

SUB-COMMITTEE ON SHIP DESIGN AND  
CONSTRUCTION  
12th session  
Agenda item 8

SDC 12/8/3  
17 October 2025  
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**EXPERIENCE-BUILDING PHASE FOR THE REDUCTION OF UNDERWATER  
RADIATED NOISE FROM SHIPPING**

**Potential URN Impacts of LNG Development on Marine Mammals in  
the Gulf of California**

**Submitted by CSC**

**SUMMARY**

*Executive summary:* This document shares the findings of a study on the potential underwater radiated noise (URN) impacts of LNG development on marine mammals in the Gulf of California. The report examines the effects of URN from LNG tanker traffic on migratory and resident whales, as well as related impacts on air quality and greenhouse gas (GHG) emissions.

*Strategic direction,  
if applicable:* 1

*Output:* 1.16

*Action to be taken:* Paragraph 15

*Related documents:* MEPC 82/17 and MEPC.1/Circ.906/Rev.1

**Introduction**

1 This document is submitted to advance the experience-building phase (EBP) for the *Revised guidelines for the reduction of underwater radiated noise from shipping to address adverse impacts on marine life* (MEPC.1/Circ.906/Rev.1) (Revised URN Guidelines). SDC 11 established a Correspondence Group on Underwater Radiated Noise and instructed it to develop a framework to assess the progress made on the application and uptake of the Revised URN Guidelines, with a view to developing a shared database and other collated resources to represent the results of the EBP. This submission aims to contribute as a resource for that database and for the progression of the EBP.

**Background**

2 There are three liquefied natural gas (LNG) export terminals proposed to be developed in Mexico, particularly in the Gulf of California (GoC): Vista Pacifico LNG; American Mexican Integrated Gas Operations "Amigo" LNG Terminal; and Saguaro Energía LNG Terminal (also known as Mexico Pacific LNG). As a result, expected LNG tanker traffic could cause significant underwater noise, threatening the region's rich marine life, whale habitats, economy and the wellbeing of nearby communities.

3 A study on the potential impacts of LNG traffic, to be expected in association with the three proposed facilities, modelled how underwater noise levels, and the number of collisions with marine mammals, particularly whales,<sup>1</sup> by such a traffic increase in the GoC. The summary report<sup>2</sup> contextualizes its findings and makes recommendations for protecting the habitat of migratory and resident whale populations. This document summarizes the findings of that report, focusing on underwater noise impacts of LNG traffic and increased collision risk with whales.

### **Importance of the Gulf of California for marine mammals**

4 The GoC in Mexico contains federally protected, globally significant marine and terrestrial conservation areas spanning over 1.8 million hectares and encompassing islets, coastal areas, and 244 islands. It is home to one-third of the world's marine cetacean species and 39% of all marine mammal species globally. It is an essential habitat for a variety of whale species, many of which are highly susceptible to underwater noise. Among the resident whale species are sperm, fin, and Bryde's whales, which have been in the GoC for thousands of years,<sup>3</sup> spending their entire life cycle within its waters. Migratory species include the blue and humpback whales, which are present from November to May, and the gray whale, found from January through March. These species come to reproduce, give birth and care for calves.

### **Current vessel traffic in the GoC**

5 Currently, the GoC experiences relatively low levels of commercial vessel traffic. Shipping activity within the region is largely localized, with higher traffic density concentrated around regular ferry routes, recreational vessels, cruise ships, and shipments to regional ports such as La Paz, Guaymas, and Topolobampo, in the southern zone of the GoC. Not including yachts or tugs, the main regional ports<sup>4</sup> showed 267 calls between June 18, 2025 and July 17, 2025. The vessel call data indicate that the GoC saw around 107 calls by cargo-carrying vessels over the month from June 18, 2025 to July 17, 2025, indicating an average of 3.5 calls per day.

