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(Original submitted in Spanish)

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Your excellences, Secretaries Ojeda Durán, Villalobos Arámbula and Albores Gonzáles,

The IUCN Species Survival Commission has for many years voiced concern over the precarious situation of vaquitas. With a 99% decline over the past decade and a population now numbering only about 10 individuals, vaquitas are our highest priority. Recent news coverage has suggested several threats to vaquitas that are well known not to be threats. I wish to put these alleged threats to rest quickly so that meaningful actions to address the only immediate threat to this species, namely accidental mortality in gillnets, can be addressed. Scientific evidence to refute the allegations is given in the Annex.

The vaquita is a 3 million-year-old species found only in the far northern Gulf of California, and it has persisted at relatively low abundance for at least the last 200,000 years (Morin *et al*. 2020). Thanks to the high-quality research led and published by CONANP scientists, the scientific community widely accepts that unsustainable mortality in gillnets (set for shrimp, totoaba and other finfish) is *the* cause of the vaquita's rapid decline (Rojas-Bracho and Taylor 1999; Rojas-Bracho, Reeves and Jaramillo-Legorreta, 2006; Rojas-Bracho and Reeves, 2013; Jaramillo-Legorreta *et al*. 2017, Thomas *et al*. 2018; Jaramillo-Legorreta *et al*. 2019). There is no reason to seek an alternative explanation for the vaquita's unprecedented decline. No emaciated vaquitas have been observed, either alive or dead (Gulland *et al*. 2020). Individuals seen recently, including calves, appear robust (Taylor *et al*. 2019). There is every reason to believe that if vaquitas were immediately protected from gillnets, throughout the species' range and particularly in what is called the Zero Tolerance Area (ZTA), the population could recover.

Totoaba nets are in the water right now, and more are being set. The first priority to save vaquitas must be to remove these nets, with a strong focus on the ZTA. Three capable ships and crew of the NGOs *Museo de la Ballena y Ciencias del Mar* and the *Sea Shepherd Conservation Society* that could be removing nets as they have done in past years are standing by and ready to resume this critical activity to support the Government of Mexico.

Deeply respectfully, I urge the Government of Mexico to support this critical activity without further delay as the totoaba spawning season is reaching its peak.

More science is always welcome, but the presently critical situation facing vaquitas requires that resources be devoted to actions dealing directly with gillnet entanglement, focusing on the small area where vaquitas are known to survive.

Sincerely,

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cc.

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Annex

Evidence to refute the recent allegations concerning threats is as follows:

- Allegation 1: Cessation of flow of the Colorado River resulted in the vaquita's decline because it is adapted to be an estuarine species
    1. The portion of the Upper Gulf known to be vaquita habitat has likely never had the sustained or widespread brackish-water conditions of a year-round estuary (Brusca *et al*. 2017, Rojas-Bracho *et al*. 2019). Cessation of river flow is a controversial issue and there is certainly more to be learned about the ecological effects (Flessa *et al*. 2019). However, as noted by Flessa *et al*., "Restoring the flow of the Colorado to the Gulf will not save the vaquita. Enforcing a gillnet ban is necessary to save this iconic species."
    2. The assertion that vaquita mortality is increased by up to 50% because the animals expend energy from osmoregulation and thermoregulation, due to the change in conditions from estuary to marine, has no scientific basis. Marine mammals are adapted to filter and quickly eliminate the high amount of salt in their oceanic habitat. All marine mammals examined to date produce urine that is at least as concentrated as seawater (1000 mosM), and most are capable of doing much better than this (Costa 2018). To date there is no evidence that vaquitas are in anyway maladapted to their current habitat. Animals are healthy and females produce calves.
    3. All vaquitas examined to date have appeared healthy, with no signs of being nutritionally stressed.
    4. The precipitous decline in vaquitas began long after the damming of the river and the timing of the decline matches an unprecedented intensification of fishing with large-mesh gillnets in the heart of the species' range.
- Allegation 2: Presence of white sharks has increased because the disappearance of estuarine conditions opens this habitat to them and they can now prey on vaquitas
    1. Sharks, in general, can tolerate a range of salinities (Cramp *et al*. 2015; Morash *et al*. 2016; Curtis *et al*. 2011). While information on salinity tolerance is limited for white sharks, tracking data show that, across age classes, they can move deep into estuaries and inhabit regions of low salinity (Harasti *et al*. 2017, P. Butcher pers. Com.). Tagged white sharks in the northeastern Pacific were detected in a range of measured salinities between 25-30 ppt (S. Jorgensen pers. com.). Thus, it is unlikely that white sharks would have previously avoided vaquita habitat due low salinity associated with riverine output.
    2. White sharks do not start targeting marine mammals until they are ~ 9 years and older (Klimley 1985). Of the 100s of sub-adult and adult sharks tagged in the northeastern Pacific, only a few have been documented in the Upper Gulf, in vaquita habitat (MarineCSI.org; Jorgensen *et al* 2010; Domeier and Nasby-Lucas 2013; Dewar *et al*. 2013).
    3. The tagged sharks that have traveled to the Upper Gulf were females and they only remained for ~1 month during the shark pupping season, which is biennial for individual sharks (Domeier and Nasby-Lucas 2013).
    4. Given points 2 and 3, the abundance of large white sharks in the Upper Gulf is expected to be very low, both now and in the past.

5. It is well known that there is broad spatial separation between white shark nursery and foraging grounds. Conditions in the Upper Gulf are consistent with those associated with white shark nursery grounds and not foraging grounds (Klimley 1985, Dewar *et al*. 2013, White *et al*. 2019; Shaw *et al*. 2021). Juvenile white sharks prefer shallow bottoms where they forage primarily on fish and smaller elasmobranchs (Klimley 1985; Shaw *et al*. 2021).

- Allegation 3: Pollutants, including those associated with local gold mining, caused the vaquita's decline.
    1. Detailed examination of 9 vaquita carcasses from 2016-2018 revealed lesions and full stomachs, both features that are consistent with gillnet entanglement (Gulland *et al*. 2020). Also, the 3 carcasses examined for pollutants had low levels compared to other marine mammals. No saxitoxin or domoic acid was detected.
    2. Mercury is very toxic and can bioaccumulate in marine organisms. However, demethylation and selenium binding may protect marine mammals against acute toxicity (Kershaw and Hall 2019). Fish, fisheries and fishers would be affected if mercury were pervasive in the Upper Gulf.

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