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Short Note

Presence of Guadalupe Fur Seals (*Arctocephalus philippii townsendi*) at Isla Roca Partida, Revillagigedo Archipelago, México

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Before the demise of their population due to extensive hunting for their fur during the 18th and 19th centuries (Hanna, 1922), the distribution of the Guadalupe fur seal (*Arctocephalus philippii townsendi*) extended from the Farallon Islands in California (38° N; Starks, 1922) to the Revillagigedo Archipelago in Mexico (18° N; Townsend, 1931; Hamilton, 1951; Repenning et al., 1971; Gallo-Reynoso, 1994; Belcher & Lee, 2002). Guadalupe fur seals are permanent residents of Isla Guadalupe which is the only breeding colony known to date. The species began recolonizing the San Benito Archipelago in 1997, likely driven by the El Niño event of that year (Maravilla-Chávez & Lowry, 1999). Nevertheless, this is a resting–foraging colony that has not achieved the status of breeding colony (i.e., few pups are born each year relative to the total number of fur seals on these islands, totaling 16 pups in a total population of 2,227 individuals, with pups representing 0.7% of the total population; Esperón-Rodríguez & Gallo-Reynoso, 2012). This low number of pups born may affect the recovery of this species (García-Capitanachi et al., 2017).

Multiple sightings of Guadalupe fur seals have been recorded over the past three decades at several localities from Vancouver, British Columbia, Canada (Hondro, 2016; D'Agnese, 2020), the northwestern coast of the U.S. (Hanni et al., 1997; Melin & DeLong, 1999; Etnier, 2002), the west coast of Baja California at the Gulf of Ulloa (Arias del Razo et al., 2017; Aurioles-Gamboa & Szteren, 2020), and in the Gulf of California (Aurioles-Gamboa et al., 1993; Gallo-Reynoso et al., 2010; Elorriaga-Verplancken et al., 2016, 2021; Amador-Capitanachi, 2018). Further south, Guadalupe fur seals have been observed along the Pacific coast of Mexico on the coasts of Colima, Guerrero, Oaxaca, and Chiapas States (Aurioles-Gamboa & Hernández-Camacho, 1999; Meraz & Sánchez-Díaz, 2008; Villegas-Zurita et al., 2015; Ortega-Ortiz et al., 2019), including extralimital records in the eastern tropical Pacific on the coast of El Salvador (Ibarra-Portillo et al., 2016) and in the Galapagos Archipelago (Páez-Rosas et al., 2020).

Their recovery at Isla Guadalupe has been successful; the actual population of fur seals on that island is around 34,000 individuals (García-Aguilar et al., 2018). This island is part of their former distribution from the Gulf of Farallones in California to the waters near Revillagigedo Archipelago in Mexico (Hoyos-Padilla & Gallo-Reynoso, 2015). Occasionally, when strong El Niño events occur as in 2014-2016, vagrant individuals visit the western coast of North America—from Mexico to Oregon and Washington (D'Agnese et al., 2020), and British Columbia (Hondro, 2016). Some of these animals strand and die due to entanglement, famine, or being preyed upon by large predators (i.e., *Orcinus orca*) as happened with one of our tagged pups at Isla Guadalupe that was recovered from the stomach of a stranded orca (unpub. data).

Guadalupe fur seals in Mexico inhabit islands close to areas of medium to high primary productivity along the northeastern coast of the Baja California Peninsula (i.e., Islas Coronado, San Benito Archipelago, Isla Natividad, and Isla Margarita; Aurioles-Gamboa et al., 2010). During the past two decades, Guadalupe fur seals have been regular visitors to some islands in the Gulf of California (i.e., Lobos, San Esteban, San Pedro Mártir, San Pedro Nolasco, Farallón de San Ignacio, Los Islotes, and Islote Las Animas) which have been documented by Gallo-Reynoso et al. (2010), Elorriaga-Verplancken et al. (2021), and Gutiérrez-Osuna et al. (2021). The majority of individuals found on these islands are juvenile and subadult males, with some adult males and few adult females, and are found mostly during the fall-winter intensive foraging period

(Esperón-Rodríguez & Gallo-Reynoso, 2012; Elorriaga-Verplancken et al., 2021; Gutiérrez-Osuna et al., 2021). None of these islands are reproductive colonies yet; therefore, they are referred to as resting and foraging rookeries in the Gulf of California (Esperón-Rodríguez & Gallo-Reynoso, 2012).

