

Report of the Eleventh meeting of the Comité Internacional para la Recuperación de la Vaquita (CIRVA)

Southwest Fisheries Science Center (SWFSC) in La Jolla, CA, USA
February 19-21, 2019.



Vaquita mother “Ana” with her 2018 calf demonstrating that vaquitas are healthy and can give birth annually. Photo by Oscar Ortiz, 26 September 2018.

EXECUTIVE SUMMARY

Letter to Mtra. Josefa González Blanco, Secretaria de Medio Ambiente y Recursos Naturales and Dr. Víctor Manuel Villalobos Arámbula, Secretario de Agricultura y Desarrollo Rural

Dear Secretaries:

The members of the International Committee for the Recovery of the Vaquita (CIRVA), a group that has advised the Government of Mexico on the conservation of this species since 1997, welcome the opportunity to continue in your service. We have just concluded the eleventh meeting of CIRVA, held at the Southwest Fisheries Science Center in La Jolla, California from February 19-21, 2019; a full report from the meeting is given below. Given the gravity of the current situation, we are writing to request you take immediate action to save the vaquita species from extinction.

As you know, the vaquita is on the edge of extinction and, unless action is taken now, the species will be lost within a few months or years during your administration. No more than 22 vaquitas remained alive during the summer of 2018, prior to the current fishing season. Each year, half of the remaining vaquitas are killed in illegal fishing nets set for another endangered species, the totoaba. Poachers prize totoaba for their swim bladders, which are dried and smuggled by organized crime cartels to China, where they are sold on the black market for prices that can reach \$46,000 USD per kg. The acoustic monitoring program indicates that the few remaining vaquitas inhabit a very small area, approximately 24 x 12 km, most of which lies within the Vaquita Refuge. However, high levels of illegal fishing for totoaba occur in this area.

This precipitous population decline has continued despite the actions taken by the Government of Mexico. We emphasize that the only remaining hope for the vaquita is to eliminate all gillnet fishing in the area where the last few vaquitas remain. This is not an impossible task, as the area to be protected is not large. However, reports from the region suggest that the illegal fishery is growing, and there have been several recent episodes of violence by illegal fishermen directed at net removal vessels and their crews, legal fishermen, and even the Mexican Navy. These events illustrate the continued failure of enforcement efforts and the lack of respect for Mexican law by illegal fishermen.

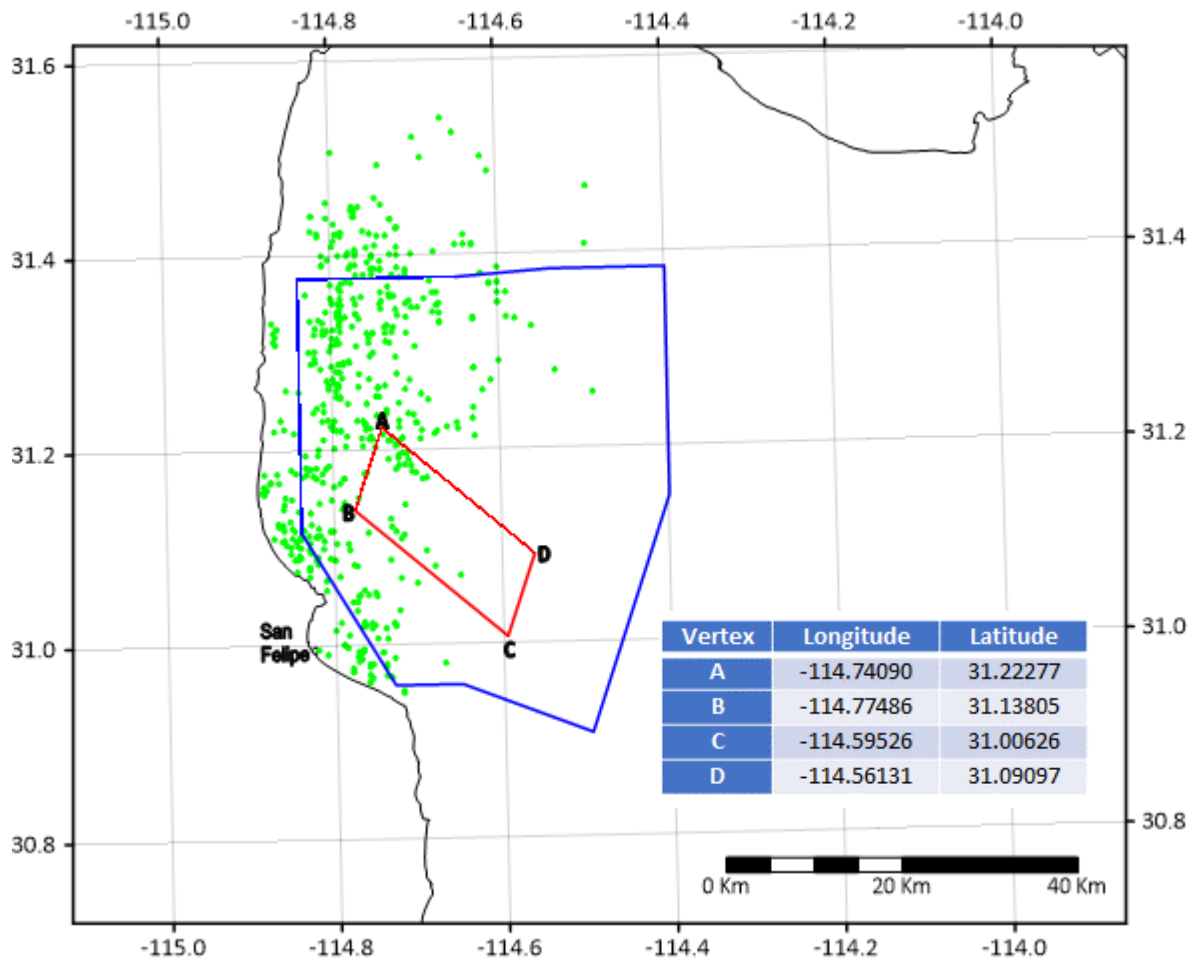
We call on the Government of Mexico to fully mobilize its enforcement assets to eliminate illegal fishing in the area where the last few vaquitas remain (please see attached Figure). In this Zero Tolerance Area, where the goal is to remove any illegal net within hours of its deployment, particularly during the totoaba season, we request that the Government of Mexico:

1. Fully fund and expand net removal efforts to maintain the area as a net-free zone;
2. Provide 24-hour surveillance and monitoring;
3. Take all necessary measures to protect net removal teams; and
4. Arrest and prosecute illegal fishermen by, for example, placing an FGR agent on net removal ships and Navy vessels to facilitate arrests.

These actions must be taken immediately, as we are currently in the peak of the illegal totoaba fishing season, which extends throughout March and April. It is important to strengthen enforcement throughout the entire protected area, but CIRVA requests that net removal effort be focused on the Zero Tolerance Area at this critical time.

There is still hope. Vaquitas are still producing calves, and the remaining animals are healthy – their population decline is caused by entanglement in illegal fishing nets, not a result of issues with their habitat, disease, or a lack of food. But, without immediate, effective action on the part of the Government, the vaquita is doomed to extinction. Furthermore, continued illegal fishing will cause irreparable harm to other species in the Upper Gulf of California, to Mexico’s biodiversity heritage, and to the human communities that depend on this ecosystem.

We respectfully offer to provide any assistance that will be useful in implementing these recommendations and in conserving the vaquita.



Map: The blue polygon is the 2018 Vaquita Protection Refuge. The red polygon is the recommended ZERO TOLERANCE AREA where nets must be removed within hours of being set. Green dots are active totoaba nets removed since 2016. Boundary coordinates for the Zero Tolerance Area are shown.

RECOMMENDATIONS – CIRVA 11

CIRVA recommends the following actions to prevent extinction of the vaquita

Immediate - now through the end of May

We call on the Government of Mexico to fully mobilize its enforcement assets to eliminate illegal fishing in the area where the last few vaquitas remain (see attached Figure). In this area of zero tolerance, particularly during the totoaba season, we request that the Government of Mexico:

1. *Fully fund and expand net removal efforts to maintain the area as a net-free zone.*
2. *Provide 24-hour surveillance and monitoring.*
3. *Take all necessary measures to protect net removal teams.*
4. *Arrest and prosecute illegal fishermen, for example, by placing an FGR agent on net removal ships and Navy vessels to facilitate arrests.*

Near term - April through August

1. Fund and support photographic identification field efforts to take advantage of good-weather “windows” in spring.
2. Fund and continue acoustic monitoring during summer.
3. Continue and accelerate alternative efforts to develop and implement the use of alternative fishing gear.
4. Implement the “*Plan for the Comprehensive Care of the Upper Gulf of California and the Comprehensive Program for the Protection and Recovery of the Vaquita*”.

Medium term - June 2019 through the following shrimp season (September -February 2020)

1. Strengthen direct linkages between alternative gear fishermen and seafood buyers.
2. Conduct cost-earnings analyses on new gears and test markets for vaquita-safe seafood.
3. Work with producers and buyers to develop and implement comprehensive chain-of-custody and traceability methods and practices.

Long term (starting in 2019 but lasting at least several years)

CIRVA reiterates its long-standing recommendation that every effort be made to support vaquita-safe fisheries and to develop viable alternative livelihoods in the Upper Gulf of California. Ultimately, successful vaquita conservation will depend on well-managed, sustainable fisheries that support, *and are supported by*, the local communities.

REPORT- CIRVA 11

The Eleventh meeting of the Comité Internacional para la Recuperación de la Vaquita (CIRVA) was held at the Southwest Fisheries Science Center in La Jolla, CA from February 19-21, 2019. CIRVA members in attendance included: Lorenzo Rojas-Bracho (chair), Armando Jaramillo-Legorreta, Barbara Taylor, Tim Gerrodette, Peter Thomas, Andrew Read, Robert Brownell, Sarah Mesnick, Frances Gulland, Nina Young, Jorge Urbán, Victor Camacho, Gustavo Cardenas-Hinojosa, Jay Barlow and Randall Reeves. CIRVA member Greg Donovan participated remotely via video. The committee's work was supported by a number of invited experts who provided presentations and contributed to plenary discussions. Rojas-Bracho chaired the meeting and Read, Thomas, Reeves, and Gerrodette acted as rapporteurs. Meeting participants are listed in Annex A. The agenda is given as Annex B.

1. Welcome

Rojas-Bracho welcomed CIRVA members and invited experts to the meeting. The agenda was reviewed and adopted.

