

FINAL REPORT

Express Meeting of the Comité Internacional para la Recuperación de la Vaquita (CIRVA)

December 16, 2015
San Francisco, California

Summary of CIRVA Recommendations

With successful implementation and enforcement of the gillnet ban, the most pressing current need is to develop and test alternative fishing gear, to ensure a future for shrimp and finfish fishing in the Upper Gulf.

- While recognizing the strong efforts of WWF-Mexico, INAPESCA, and other partners within the local communities, CIRVA **concludes** that past and current efforts to test alternative finfish gears have so far been inadequate, and **recommends** that the Government of Mexico invest more resources in these trials and elicit the involvement of international expertise in their design and implementation. A comprehensive, transparent, full-scale gear testing program for finfish must be fully supported and implemented as soon as possible to facilitate the transition to alternative finfish gear.
- CIRVA **reiterates its previous recommendation** that the gillnet ban be made *permanent* and **emphasizes**, in addition, that the current compensation program must be reframed to reward fishermen who switch to alternative gear, rather than reward them for simply not fishing. The cost of the compensation program could be reduced significantly already by the next shrimp season if fishermen are allowed to fish for shrimp with the small trawls which have been tested and are legally authorized for use in the shrimp fishery.
- Regarding the small trawl shrimp fishery, CIRVA **recommends** that:
 1. This fishery be allowed to develop as intended under NOM-002-SAG/PESC-2013;
 2. All fishermen who participate in the shrimp trawl fishery have required permits, possess the appropriate gear, and demonstrate proficiency in using that gear;
 3. All measures are in place to ensure compliance with the NOM and any additional conditions for the shrimp trawl fishery (e.g. tracking/surveillance devices on vessels, regular inspections at designated launch sites) and with the experimental protocols for field trials of alternative finfish gear;
 4. Fishermen who are fishing legally for shrimp with the small trawls, or who are participating in officially authorized field trials of alternative finfish gear (see below), are allowed to retain and sell their catch.

Noting that the development and testing of fishing gear is an ongoing process, and that experimental design and testing of finfish gear must be improved and expanded before the

fishing season begins in March, CIRVA **recommends** that the Government of Mexico focus significantly increased resources and the full commitment of all relevant agencies on a transparent, objective program of research and development of non-gillnet finfish gear, including establishing, in collaboration with the Presidential Commission and CIRVA, an international review panel to evaluate the design and implementation of this program.

1. Introduction

CIRVA members attending the Society for Marine Mammalogy Biennial Conference in San Francisco met briefly on December 16, 2015. This was a two-hour, largely informational meeting where participants received brief updates on several important issues. The following CIRVA members were in attendance: Lorenzo Rojas-Bracho (Chair), Armando Jaramillo-Legorreta, Enrique Sanjurjo, Barb Taylor, Jay Barlow, Tim Gerrodette, Bob Brownell, Jorge Urbán Ramirez, Jeff Moore, Sarah Mesnick, Frances Gulland, Peter Thomas, Nina Young, Randall Reeves and Andy Read. Read and Thomas acted as Rapporteurs.

2. 2015 Abundance Survey

Taylor briefly reviewed results of the visual sightings component of the recently completed vaquita survey. The visual survey was conducted over 64 survey days, separated into two 32-day legs, in which 28 sightings were made. The previous survey, conducted in 2008, recorded 122 sightings in 29 survey days. This corresponds to an approximately 70% decline in raw encounter rate (vaquitas sighted per km of survey effort). The distribution of the species also appears to have contracted since 2008. The 2015 survey used a new observation protocol – with two independent teams of observers – to allow estimation of $g(0)$, a distance sampling parameter that reflects availability bias.

The data obtained during this survey will be analyzed by an independent Expert Panel in March, with a final abundance estimate to be made available in May 2016. CIRVA notes the critical and integral nature of this analytical component of the survey and commends the Government of Mexico for supporting the work of this Expert Panel and the overall survey effort.

Jaramillo-Legorreta then reviewed the passive acoustic component of the survey. The sampling grid included 135 sites – sampling began on September 26 (the long-term annual passive acoustic monitoring effort for 2015 ended on that date, see below) and continued until December 12. Approximately 70 CPODs were lost during the fall survey period – and only seven of these lost units were recovered. The high rate of loss may reflect the use of surface buoys to mark the locations of the units. Some of the losses may have been caused by deliberate removal; others were likely due to interactions with commercial trawlers. Nevertheless, some vaquitas were detected acoustically in shallow waters north of the refuge in areas that had not been systematically surveyed using visual methods or during the long-term annual passive acoustic monitoring effort (2011-2015). The raw data from the passive acoustic component of the survey will be compiled in January and conveyed to the Expert Panel for analysis and integration with the visual survey results.