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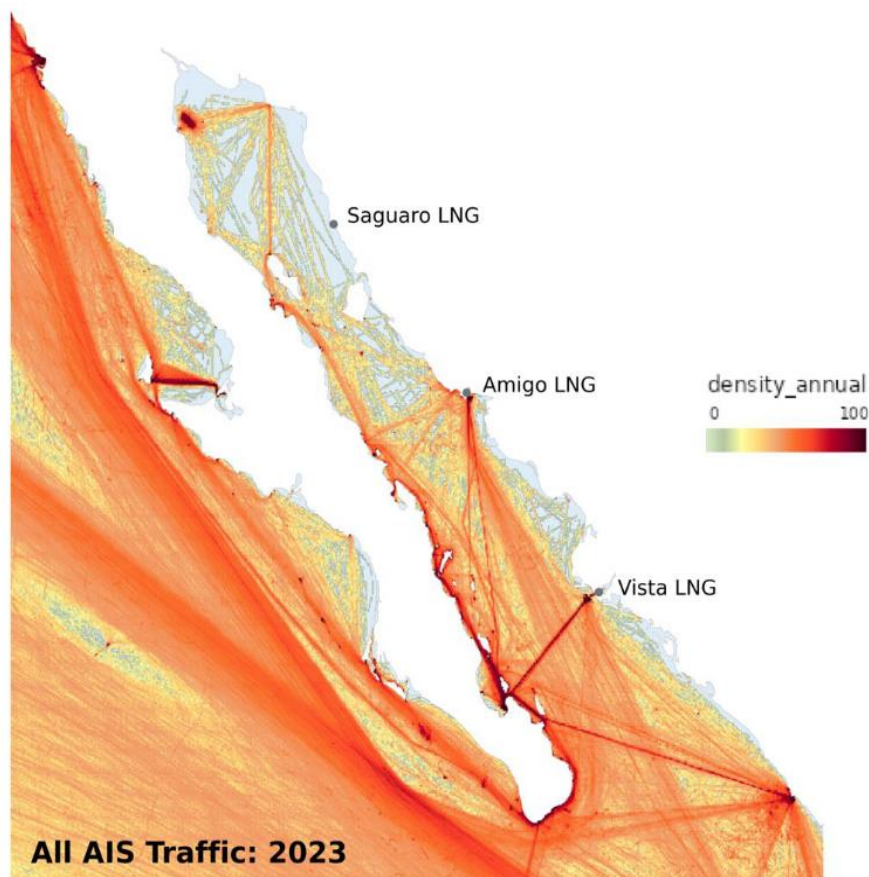
<sup>1</sup> EERA & UABCS (2025). Emissions and Underwater Noise from LNG Carrier Vessels. <https://static1.squarespace.com/static/65b27d4560a9af5ef9933359/t/6887bebf1adc1c67f7c36cd9/1753726655977/Equal+Routes+-+Mexico+LNG.pdf> Note: The study focused on six whale species: the sperm, fin, and Bryde's whales (resident whale species) and the blue, humpback and gray whales (migratory species).

<sup>2</sup> Equal Routes & Conexiones Climáticas (2025). Summary of Report: A Study of the Potential Impacts of LNG Development on Marine Mammals in the Gulf of California by EERA and UABCS. <https://www.equalroutes.ca/news-resources/report-gulfofcalifornia>

<sup>3</sup> <https://doi.org/10.1038/s41467-023-40052-z>

<sup>4</sup> Cabo San Lucas, Guaymas, La Paz, Mazatlán, Pichilingue and Topolobampo.

6 The current anthropogenic threats to whales in the GoC include vessel strikes, entanglements, noise pollution, and broader challenges resulting from habitat degradation and climate change, such as food depletion, marine pollution, and disease.<sup>5,6,7,8</sup> However, under current conditions, the intensity of these threats is still considered low.<sup>9</sup> Figure 1, below, shows the traffic intensity in the GoC in 2023.