2. Acoustic Monitoring Program and Other Scientific Efforts

2.1 Acoustic Monitoring Program

Jaramillo-Legorreta presented results from the 2018 Acoustic Monitoring Program. This included the regular summer program, underway since 2011, which is used to determine abundance trends, plus additional sampling, including a program to support the biopsy sampling field effort during September 2018 (see below). Throughout the year, but particularly during November and December, the program was hampered by the loss of acoustic monitoring instruments (CPODs) due to illegal fishing activity and intentional theft. During these two months, a total of 32 CPODs were lost at a cost close to \$32,500 dollars. Despite these setbacks, it is clear that the vaquita population has continued to decline and its range has contracted into a small area near the southwestern border of the Vaquita Refuge.

The results of the annual summer acoustic monitoring effort have been analyzed and submitted for publication (Jaramillo-Legorreta *et al.*, In Review). In this analysis, acoustic detections were combined with information on the minimum number of vaquitas known to be alive, from photographs of distinctively marked individuals taken during Vaquita CPR (hereafter VCPR) in 2017 (7) and from photographs taken during the biopsy and photo-identification survey (see below) in September 2018 (6). The total population decline since 2011 was estimated to be 98%. The catastrophic rate of decline since 2011 continues with the rate in the last three years estimated at around 50%. The analysis indicated that only about 10 vaquitas remained alive in 2018 (with a 95% chance of the true value being between 6 and 22).



Figure 1. Dead adult female vaquita found floating and recovered by the Navy, 28 March 2018 in the northwest of the refuge (31°70.00N, 114°43.00W). Cause of death was entanglement in an illegal gillnet. The carcass has circular holes on the left flank, intestines protruding, eyes and all skin missing except for one piece near melon. It was stored in ice and freezer until necropsy.



Figure 2. Dead totoabas from a single net in March 2018. A total of 36 fish were removed; three were released alive and 33 were cut into pieces. This photograph was within a few kilometers of the area where vaquitas are most frequently recorded and where vaquitas were photographed in September 2018.

In discussion, it was considered that some vaquitas could still exist outside the area monitored by the annual acoustic program. In response, Jaramillo-Legorreta noted that one of the primary assumptions of the program was that the trend of acoustic detections inside the monitored area reflects that of the entire population. It might be possible to use platforms of opportunity, such as one of the Sea Shepherd Conservation Society vessels, to explore this question after the current totoaba season ends.

Taylor noted that previous reviews of the acoustic monitoring program had concluded that most, if not all, potential sources of bias would lead to under-estimates of abundance (negative bias). This is confirmed by the effect of incorporating the minimum numbers known to be alive in 2017 and 2018, as described above.

CIRVA **strongly recommends** that the regular 46-site acoustic monitoring grid be sampled again in 2019, as in previous years, to continue the data series on population trend and provide information on distribution and occurrence. CIRVA **expresses grave concern** that CPODs are being removed or vandalized and notes that unless the acoustic equipment is adequately protected (which seems unlikely given recent experience), it will be necessary to discontinue the use of surface markers (buoys), which will increase the cost of the program.

CIRVA **further recommends** that the opportunistic use of smaller CPOD arrays be continued to assess vaquita presence and to support possible periodic photo-identification and visual monitoring efforts outside the regular summer sampling period (see below). Because of the recent loss of CPODs, CIRVA also **recommends** purchasing an additional 50 units to ensure a sufficient number are available to support the photo-identification effort and other research and monitoring programs.

2.2 Biopsy and Photo-identification Survey

Taylor described a field effort to obtain vaquita photographs and biopsies, which occurred from September 22 to 28, 2018. A full report on this field work is included as Annex C. The effort employed the Museo de la Ballena's research vessel, the *Narval*, three rigid-hulled inflatable boats (RHIBs), and a panga. The *Narval's* flying bridge was modified for visual operations and equipped with big-eye (25x) binoculars provided by the SWFSC.

On September 26, photos were obtained of a vaquita mother and calf (see the Executive Summary). At one point the pair came within 20m of the panga but at an orientation that precluded a biopsy sampling attempt. The mature female was photographically matched to the likely mother of V01F, the young animal captured and released in the VCPR effort in 2017.

Several vaquita sightings were made on September 27. One group of 4 individuals, including a small calf, was tracked for 1 hour and 42 minutes. It is very likely this was a second mother-calf pair, because the calf was reported to be smaller than the September 26 calf, but this pair was not photographed. The group of 4 approached to within 50m of the small boats but never came within biopsy range. Overall, given the locations and timing of these September 27 sightings, it was concluded that a minimum of 6 vaquitas were seen on this day.

Even though it was not possible to obtain biopsies, the field effort provided information on the minimum number of vaquitas alive in September 2018 and on aspects of the life history of several individuals. In particular, the re-sighting of the mother of V01F, this time with a new calf, indicates the potential for annual reproduction in vaquitas, which we interpret as a positive sign for the ability of the species to recover if the mortality in totoaba nets is eliminated. This observation is described in detail in a note that will be published in *Marine Mammal Science* (Taylor et al. *In Press*).

CIRVA commended the field team and thanked Diego Ruiz Sabio for his support, without which this effort would not have been possible and thanked NOAA's Southwest Fisheries Science Center for equipment loans.

CIRVA **acknowledged** that efforts to find and photograph vaquitas are most likely to be successful if four conditions are met, as follows: (i) weather is favorable (calm sea state, good visibility), (ii) an acoustic program is in place to determine the general location of vaquitas, (iii) a ship with experienced observers equipped with 25x binoculars is used to find and track the vaquitas visually; and (iv) several pangas are available, each with experienced marine mammal photographers using cameras equipped with at least 400-mm lenses to obtain photographs. CIRVA **recommends** that photo-identification efforts be conducted as soon as favorable weather conditions are expected. The purpose of such efforts is to obtain information on the minimum number of animals alive, and to refine understanding of life history including survival rates. In addition, CIRVA **recommends** exploring the possibility of using photographic capture-recapture techniques to obtain an estimate of minimum abundance (which is preferable to relying on simple single day counts of different individuals). Finally, CIRVA **recommends** that (a) local marine mammal scientists, and naturalists with training and experience in photo-identification techniques, organize rapid-response teams to take advantage of weather conditions suitable for such monitoring work and (b) more local personnel be trained and equipped to maximize the number of opportunities to obtain photographs and potentially biopsies.

3. Net Removal Program and Assessment of Enforcement

Efforts to locate and remove active and derelict totoaba nets and reduce the threat this fishing gear represents to vaquitas continued in two phases in 2018. These efforts are led by the Secretariat of Environment and Natural Resources (SEMARNAT), in collaboration with the National Institute of Ecology and Climate Change (INECC), the National Commission for the Knowledge and Use of Biodiversity (CONABIO), the Mexican Navy (SEMAR), the Federal Attorney for Environmental Protection (PROFEPA), the National Commission of Natural Protected Areas (CONANP), the Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA), and the Secretariat of National Defense (SEDENA).

NGO partners in this work include the Sea Shepherd Conservation Society (SSCS), the World Wildlife Fund (WWF-Mexico), Museo de la Ballena y Ciencias del Mar, PRONATURA, and Alternative Fishing of Baja California (PESCA ABC, a local NGO that collaborates with 40 fishermen to find illegal fishing gear). Additional support is provided by World Animal Protection, Parley for the Oceans, the Marine Mammal Center and the National Marine Mammal Foundation (USA).

In total, 659 pieces of fishing gear were removed in 2018, most (67%) were active illegal totoaba gear, with a very high overlap between the locations where gear was found and the habitat of vaquitas. Efforts and results for specific periods of 2018 are discussed in more detail below. Monthly reports of net removal activities during the totoaba spawning season (December through May) are available on the IUCN Cetacean Specialist Group website: iucn-csg.org.

3.1 January to May 2018

From January to May 2018, 208 ship days of effort were spent finding and removing fishing gear, involving vessels from the SSCS and the Museo de La Ballena, in collaboration with PROFEPA and the Mexican Navy. Five hundred and seventy (570) pieces of gear were removed in the January to May phase, 91% of these were gillnets and longlines used to fish illegally for totoaba and, 77% of these nets and longlines were in active use, including 382 totoaba gillnets (Table 1 and Figure 3). As in previous years, a wide variety of vertebrate (finfish, sharks, rays, birds, sea turtles and marine mammals) and invertebrate animal species were recorded as by-catch in the removed gear – 1,362 dead and 863 live individuals were documented.

Table 1. Active totoaba gillnets removed by SSCS and Museo de la Ballena vessels, January-May 2018.

Vessel	Jan	Feb	Mar	April	May	Total
<i>El Narval y Narvalito</i>	2	36	20	19	1	78
<i>Sharpie</i>			35	51	3	89
<i>John Paul DeJoria</i>	27	51	5			83
<i>Farley Mowat</i>		9	44	69	10	132
Total						382

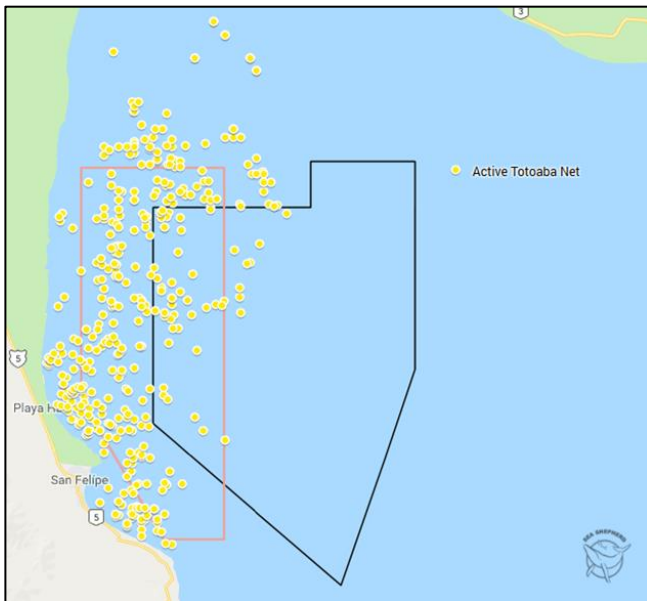


Figure 3. Locations of the 382 active totoaba gillnets removed during January-May 2018.

All nets removed during this phase were securely packed in 189 silo bags and placed in containers. In March 2018, 136 of these bags were exported to the US for recycling. Lead weights taken from some of the fishing nets were re-cast for use as diving weights.

