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PROPOSAL FOR A CONCERTED ACTION FOR THE SPERM WHALES (*Physeter macrocephalus*) OF THE EASTERN TROPICAL PACIFIC ALREADY LISTED ON APPENDIX I AND II OF THE CONVENTION*

Summary:

The Red Cachalotes del Pacífico has submitted the attached proposal* for a continuation of the Concerted Action for Eastern Tropical Pacific sperm whales (*Physeter macrocephalus*) in accordance with the process elaborated in Resolution 12.28 (Rev. COP14).

*The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CMS Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its authors.

PROPOSAL FOR A CONCERTED ACTION FOR THE SPERM WHALES (*Physeter macrocephalus*) OF THE EASTERN TROPICAL PACIFIC ALREADY LISTED ON APPENDIX I AND II OF THE CONVENTION*

Proponent(s)

Red Cachalotes del Pacífico:

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Target species, lower taxon or population, or group of taxa with needs in common

Physeter macrocephalus

Sperm whale, cachalot, cachalote

Eastern Tropical Pacific (etP) clans

Geographical range

EtP sperm whale clans are found in the deep tropical waters of the eastern Pacific Ocean, between 30°N and 30°S. Throughout their range, they can be found in international waters, as well as the exclusive economic zones of Mexico, Central American Pacific countries, Colombia, Ecuador, Perú, and Chile (Cantor et al. 2016). However, as sperm whales are highly nomadic, their range extends beyond these bounds.

Summary of Activities

1. Sustain long-term, cross-national monitoring of sperm whale clans in the region, focusing on their population trends and distribution, foraging ecology, and vulnerability to anthropogenic threats. In the next (2 – 5) years, this will involve:

- Compiling a unified database of research effort and sperm whale sightings using a collaborative platform (e.g., Global Biodiversity Information Facility, GBIF) to identify areas with information gaps.
- Locating sites and collaborators to establish passive acoustic monitoring (PAM) to monitor the seasonal abundance and clan identity of etP sperm whales in regions throughout their range.
- Identifying key actors for establishing stranding response networks, with special attention to community-based efforts, along the etP coastline.
- Implementing reverse-drift modelling to stranding events of sperm whales to infer at-

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sea mortality hotspots and overlap with anthropogenic activities.

- Establishing a unified photo-identification catalogue for the etP and surrounding waters that is available on both existing web-based platforms (Flukebook and Happywhale), and requesting a technical solution to the disconnect between both platforms.

2. Strengthen the collaboration network between local and international researchers to ensure efficient mobilization of material, human, and financial resources, as well as the sharing of knowledge and capacity. Towards this end, we propose:

- Identifying CMS member states, NGOs, and academic institutions that can fund local research and outreach activities throughout the etP sperm whale clans' range.
- Establishing a connection with the secretariat of the recently adopted Agreement on Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ Agreement) under the United Nations Convention on the Law of the Sea (UNCLOS) to access resources and participate in relevant environmental impact assessments.
- Conducting a workshop on updated research methods and technologies, and local monitoring efforts at the next meetings of the Sociedad Latinoamericana de Especialistas en Mamíferos Marinos (SOLAMAC) and Sociedad Mexicana de Mastozoología Marina (SOMEMMA), and the biannual Cachalote Consortium.

3. Raise awareness of the status and conservation challenges faced by sperm whale clans in the etP waters among policymakers and the general public. To this end, the **Red Cachalotes del Pacifico** will develop an action plan to identify key actors and avenues of influence. This will involve:

- Developing presence in social media
- Promoting the collection of data through citizen science through platforms that are geared towards their participation (e.g., Happywhale & iNaturalist)

Associated benefits

Supporting sperm whale monitoring through passive acoustic monitoring (PAM) and stranding networks can produce valuable insights not only on etP sperm whales but also on the distribution of and threats faced by other migratory marine megafauna. PAM is particularly effective for tracking highly mobile deep-diving ocean species, such as beaked whales and pilot whales, which remain data deficient under the IUCN. Similarly, well-supported stranding networks across nations can help inform on the mortality causes in a wide range of migratory species, including marine mammals, elasmobranchs, sea turtles, and seabirds. Prioritizing community-based stranding networks can also help overcome the degradation of government support for conservation that many member states (e.g., Ecuador, United States of America) currently face.