3. 2015 Passive Acoustic Monitoring Program

2015 was the fifth year of regular annual acoustic sampling. The sampling was very successful, with complete records obtained from most sites. All CPODs were changed twice during the field season (June to September), which improved the efficiency of the monitoring program. Analysis of the full data set (2011 to 2015) will be completed in January 2016 and a manuscript describing the results will be submitted for publication early in 2016. Initial examination of the raw counts of echolocation detections in 2015 suggests that the vaquita population continued to decline from 2014 to 2015.

There was a brief discussion of the potential value of extending the 2016 acoustic sampling effort in both time and space, to include the spring period (May) when calving occurs. It was suggested that this could be combined with a dedicated visual survey to look for mature female vaquitas and young calves. Any such proposed change in the design of the monitoring program, however, should be considered by the Expert Panel and the cost of such expansion would need to be weighed against other funding needs.

4. Enforcement

Rojas-Bracho briefly reviewed enforcement efforts made by the Navy to date. Very few pangas were observed during the recent vaquita abundance survey. The Sea Shepherd Conservation Society reported two trawlers operating inside the Vaquita Refuge at night and prosecutions resulted. CIRVA members agreed that, with the information available, the current enforcement program appears to be effective, although it would be helpful to obtain regular summaries of enforcement efforts and prosecutions.

5. Alternative Fishing Gear

Sanjurjo described recent progress on the development of alternative gear for shrimp and finfish fishing in the Upper Gulf. He stressed the importance of differentiating between the testing of alternative gear for shrimp (small trawls), which is more or less complete, and the testing of finfish gear, which is still in progress. Initial tests of finfish gear, including longlines, traps, stow nets, mid-water trawls and small demersal trawls, have been promising, but results indicate that experience of the fishermen deploying the gear is an important determinant of success or failure for any given trial. Twenty-six pangas are currently authorized to test the alternative finfish gear.

A recent letter from El Grupo de Pescadores Reconvertidos de San Felipe to the head of INAPESCA (Annex A) outlined some of the difficulties experienced during the trials conducted to date with both shrimp and finfish gear. A key impediment to successful testing of the finfish gear has been timing: the trials have taken place outside the best months for obtaining good results with finfish. Committee members further noted that the individuals selected to participate in the trials have often lacked familiarity with the gear, the trials have been poorly coordinated, resources have been inadequate, and the experimental design has been flawed. In their letter, the fishermen clearly express their commitment to finding sustainable alternatives to gillnets, their wish to see fishermen take greater responsibility in these efforts, and their concern over the continued failure to include them in the compensation program under the gillnet ban.

Annex B contains the report of a November 2015 field visit to San Felipe to observe the current gear-testing situation as well as a set of proposed CIRVA recommendations. This field report was provided to the meeting and its proposed recommendations were used as the basis for many of the CIRVA recommendations listed above. A comprehensive, transparent, full-scale gear-testing program, guided and subject to evaluation by a panel of international experts, is required; the rigor of these trials should meet the same scientific standard achieved by the vaquita population assessment program.

A prospectus for such a gear-testing program is provided in Annex C. The transition to alternative fishing gear is a critical component of the vaquita conservation strategy and it must be given immediate

attention at an appropriate scale. It is unrealistic to expect that the necessary work in this regard will be completed before the current ban on gillnets in the Upper Gulf expires.

6. Next Steps

CIRVA members agreed to meet again in person in May 2016, preferably in Mexico City, and also to meet virtually (i.e. by teleconference) before May. At its meeting in May 2016, CIRVA will (i) review the new (2015) abundance estimate and any new trend analyses, (ii) evaluate progress toward implementation of conservation measures, including the results of trials of alternative fishing gear and (iii) make recommendations to the Presidential Commission.