Several authors reported that Guadalupe fur seals have been found far away from their reproductive colonies and their currently known distribution area (Gallo-Reynoso, 1994; Lander et al., 2000; Gallo-Reynoso et al., 2008). These records, together with the following additional unpublished reports, confirm the extensive migratory ability of Guadalupe fur seals. A 3-y-old juvenile fur seal tagged in its pectoral fin (blue sky jumbo tag A587) by us in the summer of 2015 at Punta Sur, Isla Guadalupe, was resighted at Isla Farallón de San Ignacio (25° 26.3' N, 109° 22.6' W) in the fall of 2018. In autumn of 2020, we sighted another juvenile at Isla Farallón de San Ignacio with a blue plastic tag (impossible to read the number from the boat distance) that had also been tagged by us at Isla Guadalupe either in the summers of 2015, 2016, or 2017 when pups were tagged when they were a few weeks old. Other Guadalupe fur seal pups tagged by us were found in California, Oregon, and Washington during 2015-2016, and two adult males were observed at two different places in Vancouver—at Spring Cove, Ucluelet, and near a salmon farm (Hondro, 2016; pers. comm. from J. Harris to J. P. Gallo-Reynoso, 20 January 2016).

Herein, we report the first record of a subadult male Guadalupe fur seal, observed by MH on 22 December 2020 at 1526 h on the southern part of Isla Roca Partida (19° 0.007' N, 112° 4.329' W). The individual was resting on the uprising rock of that island at Revillagigedo Archipelago (Figure 1) and stayed throughout the evening. Members of the expedition opportunistically observed the fur seal while doing research on the sharks of Revillagigedo Archipelago. Roca Partida is an elevated peak of volcanic origin that reaches out from the ocean floor at 3,400 m as part of an unnamed submarine mountain with a summit of 1,554 m. The island drops straight down to almost 80 m and then gradually descends to the submarine mountain