Raising awareness of the presence and vulnerability of sperm whales in the etP can also help protect areas of the ocean that fall outside national jurisdictions or are overlooked by policymakers and the public. Protection of sperm whales, by restricting deep-sea mining and the operations of large liquefied natural gas (LNG) tankers in habitat-critical areas through policy informed by environmental assessments, would also benefit a wide array of lesser-known species, from deep-diving cetaceans to invertebrates. In this sense, sperm whale clans of the etP can be a flagship species not just for the conservation of cultural species, but also for the wider community of offshore marine life.

Timeframe

Activity	Expected completion
Sustaining long-term cross-national monitoring of etP sperm whales and their vulnerability to anthropogenic threats	Open-ended
Compiling a unified database of research effort and sperm whale sightings	By December 2028
Establishing candidate sites and collaborations for passive acoustic monitoring of etP sperm whales	By December 2028
Establishing a unified photo-identification catalogue	By December 2028
Establishing a network of collaborating researchers to progress the understanding of male sperm whales	By December 2026
Implementing reverse-drift modelling to stranding events of sperm whales to infer at-sea mortality hotspots and overlap with anthropogenic activities	By June 2029
Identifying key actors and supporting local stranding network responses	By December 2027
Identifying funding parties	By June 2027
Identifying and contacting potential partner organizations (NGOs, governmental agencies, academic institutions) for collaboration towards broad-scale monitoring	By June 2027
Conducting etP sperm whale workshop in the upcoming SOLAMAC, SOMEMMA, and Cachalote Consortium meetings	By December 2027
Developing an action plan for raising awareness of sperm whale conservation challenges and influencing policymakers	By December 2027

Relationship to other CMS actions

This CA contributes to the implementation of the Samarkand Strategic Plan for Migratory Species 2024-2032, which aims to ensure that "by 2032, migratory species are thriving and live in fully restored and connected habitats" (UNEP/CMS/Resolution 14.1).

Moreover, it directly advances the following CMS resolutions:

- Conservation Priorities for Cetaceans (UNEP/CMS/Resolution 14.9)
- Conservation Implications of Animal Culture and Social Complexity (UNEP/CMS/Resolution 11.23 (Rev.COP12))
- Adverse Impacts of Anthropogenic Noise on Cetaceans and Other Migratory Species (UNEP/CMS/Resolution 12.14)
- The Marine Pollution Workshop Report of the Convention on the Conservation of Migratory Species of Wild Animals (CMS, 2025)

Conservation priority

Following Resolution 11.23 on Conservation Implications of Cetacean Culture adopted at COP 11 (UNEP/CMS/Resolution 11.23), the 'CMS Expert Working group on Culture' was established to address the conservation implications of culture in cetaceans and other taxa. The Working Group identified the etP sperm whales as a suitable case study, based on evidence of the influence of culture on the population structure, distribution, and ecology of sperm whales in the region.

Female sperm whales in the etP are structured into geographically sympatric but socially segregated 'vocal clans', which consist of thousands of individuals with distinct vocal repertoires, social behaviours, and movement patterns (Rendell & Whitehead 2003,

Whitehead & Rendell 2004, Cantor & Whitehead 2015). Since clear geographic and genetic distinctions between sperm whales of different clans are absent, these behavioural differences most likely arise through social learning (Cantor et al. 2015).

The behavioural differences and demographic structure that arise from social transmission in sperm whales have important implications for their conservation (Whitehead et al. 2004, Brakes et al. 2021, Eguiguren et al. 2025). For example, sperm whales from different clans off the Galápagos Islands in 1987 had significantly different responses to adverse oceanographic conditions during an abnormally warm El Niño event (Marcoux et al. 2007, Whitehead 2010); while groups of whales from both clans had relatively lower foraging success (as indicated by defecation rates) that year, those that belonged to the *Regular* clan fared much worse than those from the *Plus-One* clan (Marcoux et al. 2007). This difference likely reflects different foraging strategies between the two clans and indicates that the *Plus-One* clan whales may be more resilient in the face of warming oceanographic conditions than *Regular* clan whales.

Additionally, sperm whale clans have been shown to perform large-scale movements across the waters of member and non-member states throughout the Eastern Pacific. These shifts are only detectable through long-term monitoring, which has revealed the complete 'cultural turnover' of sperm whale clans across decades, with clans that were frequently observed in the 1980s and 1990s being entirely replaced in the 2010s, and continued to shift in the 2020s (Cantor et al. 2016, Oliver 2025).

Based on the evidence supporting the importance of social learning to the demographic structure and conservation of this highly nomadic species, a proposal for a Concerted Action for Eastern Tropical Pacific Sperm Whales was submitted at COP12 (UNEP/CMS/COP12/Doc.26.2.2). The Concerted Action was adopted at COP12 (UNEP/CMS/Concerted Action 12.2) and subsequently renewed and revised at COP14 (UNEP/CMS/Concerted Action 12.2 (Rev.COP14)).

Although progress has been made towards advancing some of the remaining questions about the population status and distribution of clans in the region (see UNEP/CMS/COP14/Doc.32.2.2 and the report on Concerted Action 12.2 (Rev.COP14) submitted to this meeting), key knowledge gaps remain regarding the impact of specific threats on different sperm whale clans. The latest population models indicate that the etP sperm whale population in the region declined by an estimated 5% per year between 1995 and 2000 (Whitehead & Shin, 2022). In the face of compounding and emerging threats to the ocean ecosystem (e.g., changing oceanographic conditions under climate change, prospective expansion of deep-sea mining and oil exploration in the region, increased anthropogenic marine debris, mainly ocean macro- and microplastics, and acoustic pollution, Eguiguren et al. 2025), it remains a priority to evaluate and mitigate the impacts of these stressors on distinct clans of sperm whales in throughout the etP.

Relevance

Sperm whales in the etP are a highly migratory species, travelling thousands of kilometres in a year (Whitehead et al. 2008). Indeed, individuals have been re-sighted across the etP, showing migratory connections between the Gulf of California and the waters off Panama, mainland Ecuador, the Galapagos Islands, Peru, and central Chile (Cantor et al. 2016). However, the drivers and timing of these movements remain poorly understood (Whitehead 2003, Cantor et al. 2017). Additionally, there is clear evidence of a cultural component to these movements, as shown by the displacement of entire clans over a few decades documented off the Galapagos Islands (Cantor et al. 2016).

The highly migratory nature of etP sperm whales is thus shaped by their social behaviour. This complexity necessitates long-term transnational cooperation to identify and mitigate the threats they face, while accounting for their cultural identity.

Throughout their habitat and distributional range, anthropogenic climate change can impact etP sperm whales primarily by altering sea surface temperature (SST) and influencing their primary food sources, deep-sea squid (Eguiguren et al., 2023; Eguiguren et al., 2025). Rising temperatures can reduce feeding success and reproductive rates, leading to potential population-level effects and shifts in distribution (Albouy et al., 2020; Kebke et al., 2022; Peters et al., 2022; Whitehead et al., 1997). Changes in prey availability, driven by warming and other factors, may well also force sperm whales to dive deeper and longer, increasing stress and potentially impacting their long-term survival in the region. The collapse of the Humboldt squid (*Dosidicus gigas*) fishery, coupled with phenotypic shifts linked to rising water temperatures and prolonged warming, is suggested to have triggered the departure of sperm whales from the central Gulf of California—and potentially from the entire gulf—between 2016 and 2018 (Pérez-Puig et al., 2024).

Through their migratory routes, and similar to other large cetacean species, etP sperm whales are also exposed to persistent plastic pollution, such as macro- and microplastics, through direct ingestion from water or indirectly via the consumption of prey (mesopelagic and bathypelagic squids) in the Pacific Ocean Basin, including the eastern and central tropical Pacific and North Pacific (Alava et al., 2025; Avila et al., 2018; CMS, 2025; Eguiguren et al., 2023; Eguiguren et al., 2025). Ocean hotspots for encountering plastic pollution include areas like the Great Pacific Garbage Patch, while lower or moderate plastic exposure ocean regions are located along the etP, as indicated by the development of the Microplastic Pollution Exposure Index (MPEI) for sperm whales (Figure 1; Alava et al., 2024; Alava et al., 2025).

