

# Third Annual MSC Surveillance Audit Report

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## *Gulf of California Mexican Sardine Fishery*

Certificate Number: SCS-MF-0026

*Prepared for:*

**Cámara Nacional de la Industria Pesquera,  
Delegación Sonora**



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**SCS**global  
SERVICES  
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2000 Powell Street, Suite 600  
Emeryville, CA 94608, USA  
+1.510.452.8000 main | +1.510-452-8001 fax  
[www.SCSGlobalServices.com](http://www.SCSGlobalServices.com)

**Prepared for:**

Mr. Leon Tissot Plant  
 Camara Nacional de la Industria Pesquera,  
 Delegacion Sonora  
 Mexico  
**Tel.:** +52 622 22 205 22  
**Email:** leontp47@hotmail.com

**General Information**

Date of Issue	15 September 2014	
Prepared by	SCS	Sian Morgan, PhD Carlos Alvarez Flores, PhD
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Surveillance Team	SCS Oceanides	Sian Morgan, PhD (Lead) Carlos Alvarez Flores, PhD
Surveillance Stage	3 <sup>rd</sup> Annual Surveillance	
Methodologies	MSC Certification Requirements Version 1.3, January 2013	

## Table of Contents

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Preface .....	4
Glossary of Acronyms .....	5
1 Executive Summary .....	6
2 Assessment Overview .....	7
2.1 Methodology.....	7
2.2 Surveillance Team .....	8
2.3 Surveillance Meeting .....	9
3 Results .....	10
3.1 General Discussion.....	10
3.2 Principle 1 - Stock Status and Harvest Strategy .....	10
3.2.1 Fisheries Management Plan.....	15
3.2.2 Stock Status Considerations.....	18
3.2.3 Potential for Re-Scoring Principle 1 in Relation to Stock Status.....	20
3.3 Principle 2 – Ecosystem Impacts from Fishing.....	22
3.3.1 Retained Species .....	22
3.3.2 Bycatch.....	27
3.3.3 Endangered, Threatened or Protected (ETP) Species.....	30
3.3.4 Habitats .....	32
3.3.5 Ecosystem Considerations .....	32
3.4 Principle 3 – Management and Regulation.....	33
4 Conclusions and Recommendations .....	34
5 Status of Previously Raised Conditions .....	35
6 Appendix 1. Stakeholder Submissions and Team Response .....	67

6.1 Stakeholder Submissions ..... 67

6.2 Team Response ..... 76

7 Appendix 2. Updated Vessel List ..... 78

8 Appendix 3. Surveillance Audit Frequency..... 80

## Preface

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All facts in this report were provided to SCS Global Services, Inc. (SCS) by Camara Nacional de la Industria Pesquera, Delegacion Sonora, represented by Mr. Leon Tissot Plant. However, the interpretation, opinions and assertions made in this report as to the compliance of the fishery with MSC requirements are the sole responsibility of SCS.

## Glossary of Acronyms

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BAC	Biologically Acceptable Catch
BCS	Baja California Sur
Bmin	Minimum Biomass
CAB	Conformity Assessment Body
CNP	Carta Nacional Pesquera
COBI	Comunidad y Biodiversidad
COFEMER	Federal Commission for the Regulations Improvement
CONAPESCA	Comisión Nacional de Acuicultura y Pesca
CPUE	Catch Per Unit Effort
CRIP	Centros Regionales De Investigación Pesquera
CTIPM	Technical Committee for the Study of Pelagic Juveniles
ETP	Endangered, Threatened, or Protected
FMP	Fishery Management Plan
HCR	Harvest Control rule
INAPESCA	Instituto Nacional de Pesca
LRP	Limit Reference Point
MSC	marine Stewardship Council
MSY	Maximum Sustainable Yield
NOM	Norma Oficial Mexicana
OY	Optimum Yield
PI	Performance Indicator
SAGARPA	Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación
SCS	SCS Global Services
SG	Scoring Guidepost
SST	Sea Surface Temperature
TS	Target Strength

## 1 Executive Summary

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The Gulf of California Mexican Sardine fishery was certified on 21 July, 2011 by SCS Global Services, Inc. (SCS). This 2014 report represents the findings of the third annual surveillance since the fishery was certified. SCS finds that the Fishery is still in general compliance with the MSC standard. SCS recommends the continued use of the MSC certificate.

