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INTERNATIONAL
WHALING COMMISSION

Illegal gillnetting remains a serious threat to vaquitas

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[1]2019 Vaquita survey, [2]2021 Vaquita Survey

Abstract

Recently, claims have been made that a reduction in illegal gillnet fishing in the northern Gulf of California is allowing for a gradual recovery of vaquita, Mexico's endemic, critically endangered porpoise. Earlier recommendations by the Vaquita Recovery Team (CIRVA—Comité Internacional para la Recuperación de la Vaquita) had stressed that vaquita could be saved from extinction only if gillnets were banned throughout its range and fishers had adopted viable vaquita-friendly fishing methods. In 2020, a 12 x 24 km area where the few remaining individuals were regularly found was designated a Zero Tolerance Area (ZTA), an area where the gillnet ban was to be strictly enforced. Recent observations, however, indicate that illegal fishing is still rampant within the ZTA: during the shrimp season in November 2021, 117 pangas were documented in the ZTA - the combined length of their nets could have spanned the 24-km length of the ZTA at least five times. On 19 January 2022, during totoaba season, 58 pangas were counted fishing inside the ZTA, at a time when a new accord between the Mexican Navy and the Sea Shepherd Conservation Society was supposed to have greatly reduced illegal fishing within the ZTA. If vaquitas are to be saved from extinction, at a minimum, the ban on gillnet fishing in the ZTA must be enforced, and current evidence indicates that this is not happening.

Introduction

The only documented threat to vaquitas (*Phocoena sinus*) is death by entanglement in all types of gillnets (Rojas-Bracho and Reeves 2013). Recent reports from joint media events coordinated by the Secretaría de Marina - Armada de México (SEMAR) and the Sea Shepherd Conservation Society (SSCS) have suggested that this threat has not only been greatly reduced in recent times but is allowing the gradual growth of this endemic species (https://apnews.com/article/business-caribbean-mexico-environment-environment-8d24b267ce16efc819cd9a650a8069dc). Here we summarize two lines of evidence that call this optimistic perspective into question: observations during vaquita surveys in October of 2018, 2019 and 2021 during the shrimp fishing season and observations made from land documenting the number of pangas in areas of known vaquita presence over the past two years during the totoaba (*Totoaba macdonaldi*) and curvina (*Cynoscion othonopterus*) fishing seasons. Both sets of observations were made from or near the town of San Felipe and cover the area that has been demonstrated to contain the highest concentration of remaining vaquitas, using acoustic methods. This area is called the Zero Tolerance Area (ZTA).

The main fisheries are: totoaba, shrimp, curvina, other finfish and geoducks. The latter are obtained by hookah divers off pangas that generally have shades and are easily distinguished from pangas that are gillnetting. Some geoduck fishing was observed during vaquita surveys but the number of vessels were few compared with pangas that were gillnetting. All fishing is

influenced by the strong tides, winds and the biology of the target species. As a result, the concentration of pangas is highly variable in both space and time. For example, on a single day there may be many pangas within the ZTA in the calm morning with good tides running, but in the afternoon both high winds and/or slack tide may result in no pangas within the ZTA.

Regulations to protect vaquitas

Since September 24, 2020 Mexican regulations made the ZTA a no fishing and no entry zone. There is also a Gillnet Exclusion Zone (GEZ), based on the current and historical range of the vaquita, which was first established in Mexican government regulations (*Acuerdos*) on a two-year temporary basis in 2015, made permanent in 2017, and strengthened with additional restrictions in 2020. The 2020 regulation banned gillnets by all kinds of fishers including small-scale commercial fishing (industrial and sport/recreational) and boaters (Article 1), and added the following prohibitions and requirements:

> *Article 2: no use, deployment or recovery of passive or active monofilament or multifilament nylon thread gillnets within the GEZ, or having such gillnets aboard a vessel or in possession in the GEZ; no transport of gillnets in the GEZ or in a surrounding 10 km perimeter by land or air; no manufacture, possession, sale or transport in the GEZ or in any bordering cities, towns, communal lands or fishing camps; by December 23, 2020 any gillnet found in personal possession or on any vessel will be immediately seized as a precautionary measure in accordance with articles 132 section XVII and 133 section VI of the General Law of Sustainable Fisheries and Aquaculture.*
>
> *Article 10: all gillnets must be surrendered by any type of fisherman to local CONAPESCA offices by November 24, 2020.*

Although gillnetting is banned throughout the Upper Gulf of California, which includes all vaquita habitat, agreements on which types of fishing gears are legal to use and their permits regularly arrive late or not at all. These delays combined with the lack of alternative fishing gear and the ban on gillnets not being enforced, encourage the continued use of gillnets. Since the 2020 shrimp season, shrimp fishers have fished using permits created for the light trawls but are using gillnets. Permits for alternative vaquita-friendly shrimp fishing gear, like suriperas, were issued for only a few fishers but arrived too late in the season to be used. Similarly, in the 2022 curvina and other finfish seasons, the non-entangling gear agreement and permits arrived late. Fishers were already fishing with gillnets and they continued to do so. Since the end of 2018, government support paid to fishers for compensation or for training in alternative gears or livelihoods was halted.

Lines of evidence to document illegal fishing

There are several lines of evidence that independently document the amount of illegal fishing. 1) There have been 3 survey efforts in 2018, 2019 (Rojas-Bracho et al. 2019) and 2021 (Rojas-Bracho et al. 2021) that took place during the fall shrimp fishing season. These surveys used passive acoustics to identify the general locations of vaquitas and visual observations to estimate minimum numbers of vaquitas within the ZTA. 2) During the totoaba and curvina fishing seasons there have also been observations associated with net removal operations from

2016-2020 and from land in winter 2020/2021 and 2021/2022. And 3) there remain some functioning small vessel monitoring systems. As part of the current regulations:

Article 6 (Monitoring Systems For Small Vessels) of the September agreement states:

all vessels must have a monitoring system that is tamper-proof, installed and functioning.

A monitoring system was installed on most pangas that was made by Pelagic Data Systems (PDS) and uses cell phone technology to relay regular location data to a centralized location. However, few pangas have retained this system (the devices being removed by fishers) and during a meeting with the World Heritage Committee and IUCN, fisheries authorities acknowledged that there is no contract in place with Pelagic Data Systems (PDS) and there are no funds to cover the cost of this system and the analysis of the information. However, there are some data from the few pangas that still have vessel monitoring systems provided by PDS that clearly show pangas in the ZTA from January to March.

Shrimp fishing season observations (roughly mid-September through January)

Vaquita survey effort was hindered by extensive gillnetting within the ZTA in 2018, 2019 and 2021. These surveys use two ships running lines within the ZTA while keeping about 2 km apart. This formation allows the ships to come together quickly following a sighting to maximize the chances of tracking the elusive vaquitas and obtaining photographs. Acoustic monitoring of vaquitas has not been feasible since 2018 when too many detectors were being lost and estimating the minimum numbers of vaquitas through visual observations (the numbers seen within the ZTA) has become the best way to document their status. Numerous passive acoustic detectors were lost in all 3 seasons, either accidentally entangled with shrimp gillnets or deliberately removed by fishers. Thirty detectors were lost in 2019 and another 23 in 2021. In both 2019 and 2021 the level of illegal fishing was documented only on a single day of the vaquita surveys to provide evidence of the issues the survey ship had navigating the ZTA (Figure 1) while minimizing time lost to vaquita surveying. Regular data were taken on the numbers of pangas that could be counted within the ZTA on the radar screen of the SSCS ship used for the vaquita survey. 30 panga counts were conducted within the ZTA, of which 16 counts less than 20 pangas were counted; between 21 and 65 pangas were couted on 11 occasions; and on two occasions there were more than 65 vessels. On November 1 and 2, 72 and 66 pangas were counted with no Navy presence (full report here in English and in Spanish).

Prior to 2015, fishers set two nets marked by flags, each of around 1,000 meters of gillnet. These nets move along the bottom carried by the strong tides and are left to soak for several hours. Shrimp gillnetting was not observed in 2015 and 2017 vaquita research when fishers were being compensated. The recent panga counts inside the ZTA were: 87 pangas in 2019 and 117 pangas in 2021. The ZTA is approximately 12km wide and 24 km long. The expanse of gillnets on November 3, 2021 was likely between 117 km (1 km net/panga) and 234 km (2 km net/panga). Even using the lower number, there were enough gillnets to run the 24km length of the ZTA nearly 5 times.

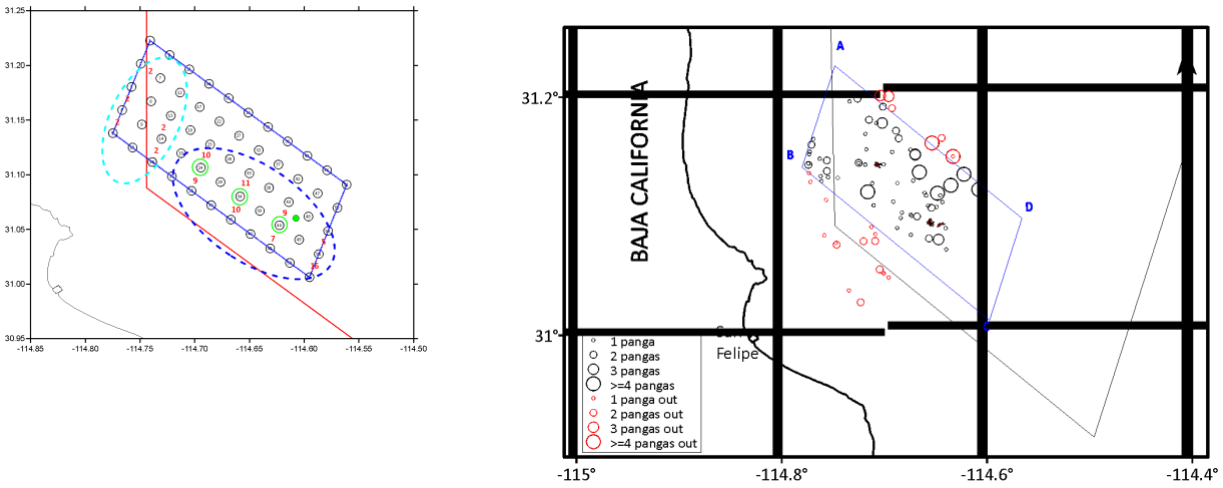

Figure 1. Left (October 17, 2019): Map of the acoustic sampling grid (black circles) within the ZTA (blue rectangular polygon). Counts of pangas are marked with red numbers, which indicate the number of vessels observed. The ellipses depict areas within the ZTA where fishing vessels were concentrated. In blue, the area with higher number of vessels and in cyan, the area with lower numbers.
Right (November 3, 2021): Panga count from within ZTA (blue polygon, vertices with letters).

The counts were made from the R/V Narval, which was anchored for the panga survey. In the southeastern anchored location, panga locations were recorded 360 degrees around the anchored research vessel. At the northwestern anchored location, locations were recorded 180 degrees in front of the research vessel. Black circles denote the position of the counted pangas observed within the ZTA. Red circles denote pangas observed outside the ZTA.

During the 2019 survey, most panga launching took place from downtown San Felipe (Fig. 2). This launching site is not authorized as a departure and disembarkation site in the September agreement. Gillnets could be seen in every panga and no officials were seen to check permits. Fishers made no attempt to disguise their illegal activities. A set of photographs and videos can be seen on the IUCN Cetacean Specialist Group website (link). We also observed fishers setting nets next to vaquitas in plain sight of research vessels (Fig. 3)

