Annual Research Report of

Gray Whale (*Eschrichtius robustus*) Monitoring during the 2026 winter season in

Laguna San Ignacio, B.C.S. Mexico.

Universidad Autónoma de Baja California Sur

Programa de Investigación de Mamíferos Marinos

Gray Whale Research in Mexico.

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The gray whale (*Eschrichtius robustus*) monitoring and research studies undertaken by the Autonomous University of Baja California Sur and the Gray Whale Research in Mexico programs (UABCS/ GWRM) are sponsored by The Ocean Foundation a Washington D.C. based ocean conservation nor-profit organization. These investigations took place in Laguna San Ignacio, B.C.S., Mexico from January 15th to March 15th, 2026. Research activities included: photo-identification, weekly boat surveys, photo-identification by boat and with the use of drones, documentation of marine mammal strandings, community outreach, and counseling university students pursuing Marine Biology majors from the Autonomous University of Baja California Sur, La Paz, Mexico (UABCS). All these activities were conducted under the Mexican Federal scientific research permit (No. SBRA/DGVS/10610/25).

Navigation and Photo-identification.

The photo-identification technique is a way to identify individuals within a population, and in the case of the gray whale, it consists of taking pictures of the flanks, both right and left sides. Photographs were taken with SLR (Nikon D7500) cameras, with a 28-300 mm lens, at a shutter speed of 1/1000 and a light sensitivity of ISO 400 (Figure 1).

Figure 1. Example of the photo-identification of the right flank of a gray whale.

Photographs were taken from a 24-foot-long boat (panga) that approached the whales at an average distance of 10 m to 20 m to obtain images of good size and resolution. The

photographs were taken to develop a record of individual whales through their distinctive coloration, scars and other markings.

Photo-identification surveys were conducted in Laguna San Ignacio for 39 days, with a total effort of 176.1 hours, where 236 gray whale sightings were documented. During the field season a total of 6015 photographs were taken and compared against each of the photo-identification images, to obtain a photo-identification catalog for the 2026 season.

In total 690 different individuals (adults) were photo-identified, out of which 8 were females with calves and 682 corresponded to single individuals (males or females without calves). According to the records for each photo-identified individual, an average residency time was estimated for each whale (time between the first and last photo-identification of each individual) that would have been documented a minimum of two days; for female-calf pairs, it was 27 days and 6.7 days for single whales. The maximum residency time of a female-calf pair was 43 days, while for single individuals it was 26. The effort time (days and hours surveying) was less than in previous winters due to the early departure of most of the gray whales from the lagoon, therefore the average residency times were shorter than in previous seasons (see Surveys section in this report).

Also, as an important part of the monitoring, the photo-identifications obtained this year in Laguna San Ignacio were compared with those from Bahia Magdalena, to determine the relationship between these two areas. Where 28 gray whales (all single whales) were seen in both areas.

Number of Individual Gray Whales Identified from Photo-Identification Data

The minimum number of individual gray whales that visit Laguna San Ignacio each winter is determined from the number of unique individuals that are identified in the photographic identification images obtained during the entire winter season. Table 1 shows the number of single whales and female-calf pairs photographically captured in the lagoon from 2005

until 2026. While the number of single whales visiting the lagoon remained relatively high, the number of females with calves continually declined during the years of the Unusual Mortality Evern (UME) beginning in 2018 until the lowest number of 8 pairs observed during 2025 and 2026 winters. These photographically identified whales represent a minimum abundance estimates of the number of gray whales observed each year in Laguna San Ignacio.

Table 1. Individual gray whales visiting Laguna San Ignacio between 2025 to 2026 from photographic identification data.

Individual Gray Whales Visiting Laguna San Ignacio from Photo-ID Records from 2005 to 2025		
Year / Año	Single Whales / Ballenas solitarias	Females with calves / Hembras con cria
2005	271	114
2006	191	54
2007	272	74
2008	152	88
2009	440	75
2010	515	38
2011	321	187
2012	332	211
2013	292	183
2014	443	195
2015	230	274
2016	350	218
2017	305	195
2018	411	83
2019	575	40
2020	419	54
2021	500	43
2022	532	41
2023	535	83
2024	822	22
2025	715	8
2026	682	8

All the photo-identifications obtained during 2026, were compared against the three photo-identification catalogs of the Western North Pacific gray whale population's feeding areas of Sakhalin Island and the Kamchatka Peninsula, that together include 460 individuals. Three recaptures between both populations were discovered; two single whales and a female with calf (Table 2).