Significant progress has been made, particularly on the observer program and understanding of P2 impacts. The Fishery was found behind target on five conditions in terms of meeting the actions in the timeline outlined in the client action plan (Table 1): information from the observer program can be used to generate associated understanding of any population-level impacts of the fishery and to design and implement relevant mitigation measures. If these conditions are not closed by May 2015, the Client risks suspension and withdrawal of the certificate.

Two new conditions were opened, based on evidence that the harvest control rule, required by the 2012 Fisheries Management Plan has been neither defined numerically, nor put into practice. In Principle 3, there is also evidence that regulations in the Carta Nacional Pesquera and NOM-003 are not in practice and associated sanctions have not been enforced.

The scores for PI 3.2.4 was adjusted to reflect significant improvements to the plan for research, execution of research and the collaborative use of research results. This performance indicator was changed from a 70 to a 90.

Overall Principle scores for the fishery after the third surveillance audit are:

Principle 1 – 80.6

Principle 2 – 81.0

Principle 3 – 86.1

The Client is respectfully reminded that scores for all Principles need to individually remain above 80 in order to main the validity of the certificate. The option of appointing a coordinator for outstanding work that is needed between May 2014 and May 2015 was discussed at the 2014 surveillance audit and is likely to help the Client coordinate efforts to close conditions that are Behind Target and to meet new conditions on agreed timelines.

Table 1. Summary of Performance Indicators with conditions.

Indicator	Year due	Status of Condition in 2013 (2 <sup>nd</sup> surveillance)	Status of Condition/Non-Conformance in 2014 (3 <sup>rd</sup> surveillance)	Score 2014
1.1.1	4	80	New condition	75
1.2.4	(2) 4	On Target	On Target	75
2.1.1	3	On Target	Behind Target	75
2.1.2	3	On Target	Behind Target	70
2.2.2	3	On Target	Behind Target	70
2.2.3	3	(Back) On Target	Closed 2014	80
2.3.1	3	(Back) On Target	Behind Target	75
2.5.1	4	80	New condition	60
2.5.2	3	On Target	Closed 2014	85
3.2.1	3	Closed 2012		
3.2.2	4	85	New condition	70
3.2.3	4	80	New condition	70
3.2.4	3	Behind Target – rescored to 80 Sept 2013	Closed 2013	90

## 2 Assessment Overview

### 2.1 Methodology

The surveillance audit was carried out in accordance with the Marine Stewardship Council (MSC) Certification Requirements Version 1.3, January 2013. Should a fishery fail the surveillance audit, and cannot address identified deficiencies in a reasonable period of time, then the use of the certificate and the MSC logo can be revoked by the certifier.

The issues for the certifier are whether the fishery has sufficiently acted on the required conditions set forth in the original certification report, is moving at an appropriate pace toward future conditions and whether a random check on the performance of the fishery verifies continued compliance with the MSC standards and existing scores.

The annual surveillance audit process is comprised of four general parts:

1. The certification body provides questions around areas of inquiry to determine if the fishery is maintaining the level of management observed during the original certification. In addition, the



surveillance team requires that the client provide evidence that the fishery management system has taken the necessary actions to meet all conditions placed on the fishery during the initial certification assessment or any previous surveillance audits.

2. The surveillance/assessment team meets with the client fishery to allow the client to present the information gathered in answer to the questions asked by the surveillance team. The surveillance team can then ask questions about the information provided to ensure its full understanding of how well the fishery management system is functioning and if the fishery management system is continuing to meet the MSC standards.

3. The surveillance team presents its findings to the client fishery at the end of the site visit. The results outline the assessment team's understanding of the information presented and its conclusion regarding the fishery management system's continued compliance with MSC standards.

4. Where appropriate, the client fishery submits final information to the surveillance/assessment team for consideration in the surveillance findings and report. The surveillance team then reviews the final information and submits a final report to the client fishery and the MSC for posting on the MSC website within 30 days. If there are continued compliance concerns, these are presented as non-conformities that require further action: changes in scores require clients to create an action plan against any new conditions.

## 2.2 Surveillance Team

Two assessment team members were involved in the 3<sup>rd</sup> annual surveillance audit. As outlined below and to fulfill the requirements in the MSC Certification Requirements, team members fulfill MSC expert requirements for at least one of Principle 1, 2 or 3 and the team contains a lead auditor, and there is continuity with the previous assessment team for the system.

**Dr. Siân Morgan**- Regional Director, SCS Global Services

Dr. Morgan has ten years of experience in the fields of marine ecology and fisheries science with particular expertise in markets-based fisheries reform, certification and quantitative methods for decision analysis. Dr. