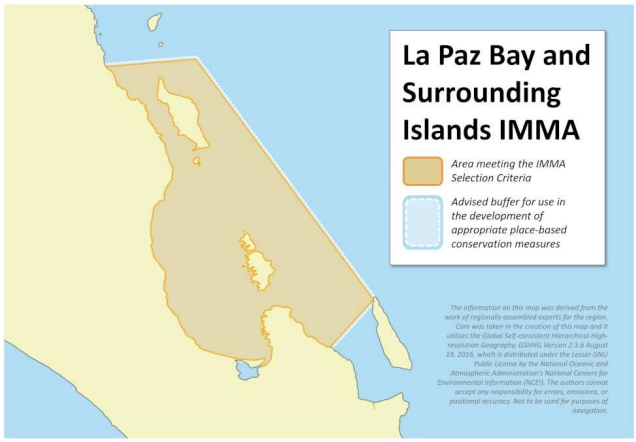

Area Size

4,937km^2

Qualifying Species and Criteria

California sea lion – *Zalophus californianus*

Criterion B (1); C (1, 2)

Guadalupe fur seal –

Arctocephalus philippii townsendi

Criterion C (1)

Criterion D (2) - Marine Mammal Diversity

Arctocephalus townsendi, Balaenoptera edeni, Balaenoptera musculus, Balaenoptera physalus, Delphinus delphis, Globicephala macrorhynchus, Grampus griseus, Megaptera novaeangliae, Orcinus orca, Physeter macrocephalus, Tursiops truncatus, Zalophus californianus

Summary

La Paz Bay IMMA is located in the southwest Gulf of California, Mexico. Extending over an area of approximately 100km x 45 km, this IMMA comprises two islands (San José Island and Espíritu Santo Archipelago) classified as Federal Protected Areas. Within this region there is a high diversity of marine mammal species, including odontocetes and baleen whales. It also serves as a significant area for pinnipeds. Most importantly

La Paz Bay and Surrounding Islands IMMA

Summary, continued.

the IMMA hosts a recently discovered a colony at Las Ánimas of more than a thousand Guadalupe fur seals (*Arctocephalus philippii townsendi*), considered 'Endangered' under Mexican Law. The colony has constantly increased since 2019. The area also contains a breeding site of California sea lions (*Zalophus californianus*) that is part of the Espíritu Santo Island National Park (CONANP). Los Islotes is the only California sea lion rookery in the Gulf of California that is not decreasing in number, while the rest of California sea lion rookeries in the Gulf of California have declined ~65% in 30 years due to climate change. Finally, the IMMA contains haul-out sites of this species that are constantly occupied throughout the year.

Description:

La Paz Bay is the largest and deepest coastal body of water in the Gulf of California. It is approximately 80 km long and 35 km wide. This is a highly productive area located near the mouth of the Gulf of California, where there is a convergence of waters from the Gulf of California, the California Current and southern tropical waters (Álvarez-Borrego, 1983). The bay has a bathymetric gradient with depths to the south ranging from 10 m to 450 m (Marinone, 2003). There is a local mesoscale gyre process occurring in this region in summer (Martínez-López et al., 2001; Pardo et al., 2013). This IMMA is delimited by three main components: La Paz cove and two large Islands (Espíritu Santo and San José) that have a length that ranges from 25 to 30 km and widths of around 10 km

each. The two islands are surrounded by small islets, including the Espíritu Santo archipelago. The area also includes El Mogote (24.167970°N, -110.371737°W), a 10 km long sandbar located in front of the City of La Paz. This sand bar presents a high incidence of marine mammal strandings, including California sea lions, *Zalophus californianus* (Elorriaga-Verplancken et al., 2016, 2018) (Figure 1 of Annex 1).

Additionally, the IMMA's proximity to La Paz city, facilitates marine wildlife tourism, which must be constantly regulated. This touristic component, as well as fishing efforts could pose a threat to the Guadalupe fur seal, *Arctocephalus philippii townsendi*, colony on Las Animas, which is located 58 km north of Los Islotes (within this IMMA), if these remain unmanaged or unregulated.

Figure 1: La Paz Bay and surrounding islands IMMA.

There is a non-reproductive colony of California sea lions on Las Ánimas, where a colony of Guadalupe fur seals is located (Elorriaga-Verplancken et al., 2021).

The two islands (Espíritu Santo and San José) that this area comprises are classified as Federal Natural Protected Areas under the coordination of the National Commission for Natural Protected Areas (CONANP). Espíritu Santo is a National Park and an UNESCO World Heritage Site. This IMMA hosts fisheries that include interactions with pinnipeds from the area (Elorriaga-Verplancken et al., 2022), as well as vessel traffic whose noise can have an impact on the vocal repertoire of resident dolphins (Antichi et al., 2022).

Criterion B: Distribution and Abundance Sub-criterion B1: Small and Resident Populations

The IMMA hosts a breeding colony of ~650 California sea lions (*Zalophus californianus*) on "Los Islotes" (northern most portion of the Espíritu Santo National Park) (Adame et al., 2017). The breeding colony, or rookery, is a consistent site for California sea lions, that engage in breeding behaviour in summer months (Adame et al., 2017). While this area does not include most of the Gulf of California population, it includes the only portion of this wider population that has not declined over the last three decades (Adame et al., 2020; Pelayo et al., 2021). Moreover, their abundances also increases from November to April due to the arrival of immigratory subadult male California sea lions from the Pacific Ocean. These individuals enter the Gulf of California during this period and seem to migrate back to the Pacific, before the breeding season begins in summer. Some of these subadult males strand (weak, sick or with poor body condition) in the region during this period, especially along the large sandbar called "El Mogote", which delimits La Paz Cove (Elorriaga-Verplancken et al., 2018).

Moreover, there are California sea lion haul-out sites (non-reproductive) on locations like San Francisquito, San Rafaelito, and Las Ánimas, within the boundaries of the IMMA, with abundances from around 20 to 170 individuals.

Figure 2: California sea lion rookery at Los Islotes. Photo credit: Fernando Elorriaga-Verplancken.

Criterion C: Key Life Cycle Activities
Sub-criterion C1: Reproductive Areas

The breeding colony of California sea lions at Los Islotes (Figure 2) is one on the most important along its Mexican distribution because, unlike the rest of colonies in the Gulf of California, it is not in decline (Adame et al., 2020). The number of births on Los Islotes is variable each year, averaging around 150 pups within each breeding season (Adame et al., 2017; Elorriaga-Verplancken, unpublished data). The Guadalupe fur seal (*Arctocephalus philippii townsendi*) colony on Las Animas Islet (10 km east of San José Island) was discovered in March 2019 (Figure 3), at which time around 12 fur seals were recorded. In August 2020, a total of around 120 individuals was registered (Elorriaga-Verplancken et al., 2021). In May, 2022 1,262 individuals were documented (Elorriaga-Verplancken et al., unpublished data), mostly juveniles and subadults, which is typical of pinnipeds expansion sites (Aurioles-Gamboa et al., 2010).

The colonization by Guadalupe fur seals at Las Ánimas in 2019 may be the result of their population recovery. The species main reproductive colony is still located on Guadalupe Island in the Mexican Pacific; however, its population is growing at an annual rate of 8.4% (Juárez-Ruiz et al., 2022). The growth rate, recovery, and these new colonies south of Guadalupe and in the Gulf of California are in contrast with a significantly long (2015-2021) unusual mortality event (UME) of Guadalupe fur seals that took place along the coasts of California, Washington, and Oregon (NOAA Fisheries, 2021). The colonization site of Guadalupe fur seals at Las Ánimas is not reproductive yet; however, its rapid

Figure 3: Guadalupe fur seal colony at Las Ánimas. Photo credit: Fernando Elorriaga-Verplancken.

growth and increased density could provide conditions for reproduction due to an eventual Allee effect (Aurioles-Gamboa et al., 2010) if this trend keeps taking place. There is also a non-reproductive colony of California sea lions on Las Ánimas, where a colonization site of Guadalupe fur seals is located (Elorriaga-Verplancken et al., 2021).

Sub-criterion C2: Feeding Areas

La Paz Bay and its surrounding area is characterized by high biological production year-round due to a local mesoscale gyre phenomenon that is active during summer months (Martínez-López et al., 2001; Pardo et al., 2013), providing a stable prey availability for different consumers, such as marine mammals.

Since Los Islotes presents a California sea lion breeding site, adult females that give birth every summer, must alternate maternal care (one-year lactation) with regional foraging trips of 2-3 days (Boness & Bowen, 1996; García-Rodríguez & Aurioles-Gamboa, 2004). Telemetry studies at Los Islotes provide evidence that this area as an important foraging ground for California sea lions (Kuhn et al., 2004). Main prey of the California sea lion, in this region, are *Aulopus* sp., *Engraulis mordax, Serranus aequidens, Benthosema panamense*, and members from the Mictophidae family, among other species (Hernández-Camacho et al., 2020).

In the case of Guadalupe fur seals in this area, there is scarce knowledge; however there is work in progress (Elorriaga-Verplancken et al., in process). Trophic assessments based on scat analysis are necessary to know the regional resources that are available for this recovery colony. Due to their year-round presence, we assume they must forage locally; however,

further study is required to demonstrate this with any certainty.

Figure 4: Interaction between a Guadalupe fur seal (black individual) and a California sea lion (light brown individual) at Las Ánimas islet. Photo credit: Fernando Elorriaga-Verplancken.

Criterion D: Special Attributes
Sub-criterion D2: Diversity

The productive waters and habitats of the La Paz Bay IMMA support a high diversity of marine mammals. In addition to the Guadalupe fur seal and the California sea lion, that satisfy other criteria in this IMMA, additional species that occur regularly in the IMMA are the minke whale (*Balaenoptera acutorostrata*), fin whale (*Balaenoptera physalus*), blue whale (*Balaenoptera musculus*), humpback whale (*Megaptera novaeangliae*), common bottlenose dolphin (*Tursiops truncatus*), common dolphin (*Delphinus delphis*), pilot whale (*Globicephala macrorhynchus*), Risso's dolphin (*Grampus griseus*), orca (*Orcinus orca*), sperm whale (*Physeter macrocephalus*), and the dwarf sperm whale (*Kogia sima*) (Urbán et al., 1997; Pardo et al., 2013 ; Gómez-Gallardo et al., 2020; Rosales-Nanduca et al., 2020; Urbán et al., 2020).

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