The death of stranded sperm whales has already been linked to the individual consumption of several tons of plastic, often abandoned, lost, and discarded fishing gear (ALDG) or “ghost nets” (Avila et al., 2018; Alexiadou et al., 2019; Alexiadou et al., 2022; Unger et al 2016). In the etP, micro- and macro-plastics have also been found in most Humboldt squid tissues off Ecuador and the Humboldt Current (Rosas-Luis et al., 2016; Gong et al., 2021), indicating the ingestion of plastic pieces by Humboldt squid and other squid species from the deep.

Additionally, vessel collisions are a concern in areas of high maritime traffic, such as the Gulf of California, where proposals are being considered for the operation of large LNG tankers. Direct evidence of vessel strikes on cetaceans is notoriously hard to obtain, as struck individuals may not wash ashore. However, vessel collisions have been documented as a cause of death in other regions where sperm whale habitat overlaps with major fishing routes (Frantzis et al., 2019). Before the departure of sperm whales from the Gulf of California, there was documented evidence of a juvenile being struck by a vessel (HPP - personal observation).

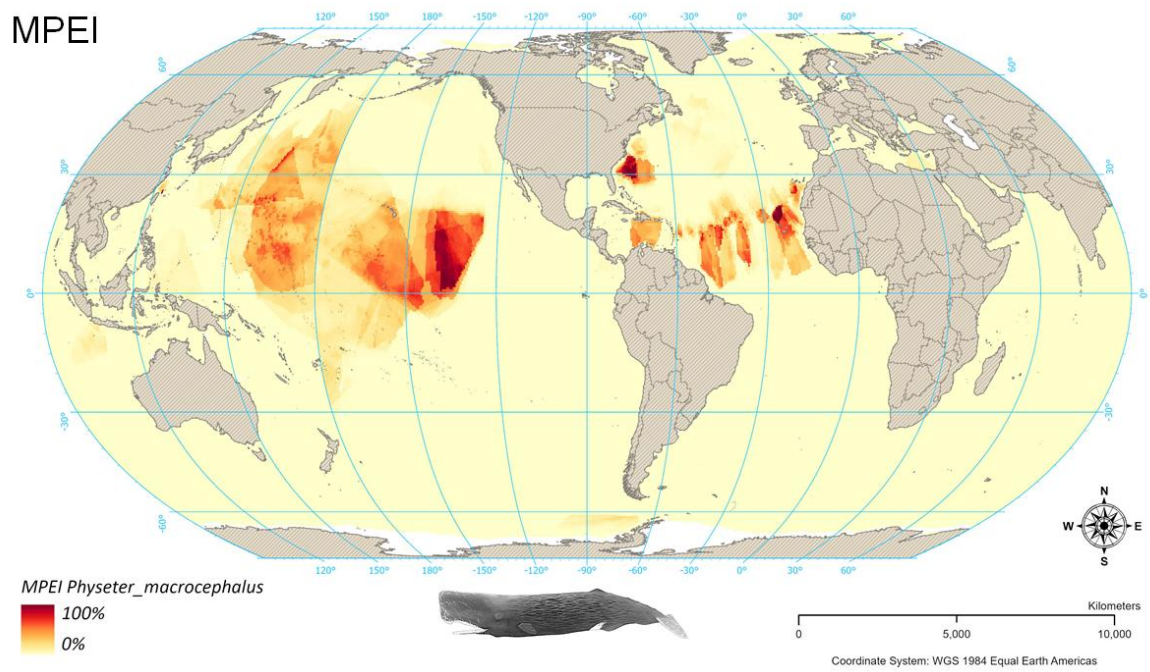

Figure 1. Microplastic Pollution Exposure Index (MPEI) for the sperm whale in the global ocean. The MPEI is estimated using the probability multiplication rule for two independent events: the microplastics concentration distribution (Litterbase and Microplastic initiative databases) multiplied by the sperm whale native range distribution (i.e., the species distribution map, retrieved from AquaMaps) in the global ocean. Adapted from Alava et al. (2024; 2025).