Table 2. Gray whale individuals documented in Laguna San Ignacio during the 2026 season, that have also been photo-identified in the western population's feeding areas (Sakhalin or Kamchatka, Russia) in previous years (the catalog numbers with the letter M correspond to females with calves).

LSI, Mexico GWRM (PRIMMA-GWRM 2026)	Sakhalin, Russia (Burdin & Welle 1994 a 2024)	Sakhalin, Russia (Tyurneva & Yakovlev, 2002-2017)	Kamchatka, Russia (Tyurneva & Vertakin, 2004-2011)
26-0464-D-LSI	WGW-207	KOGW 212	---
26-0613-D-LSI	WGW-170	KOGW 162	Kam GW 142
26-0692-D-LSI-M	WGW-204	KOGW 178	---

Also, the photo-identification catalog for the 2026 season will be compared against the catalogs from 1977- 1982, to identify the minimum age of some gray whales that continue visiting Laguna San Ignacio.

Body Condition.

Individual whale's body condition was evaluated from photographs of their head, scapula and flank regions. The proportion of whales that exhibited indications of poor condition or the "skinny whale syndrome" (nutritional stress) was determined by numerically scoring the reduction of their body fat and blubber layer compared to healthy individuals. For example, poor condition whales showed a post-cranial depression behind the blowholes

and cranium where there is normally body fat in healthy animals. Similarly, the scapula's dorsal ridge and concave flanks are visible in whales that are in poor condition (Figure 2).

Figure 2. Picture showing the characteristics of a gray whale in poor body condition or the "skinny whale syndrome" (Note the post-cranial depression, visible scapular bone, and concave flank).

Body condition was evaluated using the methodology and criteria proposed by Weller et al., (2000) and Bradford et al., (2012) where a numerical value from 1 to 3 is assigned to the head, and 1 to 2 to the scapula and the flank regions, depending on their condition. The greater the values the better the body condition is (Table 3).

Table 3. Categorization scoring of gray whales' body condition (Bradford 2012).

Categorías	C E D									
Normal	322	321	32X	312	31X	3X2	3X1	3XX		
Aceptable	311	222	221	22X	212	21X	2X2	2X1	2XX	
Pobre	211	122	121	12X	112	111	11X	1X2	1X1	1XX
Desconocida	X22	X21	X2X	X12	X11	X1X	XX2	XX1	XXX	

In Laguna San Ignacio, a total of 682 single whales and 8 females with calves were photo-identified. Of these, the body condition of 594 single whales of which 269 (45.3%) presented a good or normal body condition; 243 (40.9%) a fair body condition and 82 (13.8%) a poor body condition (skinny). When compared to the values from previous

years, the “fair” and “poor” body conditions showed a slight increase compared to 2025, while the “good” body condition declined 3.5% (Figure 3).