3.2 June to November 2018

From June to November 2018, fishermen in 20 pangas spent each of 56 vessel days finding fishing gear, working with an SSCS ship and a Museo de la Ballena ship that were removing the nets. Effort between June-November 2018, which falls outside the main season for illegal totoaba fishing, was reduced because of: (i) lack of fuel for small boats (pangas) and El Narval (Museo de la Ballena), (ii) administrative issues related to the management of program funding, (iii) lack of a new fuel donation from PEMEX, and (iv) rough weather. Nevertheless, a total of 89 pieces of gear were removed, 72.5% of them totoaba gillnets and longlines. All but two of these were inactive. The locations of the totoaba gillnets removed during this period are shown in Figure 4. Vertebrate and invertebrate by-catch continued to be high with 229 dead and 1,179 live individual animals recorded during this period.

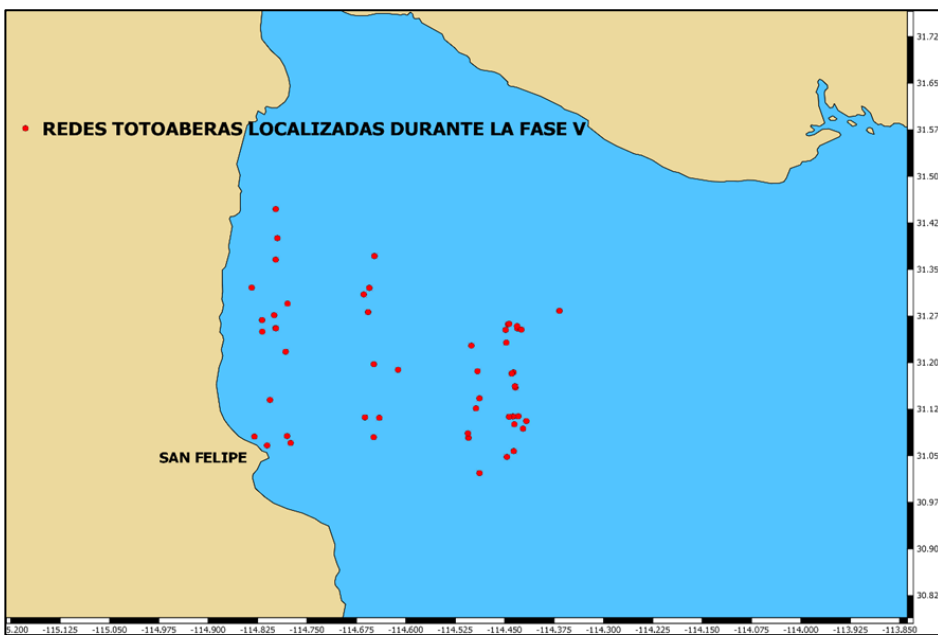


Figure 4. Locations of totoaba gillnets removed during June-November 2018.

3.3 December 2018 – February 2019

Illegal fishing resumed at high levels toward the end of 2018 and into 2019 as evidenced by the number of nets removed despite hindrances (see below) to removal efforts. SSCS removed 41 pieces of gear in 15 ship days of effort in December 2018 and SSCS and Museo de la Ballena 22 pieces in 7 ship days from January 2019 to the 15th of February 2019.

3.4 Cumulative net removals since 2016

Figure 5 shows the cumulative numbers of active totoaba nets removed by SSCS during its Operations Milagro from January 2016 to February 2019. Figure 6 shows the cumulative numbers of nets removed by SSCS, Museo de la Ballena and by all cooperating groups from January 2016 to February 2019. These data clearly demonstrate an increase in illegal fishing for totoaba, which constitutes an ongoing threat to the existence of the vaquita.

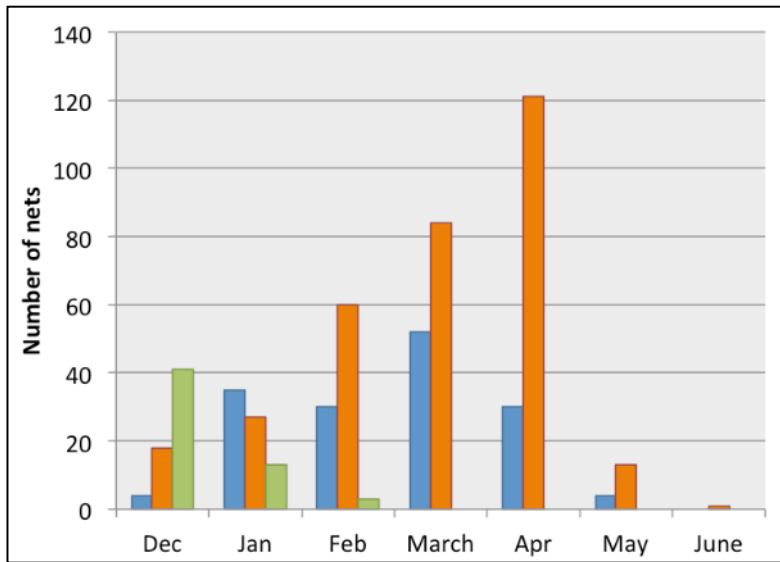


Figure 5. Active totoaba nets removed from 2016-2019 by Operación Milagro. Net removals from December 2018 – February 2019 were reduced compared to previous years due to less removal effort in January and February 2019 than in the previous two years because of to the attacks on the SSCS vessel, that left the area for repairs for over a month, and the absence of the *Narval* from the Upper Gulf in early 2019. *Blue: OPM3 2016-17; Orange: OPM4 2017-18; and Green OPM5 2018-19*

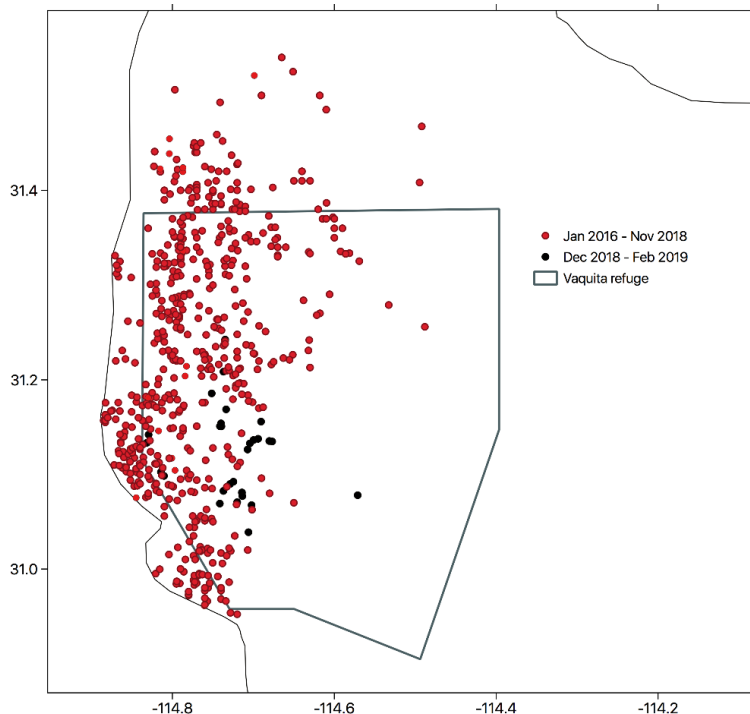


Figure 6. Nets removed by the inter-institutional gillnet removal program, from January 2016 to February 2019.

Red: January 2016 – November 2018; Black: December 2018 – February 2019. Black line shows the Vaquita Refuge

3.5 Violent attacks on net removal operations

Violent, brazen attacks on an SSCS Se ship on 19 January and 31 January 2019 by large numbers of individuals in dozens of pangas disrupted net removal efforts being conducted in the presence of Mexican Navy vessels, one of which also came under attack. As of the date of the CIRVA meeting, no person had been charged in these attacks although investigations are ongoing. The attacks hindered net removal operations for a period of time, but SSCS vessels had resumed operations in the region by mid-February 2019, and three large ships will be deployed for the peak of the illegal totoaba fishing season.

3.6 CIRVA recommendations on net removal and enforcement

Given the continued high level of setting of illegal totoaba gillnets, as evidenced by the large numbers of nets removed in 2018, there is no question that illegal totoaba fishing and the risk it poses to the survival of vaquitas continued unabated during 2018. This illegal totoaba fishing continues at high levels in 2019.

Enforcement efforts have been completely ineffective in reducing the illegal totoaba fishery in the Upper Gulf of California. The failure of the Navy or other governmental representatives to respond forcefully to the violent direct attacks on net-removal vessels and persons operating legally in government-sanctioned net-removal programs is indicative of the erosion of respect for the rule of law in the region.

CIRVA **commends** the valiant work of agencies, organizations and individuals involved in the net-removal operations in the Upper Gulf of California throughout 2018 and early 2019.

CIRVA is **alarmed** by the unlawful violent attacks on net-removal vessels and their crews and is extremely concerned for the safety of those individuals who are directly involved in the efforts, authorized and led by the Mexican Government, to find and remove illegal fishing gear from the range of the vaquita.

Thus, CIRVA **calls on** the Government of Mexico to fully mobilize its enforcement assets to eliminate illegal fishing in the area where the last few vaquitas survive, a small area henceforth referred to as the “Zero Tolerance Area” where the goal will be to remove any illegal net within hours of its deployment (see Figure 7). In this Zero Tolerance Area, particularly during the totoaba season, we **recommend** that the Government of Mexico:

1. Fully fund and expand net-removal efforts to maintain the area as a net-free zone;
2. Provide 24-hour surveillance and monitoring;
3. Take all necessary measures to protect net-removal teams from harm or intimidation; and
4. Arrest and prosecute illegal fishermen, for example, by placing an FGR agent on net-removal ships and Navy vessels to facilitate arrests.