Annex A

Summary of letter, 6 December 2015, sent to Pablo Arenas (Chief Director of INAPESCA) by the Grupo de Pescadores Reconvertidos de San Felipe, BC (Group of Converted Fishermen of San Felipe, BC) to voice their opinion on the "Research Project Development of sustainable fishing gear in the Upper Gulf of California"

- Our group decided to participate voluntarily with 13 pangas and at the same time in the construction of the alternative fishing gear and adjusting it during the testing trials.
- We had several things making us reluctant to participate in such activity including fuel was too little to perform tests and we lacked winches needed for better operability.
- Regarding shrimp: things were bad from the beginning. The fisheries sector was badly organized and the authorities responsible for administrative and financial issues did not meet the proposed agreements themselves: for example the project never started as had been agreed, that is, as we normally fish in the UG. We had expected to be able to start fishing by Sept 27 with the expectation of obtaining good results because there would be no gillnets to obstruct our alternative gear and hence we could demonstrate the efficiency of the small trawlers and that shrimp fishing with this type of net is profitable.
- Another problem was the entrance to the UG of the industrial shrimp trawlers that make our activities more difficult.
- Besides the above, the weather presented difficulties with the presence of many cold fronts that complicated our operations. Therefore, for safety reasons we suspended the activities.
- We think that with everything that has happened the project is unlikely to produce good results. It appears that were done this way on purpose so that the project would fail.
- Regarding finfish: for us it is impossible to demonstrate positive results since in this part of the Upper Gulf the months from March to July are the best dates to get good results with finfish and not in the months that the gear is currently being tested.
- What we are seeking is a greater responsibility on the part of all those involved, fishermen and authorities alike, so that we are able to make our project work.
- We hope that we can work in the next months because we are really interested in making this work.
- Finally, another problem is that we have not been properly compensated for not fishing shrimp with gillnets.
- We request that we be included in the compensation program just as the other fishermen were compensated.

GRUPO DE PESCADORES RECONVERTIDOS DE SAN FELIPE BAJA CALIFORNIA
SAN FELIPE BAJA CALIF. A 9 DE DICIEMBRE DE 2015

DR. PABLO ARENAS FUENTES
Director del instituto nacional de la pesca.
PRESENTE.

POR MEDIO DEL PRESENTE RECIBAN UN CORDIAL SALUDO DEL GRUPO DE PESCADORES RECONVERTIDOS DE SAN FELIPE BAJA CALIFORNIA APROVECHAMOS LA PRESENTE PARA DAR NUESTRA OPINION SOBRE EL PROYECTO DE INVESTIGACION (DESARROLLO DE ARTES DE PESCA SUSTENTABLE EN EL ALTO GOLFO DE CALIFORNIA) QUE HEMOS VENIDO REALIZANDO HASTA EL DIA DE HOY .

EL SECTOR PESQUERO DE SAN FELIPE DECIDIMOS VOLUNTARIAMENTE PARTICIPAR CON TRECE EMBARCACIONES Y A LA VEZ PARTICIPAR EN LA CONSTRUCCION DE LAS ARTES DE PESCA MISMAS QUE IBAMOS A PROBAR E IRLAS AJUSTANDO A MODO QUE SE BUSCARA LA EFECTIVIDAD DE LAS MISMAS .

TENIAMOS VARIOS COSAS EN CONTRA PARA PODER REALIZAR DICHA ACTIVIDAD YA QUE EL COMBUSTIBLE ERA DEMASIADO POCO PARA REALIZAR LAS PRUEBAS EN LOS PESCADEROS TRADICIONALES TAMBIEN LA FALTA DE WINCHES HACEN FALTA PARA UNA MEJOR OPERATIVIDAD Y EFICACIA DE LOS EQUIPOS.

EL TEMA DEL CAMARON DESDE UN PRINCIPIO EMPEZAMOS MAL EL SECTOR PESQUERO MAL ORGANIZADO DESPUES LAS AUTORIDADES RESPONSABLES ENCARGADAS DE LAS CUESTIONES ADMINISTRATIVAS Y DEL FINANCIAMIENTO DE LAS NECESIDADES QUE AMERITABA ESTE PROYECTO NO ESTABAN CUMPLIENDO LOS ACUERDOS QUE ELLOS MISMOS PROPUSIERON POR EJEMPLO EL PROYECTO NUNCA SE EMPEZO COMO SE HABIA ACORDADO QUE SE PESCARIA COMO NORMALMENTE SE HACE EN ESTA PARTE DEL ALTO GOLFO QUE SALDRIAMOS VIA A LA PESCA EL DIA 27 DE SEPTIEMBRE DE 2015 Y ESTO ERA CON EL FIN DE TENER BUENOS RESULTADOS YA QUE NO TENIAMOS REDES DE ENMALLE QUE NOS OBSTRUYERA NUESTRO TRABAJO Y ASI PODER COMPROBAR LA EFICIENCIA DE LA RED DE ARRASTRE Y ASI PODER DARNOS CUENTA SI REALMENTE SE PUDIERA SUBSISTIR CON LAS CAPTURAS DE ESTA RED .