The actions proposed here contribute to the fulfillment of CMS mandates stated in the Resolution on Conservation Implications of Cetacean culture (UNEP/CMS/COP11 Resolution 11.23). These include that Parties and stakeholders should:

1. consider culturally transmitted behaviours when determining conservation measures;
2. evaluate the interactions between multiple anthropogenic threats and culturally driven social structure and behaviour; and
3. gather and publish pertinent data for advancing the conservation management of these populations and discrete social groups.

This request for renewing this concerted action directly aims at advancing objectives 2 and 3, which provide key evidence for informing actions taken under objective 1.

Absence of better remedies

Protection and monitoring of sperm whales in the etP is considered by other instruments, but most of these are restricted to threats related to their direct catch and commerce (e.g., CITES Appendix I, IWC), or relate to individual nations (e.g., local biodiversity conservation policies). However, the highly nomadic nature of etP sperm whales, who traverse member states and non-member states, means that effective conservation and monitoring are only possible through international cooperation involving Indigenous people from coastal communities and oceanic islands, citizen scientists, researchers, and policymakers. A CMS Concerted Action is therefore the ideal instrument for building and strengthening the cooperation and communication needed for adequate monitoring, identifying regions of high conservation priority, and mitigation measures. The CMS is also unique among international instruments as it has spearheaded the recognition of the role that social learning and culture have on the conservation of highly social migratory species.

Readiness and feasibility

The proponents of this concerted action (i.e., **Red Cachalotes del Pacifico**) have led the recent progress on previous iterations of the Concerted Action for the sperm whales of the etP. This team is composed of researchers from states across the range of etP sperm whale clans and beyond, including Mexico, Colombia, Ecuador, Peru, Chile, Canada, the United States and the United Kingdom. The team includes a wide and diverse array of expertise in the ecology, behaviour, and conservation of sperm whales in the region, and has local as well as global ties that would enable the success of the activities herein proposed. Emergent technologies that make data analysis and collaboration at a transnational scale more feasible have already contributed towards the early stages of improving our understanding of the large-scale movements of sperm whale clans across the region.

As highlighted in the **Report on the Implementation of the Concerted Action for the Sperm Whales (*Physeter macrocephalus*)** UNEP/CMS/COP15/Doc.31.2.7, the primary obstacle towards generating an understanding of the interplay between culture and conservation in sperm whale clans that informs management decisions is the lack of financial support for research across range states. This is why this Concerted Action proposal prioritizes building connections with governmental and non-governmental institutions to ensure resource mobilization to critical areas where knowledge is lacking.

Likelihood of success

Strengthening the collaboration network through institutional partnerships and secured funding will ensure monitoring of sperm whale clans and the threats they face across the etP and neighbouring waters. This will provide important evidence towards determining the appropriate conservation actions required to protect sperm whale populations and their cultural diversity in the region at an appropriate spatial scale. By expanding the scope of the Concerted Action to include research on male sperm whales' movements and reproductive behaviour in the Pacific Ocean, this initiative will address a critical knowledge gap, contributing towards a more holistic understanding of the factors affecting the reproductive potential and vulnerability of sperm whales in the region.

A legacy mechanism for long-term data collection on the presence and movements of sperm whale clans in the region is already taking shape, with early outcomes underway (e.g., the first PAM monitoring project in Chile, and the contribution of collaborators in Mexico, Chile, and Northwest USA to a cloud-based Photo-ID catalogue). Securing institutional partnerships and financial support will sustain these efforts in the long term and help expand efforts to community-based and citizen science initiatives. Broader involvement outside academia, for example, via citizen science and Indigenous traditional ecological knowledge, will not only provide a cost-effective way to collect data at wider temporal and spatial scales, but also raise awareness of sperm whale conservation and environmental stewardship among the public. This is a key element in securing outreach, support, and political will to implement future conservation actions.

Magnitude of likely impact

The impact of the Concerted Action for the ETP Sperm whales is intended to extend across the majority of the range of this species in the Eastern Pacific Ocean. This range includes several CMS member states (Chile, Peru, Ecuador, Panama, and Costa Rica), as well as non-member states (Nicaragua, El Salvador, Guatemala, and Mexico). The vast range of sperm whales makes them an ideal flagship and sentinel species ("canary in the coal mine") for international collaboration towards the conservation of migratory oceanic species and for extending CMS membership.