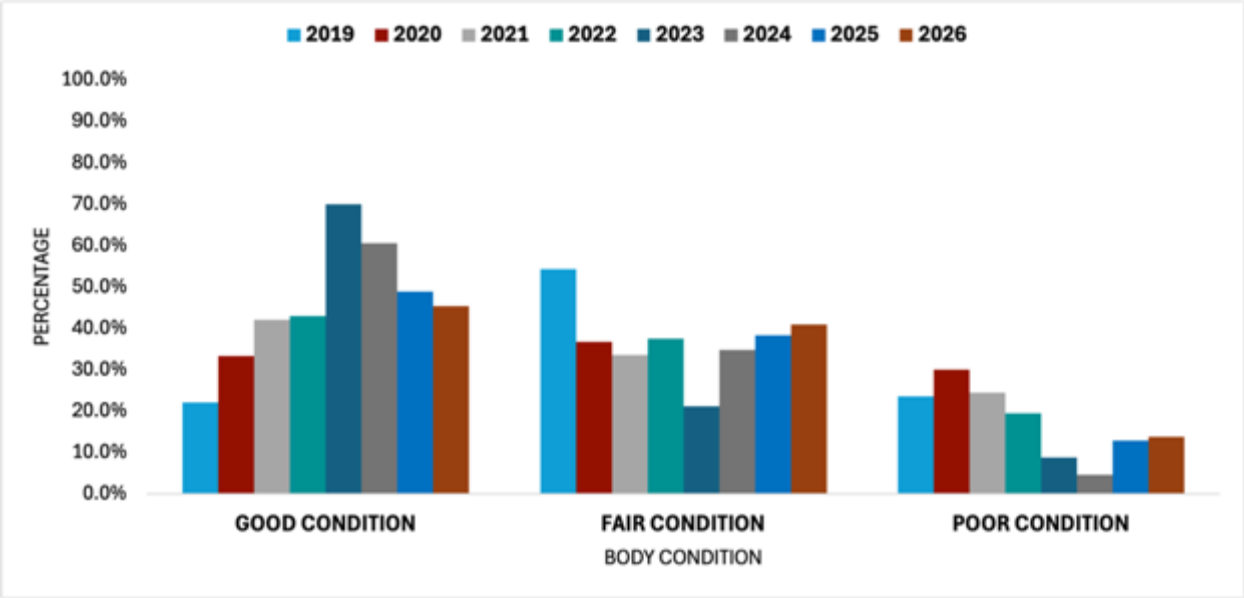

Figure 3. Comparison of the percentages and number of single individual whales according to their body condition between 2019-2026.

All 8 females with calves were evaluated; 100% presented a good body condition with none in fair or poor body condition. Although the body condition of the females with calves was good, the number of calves is still very low. It was the same number (8 pairs) observed as in 2025, which was the lowest ever recorded in the lagoon since 2005 (Figure 4, Table 1).

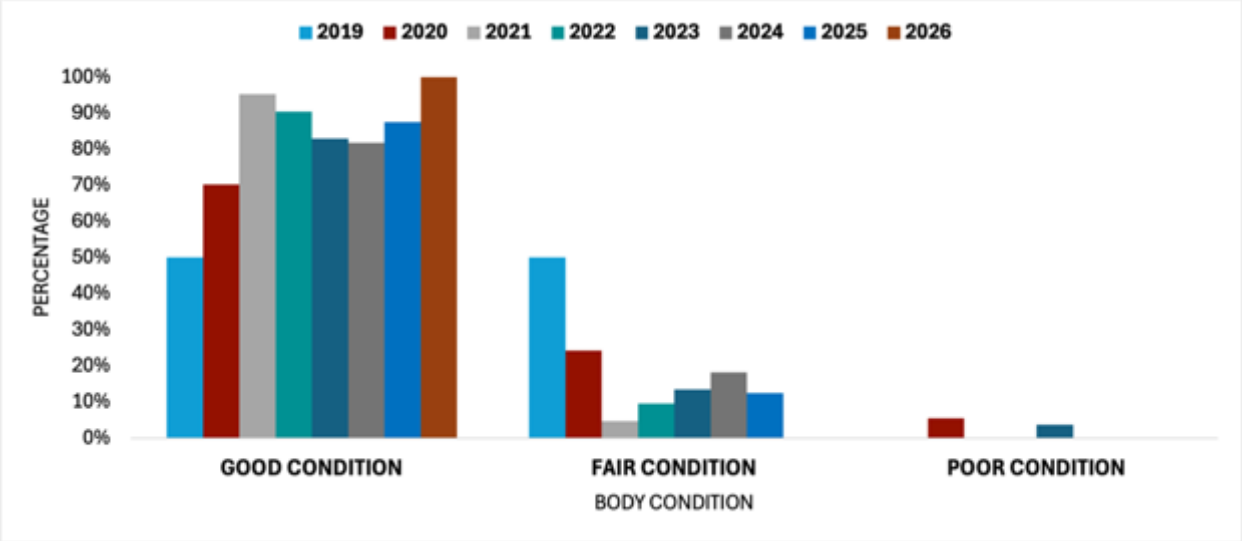

Figure 4. Comparison of the percentages and number of females with calves according to their body condition between 2019-2026.

Aerial Monitoring UAV Dones.

Two DJI Mavic 3 Pro drones were used to photographs gray whales in Laguna San Ignacio. Each drone was equipped with a 20 Megapixel digital camera, a 24 mm f2.8-f11 lens with a polarizing filter, and laser range finders (LightWare SF11/C) that provided precise measurements of the altitude of the drone above water surface. From January 19th to March 7th, 211 flights were made, for a total of 55 hours, where 374 gray whale individuals were identified, out of which 368 were single animals and 6 females with calves (Figure 5).

In addition to the photo-identifications, 393 images were obtained to evaluate the body condition. Once this process concludes body condition in 2026 will be compared with the data of previous years, to evaluate the changes in their body condition throughout the previous years.

Videos that last over 5 minutes will provide data for behavioral analysis of whale age and sex groups and interactions with other species (*e.g., Tursiops truncatus*) in Laguna San Ignacio.

Figure 5. The use of drone for photo-identification and the evaluation of body condition.

Surveys.

Boat surveys were conducted from a 24 ft long "panga" (boat), with an outboard motor of 90 hp. The surveys start on the northernmost region of Laguna San Ignacio, where the boat is anchored for 20 minutes while observing the surrounding area with the help of binoculars (Bushnell 10x 50). After that, a Global Position System (GPS) route through the middle of the lagoon was undertaken, traveling from the north to the south at a speed of 11km/h which maximized the likelihood of a whale surfacing in view of the observers (Figure 6).

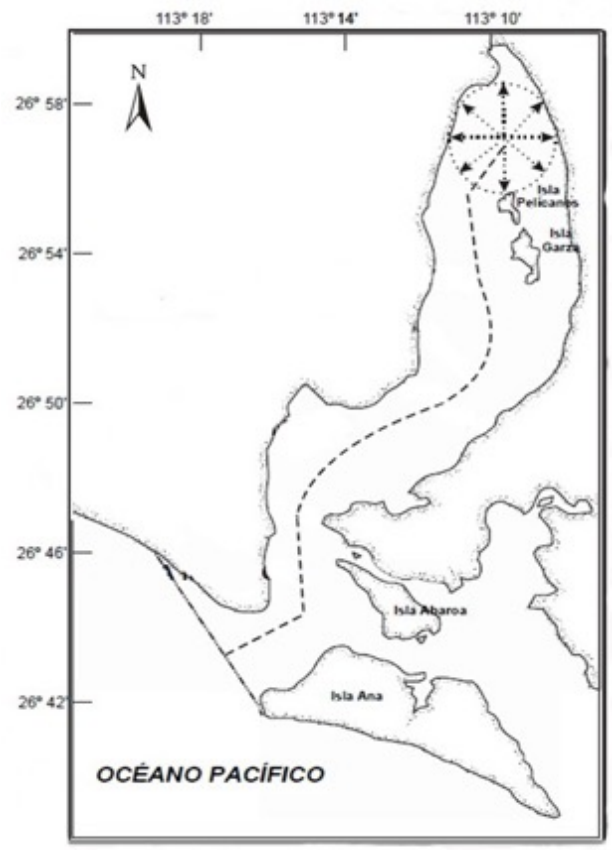

Figure 6. Boat survey track line followed during the surveys in Laguna San Ignacio.

Undertaking the surveys in Laguna San Ignacio requires two observers on each side of the boat (left and right), a data recorder to write the number of individuals observed, the location (designated areas for the survey), as well as weather conditions and the animals' orientation.

The purpose of the surveys is to obtain a count of the minimum number of whales inside of Laguna San Ignacio every 4-5 days throughout the winter reproductive season, as well as to determine their special distribution within the lagoon. During the 2026 season, 8 surveys were completed between January 21st and March 10th, with 5 to 8 days in between each survey, depending on the weather conditions. The greatest number of whales was recorded on February 21st, with 164 whales observed (Table 4).

Table 4. Summary of the boat surveys in Laguna San Ignacio during the 2026 winter, where the numbers of whales are identified as singles whales (adult & juveniles without calves), and pairs of females with calves (two whales for each pair).

Survey No.	Date	Singles	Mc	Total
1	21-Jan-26	14	3	20
2	01-Feb-26	63	3	69
3	6-Feb-26	123	2	127
4	13-Feb-26	137	2	141
5	21-Feb-26	158	3	164
6	27-Feb-26	58	3	64
7	04-Mar-26	13	1	15
8	10-Mar-26	7	0	7

In the case of single individuals, the maximum number of whales was recorded on February 21, with 158 whales and for females with calves the maximum number was 3 pairs and was observed in 4 of the surveys. (Fig. 7). In addition, the surveys indicate that in 2026 the whales began to leave the lagoon approximately two weeks earlier than in previous winters. We believe this early departure was influenced by the sea-surface temperature (SST) which was warmer than average or what is known as the "El Niño" condition. The relationship between SST and the timetable of the gray whale occupation of its winter aggregation areas is currently under investigation.