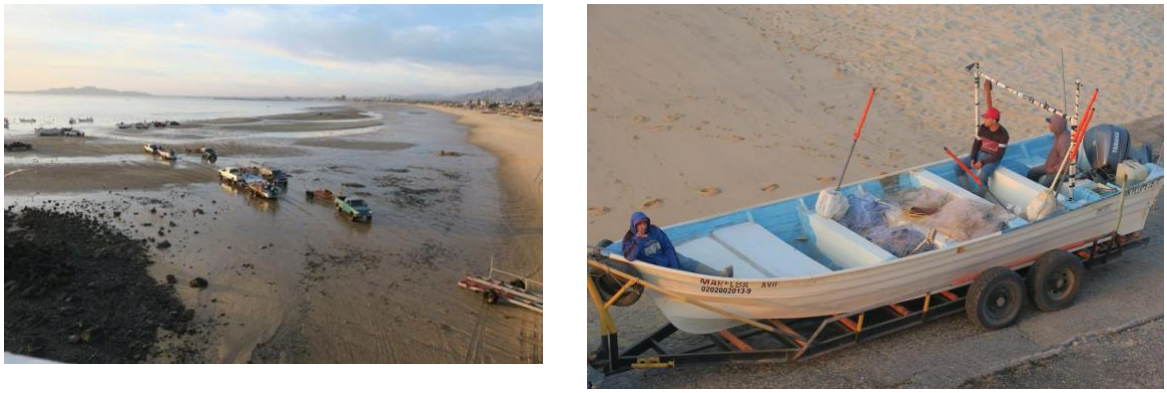

Figure 2. Left: Pangas launching from downtown San Felipe in 2019 (town visible on right). Right: Panga about to launch with four flags indicating two gillnets with each likely to be 1 km long. Note no attempt to disguise identities of fishers or the vessel.

Figure 3. Vaquitas surfacing in front of a panga pulling a gillnet inside the ZTA in 2019.

Totoaba and Curvina fishing season (roughly December through May)

Both totoaba and curvina spawn in the Upper Gulf of California in winter. It has been illegal to fish for totoaba since 1975 and, as a result, fishing was initially done mainly at night with nets anchored to the bottom with no surface markers, indicating an attempt to evade law enforcement. Once the net-removal program began in October 2016, cooperatively between SSCS, Museo de la Ballena and the Mexican Navy, fishers feared losing valuable nets and fish. By 2019 over 1,000 mostly actively fishing nets were removed and destroyed (https://seashepherd.org/news/sea-shepherd-removes-over-1000-pieces-of-illegal-fishing-gear-from-vaquita-habitat/). In 2017 a riot and resulting violent clash between local residents and the Navy occurred over the arrest of a fisher where Navy enforcers were shown being beaten in the film Sea of Shadows. The Naval enforcers were not allowed to fight back against the rioters due to a policy of non-confrontation. After that, tactics by local fishers became increasingly orchestrated and violent, particularly against the SSCS ships and no enforcement actions were taken against the perpetrators of the violence. This pattern culminated in the death of a fisher in an accidental collision with a SSCS ship on 31 December 2020 and the net removal vessels were asked to leave the area, which greatly curtailed net removals. When the SSCS and Museo de la Ballena vessels were allowed to return in the fall of 2021 they were not allowed to pull nets, but rather were to inform Procuraduría Federal de Protección al Ambiente (PROFEPA, Attorney General for Environmental Protection) and SEMAR about abandoned gillnets located in the area and in the refuge area (either the ZTA or the Vaquita Refuge). SSCS and Museo de la Ballena were not allowed to release any data regarding fishing activities to the public. Totoaba fishing has become similar to shrimp and curvina fishing where fishers stay with their nets. The non-confrontation policy makes staying with illegal nets a sound strategy. The lack of finding unattended nets, as was the case for totoaba fishing between 2011 and 2019, is therefore not evidence of a lack of totoaba fishing, but rather evidence that fishers can operate and stay with nets without fear of enforcement.

ZTA Watch Findings

Data on the level of fishing has been recorded from land and are available in a ZTA Watch Report, which is summarized here (full report available online). The ZTA Watch is conducted by

local residents using high power binoculars and a consistent methodology with advice from scientists. Due to safety considerations, the residents wish to remain anonymous.