DESPUES DE ESTE PROBLEMA SE NOS VIENE OTRO LA ENTRADA DE LA FLOTA CAMARONERA MAYOR (barcos) TODAVIA HACIENDO MAS DIFICIL NUESTRA ACTIVIDAD AUNADO A ESTO SE NOS VIENE LAS CUESTIONES CLIMATICAS BASTANTES FRENTE FRIOS QUE NOS HACEN MUY IMPOSIBLES LAS OPERACIONES CON NUESTRAS EMBARCACIONES Y ES POR ESO QUE MEJOR SUSPENDEMOS LA ACTIVIDAD PARA NO PONER EN RIESGO NUESTRA INTEGRIDAD ASI COMO LA DE NUESTROS COMPAÑEROS

NOSOTROS PENSAMOS QUE CON TODO LO QUE NOS HA PASADO DIFICILMENTE EL PROYECTO ARROJE BUENOS RESULTADOS PORQUE A COMO SE VINIERON DANDO LAS COSAS ESTO SE HIZO CON EL FIN DE QUE NO FUNCIONE ACLARANDO ESE ES NUESTRO PUNTO DE VISTA

AHORA EN EL TEMA DE LA ESCAMA PARA NOSOTROS ES IMPOSIBLE DEMOSTRAR RESULTADOS POSITIVOS YA QUE EN ESTA PARTE DEL ALTO GOLFO LOS MESES DE MARZO ABRIL MAYO JUNIO y JULIO SON LAS FECHAS OPTIMAS PARA OBTENER BUENOS RESULTADOS Y NO EN LAS

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MURIA M. José Luis Alvarez Mendez

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RAFAEL MUÑOZ CARRILLO

PAULO MUÑOZ LOPEZ

SENIO/ABC

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Nemesio Ortiz
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P. P. Enrique Garcia
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Miguel Ramos Sillas

FECHAS QUE ESTAMOS HACIENDO PRUEBAS ACTUALMENTE CREEMOS QUE HACIENDO LAS COSAS EN DESTIEMPO DIFICILMENTE VEAMOS PROSPERAR ALGUN PROYECTO HASTA EL DIA DE HOY NO PODEMOS DECIR QUE SE ESTA REALIZANDO UN PROYECTO QUE DEJE SATISFECHO A NINGUNA DE LAS PARTES INVOLUCRADAS.

LO QUE VENEMOS BUSCANDO CON TODO ESTO ES UNA MAYOR RESPONSABILIDAD POR PARTE DE TODOS LOS INVOLUCRADOS TANTO COMO PESCADORES Y AUTORIDADES PARA QUE AL FINAL DE TODO ESTO PODER DECIR QUE LOGRAMOS QUE FUNCIONARA NUESTRO PROYECTO ESPEREMOS QUE LOS MESES DE ENERO, FEBRERO Y MARZO PODAMOS DARLE SEGUIMIENTO A NUESTRAS PRUEBAS DE CAMARON Y ESCAMA PORQUE LOS MAS INTERESADOS QUE ESTO FUNCIONE SOMOS NOSOTROS EL SECTOR PESQUERO.

OTRO PROBLEMA QUE TENEMOS LOS RECONVERTIDOS DE SAN FELIPE ES QUE NO SE NOS TOMO EN CUENTA EN LA COMPENSACION POR LA NO PESCA DE CAMARON PORQUE SEGUN ACUERDOS QUE TUVIERON LOS DIRECTIVOS DE LAS FEDERACIONES DE SAN FELIPE IBAMOS A PESCAR CON NUESTROS PERMISOS COMERCIALES

COSA QUE NO SUCEDIO IGNORAMOS PORQUE SE CAMBIAN LOS ACUERDOS CREEMOS QUE LAS AUTORIDADES QUE HACEN TODOS ESTOS CAMBIOS NO SE DAN CUENTA DE LA PROBLEMATICA FAMILIAR QUE ESTO NOS OCASIONA.