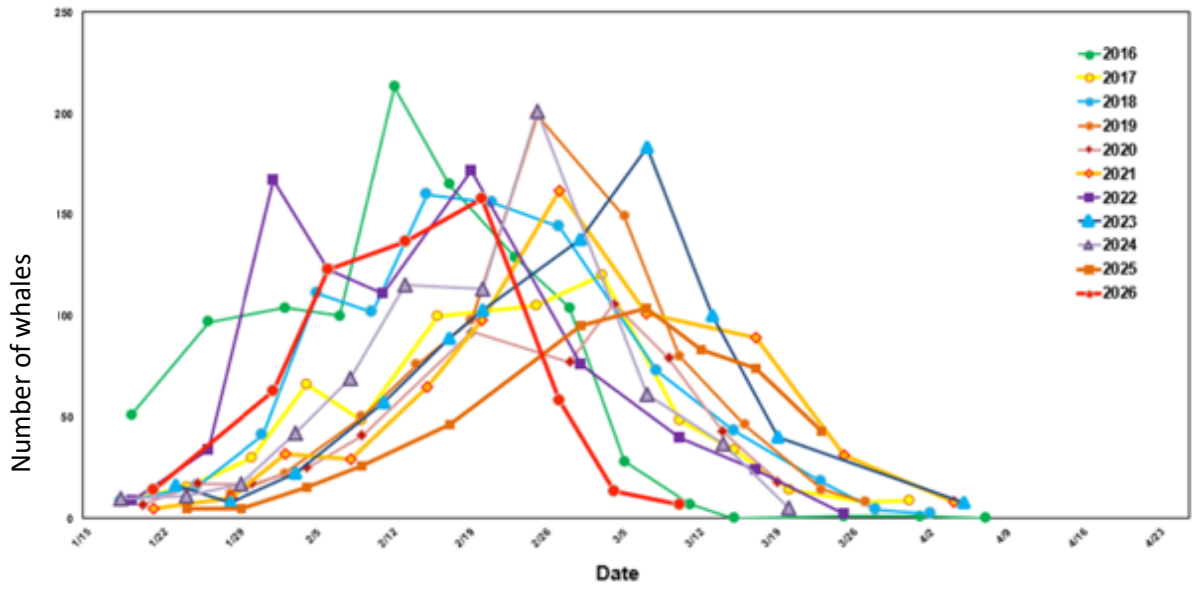

Figure 7. Counts of single whales from boat surveys in Laguna San Ignacio, from 2016 to 2025. The red line indicates the counts obtained in 2026.

Regarding the date with the most abundance of females with calves, this presented in 4 out of the 8 surveys, with only 3 pairs of females with calves observed, which was similar to the low numbers observed last year in 2025. These are the lowest numbers of female-calf pairs recorded in this lagoon during the previous 20 years (Figure 8).

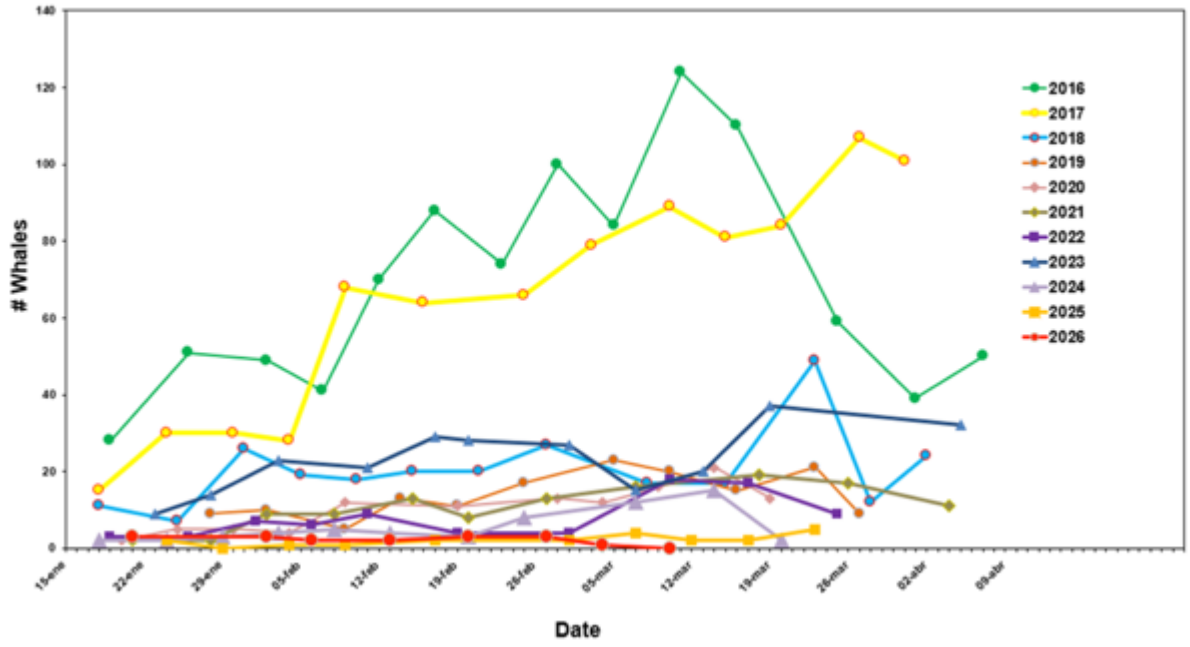

Figure 8. Survey counts of females with calves, comparison in Laguna San Ignacio from 2016 to 2026. The red line indicates the values obtained in 2026.

Dolphin Monitoring.

In addition to gray whale monitoring, the resident population of Bottlenose Dolphin (*Tursiops truncatus*) was photographically monitored (Figure 9). Eight sightings were recorded with group sizes of 1 to 20 animals, the average groups size being 11 individuals. The photo-identifications obtained will be compared against the individuals in the 2009-2025 catalog, to know more about their distribution, abundance and residency.

Figure 9. Bottlenose dolphin (*Tursiops truncatus*) photo-identification in Laguna San Ignacio B.C.S., Mexico.

Community Outreach and Education.

During the 2026 season several educational presentations were given to the visitors to the Kuyimá Eco-Tour and Baja Discovery Punta Piedra eco-tour camps. Additionally, GWRM staff made 25 presentations about the gray whales and the research program to visiting eco-tour groups in 2026. Also, two groups of undergraduate students (15 and 26) studying Marine Biology in the Autonomous University of Baja California Sur, visited and received instruction on field research methods for studying gray whales and other marine wildlife, and academic counseling (Figure 10). These visits took place from February 21st to February 25th and February 27th to March 3rd.

Figure 10. Group of undergraduate students from Marine Biology from the Autonomous University of Baja California Sur, Mexico (UABCS).

During the 2026 winter season GWRM researchers presented a Community Reunion or "science symposium" in the community of Ejido Luis Echeverria to celebrate the 20th year anniversary of our Gray Whale Research project. Several presentations by our researchers shared the results and findings of the monitoring activities of the past few years, as well as the current status of the gray whale population following the Unusual Mortality Event (UME) of 2019-topresent (Figure 11).

Figura 11. Community Reunion at the Ejido Luis Echeverria Community Meeting Hall on 28 February 2026, to present the results of the gray whale research to the local community and visitors to the lagoon.

Strandings.

During the 2025-2026 winter season, 8 adult gray whale (*Eschrichtius robustus*) and one dolphin (*Tursiops truncatus*) strandings were discovered and examined in Laguna San Ignacio (Table 5), these records will be added to those reported in other lagoons to estimate the number of stranded gray whales in Mexico.

Table 5. Stranding records that occurred in Laguna San Ignacio during the 2025-2026 season.