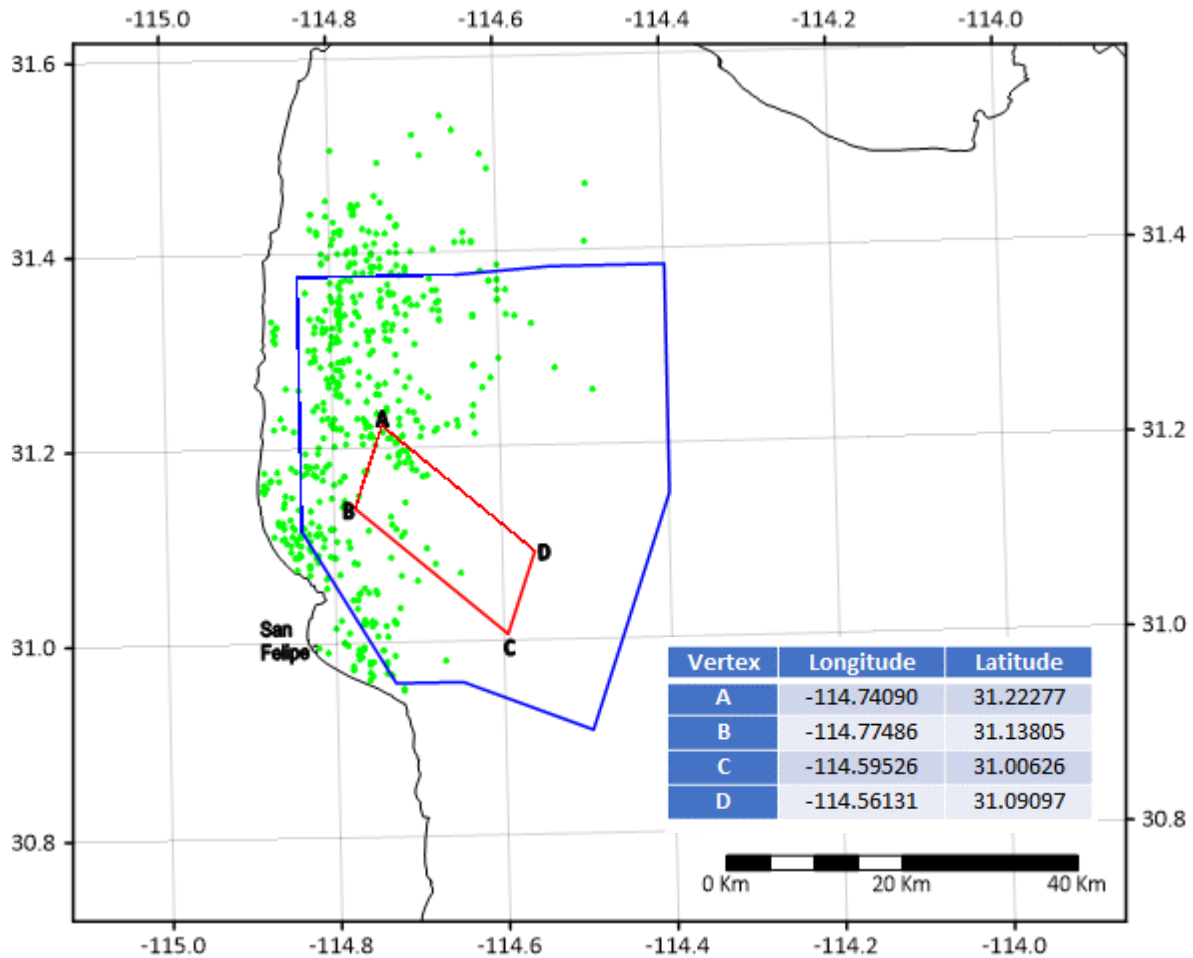


Figure 7. The blue polygon is the 2018 Vaquita Protection Refuge. The red polygon is the recommended ZERO TOLERANCE AREA where nets will be removed within hours. Green dots represent active totoaba nets removed since 2016. The boundary coordinates for the Zero Tolerance Area are shown.

3. 7 Historical perspective on illegal fishing in the Upper Gulf of California

Although illegality escalated with the resumption of the lucrative totoaba market in the early 2010s, illegal fisheries have been a serious challenge to vaquita conservation since CIRVA's inception (1997). An early finding of the committee was that the amount of shrimp gillnet deployed by individual pangas was routinely ten times longer than allowed. Fishermen have complained for many years about unmarked pangas fishing illegally in the Upper Gulf. In 2011 fishermen advised the Presidential Commission on Vaquitas that even though all pangas were supposed to be registered under a unique number, they routinely observed multiple pangas displaying the same number. Some fishermen have pleaded for enforcement of the laws, but the complete lack of consequences for illegal behavior has made the resumption of totoaba fishing an easy choice for many others. The resurgence of the totoaba fishery began prior to the previous

presidential administration. According to the Environmental Investigation Agency¹, the Chinese market for totoaba *buches* (swim bladders) was already flooded by 2012 and the catastrophic decline in vaquita numbers was reported by CIRVA in 2014 – prior to announcement of the Presidential four-part plan in 2015. The lack of enforcement of fishery regulations and other laws intended to protect wildlife is systemic, long-standing, and deeply entrenched. Changing this situation will require political courage and leadership, as well as strong public support. CIRVA reiterates its recommendation from its 9th meeting (April 25-26, 2017) that the Mexican Government use the information provided by the gear removal efforts, the past and ongoing recovery of vaquita carcasses, and Sea Shepherd Conservation Society’s observations of illegal fishing to launch – with the utmost urgency – intelligence-led enforcement operations to dismantle illegal fishing operations as well as the organized criminal syndicates driving the international illegal trade in totoaba.

4. Update on Alternative Gear Development and Deployment

In its last report (CIRVA-10), CIRVA acknowledged and applauded the efforts of the Expert Committee on Fishing Technology (ECOFT) and **endorsed** that ECOFT’s recommendations concerning, among other things:

1. a transparent, multi-year workplan;
2. the need for INAPESCA to consult and inform ECOFT before conducting new field tests or proposing the approval of new gear;
3. the use of Electronic Monitoring Systems (EMSs) with video in all gear-testing and fishing operations in the Upper Gulf of California (UGC); and
4. the issuance by CONAPESCA of fishing permits for use of small trawls by commercial vessels equipped with EMSs.

In addition, CIRVA recommended that Mexico prohibit the use of monofilament or multi-monofilament nylon line in the construction of alternative gear, including purse seines and suriperas.

CIRVA-11 **reiterates** its strong support for these recommendations.

At this meeting, Chris Glass again briefed CIRVA on key activities of ECOFT since the CIRVA-10 meeting. Emilia Marin (WWF-Mexico) also gave an update on gear trials.

4.1 Joint Working Group (JWG) meeting

On May 8, 2018 some members of ECOFT and CIRVA met in Ensenada, MX, to develop guidelines for establishing vaquita-safe fisheries in the UGC, which are badly needed by the local fishing

¹ <https://eia-international.org/report/collateral-damage/>

communities. The most critical features identified by the ECOFT-CIRVA Joint Working Group (JWG) are as follows:

1. The possession, manufacture, and sale of gillnets (any nets that are capable of entangling non-target animals) or their net components must be outlawed.
2. Any gear that is deployed must pose no risk to vaquitas.
3. All experimental trials must be conducted by manageable numbers of appropriately trained fishermen.
4. Permits must be granted by CONAPESCA in a timely manner.
5. Poaching and illegal fishing must be eliminated.
6. The transition period for phasing out the compensation program (for not fishing) should be as short as possible.

New gear options for starting the transition to gillnet-free fisheries in the UGC are available, and there is no technical reason for this transition not to proceed.

The JWG reached the following conclusions regarding alternative gear, on the assumption that all pangas in the UGC have a VMS aboard:

1. Gears that are available and ready to use –
 - a. Small trawl (50ft and 35ft)
 - b. Pot (baited for finfish)
 - c. Longline
 - d. Handline
 - e. Trolling
2. Gears that are available but that require additional field testing –
 - a. Suripera
 - b. Purse seine
 - c. Danish Seine
3. Other gears that may be effective but have yet to be tested –
 - a. Unbaited trap for octopus
 - b. Beach seine
 - c. Small trawl for finfish
 - d. Beam trawl

Other feasible alternatives for the fishing sector that could be implemented immediately include the use of pots for crabs and snails and the use of diving techniques to obtain conch species.

The JWG report (which was provided as a background document for CIRVA-11) includes timelines, tasks, and responsible parties for developing and implementing the transition to non-gillnet fisheries.

4.2 Research on alternative fishing strategies and the results of experimental trials

Experimental trials took place between July 23-25, 2018 at the flume tank facility, Center for Sustainable Aquatic Resources, Marine and Fisheries Institute, Memorial University, St. John's, Newfoundland, Canada. Three sets of trials were conducted in response to the request to develop alternative fishing gears for the UGC. Two of these trials (35ft small trawl and suripera) were a continuation of research previously conducted in the flume tank by ECOFT. The third set of trials, which involved gillnet configurations proposed by fishermen and fishing federations in the UGC, was conducted at the request of the then Mexican Environment Secretary, Rafael Pacchiano.

Monofilament Gillnets:

All of the monofilament gillnets provided by the fishermen's federations and tested in the flume tank would entangle and kill vaquitas and other large marine animals. After assessing the research conducted on these nets, and having undertaken, in good faith, appropriate research to address the ideas and questions raised by the fishermen, ECOFT stressed that it does not approve any of the gillnets that were tested for use in the UGC.

35ft Shrimp Trawl:

Additional trials were conducted with an enhanced version of the 35ft trawl that removes the need for trawl doors by using a beam to hold the net open. This enhanced trawl reduces drag, is therefore more fuel efficient, requires a single towing rope, and, therefore, is easier to operate than the 50ft trawl. ECOFT strongly recommended that the 35ft net be deployed on a trial basis during the autumn 2018 shrimp fishing season and that basic training in its use be conducted as a matter of urgency.

Suripera:

These and previous tank tests identified simple modifications that would make the net suited to use in the UGC and these can begin immediately. ECOFT recommended that lightweight PE twine be used in place of monofilament nylon and that minor modifications be made to the edges of the net to remove loose panels. The length of the front skirt should be extended with regard to the rear skirt to ensure the rear skirt is held at a minimum of 2m above the seabed. ECOFT recommended use of the suripera as a viable, fuel-efficient fishing method in the UGC. Basic training in its use should begin as a matter of urgency.

4.3 Gear trials

After delays caused by the recent attacks on net-removal teams and vessels (see above) and the need for INAPESCA to complete the above-mentioned modifications to the suripera, the long-planned gear trials were expected to finally get underway in mid-February 2019. Three pangas were available for these trials.

4.4. CIRVA conclusions and recommendations

CIRVA notes that alternative gear development is one of the most important means of developing sustainable fisheries (which includes consideration of effects on other non-target organisms) in the Upper Gulf region. CIRVA thanked Glass and Marin for the information and expressed appreciation for their work and that of others involved. It was noted that at least some local fishermen have attempted to discredit the validity of the flume tank testing of the gillnet samples they provided, arguing that the only way to test effectiveness and determine whether these nets do or do not represent a threat to vaquitas is to conduct field trials in the UGC.

CIRVA **encourages** Glass, as chair of ECOFT, to continue his efforts to communicate regularly with relevant agencies in the new administration (e.g. INAPESCA and SEMARNAT) and **recommends** that those agencies review, support, and follow ECOFT's recommendations.

CIRVA accepts the findings of ECOFT and **repeats its earlier recommendations** that:

1. Mexico prohibit the use of monofilament or multi-monofilament nylon line in the construction of alternative gear, including purse seines and suriperas and
2. Take to heart and implement the findings, advice, and recommendations of ECOFT expeditiously.

In addition, CIRVA **encourages** WWF, in consultation with ECOFT, to continue working with INAPESCA and willing fishermen to use gear and practices that have been shown to be vaquita-safe, widely available, and affordable to communities in the UGC.

CIRVA **notes** that the trials now underway provide an opportunity to help fishing communities become familiar with and accept alternative fishing methods as well as to collect data on the economics of using different gear types.

5. Status of Emergency Petition and Court Actions Related to the Vaquita and Agreements between the USA and the Government of Mexico

CIRVA received an overview provided by Young on actions that have been taken by the environmental community in U.S. courts and on agreements between the governments of Mexico and the United States. Those actions and agreements are summarized here.

On May 18, 2017 Natural Resources Defense Council (NRDC), Center for Biological Diversity (CBD), and Animal Welfare Institute (AWI) petitioned the U.S. Secretaries of Homeland Security, the Treasury, and Commerce ("Plaintiffs") to "ban the importation of commercial fish or products from fish" sourced using fishing activities that "result in the incidental mortality or incidental serious injury" of vaquitas "in excess of United States standards." The petitioners requested that the secretaries immediately ban imports of all fish and fish products from Mexico that do not satisfy the MMPA seafood import provisions, claiming that emergency action banning such imports is necessary to avoid immediate, ongoing, and "unacceptable risks" to the vaquita.

On December 21, 2017 the petitioners filed suit in the U.S. District Court for the District of Columbia, which among other things challenges the failure of NMFS, the U.S. Department of Commerce, the U.S. Department of the Treasury, and the U.S. Department of Homeland Security (“Defendants”) to respond to the petition without unreasonable delay pursuant to the Administrative Procedure Act (“APA”) 5 U.S.C. §§ 551-559; 701-706. On March 21, 2018, the petitioners filed suit before the U.S. Court of International Trade (CIT) seeking an injunction requiring the Government to ban the importation of fish or fish products from any Mexican commercial fishery that uses gillnets within the vaquita’s range. On April 16, 2018, Petitioners filed a motion for a preliminary injunction at the CIT, and the U.S. Government responded with a motion to dismiss. The CIT held oral arguments on the preliminary injunction on July 10, 2018.

On July 26, 2018, the CIT denied the Government’s motion to dismiss the case brought by NRDC, CBD, and AWI and granted the Plaintiffs’ request for a preliminary injunction requiring the U.S. Government, pending final adjudication of the merits, to ban the importation of all fish and fish products from Mexican commercial fisheries that use gillnets within the vaquita’s range. The United States accordingly implemented an embargo on curvina, sierra, chano, and shrimp caught with gillnets within the vaquita’s range.

5.1 Consultation and commitment by the Government of Mexico to enhance vaquita conservation

In response to the emergency petition, the USA and the Government of Mexico (GOM) engaged in consultations throughout 2017 and 2018 to evaluate the GOM’s regulatory program and enforcement actions and to identify additional actions that the GOM could take to enhance vaquita conservation and enforcement.

On November 9, 2018 the GOM transmitted to the USA (NMFS) a “*Plan for the Comprehensive Care of the Upper Gulf of California and the Comprehensive Program for the Protection and Recovery of the Vaquita*” (hereafter “the Plan”) that describes regulatory actions and commitments to strengthen enforcement, promote transparency, and facilitate trilateral cooperation among the governments of Mexico, the USA and China, especially as it pertains to the trafficking of totoaba swim bladders. The Plan represents the revised regulatory program intended to govern the incidental mortality of vaquitas in UGC export fisheries. The GOM also requested a comparability finding for the following “vaquita-safe” fisheries: Upper Gulf of California shrimp trawl fishery, for both small and large vessels; Upper Gulf of California shrimp suripera fishery; Upper Gulf of California sierra purse seine fishery; Upper Gulf of California sierra hook and line fishery; Upper Gulf of California chano trawl fishery, for small vessels; Upper Gulf of California curvina purse seine fishery; Upper Gulf of California sardine/curvina purse seine fishery, for both small and large vessels; El Golfo de Santa Clara curvina rodeo-style gillnet fishery.

5.2 Summary of the Plan

Young provided the following as a summary of the Plan. The Plan establishes that the GOM will no longer authorize gillnet fisheries (except the fishery for curvina using rodeo-style gillnet gear)

in the Upper Gulf of California, in accordance with the permanent ban on passive gillnet fishing within the restricted area contained in the Regulatory Agreement of June 30, 2017. Therefore, with the exception of the El Golfo de Santa Clara curvina rodeo-style gillnet fishery, the GOM will permanently ban all gillnet fishing in the UGC and eliminate the exemption to the gillnet ban for sierra (gillnets are no longer authorized for use in the sierra fishery).

The GOM will move to a system where fishermen can only fish with fishing gear that is specifically authorized. The GOM will not authorize passive gillnets and will only authorize specific vaquita-safe gear types for use in fisheries operating in the UGC. Specifically, for shrimp, chano, and sierra the GOM will only authorize small-scale trawl, suripera, purse seine, and hook and line gear, none of which have any documented bycatch of vaquita. The GOM intends to revise this regulatory agreement following the 2019 curvina fishing season and the successful testing and approval of an alternative gear to rodeo-style gillnet gear. The GOM would then extend the permanent gillnet ban to all monofilament and multifilament nylon gillnets/entangling nets or modifications thereof regardless of their mode of operation (e.g. passive or active), thereby eliminating all exemptions.

Additionally, the GOM will significantly strengthen its regulatory and enforcement regime by: prohibiting night-time transit of fishing vessels; banning the possession, sale, or manufacture of mono- or multi-filament nylon gillnets of mesh size greater than 5.75 inches throughout the UGC (e.g the size of all illegal totoaba gillnets); banning the possession, sale, or manufacture of mono- or multi-filament nylon gillnets of all mesh sizes in El Golfo de Santa Clara (while allowing small gillnets used south of San Felipe outside vaquita habitat); reducing the number of landing and departure sites in El Golfo de Santa Clara; requiring the marking of fishing gear to identify owner and area of operation; requiring that all authorized gillnet gear used outside the restricted area be registered with local fisheries authorities; and requiring the surrender to fisheries authorities of all unauthorized gear.

To strengthen its fisheries and illegal wildlife trafficking enforcement and to improve the transparency of its enforcement efforts, the GOM will:

- Implement camera surveillance north and south of San Felipe;
- Amend Federal criminal procedures to include individuals engaging in totoaba trafficking under the penalties in the Federal Penal Code;
- Achieve real-time reporting and enforcement of vessel monitoring system information;
- Provide monthly reports to NMFS and CIRVA on enforcement efforts;
- Provide quarterly notifications to the U.S. Department of Justice Environmental Crimes Section; and
- Improve international collaboration on enforcement and interdiction by convening an enforcement contact group, which included representation from CIRVA.

In the Plan, the GOM committed to providing full implementation of vaquita-safe fishing gear in UGC fisheries. The Plan includes: an alternative gear research plan; a commitment to

develop an implementation plan for this alternative gear research plan in consultation with the ECOFT; and a commitment to develop a plan for the transparent review of data and information on alternative gear development and testing.

These regulatory improvements directly respond to, and will implement, recommendations made by CIRVA and NMFS.

5.3 Status of the Plan with the new administration

The USA and the GOM are continuing their consultations. However, the new administration in Mexico has not clearly committed to implement the Plan fully and, to date, has missed key deadlines.

5.4 CIRVA Recommendations

CIRVA **welcomes** the “Plan for the Comprehensive Care of the Upper Gulf of California and the Comprehensive Program for the Protection and Recovery of the Vaquita.” Recognizing that the commitments embodied in the Plan were made by the previous administration, CIRVA strongly **urges** the present Government of Mexico to implement, fully and expeditiously, the commitments made in the Plan. CIRVA **stands ready** to assist the Government of Mexico in the roles identified for CIRVA in the Plan including:

- reviewing monthly reports of enforcement efforts;
- participating in an enforcement contact group; and
- providing advice on implementation of the plan for alternative gear.

6. Socio-economics and markets

Since its inception, CIRVA has considered the need to preserve the fishing economies of local communities as a key element of its advice on conserving the vaquita. Mesnick provided updates on multi-institutional efforts to apply market-based approaches to vaquita conservation and on recommendations of an expert panel of economists initially convened in a special session at the North American Association of Fisheries Economists conference in April 2017. The efforts focus on tools to incentivize the transition to gillnet-free fisheries and on opportunities for alternative livelihoods.

Members of the expert panel met in January 2019 to refine advice for short- and long-term actions (initially reported at CIRVA-9, see section 3.2 and Appendix 5 of the CIRVA-9 report). In the short term, effective enforcement remains critical. The continued presence of illegal fishing undermines efforts to incentivize the transition to new gears and hampers development of legal fisheries. In the long term, the lack of formal and informal institutions

that would provide a structure of incentives, viable legal alternatives, and the necessary compliance hinders efforts to protect vaquitas and support legal fisheries. Such institutions are essential for combating the lucrative illegal trade in totoaba swim bladders, which enforcement alone cannot abate.

6.1 Lack of availability of products

Efforts to engage markets continue to be hampered by a lack of seafood product captured without gillnets, including failure of government programs to further the development, testing, and permitting of new gears (see above). A multiple-year study of retail seafood markets in San Diego by Oriana Poindexter *et al.* provided data on retail prices showing that traceable, certified shrimp products from Mexico can garner a price-premium. The economic case for substituting gillnets with alternative gears was analyzed by WWF, recognizing heterogeneity in fishing trips. The study found that small-trawl gear for shrimp could be a viable option for a limited number of fishermen, yet the data were insufficient for a thorough cost-earnings analysis. Market strategies, technological improvements (reduction of fuel costs), training (increase in skills of fishermen), and regulatory changes are all part of the discussion on how to increase the number of fishermen who are achieving profitable catches with the new gear.