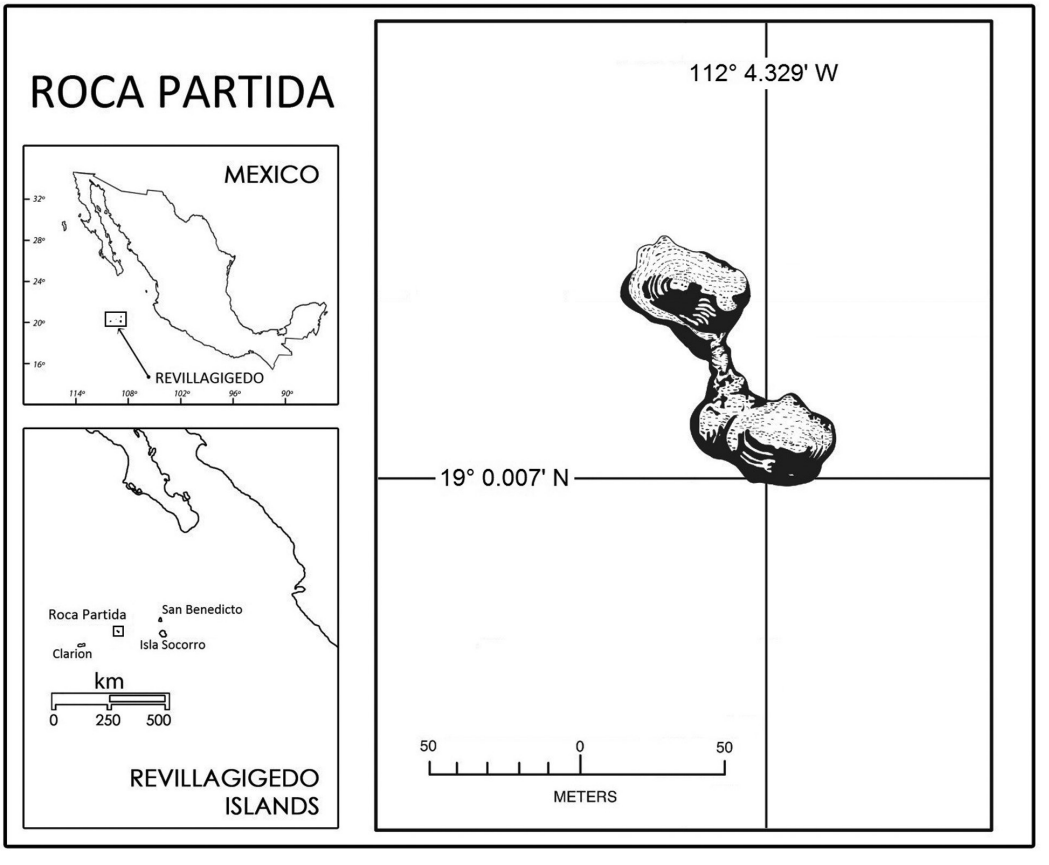

Figure 1. Isla Roca Partida at Revillagigedo Archipelago (from Richards, 1964; modified by J. P. Gallo-Reynoso)

as a volcanic cone. The above-water structures are composed of two lava peaks that reach 33 m (Richards, 1964). Roca Partida is located 292 km east of Isla Clarión, the second largest island of the archipelago (Richards, 1964).

Given that the observation took place during La Niña of 2020 in which Pacific surface water temperatures decreased from 1° to 1.5°C below normal (National Oceanic and Atmospheric Administration [NOAA], 2021), that event may have caused this individual fur seal to move far away from its likely colony at Isla Guadalupe in search of prey. La Niña events tend to increase overall primary productivity and produce abnormal temperatures in temperate and subtropical waters, making prey move with water masses, and leading to an increase of likely prey species (i.e., squids) for the fur seal. This may cause individuals of this species to disperse far from their former range and can lead to extralimital movements of pinnipeds reaching as far as the Galapagos Archipelago (Páez-Rosas et al., 2020).

We determined that the fur seal was a large subadult male based on the size of its fore-flippers (Figure 2); it appeared similar in size to subadults from Isla Guadalupe but not yet the size of a full-grown adult. The individual was somewhat slender but in apparent good body condition. This individual was observed ~650 km southwest of the Gulf of Ulloa, a locality where Guadalupe fur seal males tend to aggregate for foraging (Aurioles-Gamboa & Szteren, 2020); ~590 km from a resting colony at Isla Santa Margarita (24° 18.655' N, 111° 42.614' W) of fur seals mixed with California sea lions (*Zalophus californianus*); ~790 km from a resting colony at Las Ánimas in the Gulf of California (25° 06.7' N, 110° 30.6' W); ~810 km west of an incipient colony of the species on Isla Farallón de San Ignacio (25° 26.3' N, 109° 22.6' W); ~600 km from the nearest foraging and resting colony at Islas San Benito Archipelago (Esperón-Rodríguez & Gallo-Reynoso, 2012); and ~815 km from Manzanillo on the coast of central Mexico (19° 4.003' N, 104° 22.002' W; Ortega-Ortiz et al., 2019; Figure 3). Other nearby sightings of Guadalupe fur seals have been of two adult males at sea at latitudes near the Revillagigedo

Figure 2. Subadult male Guadalupe fur seal (*Arctocephalus philippii townsendi*) resting on the southern part of Isla Roca Partida, 22 December 2020 (*Photo credit:* Amanda Zeisset)

Archipelago: one in 1997 between Manzanillo and Socorro (18° 58.036' N, 107° 39.996' W; Hoyos-Padilla & Gallo-Reynoso, 2015), and a previous observation of a subadult male sighted in 2005 from a tuna fishing boat between Isla San Benedicto and Isla Socorro (19° 5.055' N, 110° 50.003' W; pers. comm. from F. Quintero-Mockabe to J. P. Gallo-Reynoso; Figure 3).

Several fish and squid species that fur seals eat around Isla Guadalupe and other parts of their range (Gallo-Reynoso & Esperón-Rodríguez, 2013) are also found at Revillagigedo such as the Japanese mackerel (*Scomber japonicus*) and jumbo squid (*Dosidicus gigas*); these prey species have also been observed in the waters of Roca Partida (Lara-Lizardi, 2018) and may explain the presence of this fur seal in the area. It is encouraging to find a Guadalupe fur seal at Roca Partida since the Revillagigedo Islands were home to Guadalupe fur seals before their commercial exploitation (Repenning et al., 1971).