ZTA Watch monitors and records the presence of vessels in the ZTA – pangas (fishing skiffs), enforcement vessels (Mexican Navy- SEMAR) and NGO monitors (SSCS and Museo de la Ballena y Ciencias del Mar). The entire ZTA can be viewed with powerful binoculars from points north of San Felipe. Observations are taken from 1-6 times per 24-hour period on a semi-random basis.

The data in Figure 4 show an increase in the number of pangas within the ZTA in the 2021/2022 season compared with the 2020/2021 season. The number of pangas in the ZTA during the 2020-2021 observation period trended somewhat lower, despite SSCS being absent for most of the period. The maximum number of pangas estimated in the ZTA for this period averages 6.7, compared to 10.1 for 2021-2022. Between January 1 and March 25, the number of days with more than 20 pangas within the ZTA was 6 in 2021 and 12 in 2022. Note that SSCS vessels were present on several of the high count period in 2022.

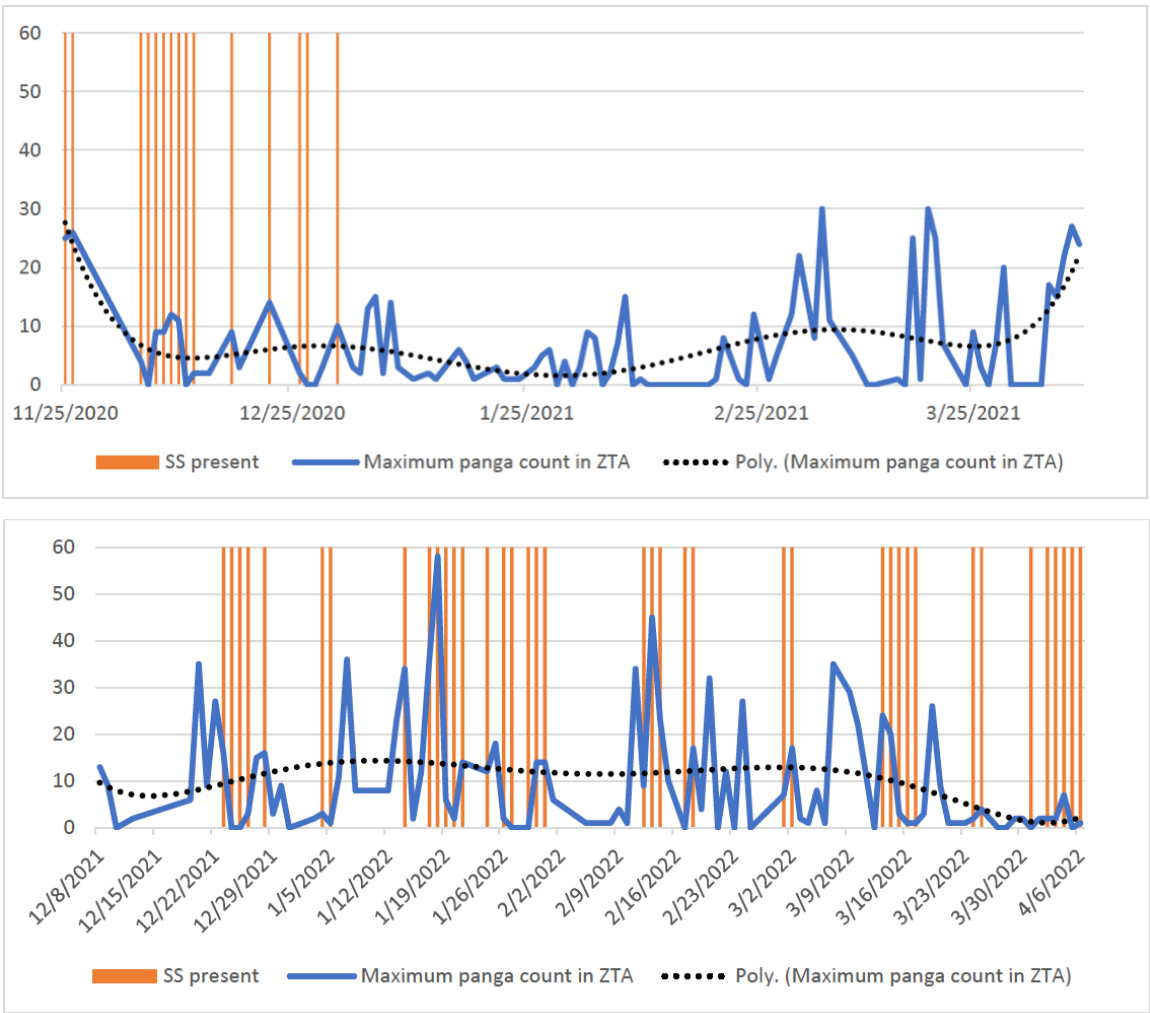

Figure 4. Maximum daily panga count within the ZTA in the 2020/2021 totoaba season (top) and the 2021/2022 season (bottom). "Poly" stands for "polynomial trend line" used to fit data that fluctuates.

On April 5 2022 in Mexico City, SSCS announced that a new reporting and response protocol with SEMAR was entered into effect January 10 2022 and has resulted in "a substantial

reduction in the number of fishing vessels in the ZTA". The Mexican Navy said, "*since that time, there have been no reports of massive numbers of fishing boats*." Figure 4 indicates that the highest number (n = 58) of pangas seen in the ZTA during totoaba season occurred on January 19, 2022 after the new response protocol was in effect.

There is also substantial fishing effort outside the ZTA within the areas where vaquitas have been detected in the recent past and well within the Vaquita Refuge (Figure 5). Vaquitas are in no way restricted to the ZTA. Even though guarding the ZTA is supposedly a top priority, rampant gillnet use throughout their nearby habitat remains a significant threat. All pangas leaving San Felipe with gillnets are fishing illegally and constitute an enforcement failure.

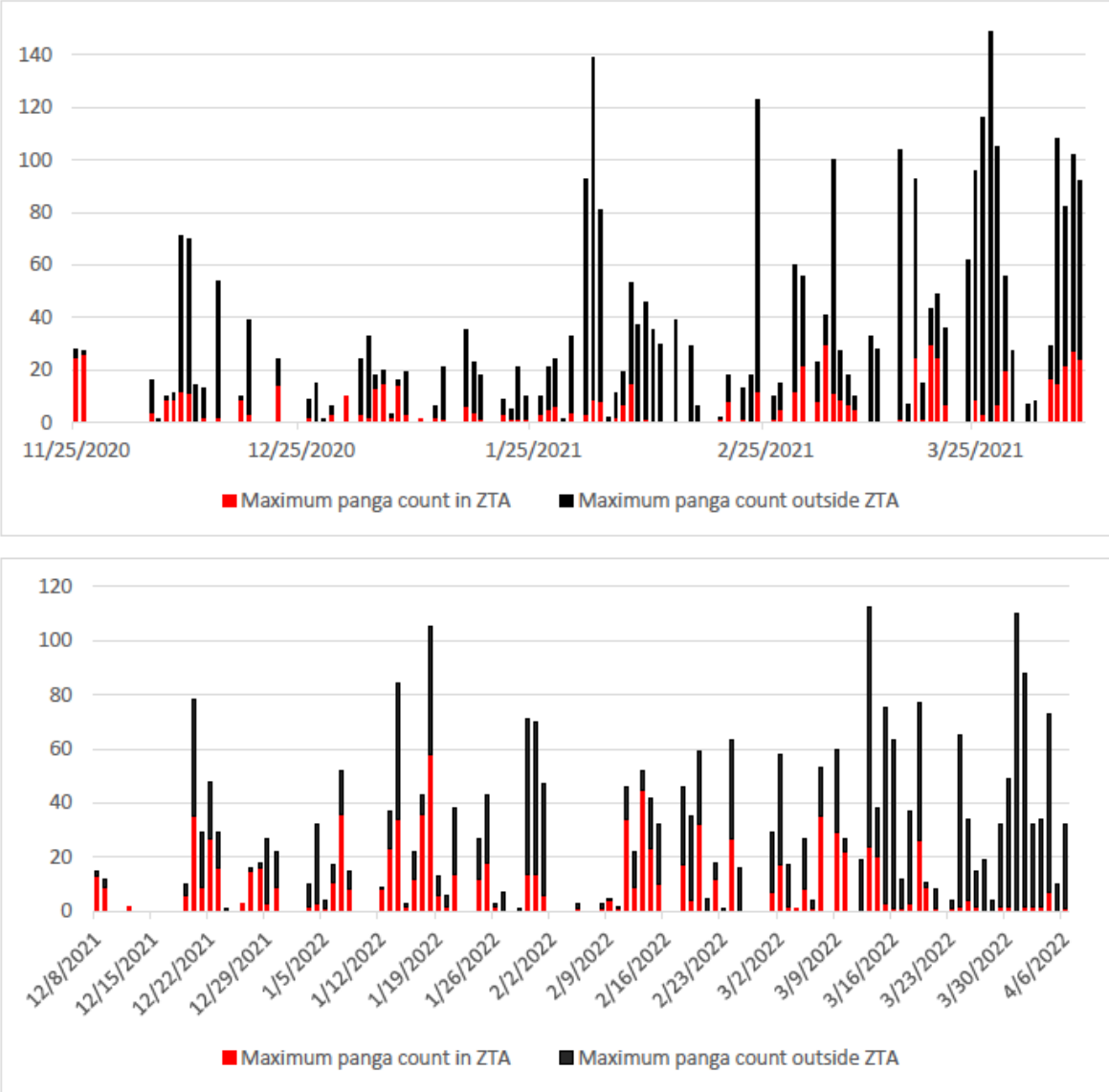

Figure 5. Pangas visible by ZTA Watch (all within vaquita habitat).

Discussion

The evidence presented here is consistent with persistent illegal fishing with gillnets within the range of the last vaquitas. The vaquita recovery team (CIRVA -- Comité Internacional para la Recuperación de la Vaquita) has long maintained that until fishers in both San Felipe and El

Golfo de Santa Clara can make a living without resorting to gillnets, vaquitas will continue on their path towards extinction (CIRVA 2019). Although alternative gears exist to fish without killing vaquitas, these gears have not been promoted to fishers, who have little or no training in their use, and no program by the fisheries authorities has been implemented to transition fishers to these gears so that they can make a decent living.

The non-confrontation policy remains in place and fishers clearly do not fear enforcement. The policy of dissuasion has only emboldened illegal fishers and totoaba traffickers, who know that the chances of punishment are minimal. In essence, almost all fishing is now illegal and no alternative ways of making a living are readily available. It is not clear how the new protocol announced between the SEMAR and SSCS could be expected to quickly solve this long-standing problem. All evidence points to the contrary and emphasizes the critical need for transparent monitoring and reporting of fishing efforts.

Vaquitas become entangled in all types of gillnets, including those set for shrimp and finfish, but those set for totoaba, a fish similar in size to vaquita, are the most lethal (Vidal 1995). Undoubtedly the decline between 2011 and 2017 was driven by the illegal totoaba fishery as compensation to fishers greatly reduced shrimping. With the resumption of shrimping with gillnets, it is important to remember that the loss of over half of the vaquitas species between 1997 and 2008 (Gerrodette et al. 2011) occurred when there was almost no totoaba gillnetting and the most valuable commercial fishery in the region was for shrimp, which also uses gillnets known to kill vaquitas (D'Agrosa et al. 2000).

We conclude that: 1) Illegal fishing for totoaba, as well as illegal gillnet fishing for shrimp and curvina, remain serious threats to the continued existence of the vaquita, 2) the programs and policies of the current Obrador administration in Mexico are failing to provide adequate protection, and are weakening past progress made in vaquita conservation, and 3) the need to immediately remove all gillnets from the vaquita's small range, and to provide suitable long-term alternatives to fishers and related industries, is more dire than ever.

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