**Figure 1 – Traffic intensity in the GoC in 2023**

(Source: EERA & UABCS (2025), *ob. cit.*, figure 6)

### Expected Increase in LNG tanker traffic

7 The proposed LNG terminals would introduce new, concentrated traffic bands from large LNG tankers, particularly in the central basin and farther north into the GoC (areas which currently experience relatively low vessel activity and where several whale species live all year-round).<sup>10</sup> Figure 2, in the next page, shows the sightings of the three resident species in the GoC and the projected routes of the LNG tankers and the projected URN.

<sup>5</sup> <https://doi.org/10.1111/j.1748-7692.2001.tb00980.x>

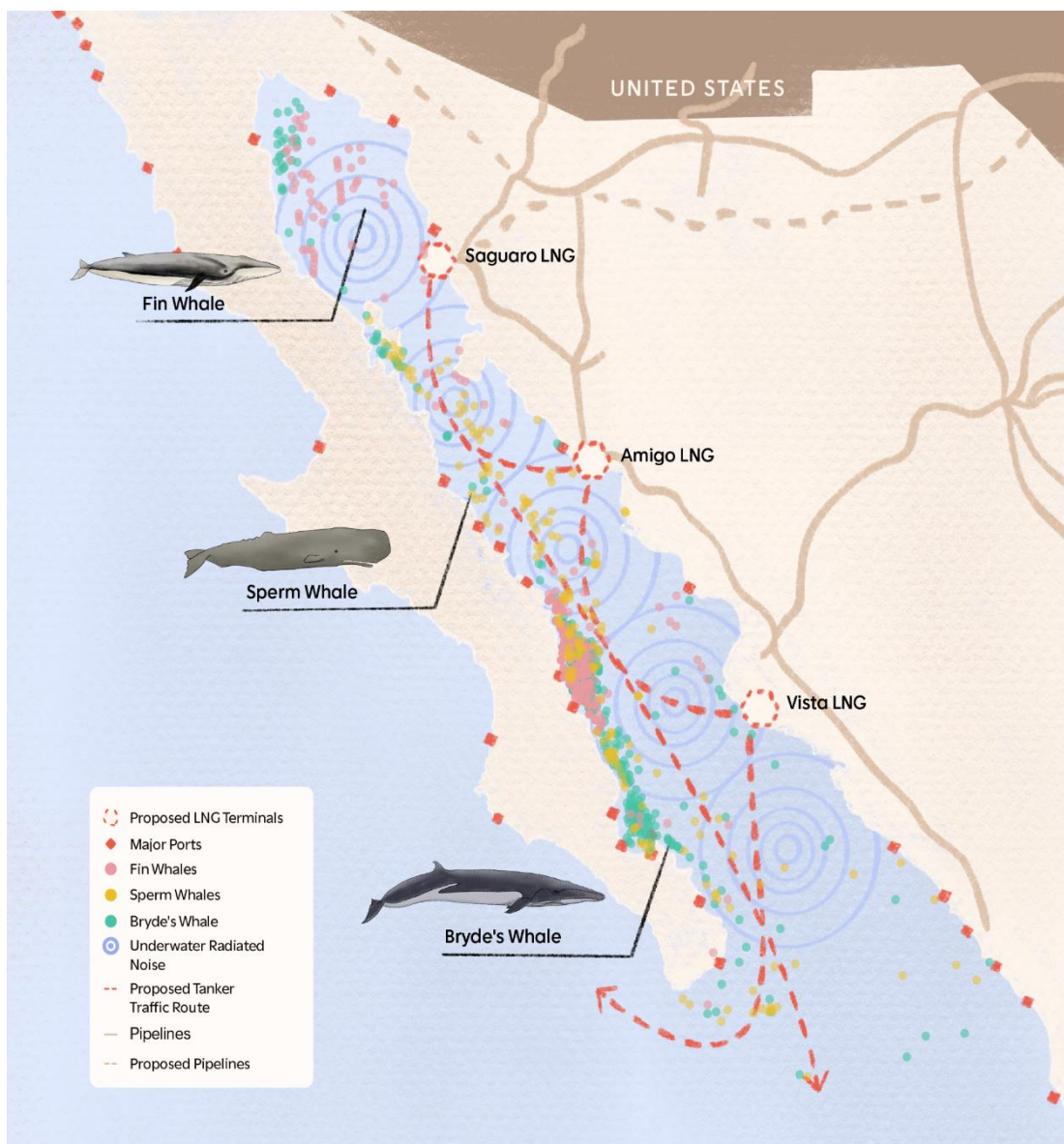
<sup>6</sup> [https://doi.org/10.1007/978-1-4939-8574-6\\_10](https://doi.org/10.1007/978-1-4939-8574-6_10)