Code	Species	Date	Sex	Total length (m)	Age category
LSI-001	Gray whale	12-jan-26	Female	12.95	Adult
LSI-002	Gray whale	25-jan-26	Male	11.88	Adult
LSI 003	Gray whale	04-feb-26	Male	11.82	Adult

LSI-004	Gray whale	27-feb-26	---	---	Adult
LSI-005	Gray whale	02-mar-26	Male	~12	Adult
LSI-006	Gray whale	02-mar-26	Male	~11	Subadult
LSI-007	Gray whale	05-mar-26	Female	12.5	Adult
LSI-008	Gray whale	24-mar-26	Male	---	Adult
	Bottlenose dolphin	06-mar-26	Female	3.04	Adult

As part of the monitoring of the gray whale population, on February 26th, in collaboration with Exportadora de Sal S.A. and the Natural Commission of Natural Protected Areas (CONANP), two search surveys were undertaken to look for stranded whales around the lagoon complex of Ojo de Liebre to the north of Laguna San Ignacio. The first survey was conducted on a 25 km long beach of Isla Arenas (at the mouth of the Laguna Ojo de Liebre), and the second survey along the coast of Laguna Manuela south of the lagoon entrance. During the first survey 26 dead gray whales, one dead humpback whale, one dead blue whale, 3 dead dolphins of different species and a dead Californian sea lion were discovered. On the second survey 6 dead gray whales and a dead common dolphin were found (Table 6).

Table 6. Whales and other marine mammals strandings in the lagoon complex Laguna Ojo de Liebre during the routes conducted on February 26th, 2026.

Code	Species	Date	Sex	Total length (m)	Age category
LOL-001	Gray whale	31-dic-25	Female	12.8	Adult
LOL-002	Gray whale	02-feb-26	Male	---	Adult
LOL-003	Gray whale	26-feb-26	Male	12.19	Adult
LOL-004	Gray whale	26-feb-26	Male	11.93	Adult
LOL-005	Gray whale	26-feb-26	---	6.9 Incomplete	Unknown
LOL-006	Gray whale	26-feb-26	---	---	Adult
LOL-007	Gray whale	26-feb-26	---	10.36 Incomplete	Adult
LOL-008	Gray whale	26-feb-26	---	---	Adult
LOL-009	Gray whale	26-feb-26	---	10.60 Incomplete	Adult
LOL-010	Gray whale	26-feb-26	Male	11.42	Subadult
LOL-011	Gray whale	26-feb-26	---	11.70 Curve	Adult
LOL-012	Gray whale	26-feb-26	---	7.35 Incomplete	Unknown
LOL-013	Gray whale	26-feb-26	---	11.4	Adult

LOL-014	Gray whale	26-feb-26	---	13.9	Adult
LOL-015	Gray whale	26-feb-26	Male	11.98	Adult
LOL-016	Gray whale	26-feb-26	Male	12.25	Adult
LOL-017	Gray whale	26-feb-26	Female	11.32	Subadult
LOL-018	Gray whale	26-feb-26	Male	10.6	Subadult
LOL-019	Gray whale	26-feb-26	---	---	Unknown
LOL-020	Gray whale	26-feb-26	Female	11.95	Adult
LOL-021	Gray whale	26-feb-26	---	10 Incomplete	Adult
LOL-022	Gray whale	26-feb-26	Female	13.85	Adult
LOL-023	Gray whale	26-feb-26	Male	12.3	Adult
LOL-024	Gray whale	26-feb-26	---	5.8 Incomplete	Juvenil
LOL-025	Gray whale	26-feb-26	Male	12.3	Adult
LOL-026	Gray whale	26-feb-26	Male	11.1	Subadult
LOL-027	Gray whale	26-feb-26	---	9 Incomplete	Unknown
LOL-028	Gray whale	26-feb-26	---	---	Unknown
LOL-029	Gray whale	26-feb-26	Male	12	Adult
LOL-030	Gray whale	26-feb-26	Male	12.2	Adult
LOL-031	Gray whale	26-feb-26	Male	12.18	Adult
LOL-032	Gray whale	26-feb-26	Female	11.65	Subdult
LOL-033	Gray whale	26-feb-26	---	8.5 Incomplete	Subadult
LOL-034	Gray whale	26-feb-26	---	10.3	Unknown
LOL-035	Gray whale	26-feb-26	---	13.5	Adult
	Blue whale	26-feb-26	Female	20.8	Adult
	Humpback whale	26-feb-26	---	---	Unknown
	Striped dolphin	26-feb-26	---	2.24	Adult
	Common dolphin	26-feb-26	Female	1.78 Incomplete	Adult
	Common dolphin	26-feb-26	---	---	Adult
	Bottlenose dolphin	26-feb-26	Male	2.55	Adult
	Californian sea lion	26-feb-26	Male	2.42	Subadult

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