LOS PESCADORES RECONVERTIDOS DE SAN FELIPE ESTAMOS SOLICITANDOLE A LA AUTORIDADES QUE SE NOS INCLUYA DENTRO DEL PROGRAMA DE COMPENSACION AL IGUAL QUE EL RESTO DE NUESTROS COMPAÑEROS

TAMBIEN QUEREMOS DEJARLES BIEN CLARO QUE PONEMOS NUESTRAS EMBARCACIONES A SU DISPOSICION PARA SEGUIR APOYANDO AL INAPESCA EN LAS PRUEBAS DE LAS DIFERENTES ARTES DE PESCA

SIN MAS POR EL MOMENTO LE ENVIAMOS UN CORDIAL SALUDO QUEDAMOS ASUS ORDENES PARA CUALQUIER DUDA O ACLARACION

Victor Romero
R.R.U.




Antonio Sobreros Albarran

Rosario Romero Orz

- C.C.P RAFAEL PACCHIANO ALAMAN SECRETARIO DE SEMARNAT
- C.C.P.LIC. MARIO AGUILAR COMISIONADO CONAPESCA
- C.C.P.ING. VICTOR ARRIAGA HARO DGOPA. CONAPESCA
- C.C.P. DANIEL AGULAR SUBDIRECTOR DE TECNOLOGIAEN EL PACIFICO NORTE
- C.C.P ENRIQUE SANJURJO COORDINADOR DE DESARROLLO DEL PROGRAMA GOLFO DE CALIF.
- C.C.P LORENZO ROJAS BRACHO COORDINADOR DE INVEST.Y CONS. DE MAMI.MARINOS.INECC
- C.C.P.BARBARA TAYLOR CIENTIFICA DEL CIRVA.



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Annex B

Proposed Experimental Fishing Protocol and Implementation

Prepared by Nina Young on behalf of the site visit team from the United States (Submitted on December 7, 2015 to CIRVA members for their consideration)

INTRODUCTION

A team from the National Marine Fisheries Service (NMFS), the Marine Mammal Commission (the Commission), and the Marine Mammal Center (TMMC) recently completed a site visit in the coastal communities and on the water of the Upper Gulf of California. All three institutions have funded gear research for alternatives to gillnets with the goal of finding vaquita-safe, economically acceptable fishing methods for the coastal communities. Prior to the site visit, the team had an opportunity to review the experimental protocol for the gear research underway. In addition to concerns about this protocol, the site visit revealed multiple and serious problems in the actual implementation of the fishing gear experiments, all of which are seriously delaying the progress in finding alternative gear. Based on these conclusions, NMFS and the Commission are submitting this urgent proposal for consideration by CIRVA at its upcoming meeting in San Francisco. The proposal can be summarized as follows:

- 1) Increase the resources and commitment of all concerned agencies in Mexico in a transparent, objective, and fully implemented program of research and development of alternatives to gillnet gear, and, as was done for the survey, establish an international review panel and partner with fishing gear experts from NMFS for review, design, testing, and adoption of the alternative gear.
- 2) Allow the establishment of an experimental commercial shrimp trawl fishery for all fishing vessels which possess the experimental trawl prototype.

BACKGROUND AND SUMMARY OF EXPERIMENTAL PROTOCOL

The following section summarizes the experimental protocol as it was designed (but not always followed) prior to the experiments conducted over the past year.

In the upper Gulf of California, the commercial harvest for fish averages 4,457 tons each year (mainly *curvina* (*Cynoscion spp.*), chano (*Micropogonias megalops*), and sierra *Scomberomorus spp.*). This represents about 663 commercial fishing licenses. In the last 5 years, the fishing fleet has also produced an average of 973 tons of shrimp, mainly blue shrimp (*Litopenaeus stilyrostris*).

The main communities in this region are San Felipe in Baja California, the Gulf of Santa Clara, Puerto Peñasco in Sonora¹. These communities comprise roughly 46,000 people who live primarily on fishing.

¹ Puerto Peñasco fishermen are excluded from the closure compensation and the experiments. This was not in the protocol, but imposed by the government (Fisheries) once the experiment was launched.

The following is a summary of the originally proposed gear experiments and the experimental design provided by INAPESCA.

Objectives of the Gear Experiments

- Evaluate the performance, catch efficiency, selectivity, and economic return of various fishing technologies for fish and shrimp, including shrimp trawl net prototype RS-INP-MEX of 50,' RESCAMA trawl net, the stow net, and fixed and collapsible fish traps, where the primary objective is to avoid bycatch of totoaba, sea turtles and vaquitas.
- Determine the fishing performance of the different technologies based on set time, bait type, and depth of draw.
- Build the capacity of the participating fishermen in the construction, operation, and maintenance of the traps, as well as the trawl net and stow net.
- Evaluate the cost effectiveness of harvesting shrimp with a trawl net per for small vessels, fixed motor, and deck machinery.

Methods

The protocols propose using 26 small fishing vessels, with outboard motors of 115 hp. Thirteen vessels homeported in San Felipe and 13 from the Gulf of Santa Clara. The sample size of 26 boats was determined by the level of precision, availability of resources, and experimental logistics.² INAPESCA provides the fishing equipment, training on construction, operation and maintenance of the equipment, 100 liters of gas and oil per outing, and an onboard observer.

With support from the National Marine Fisheries Service of NOAA (Panama City, FL, USA June 10 to 26, 2015) measurements and underwater videos were taken to study the hydrodynamics of the fishing technology.

Experimental Fish Harvest:

- From April to November, 2015, the 26 boats will fish at least 5 days per month during survey periods determined by INAPESCA, during normal fishing periods, weather and water conditions permitting.
- The trawl nets harvest should include at least 3 sets per day for 1 to 3 hours.
- The stow nets are to be checked once or twice and during a change of tide.
- When using the traps fishermen can test different depths and types of bait (based on availability). Time of set should be recorded and the traps should be checked every three hours.
- Each boat will have an observer, trained by INAPESCA, who will record information.

² Additionally, fishermen with the shrimp trawls may be able to participate in a separate experiment. In fact, this was not implemented.

Experimental Shrimp Harvest:

- The 26 boats will conduct trips during normal fishing times and conditions. Each trip will include at least 3 hauls of 1 to 3 hours for 10 days each month (at least 5 of which need to be during the daytime).
- In addition to the observer, each boat will have a technical expert (selected by INAPESCA), that will help in the operation of the equipment.
- Fishermen will also use the B/I UNICAP XVI from the beginning of the harvest season to March 2016, to determine where the trawl net prototypes can best be used, identify areas vulnerable trawling, and identify any obstacles.

CONCERNS WITH EXPERIMENTAL PROTOCOL

NOAA Fisheries Office of International Affairs' and the Marine Mammal Commission's review of the protocols, observations, and discussions with some project administrators make it clear that the experiment lacks transparency and is ever-shifting. This makes it very challenging for the scientists, engineers, fishermen and other participants to conduct successful gear trials. For example, the Government of Mexico (GoM) decided, as the shrimp season began, that the early adopters of the Red Selectiva would not be allowed to freely fish commercially during the shrimp season. They were to receive compensation like the other fishermen and only a selected few of this original pioneering group would be fishing under the experimental protocol. As of early November these fishermen had not yet received compensation and their role in the experimental protocol remained uncertain. The means of selection of participants in both shrimp and finfish trials may have a bearing on the willingness of participants to comply with experimental protocols and ultimately on the objectivity of the trials and the validity of results.

There are concerns about the protocols for testing the Red Selectiva, including:

Original protocol design

- Fishermen are not allowed to retain the catch, nor gain financially from participating in the experiment. This removes incentives for the captain and crew to catch as many shrimp as possible, potentially biasing the results towards poor economic performance.
- The experimental design does not allow for evaluation, modification, and retesting of the gear to improve performance; this stems from a concern that some fishermen could cause the gear to perform poorly thereby sabotaging the experiment.
- The experimental design does not allow for the testing of less expensive shrimp trawl gear designs that are not currently specified in the Mexican regulations.

Difficulties in execution

- Because of limited budgets and the manner in which participants have been chosen, INAPESCA and WWF cannot guarantee strict adherence to the protocol including the number of technicians, observers, and vessel operators. The absence of observers and technicians may hamper detailed data collection.
- To accommodate fishermen participation, a sizeable number of vessels and fishermen of various skill levels will be used, resulting in greater variability in the experimental data.
- Fishermen seem generally unwilling to participate in the experiment and, given how they were selected there is a level of distrust in their willingness to strictly adhere to protocols;

Likewise there are concerns about the protocols for testing the finfish alternative gear including:

Original protocol design

- Given the numerous gear types to be tested, there may not be sufficient replications to ascertain the performance of the gear;
- The experimental protocol does not allow for the retention and sale of the catch, elimination or modification of poor performing gear, or greater emphasis on promising gear types

Difficulties in execution

- During the period of the normal shrimp season fishermen have focused on participating in the shrimp trawl trials, resulting in fewer sets with the finfish gear than prescribed in the experimental protocol;
- Fishermen seem generally unwilling to participate in the experiment;
- INAPESCA and WWF cannot guarantee strict adherence to the protocol including to the required number of technicians, observers, and vessel operators. The absence of observers and technicians may hamper detailed data collection; and
- Again the reliance on fishermen with various levels of experience and numerous vessels introduces variability in the experiment that may confound the results.

On November 10, 2015 representatives of the Marine Mammal Commission, The Marine Mammal Center and NOAA Fisheries Office of International Affairs observed 2 trawl hauls and 1 stow net haul under the experimental protocol. The team also visited a location where finfish trawl and pot gear are fabricated. Based on conversations with representatives from the fishing community, WWF, and INAPESCA, the U.S. delegation identified the following concerns:

- Due to several of the reasons outlined above, participation in, and progress on alternative gear experiments is far below levels needed to meet the objectives of the experimental protocol.

- To facilitate enforcement efforts, fishermen possessing the alternative shrimp trawl have been prohibited from fishing with the gear during the closure. This prohibition prevents fishermen from improving the efficiency of the trawl gear and training other fishermen in its use to socialize this gear within the shrimp fishery.
- With 18 months remaining in the gillnet ban/closure, no viable alternative finfish gear is available for broader testing, refinement, and socialization within the fishery. This is a serious concern for the conservation of vaquita and the economic sustainability of the fishing villages in the upper Gulf of California, which are, for the moment dependent upon the compensation package that accompanied the two-year gillnet ban.
- This lack of viable proven alternatives is also problematic because the Nom (reference) mandates that by 2015, the entire shrimp fishery must be converted to shrimp trawls from gillnets. Therefore, upon the reopening of the fishery, all shrimp fishermen must be permitted and fish with the alternative shrimp trawl. This transition will be very difficult if fishermen neither have the gear, nor are skilled in its use.

NOAA Fisheries IA and MMC are deeply concerned that, as currently designed and implemented, the experimental protocol may not result in sufficient controls, replicates, and performance enhancements to fully test and develop a viable alternative gear to gillnets that can be fully adopted by the commercial fleet. There is further concern over the ability (and willingness) of the GoM to issue the necessary permits and regulations to allow for adoption of such gear by the end of the two-year gillnet ban.

There would be significant benefits to judiciously suggesting modifications to the protocols underway for INAPESCA's fishing gear testing. Additionally, the active engagement of NMFS or other international gear experts could improve INAPESCA's experimental design and improve the chances for the successful development of alternative gear. While WWF Mexico appears to be trying to take steps in this direction, some constructive, higher-level intervention by the international community could be useful to ensure a more transparent, accountable, and scientifically sound experiment. Without this high-level intervention, the ability to develop alternative gear that ensures economically viable fishing will be impossible, and the pressure to return to gillnetting will only increase.

RECOMMENDATIONS

On the basis of these concerns **CIRVA should consider making the following recommendations** (in addition to the continued recommendation that the gillnet ban must be made permanent):

CIRVA recommends that in order to take full advantage of the two-year emergency gillnet ban to develop alternatives to gillnets that do not entangle vaquitas, the Government of Mexico must:

- Allow the establishment of an experimental commercial shrimp trawl fishery; and
- Focus significantly increased resources and the full commitment of all concerned agencies on a transparent, objective, and fully implemented program of research and development of non-

gillnet finfish gear, including establishing an international review panel to evaluate the design, testing, and implementation of the alternative gear.

CIRVA recommends the following conditions for the Experimental Shrimp Trawl Fishery

- All fishermen participating in the experimental shrimp trawl fishery must have the required permits and the shrimp trawl gear;
- The permit must be displayed on the vessel;
- The vessel must have a working tracking device (AIS, VMS, or equivalent)
- Vessels can only be launched from a designated area within each village and must be inspected by an enforcement official prior to the fishing trip;
- The vessel should include some type of onboard or video surveillance;
- The shrimp trawl gear can be modified from the requirements of the NOM to improve efficiency, provided the modifications are documented and provided to those administering the trials;
- Fishermen must participate in the data collection program providing data on fuel usage, set times, and catches;
- Fishermen must participate in training programs in the gear use; and
- Fishermen may retain and sell their catch.