<sup>7</sup> <https://biblioteca.semarnat.gob.mx/janium/Documentos/Ciga/libros2009/487a.pdf>

<sup>8</sup> <https://iwc.int/management-and-conservation/environment>

<sup>9</sup> EERA & UABCS (2025), *ob. cit.*, p.20.

<sup>10</sup> Whale population densities are informed based on tagged individuals, opportunistic sightings and voluntary reports from recreational and tourist vessels, therefore the spatial distribution of species should be understood as the density of whale sightings, not necessarily population density or distribution.



**Figure 2 - sightings of the three resident species in the GoC and the projected routes of the LNG tankers and the projected URN**

(Source: Equal Routes & Conexiones Climáticas (2025). Summary of Report: A Study of the Potential Impacts of LNG Development on Marine Mammals in the Gulf of California by EERA and UABCS.

<https://www.equalroutes.ca/news-resources/report-gulfofcalifornia>, p.5)

### Increased underwater noise

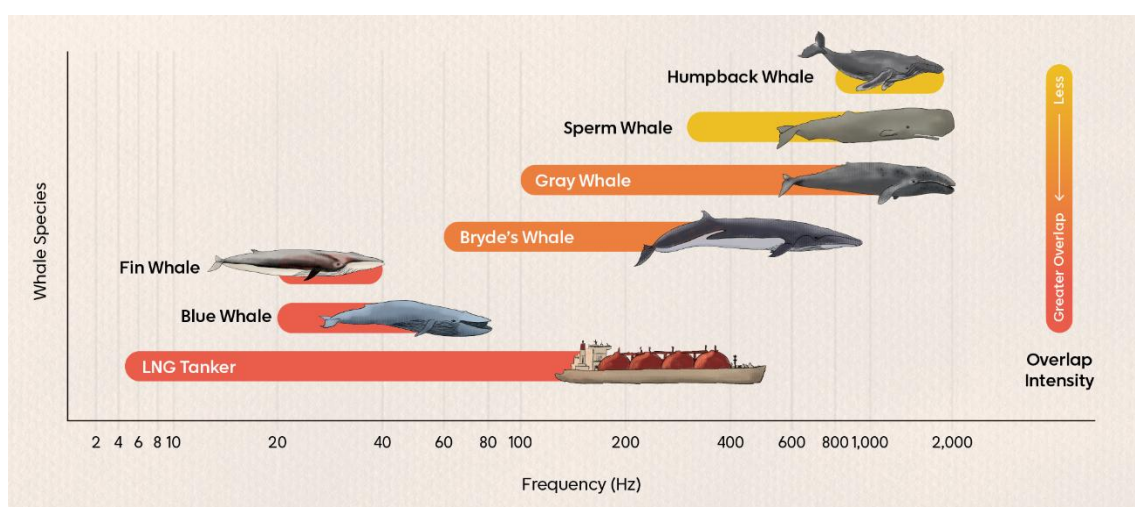
8 Noise pollution is a serious threat to marine life. Much of the underwater ship noise can be attributed to propeller cavitation, a process where spinning propeller blades create vapour bubbles that collapse noisily underwater. High noise levels can cause permanent or temporary hearing loss, known respectively as permanent threshold shift (PTS) and temporary threshold shift (TTS), and even moderate noise can mask sounds that are important to an animal's survival, increasing stress and energy use.<sup>11</sup> Additionally, animals may exhibit

