night from the small congregation (mean 29 ± 15 murrelets from 2013 to 2016; Whitworth et al. 2018) at sea in Seal Cove (32.905° N, 118.534° W) during the breeding season in early May 1994 and 1996 provided more compelling evidence of possible nesting at San Clemente Island (Table 1).

The possibility of the Guadalupe Murrelet's breeding at San Clemente Island

FIGURE 1. Breeding ranges of the Guadalupe (diamonds) and Scripps's (circles) Murrelets at islands off the Pacific coast of southern California and northwestern Baja California, Mexico, including recently confirmed Guadalupe Murrelet colonies at San Clemente Island (SCI) and Santa Barbara Island (SBI), California. S, suspected breeding.

was first proposed by Carter et al. (2009) after six Guadalupe Murrelets were captured along with six Scripps's Murrelets (*S. scrippsi*) in the congregation at Seal Cove on 27 April 2008. Carter et al. (2009:28) wrote that "the presence of *hypoleucus* individuals at San Clemente Island from 1976 to 2008 suggested that both murrelet subspecies may currently breed at the island" and later added that "the possibility of *hypoleucus* breeding at San Clemente Island is greater than at other islands in southern California, given [their] regular use of at-sea congregations." At the time, the two taxa were still considered conspecific (Birt et al. 2012).

The consistent presence of Guadalupe Murrelets (including birds with

Table 1 Murrelets Captured at San Clemente Island, California, 1994–2021

Year (nights)	Total captures[a]	No. Guadalupe Murrelets	Breeding (%)[b]
1994 (2)	9	2	0
1996 (1)	6	1	0
2008 (1)	12	6	0
2012 (5)	42	4	1 (25%)
2013 (6)	54	6	1 (17%)
2014 (9)	56	6	1 (17%)
2015(4)	41	2	0
2016 (5)	48	3	0
2019 (7)	38	0	—
2020 (4)	34	8	6 (75%)
2021 (1)	8	0	—
Total (45)	348	38	9 (24%)

[a]Scripps's and Guadalupe Murrelets combined.

[b]Number and percentage of Guadalupe Murrelets with brood patches, presumed breeding.

brood patches) at Seal Cove from March to May from 2012 through 2021 (Whitworth et al. 2018) reinforced our suspicions of regular breeding at San Clemente Island (Table 1; Figure 2). We did not consider the large proportion of Guadalupe Murrelets without brood patches (76%; $n = 38$; Table 1) as indicative of a lack of breeding at San Clemente Island because at all the islands studied to date, the proportion of murrelets with brood patches in such congregations is <20% (Whitworth unpubl. data). Furthermore, the proportions of birds with brood patches in the Guadalupe (24%) and Scripps's murrelets (27%) were very similar (Whitworth unpubl. data). Overall, the Guadalupe Murrelet represented 11% of all murrelets captured at San Clemente Island since 1994, with annual proportions ranging from 0% in 2019 and 2021 to 50% in 2008. Although Guadalupe Murrelets were not captured at San Clemente Island in 2019 or 2021, we still heard them occasionally calling in the congregation at Seal Cove. The Guadalupe Murrelet's call is a short, rapid trill and quite distinct from the series of high-pitched whistles characteristic of Scripps's Murrelet.

Despite the Guadalupe Murrelet's consistent presence at San Clemente Island during breeding-season surveys from 1994 to 2021, its first nest at that island was not found until 2022. This nest was first noted on 2 March when an incubating adult murrelet was observed in an artificial nest on the north shore of Seal Cove. The murrelet was not immediately identified as a Guadalupe because it was sitting in a position that did not provide a view of its facial plumage (Figure 3), the most obvious external feature distinguishing the Guadalupe and Scripps's murrelets (Jehl and Bond 1975). The Guadalupe Murrelet has a distinct white crescent that extends above the solid white underparts and surrounds most of the eye, whereas Scripps's has a solid black cap that completely surrounds the eye (Figure 1). We did not capture or prod murrelets in their nests to determine their species or if they were incubating eggs because they are prone to abandon nests when touched (Murray et al. 1983), although they are quite tolerant of occasional activity around nests and being photographed (Whitworth pers. obs.).

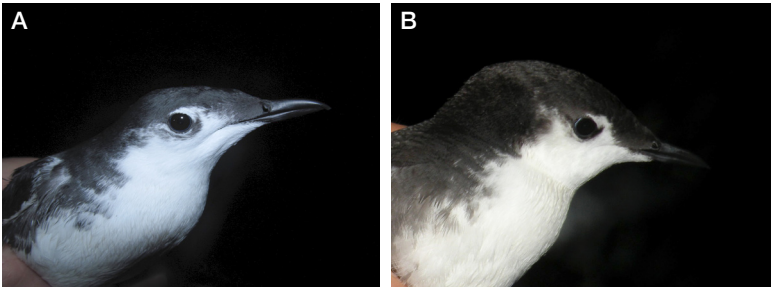

FIGURE 2. Guadalupe Murrelets captured from congregations at sea near San Clemente Island, California, 21 April 2013 (A) and Santa Barbara Island, California, 16 May 2009 (B).

Photos by Darrell L. Whitworth

We did not visit this nest again until 20 June 2022, by which time the eggs had already hatched and the family group had departed the island. Species identification was based on video taken by a trail camera focused on the nest entrance that we had deployed during the first visit on 2 March. This camera detected an adult Guadalupe Murrelet (Figure 4) outside the nest on 6 March (01:13), 9–10 March (22:10–00:36), 12 March (22:44), 15–16 March

FIGURE 3. Guadalupe Murrelet incubating in an artificial nest at Seal Cove, San Clemente Island, California, 2 March 2022.

Photo by Darrell L. Whitworth

FIGURE 4. Trail-camera image of an adult Guadalupe Murrelet outside a nest at Seal Cove, San Clemente Island, California, 9 March 2022.

(23:38–02:35, 18 March (21:35), and 21 March (00:12–03:34). On the night of 21 March (19:22), two murrelet chicks (Figure 5) were recorded departing the nest, and an adult Guadalupe Murrelet was heard calling incessantly to lure the chicks to sea. Species identification of the chicks from this image was unclear, but only adult Guadalupe Murrelets were detected outside the nest, and the adult calling to the chicks was unquestionably a Guadalupe Murrelet. However, it is possible the chicks resulted from a mixed pair (e.g., Winnett et al. 1979, Wolf et al. 2005).

On 7 March 2021, we discovered a Guadalupe Murrelet nest in a rock crevice at Santa Barbara Island while surveying murrelet habitat in the "West Cliffs" area southeast of Webster Point (38.483° N, 119.047° W). We tentatively identified the incubating adult as a Guadalupe Murrelet by its facial plumage and verified the species by inserting a camera phone into the crevice to get a better image of the face (Figure 6). During later visits, we observed an incubating Guadalupe Murrelet in the crevice on 21 March and two hatched eggs on 8 April. This represented the first record of successful breeding of the Guadalupe Murrelet anywhere other than islas Guadalupe and San Benito (Winnett et al. 1979). We suspect a Guadalupe Murrelet occupied this nest in 2022 but could not confirm the species because only whole eggs (18 and 21 March) and shells from depredated eggs (14 April) were observed in the site. As at San Clemente Island, Guadalupe Murrelets had been documented attending the large congregation (usually hundreds of murrelets) at sea near their nesting area on the west side of Santa Barbara Island in some years prior to discovery of the nest in 2021. We captured one of a pair of Guadalupe Murrelets about 1 km off Webster Point while banding on 16 May 2009 (Figure

FIGURE 5. Trail-camera image of two murrelet chicks departing a nest at Seal Cove, San Clemente Island, California, 21 March 2022.

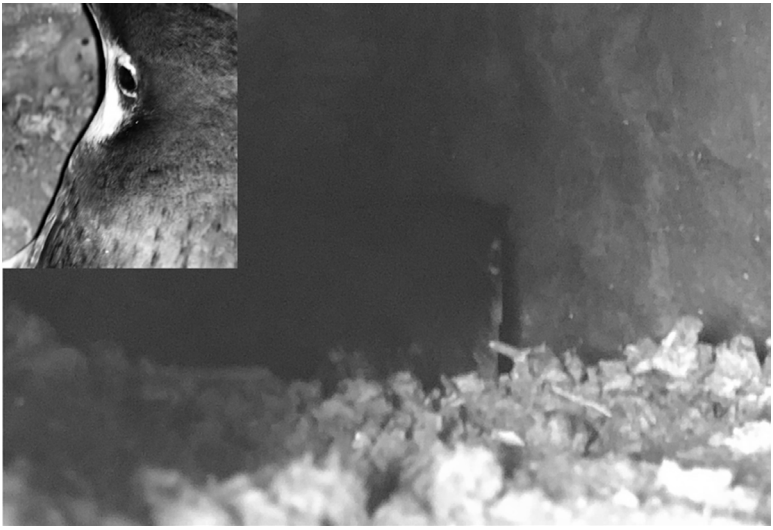

FIGURE 6. Guadalupe Murrelet incubating in a natural crevice at Santa Barbara Island, California, 7 March 2021. Inset: Close-up of the facial pattern used to identify species.

Photos by James A. Howard

2) and heard an unseen Guadalupe Murrelet calling in the same area during a nocturnal survey by spotlight on 11 April 2015.

Continued monitoring of the murrelet populations at both San Clemente and Santa Barbara islands will be needed to ascertain the Guadalupe Murrelet's status there. Although the species' populations at both islands are undoubtedly small, they also represent half the known breeding locations of this species considered endangered by both Mexico's Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT 2010) and the International Union for the Conservation of Nature (IUCN 2017). Given the challenges we have had finding even one Guadalupe Murrelet nest each at San Clemente and Santa Barbara islands, it is clear that spotlight surveys (Whitworth and Carter 2014) and captures at sea (Whitworth et al. 1997) are the most efficient methods of monitoring the small populations at these islands.

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