6.2 Supply chain meeting

On June 18, 2018, Ocean Garden Products in San Diego hosted a supply chain meeting, organized by SEMARNAT and some CIRVA members. Participants included major US shrimp importers, San Felipe fishing cooperatives, Pesca ABC, SEMARNAT, CONAPESCA, NGOs (WWF, NRDC), Scripps Institution of Oceanography, and SWFSC. Discussion focused on the challenges of a volatile U.S. shrimp market with increasing competition from aquaculture and low-cost imports and of substituting gillnets for alternative gears. The following actions were identified as necessary by United States buyers: (a) establish fishing methods and gear to be used in capturing wild Mexican shrimp in the Upper Gulf of California; (b) provide panga fishermen with gear and tracking devices; (c) develop a processing model – and control documents – to ensure full traceability of all production; (d) create a branded, commercially viable product to be sold in the United States retail market; and (e) communicate the value and “sustainability” message to customers and consumers via a marketing campaign.

6.3 Meetings of the Committee for Economic and Community Development of the Upper Gulf of California (CEDO) on development of alternative livelihoods

The development of alternative livelihoods shows little progress. A second meeting of CEDO was held on April 23-24, 2018 as part of the MOU between the Mexican government and the Carlos Slim and Leonardo di Caprio foundations. Proposals for new businesses and social development projects were presented by members of local communities but these remain unfunded. Private funders appear disillusioned with the region and the status of the MOU is unclear. CIRVA reiterated the importance of providing alternatives for fishers and discussed expanding participation among women in future efforts to develop alternative livelihoods.

6.4 Reports of “laundering” of gillnet-caught shrimp

CIRVA received a report from the Sustainable Fisheries Partnership (SFP) that illegal gillnet-caught shrimp was being “laundered” (mixed with catch from bottom trawlers) and exported

to the United States as legal trawl-caught product. Evidence of illegal shrimp gillnetting is also abundant on social networking sites in the Upper Gulf of California. This issue has led SFP to draft new procurement advice for all seafood from the Upper Gulf of California and to engage importers of Mexican shrimp to commit to implementing control documents throughout their supply chains, including processing plants, to discourage illegal fishing. Mexico and the United States, and the shrimp supply chain on both sides of the border, must work cooperatively to eliminate illegal fishing and the importation of illegally-sourced product into the US.

6.5 Recommendations

CIRVA **reiterates its previous recommendation** that every effort be made to strengthen direct linkages between the fishermen using alternative gears and the seafood buyers as a way of incentivizing the conversion of the fleet to gillnet-free operations.

CIRVA **recommends** that Mexico work with gear-testing partners to conduct rigorous cost-benefit analyses on the new gears and to test markets for the vaquita-safe products.

CIRVA **recommends** that Mexico work with producers and buyers to develop and implement a comprehensive chain of custody and traceability system for vaquita-safe products from the Upper Gulf of California. It is critical that this system be in place before legal shrimp fishing resumes in September 2019 and that information is accessible to producers, buyers, and consumers.

7. Post-Vaquita CPR (VCPR) efforts

7.1. Lessons Learned from “Ex-situ Conservation Options” Workshop

Taylor summarized the “*Ex Situ* Options for Cetacean Conservation” workshop held in December 2018 in Nuremberg, Germany. This workshop was intended to draw lessons learned from experience with the vaquita and baiji and inform discussions regarding *ex situ* options with other threatened small cetaceans. The primary lessons learned from VCPR that should be applicable to other small cetaceans were as follows:

- Catastrophic declines can occur with threatened populations
- To be prepared for such crisis situations, gaps in the information needed to make decisions about whether, when, and how to implement *ex situ* options must be identified and filled
- Filling those gaps will take considerable time
- *Ex situ* options should be pursued when there are still at least hundreds instead of only tens of animals in the wild population.

Many of the information gaps need to be filled for effective conservation action, whether it is *in situ* or *ex situ*. For example, it is essential to learn as much as possible about the distribution of both the animals and the threats they face, animal movements (and hence exposure to threats), basic population demography, and biology, including diet. Other information gaps may be

specifically related to translocating or taking animals into captivity (for example, determining a species' vulnerability to capture myopathy and to mitigate this risk factor). For several species, the workshop assigned a high priority to filling gaps in taxonomy. For example, cases have been made for recognizing three species or subspecies of Amazon river dolphins (*Inia geoffrensis*) and two species of South Asian river dolphins (*Platanista gangetica*). Dealing with the taxonomy of the Irrawaddy dolphin (*Orcaella brevirostris*), of which several subpopulations are red-listed as Critically Endangered, is also a challenge.

Workshop participants included species specialists for seven representative species as well as veterinarians, and animal husbandry experts. The workshop concluded that the One Plan Approach developed by the IUCN Species Survival Commission's Conservation Planning Specialist Group, which attempts to integrate in situ and ex situ options to minimize extinction risk, is a good model for all species. Although none of the seven species considered at the workshop was judged to be in immediate need of *ex situ* actions similar to those taken with the vaquita, it was agreed that preparatory work to fill information gaps was an urgent need for all of the species so that a One Plan Approach could be pursued to allow timely, well-informed decision-making. The workshop also pointed out that semi-natural situations, similar to the ox-bow lakes used to establish and maintain insurance populations of Yangtze finless porpoises in China, could be available for many of the species and such options should be actively explored.

The vaquita example provides motivation to change fundamentally how we view the conservation of the seven species of small cetaceans considered at the workshop. Nearly all of them are red-listed as threatened because of declining abundance due to unsustainable mortality in gillnets. The absence of good examples of small-scale fisheries transitioning from gillnets to cetacean-safe gear makes it clear that more conservation options will be needed to prevent future cetacean extinctions. The report of the workshop will likely be published as an IUCN document within the next year.

7.2 Vaquita Tissue Culture and Genomic Sequencing

Phillip Morin, Marine Mammal Genetics Group, SFWSC, presented an update on culturing vaquita cells acquired from animals during VCPR. This work is being carried out in collaboration with Marlys Houck, Curator of the Frozen Zoo, San Diego Zoo Institute for Conservation Research.

The Biodiversity Banking Team successfully cultured vaquita cells from both vaquitas captured during VCPR and were able to freeze 136 vials of viable cells (Table 2). The cells have been karyotyped, and samples were sent to the Vertebrate Genome Lab at Rockefeller University in August 2018 for genome sequencing.

The Reference genome has been sequenced as part of the Vertebrate Genome Project (VGP) (funded by NMFS), surpassing all the quality criteria set for VGP genomes. Genome scaffolding (ordering of completed sequences into chromosomes) is in progress and will be followed by annotation of genes later this year. Publication of the genome and some comparative analysis is planned for mid-year. Additional partial genome sequences (funded by The Marine Mammal Center) from 21 vaquita samples held in the SFWSC MMASTR collection have been generated and will be assembled based on the reference genome for further demography, diversity, and conservation genomics analyses.

Table 2. Frozen Vaquita Tissue Cultures

ID	KB	Sampling Site	Number of Freezes	Number of Vials	Number of Tissue pieces	Samples given to Molecular Genetics
V01F	21961	Skin	2	20		Small piece of skin
V02F	21983	Mesovarium	9	68	3	Liver
		Kidney	3	24		
		Trachea	2	14		
		Liver				
		Skin	1	10		

7.3 Disposition of VCPR assets

Smith explained that VCPR assets specific to the land-based facility for vaquitas were donated to the Museo de la Ballena y Ciencias del Mar to open the first facility for housing stranded marine animals in Baja, Mexico, the “Centro de Rescate de Mamíferos y Tortugas Marinas”, jointly with the Universidad Autónoma de Baja California Sur (Autonomous University of Southern Baja California). VCPR San Felipe Site Manager Ricky Rebolledo and Logistics Manager Kerry Coughlin inventoried all equipment, labeled all parts for ease of rebuilding, hired locals for all stages of break-down, and transported equipment from San Felipe to La Paz, BCS, by truck. The Centro de Rescate site was prepared and built up during the fall of 2018 and is now operational and accepting stranded marine animals in need of rehabilitation. The center has hired Rebolledo to be the facility manager and stranding coordinator. Rebolledo is training local partners and volunteers on marine mammal stranding response protocols and is engaged in education and outreach efforts throughout the region. The first patients were three sea turtles and a Guadalupe fur seal. Rebolledo remains on call for San Felipe in case of a vaquita entanglement or stranding, and some emergency response and necropsy equipment have been staged at Campo Uno.

7.4 VCPR Second Phase

A second phase of VCPR is being launched, separate and distinct from the previous rescue mission. This second phase will continue those activities being conducted before and/or during VCPR that are critical to vaquita conservation. Specifically, VCPR aims to raise funds and awareness for net pulling operations in Vaquita Refuge, or the area that CIRVA recommends, to remove illegal and ghost fishing gear. Funds to support the efforts of Museo de la Ballena and Ciencias del Mar in net pulling, as well as to support the fishing communities by employing fishers to participate in activities that are central to the health of the Upper Gulf ecosystem.

The second phase will also raise funds and awareness for ongoing acoustic detection efforts that direct authorities to key protection areas for proper enforcement efforts and monitor vaquita status. These acoustic detection efforts also employ fishers to participate in this key effort.

Finally, given the success and potential to promote vaquita conservation, it is of utmost importance to support the photo ID efforts as a way to monitor vaquita population and support the tissue culture efforts by attempting to obtain fresh vaquita biopsies, as recommended by CIRVA during this meeting.

7.5 Impact campaign

Smith presented the impact campaign centered around the recently released documentary *Sea of Shadows*. This film has already increased awareness of the vaquita's plight in the global conservation consciousness. The film has been purchased by National Geographic and is expected to reach a wide audience. Ru Mahoney, impact producer, developed an impact campaign with support and assistance from members of Malaikai Pictures, Terra Mater, Jackson Hole WILD, NMMF, CONABIO, Elephant Action League, and Sea Shepherd Conservation Society. The impact campaign is built on research-based strategies to build coalitions, empower communities, and engage with public audiences. Such campaigns serve to increase the capacity of stakeholders, insuring that when the campaign team moves to another project, the campaign achievements are carried further by the stakeholders.

From the perspective of VCPR, the primary goal of the impact campaign is to leverage the international attention that the documentary film is receiving to build global support for vaquita conservation actions. We hope to take full advantage of this unique opportunity by linking VCPR to the *Sea of Shadows* film on the VCPR's active website and by encouraging fundraising for the second phase of VCPR.