This observation suggests the continual dispersal of subadult male Guadalupe fur seals from their reproductive and foraging colony at Isla Guadalupe and foraging colony at San Benito Archipelago. We suggest continuous monitoring of Guadalupe fur seals as well as California sea lions, which have also been recently observed at the Revillagigedo Archipelago (Hoyos-Padilla & Gallo-Reynoso,

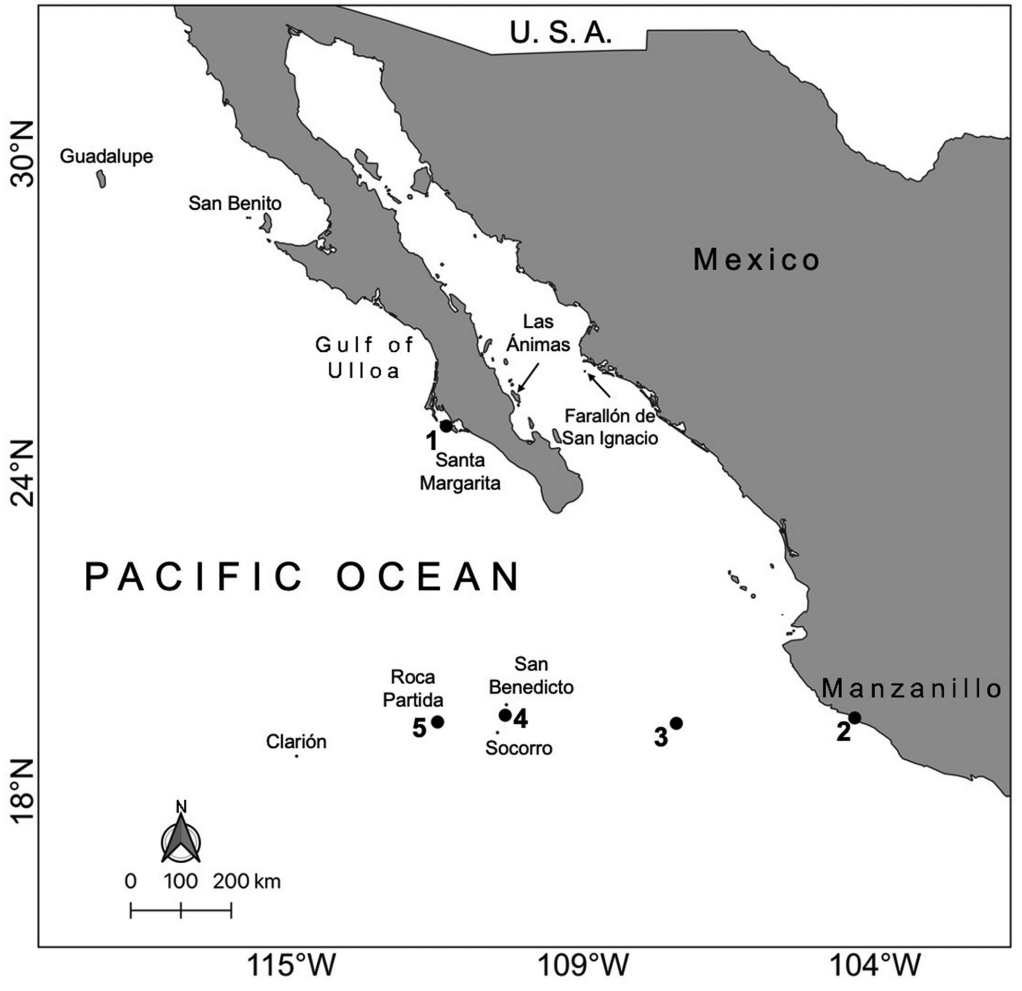

Figure 3. Locations where Guadalupe fur seals have been observed hauling out: (1) Isla Santa Margarita, (2) the offshore of Manzanillo Port, (3) swimming in between Manzanillo and Isla Socorro, (4) offshore of Isla Socorro, and (5) this observation at Isla Roca Partida. Other observations which are unnumbered are of new incipient colonies such as Islote Las Ánimas and Isla Farallón de San Ignacio.

2015). As was expected by the scientific community for a long time, we are witnessing the presence of this species revisiting the Revillagigedo Archipelago. Will Guadalupe fur seals start colonizing the Revillagigedo Archipelago as part of their current range and as an alternative habitat? We certainly hope they will.

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