11 <https://doi.org/10.1098/rspb.2011.2429>

behavioural changes, such as abandoning feeding or nursing activities, experiencing reduced ability to communicate or leaving habitats.<sup>12</sup>

9 Compared to a quiet ocean background level of 90 to 100 decibels, a ship generating 174 decibels<sup>13</sup> produces a sound roughly 25 million to 250 million times more intense, with an acoustic footprint that can extend far beyond the terminal area and its shipping lanes, covering an area of 21 square kilometres or more from the source, affecting whales and other species.

10 In the GoC, source-level noise estimates for LNG tankers are strongly linked to vessel speed, with the loudest underwater noise, up to 192 dB, likely occurring along the main vessel route through the middle of the GoC. This produces low-frequency sounds that overlap with the noise sensitivity ranges of various whale species, as indicated in figure 3, below, with the potential to impact communication, feeding, and calving behaviours.<sup>14</sup>



**Figure 3 - mated Overlap Between Whale Communication Ranges and Peak LNG Tanker noise in the GoC**

(Source: Equal Routes & Conexiones Climáticas (2025). Summary of Report: A Study of the Potential Impacts of LNG Development on Marine Mammals in the Gulf of California by EERA and UABCS.

<https://www.equalroutes.ca/news-resources/report-gulfofcalifornia>, p.11)

11 The illustration above estimates the overlap between the communication frequency ranges of resident and migratory whale species in the Gulf of California and the peak underwater radiated noise (URN) generated by LNG tankers. The highest source level noise, reaching up to 192 dB at 80 Hz, occurs along the main vessel route through the centre of the Gulf. Species that vocalize within or near this low frequency range, such as blue and fin whales, face a greater risk of acoustic disturbance.

## Conclusion and recommendations

12 The proposed LNG terminals and the resulting increase in LNG tanker traffic are expected to pose serious threats to the GoC's unique biodiversity and conservation areas, including those designated as a UNESCO "World Heritage Site" and "Important Marine Mammal Areas". These developments increase the risks of air, water, and underwater noise

<sup>12</sup> <https://doi.org/10.1111/j.1365-2907.2007.00104.x>

<sup>13</sup> Propeller cavitation accounts for 60-70% of total ship noise, this means that propeller design and efficiency on newer vessels would have a greater impact on underwater noise levels than the choice of fuel or engine type.

<sup>14</sup> [https://projects.eao.gov.bc.ca/api/document/58923174b637cc02bea163f1/fetch/Appendix\\_P](https://projects.eao.gov.bc.ca/api/document/58923174b637cc02bea163f1/fetch/Appendix_P)

pollution. Given the GoC's critical ecological role—particularly as a habitat for resident and migratory marine megafauna—a precautionary approach to industrial development is essential.

13 It is increasingly evident that the region's ecological integrity is incompatible with the scale and nature of heavy marine traffic associated with proposed LNG facilities.

14 Recommendations to the Sub-Committee based on this assessment include:

- .1 acknowledging the irreversible impacts of underwater noise caused by LNG tanker traffic in the GoC's marine mammals' behaviours and habitat;
- .2 promoting the development of ship design that takes into account the serious damage underwater noise causes to the marine habitat; and
- .3 opposing LNG traffic in critical ecological marine areas, like the GoC, because of, among others, the URN it causes affecting marine mammals and other marine species.

#### **Action requested of the Sub-Committee**

15 The Sub-Committee is invited to note the information provided in this document between paragraphs 2 to 11, the recommendations in paragraphs 12 to 14, when considering the promotion of ship designs to mitigate underwater radiated noise, and take action, as appropriate.

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