Moreover, the role that culture plays in shaping the behaviour and vulnerability of sperm whales to anthropogenic threats makes them a suitable case study for broadening awareness among conservation organizations, decision makers, and researchers on the importance of incorporating culture into conservation instruments and practice.

Cost-effectiveness

The activities outlined in this concerted action will require substantial and sustained funding (over USD 300,000 over a period of 5 – 10 years). By adopting the action plan, the CMS would endorse and strengthen funding acquisition efforts led by members of **Red Cachalotes del Pacifico** and their broader network. Likely funding sources include academic institutions as well as governmental and non-governmental agencies. Coordinating efforts among researchers across the region will enable the design of more holistic, conservation-focused projects that can attract larger funding sources.

A cooperative approach will avoid duplication of efforts. Moreover, monitoring activities have been designed to maximize cost-effectiveness by focusing on methods that produce data at relevant spatial and temporal scales at relatively low cost. For instance, consolidating existing sightings and photo-identification data on an AI-assisted matching platform will advance knowledge of sperm whale clans' movements without the need for direct tracking. Similarly, while installing PAM systems requires considerable initial investment, collaboration with research groups studying other marine megafauna and the adoption of AI-assisted detectors ensure that resources are used efficiently.

Consultations planned / undertaken

This Concerted Action was prepared by the **Red Cachalotes del Pacifico**, which includes experts from nations across the etP sperm whales' home range and beyond (including Chile, Ecuador, Colombia, Mexico, Peru, the United States, Canada, and the United Kingdom). Members of the network have a broad range of expertise on the biology, behaviour, and conservation of sperm whales, as well as direct knowledge of the challenges associated with marine research and conservation in Central and South America. The preceding Concerted Action emerged from the CMS Workshops on Conservation Implications of Animal Culture and Social Complexity (Brakes et al. 2021). The etP sperm whale case study was also presented at the ACCOBAM-ECS Workshop ‘Cetacean Culture: Navigating Change in the ACCOBAMS Region and Beyond’ (2025), as a means to exemplify the challenges and opportunities for integrating culture into the conservation of cetaceans.

Activities and expected outcomes

Activity	Outputs/Outcomes	Timeframe	Responsibility	Funding
Identify funding sources (CMS member states, NGOs, international conservation bodies, and academic institutions)	Access to funds that can support local research and outreach activities.	1 – 2 years	**Red Cachalotes del Pacifico**	NA
Conduct **workshops** on methodologies and local research efforts in regional symposia/meetings	An extended network of collaborators, throughout which knowledge and tools for sperm whale research and conservation are shared.	1 – 2 years	**Red Cachalotes del Pacifico**	4,000 USD for travel and fees. (TBD)

Activity	Outputs/Outcomes	Timeframe	Responsibility	Funding
Develop a social media presence & press strategy that enables **outreach to the general public**.	Increased public awareness of sperm whale culture and conservation, and participation in citizen science platforms.	2 years	**Red Cachalotes del Pacifico**	2,500 for media labour (TBD)
Compile a unified database on **research effort and sperm whale sightings** using a collaborative platform that taps into open citizen science-based data.	Improved understanding of sperm whale distribution, effort, and areas of interest	2 years	**Red Cachalotes del Pacifico** and local collaborators	5,000 USD for labour (TBD)
Establish a **unified photo-identification catalogue** for the etP and surrounding waters available in both existing web-based platforms (i.e., Flukebook and Happywhale.	Improved understanding of large-scale sperm whale clan movements throughout the region.	2 years	**Red Cachalotes del Pacifico** and local collaborators	5,000 USD for labour (TBD)
Locating sites and collaborators to establish **passive acoustic monitoring (PAM) stations**.	A network of PAM that informs on the distribution and temporal changes of sperm whale clans in key habitats	5 years	**Red Cachalotes del Pacifico** and local collaborators	300,000 USD for PAM equipment, deployment, and analyses (TBD)

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