CIRVA recommends the following conditions for the Finfish Gear Development and Research Program and assessment of the program

- INAPESCA in collaboration with the Presidential Commission and CIRVA will establish an international review panel to review the experimental protocol for finfish gear testing, the data from the first year of the experimental protocol, and make recommendations for revisions to the experimental protocol;
- Fishermen who participate in the finfish gear development program must adhere to the experimental protocols, refusing to do so will result in the forfeiture of permits or compensation;
- Gear modifications can be made to the gear to increase efficiency provided they are documented and the necessary changes are made to the experimental protocol; and
- The international review panel will review the results of the finfish gear development and research program quarterly and make recommendations for further modifications.

Annex C

Prospectus for gear testing programs

Prepared for CIRVA by Tim Werner, Bycatch Consortium, New England Aquarium, 19 December 2015³

As part of emergency measures enacted to reverse the decline of the vaquita population, the Government of Mexico has placed a temporary complete ban on the use of gillnets in the Upper Gulf. Other types of fishing gear and practices could be used within vaquita habitat without posing a threat to vaquitas. The use of such gear and practices would permit the commercial exploitation of the area's productive shrimp and finfish fisheries while assisting vaquita recovery. For this reason, the development of new kinds of fishing gear and practices in the Upper Gulf is a high priority being advanced by both the Government and CIRVA.

The main types of commercial fishing gear come under five broad categories: seines and gillnets, hooks-and-lines (such as longlines), pots/traps, dredges, and trawl nets. Although most of these gear types are not thought to pose a high risk of bycatch of small cetaceans, gillnets clearly do (Read et al. 2006; Reeves et al. 2013). Therefore, if commercial fishing is eventually going to resume within vaquita habitat, these other types of gear should be considered as potential alternatives. However, there is only limited or no experience of using these types of gear in the Upper Gulf, so before opening or re-opening closed areas to fishing it will be necessary to implement a program to evaluate various gears and practices in the Upper Gulf. Evaluation of alternative gears is an iterative process that involves initial development of prototypes followed by fine-tuned adjustments to gear components and their deployment so as to optimize catch-per-unit-effort (CPUE), and to minimize bycatch of non-targeted species. Development of alternative gear should therefore proceed over more than one fishing season if it is to be adequately evaluated. Also, since local fishermen have little or no previous experience in using these types of gears, adequate time is needed to re-outfit fishing vessels to support different fishing gears and to allow fishermen to develop competency in using new gear so that they can fish it profitably. Gear also needs to be tested during seasons and areas in which it has the highest likelihood of catching targeted species, so tests may be seasonal rather than throughout the course of a year.

Considerable expertise exists internationally that can assist in the technical design and experimental protocols for evaluating new fishing techniques in the upper gulf. These include members of the ICES-FAO Working Group on Fishing Technology and Fish Behaviour (WGFTFB), the ICES Working Group on Bycatch of Protected Species (WGBYC), staff of the Engineering and Harvesting Branch of NOAA's Southeast Fisheries Science Center (Mississippi Laboratories), and a number of individual researchers that specialize in particular gear types. One way to increase the likelihood that trials using new fishing gear developed specifically for fishing in the upper gulf are adequately evaluated is by linking local expertise on fishing gear in Mexico with one or more individuals associated with these groups.

³ This document was not reviewed by the CIRVA Express meeting but participants subsequently agreed to include it during report preparation.

The urgency of the situation with respect to vaquita bycatch and the need to identify commercially viable fishing within the region as soon as possible strongly argues for drawing from this expertise. One possibility would be to establish an advisory group of fishing gear development experts comprised of members from both inside and outside Mexico, to help oversee field trials. At the very least, experts working with particular gear types and experimental protocols for testing them should be engaged in assisting trials of new gear. The model would be similar to the cooperative arrangement among various national and international scientists who collaboratively carried out the most recent population surveys of vaquita, a process that led to the most aggressive conservation measures to date for this species.

Groups such as the Consortium for Wildlife Bycatch Reduction, based at the New England Aquarium, might help facilitate the mobilization of this expertise. The Consortium works within the US and internationally to test alternative gear to gillnets, primarily pots, and has expertise in testing fishing techniques that reduce bycatch of endangered species such as cetaceans, in longline, pot, and gillnet gear. The Consortium works collaboratively with marine species scientists, engineers, and fishermen to design and carry out field trials of alternative or modified gear.