8. Mexico's Application to Register to Captive-breed Totoaba for Commercial Purposes under CITES

On May 30, 2018 the Secretariat of the Convention on Endangered Species of Wild Fauna and Flora (CITES) issued Notification 2018/054 to inform CITES Parties of the request from Mexico for the Secretariat to include "Earth Ocean Farms" in the *Register of Operations that Breed Appendix-I Animal Species in Captivity for Commercial Purposes* (Register) for the purposes of breeding totoaba (*Totoaba macdonaldi*) for international commercial trade.

Under Article VII, paragraph 4 of the Convention, specimens of Appendix-I animal species bred in captivity for commercial purposes shall be deemed to be specimens of species included in Appendix II. In accordance with Resolution Conf. 12.10 (Rev. CoP15), the exemption of Article VII, paragraph 4 of the Convention is implemented through the registration by the Secretariat of operations that breed specimens of Appendix-I species in captivity for commercial purposes.

The CITES Notification referenced above stated that "Earth Ocean Farms" would be included in the Secretariat's Register 90 days after the date of the Notification (August 28, 2018) unless the Secretariat received an objection from a Party that is fully documented and includes the supporting evidence that has given rise to concerns. Prior to the deadline, the Secretariat received objections from Israel and the United States of America about the proposed registration.

8.1 Concerns with the proposal

The overarching concern outlined by the United States is that allowing a mechanism for the legal trade of captive-bred specimens of totoaba, while there is an ongoing, uncontrolled illegal harvest and trade of totoaba, will undermine the survival of the species in the wild. This situation is unique because the illegal harvest and trade of totoaba has severe impacts not only the totoaba, but also on the vaquita, another Appendix-1 listed species, which is at grave risk of

extinction due to entanglement in illegal totoaba gillnets. The United States also expressed concern that commercial trade in captive-bred totoaba would perpetuate the demand for totoaba swim bladders and increase incentives for illegal harvest and trade of wild-caught fish to meet the demand for the largest, most valuable bladders that come from fish that are 10-15 years old. Also, a legal trade could provide a means for laundering illegally caught wild totoaba swim bladders. The United States indicated its belief that the registration of this breeding operation would undermine efforts to conserve both the totoaba and the vaquita.

8.2 CITES Process Forward

In accordance with Resolution Conf. 12.10 (Rev. CoP15), Annex 2, paragraph 3, the CITES Secretariat referred the relevant documentation related to the registration of “Earth Ocean Farms” to the CITES Animals Committee and invited it to comment on the objections within 60 days. After consultations between Mexico and the Parties raising objections, the issue will likely be referred to the CITES Standing Committee at its 71st meeting (Colombo, Sri Lanka, May 23, 2019).

In this regard, CIRVA **advises** that it remains seriously concerned about the lack of control over the illegal fishing for totoaba and the illicit trade of totoaba swim bladders given the significant threat these activities pose to the vaquita.

In the absence of sufficient controls on the illegal harvest and trafficking of totoaba, CIRVA **also advises** that it is particularly concerned that the development of a legal trade in captive-bred totoaba will undermine the efforts that have been made toward the conservation of vaquitas by providing a means to launder the swim bladders of illegally caught wild totoaba.

9. Acknowledgements and Adoption of report

In closing the meeting, the Chair thanked all the participants for their hard work and for maintaining hope despite the huge challenges remaining. The dedication of so many people was truly inspiring.

CIRVA thanked WWF-Mexico for its constant support to bring these meetings to life. Also to Lisa Balance and Barb Taylor for hosting the meeting at the Southwest Fisheries Science Center/NOAA Fisheries and to Brittany Hancock-Hanser and Annette Henry for their support during the meeting.

The report was adopted by correspondence on 6 March 2019.

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ANNEX B: AGENDA

TUESDAY, 19

1. Welcome

- Introduction of participants
- Confirm chair and rapporteurs
- Review and adopt the Agenda
- Documents available

2. Acoustic monitoring program and other science efforts

- 2017 – 2018 results update (Jaramillo-Legorreta and Cárdenas-Hinojos)
- Biopsy and photo ID September survey (Taylor and Rojas-Bracho)
- Discussion and recommendations

3. Review of CIRVA 10 recommendations

4. Review of Developments in the Upper Gulf (Fishing activity, enforcement, and net removal efforts)

- Review of the effectiveness of the enhanced enforcement zone during 2018 – February 2019 (period of illegal totoaba fishing. Shrimp and finfish seasons)
- December 2017- February 2019: Net Removal efforts and attacks to Sea Shepherd and Museo de la Ballena (Locky-Sea Shepherd and Diego-Museo de la Ballena)
- Report of meetings with the new authorities (Lorenzo, Diego and Locky)
- Conclusions regarding these items

5. Update on alternative gear development and deployment

- Report of the joint ECOFT/CIRVA meeting and gear testing in 2018 (Chris)
- Socio-economics and market developments (Sarah, Enrique and Emilia, WWF)
- Discussion and recommendations

WEDNESDAY, 21

6. Status of US Embargo on seafood produced by Upper Gulf fisheries and Review of Agreements between the United States and Mexico to strengthen vaquita conservation and enforcement efforts. (Nina).

7. Post-Vaquita CPR efforts

- 7.1 Lessons learned Ex-situ workshop (Taylor)
- 7.2 Update on genetics work (Morin)
- 7.3 Disposition of CPR assets (Smith)
- 7.4 VCPR Second Phase (Smith)
- 7.5 Impact campaign (Smith)

Discussion and recommendations

8. Mexico's Application to Register to Captive-breed Totoaba for Commercial Purposes under CITES (Young)

9. Next steps – Discussion of new or revised recommendations

10. Any other business

THURSDAY, 22

09:00 – 13:00

11. Review of the report

13. Press release/statement

ANNEX C:

Summary: Vaquita biopsy and photo ID field efforts, September 22-29, 2018

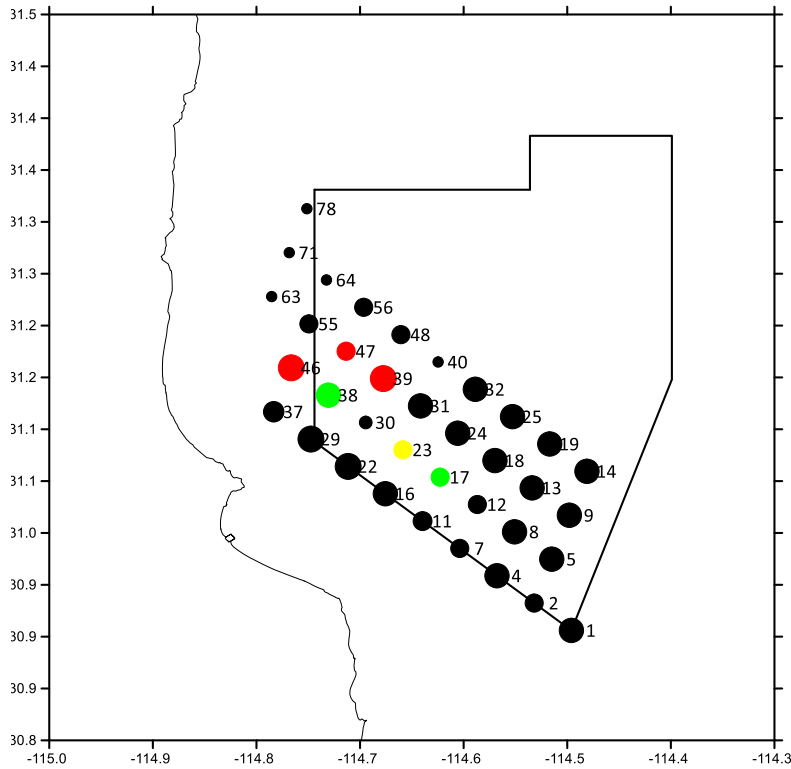
Lorenzo Rojas-Bracho¹, Armando Jaramillo Legorreta², Gustavo Cárdenas Hinojosa², Edwyna Nieto García², Diego Ruiz Sabio³, Annette Henry⁴, Barbara L. Taylor⁴.

1. Comisión Nacional de Áreas Naturales Protegidas, Ensenada, BC, México
2. Instituto Nacional de Ecología y Cambio Climático, Ensenada, BC, México
3. Museo de la Ballena y Ciencias del Mar, La Paz, BCS
4. Southwest Fisheries Science Center, NOAA, La Jolla, CA.

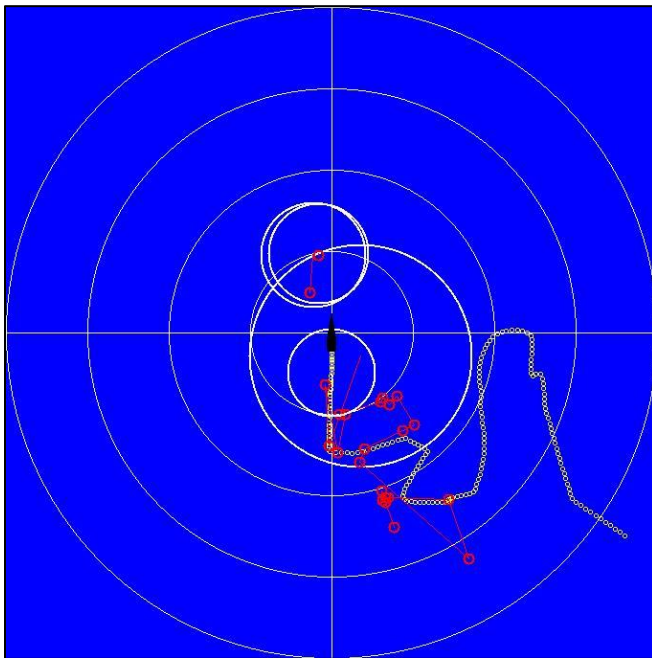
A field effort to obtain photographs and biopsies from vaquita was held between September 22 and 28, 2018. Preparations and setup were conducted on the 22nd and 23rd to prepare the ship (the Museo de la Ballena's Narval) and the small boats (3 belonging to Museo de la Ballena RHIBs and a panga belonging to a fishermen). Cell culture was supplied by the San Diego Zoo and small field coolers specially set up for field use in hot temperatures were supplied by Southwest Fisheries Science Center (SWFSC). SWFSC also loaned much of the equipment needed for the visual search (25x big eye binoculars with stands, handheld binoculars, computers and VHF radios). The visual team tracked vaquitas using a computer program specially modified for use with vaquitas (WinCruz Vaquita) that was developed for VaquitaCPR. Acoustic equipment (C-PODs) were supplied by SEMARNAT. The Narval was modified for visual operations on the flying bridge and all vessels were shaded.

The effort was timed to take advantage of the availability of several key vaquita observers and a good weather window. C-POD data were analyzed to give us the highest chance of locating vaquitas. Although the number of detections were low, the data allowed us to focus in a small area between sampling sites 12, 18, 46 and 55(see map below). Winds less than 7 knots are needed to spot vaquita. Conditions were not optimal on September 24-25 but were sufficient to allow the team to practice making a sighting, assembling the 'tracking team' on the flying bridge and quickly getting the biopsy/photo teams to the small vessels with all the needed equipment.

Vaquita sightings were made on September 26 and photos were obtained. Sighting #003 was a mother and calf that were photographed. The pair was observed surfacing within a body length of one another over 30 times. At one point the pair came close (about 20m) to the panga but they were coming directly towards the vessel and so no biopsies could be taken. The mother was photographically matched to the likely mother of V01F from 2017. This pair was tracked from 9:10 until 10:09 (59 minutes). A second pair (#004) was sighted at 10:03 and tracked until 10:26 (23 minutes). Observers thought the second pair were different and of roughly equal size to one another, which was confirmed in photos.



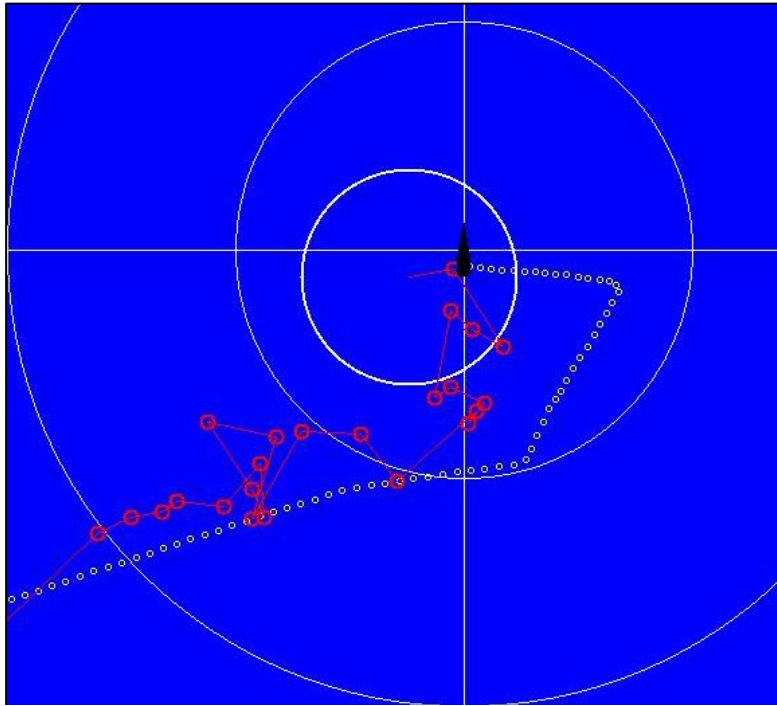
Map showing the sampling sites used to obtain acoustic monitoring data to determine the zones with presence of vaquitas few hours previous to the visual effort to locate them. Circle sizes represent sampling effort. Black circles are sites with no detections. Colored circles indicate sites with acoustic detection of vaquitas, where red is lowest and green largest detection rates.



Screen image of sighting #003. The Narval is in the center with its path indicated by yellow circles. Each concentric white circle is 1 nautical mile. The linked red squares show the path of the mother/calf pair showing the meandering and unpredictable pattern that made placement of the small boats difficult.

Vaquita sightings were also made on September 27 and both, photos and videos were obtained. Sighting #012 was a pair seen between 06:39 and 06:51. Small boats were launched but we were

unable to track or photograph this pair. Sighting #013 was also a pair where boats were launched but we were unable to track or photograph. Sizes of the individuals of both #012 and #013 were too distant to determine relative sizes. Sighting #015 was a group of 4 individuals that included a small calf and was tracked for 1 hour and 42 minutes (from 11:06 until 12:48). During this time, they got within 50m of various small boats but never within biopsy range. The four vaquitas evidently then split into two pairs (which is consistent with photographs reviewed later). One of the pairs was last sighted at 13:41 for a total tracking period of 2 hours and 35 minutes. Given the locations and timing of sighting #013 and #015 it was felt these were separate groups and that a minimum of 6 vaquitas were seen.



The track of the four vaquitas recorded from the visual team on the Narval shows the meandering path. Given the experience on the previous day, we opted for a Y formation of the 4 small vessels so that one stayed behind where we thought the vaquitas would go and could catch the animals if they reversed their path. This reversal happened and the rear boat picked up surfacing we may have missed. The Y formation seems like a good strategy.

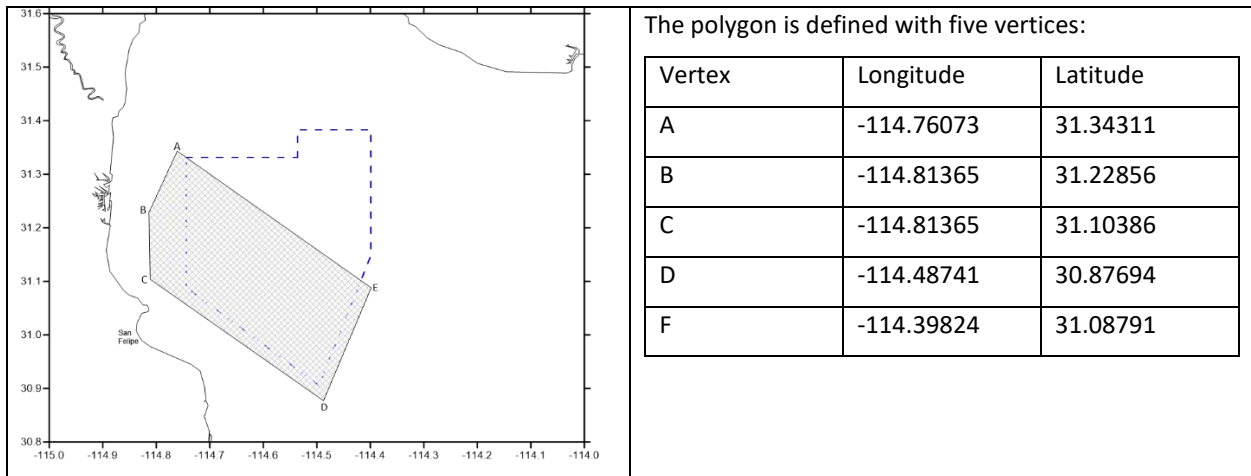
September 28th and 29th had marginal conditions for vaquita sightings and there were no further opportunities for either photographs or biopsies.

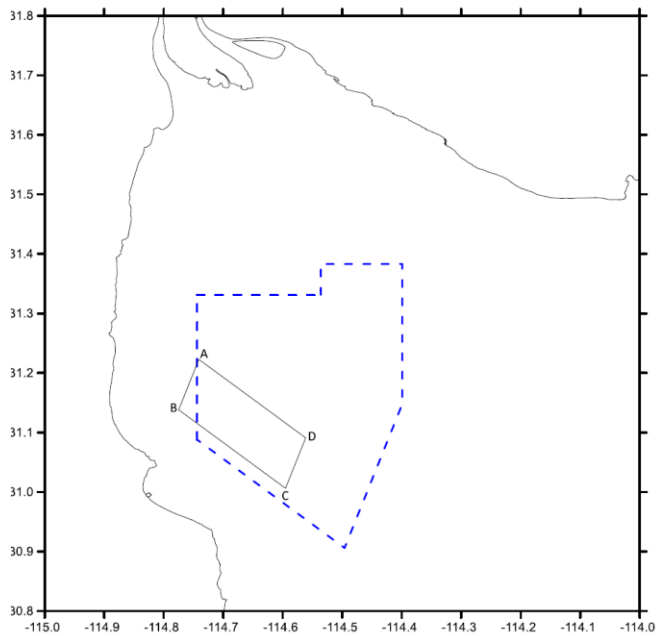
Overall, the field session was very successful. Key elements were: 1) having the acoustic 'intelligence' to tell the visual team the area to search, 2) having an experienced visual team with the full big-eye and computer set up and the specialized computer software, 3) having a small boat system that could be deployed rapidly and could follow directions from the ship. Lessons learned are that the biopsiers (who are often the best observers and photographers as well) should be equipped with cameras with 400mm lenses. If there are 2 biopsiers per boat, the procedure could be that only one do photography until the animals approach closely enough for biopsy. The number of scientists left on the Narval flying bridge (4) was a bare minimum. There were 2 observers on the big-eyes that had very long shifts (up to 7 hours). It is needed to have both, a full-time recorder and a full-time radio person to direct the vessels. It may be possible to use 3 rather than 4 small boats, but it does reduce the chances of vaquitas coming too close by

chance. The animals seemed disturbed (changed behavior to move rapidly away from vessels) on a few occasions. Each time, those on the boats saw the change and either came to a stop or slowed. The kayak was considered but not deployed as once the decision was made there were no further good opportunities. It is not clear whether the kayak could be used successfully. While the vaquitas clearly knew where the boats were and avoided being approached, they were also too fast to expect the kayak to keep up given their meandering (unpredictable) paths. There were a few occasions when the mother/calf pair were seen to be traveling down visible calm slicks. It may be possible if a kayak were being towed and such a behavior was observed to position the kayak in the slick ahead of the vaquitas.

Altogether, it is more likely that a mark/recapture estimate could be made of the number of remaining vaquitas than obtaining a biopsy. However, both efforts can be done simultaneously and there is definitely merit in showing that vaquitas not only exist but are fat and having healthy calves. If the Narval was set up with its own big-eyes, computers and software, similar efforts could be mounted very quickly to take advantage of good weather windows with a relatively small cost to pay key observers and their airfare. This assumes that the acoustic monitoring effort would continue through the totoaba season in the area of high vaquita use. Of course, the Narval would need support and to be diverted from net removal operations.

To further increase the chances of success, a polygon was designed to concentrate field activities, based on the distribution of recent acoustic detections and on the experience gained during the VaquitaCPR project. The map is shown below.





Core area of acoustic activity during the survey

Vértice	Longitud	Latitud	Longitud	Latitud
A	-114.74090	31.22277	-115° 44.454'	31° 13.366'
B	-114.77486	31.13805	-115° 46.492'	31° 08.283'
C	-114.59526	31.00626	-115° 35.716'	31° 00.375'
D	-114.56131	31.09097	-115° 33.678'	31° 05.458'

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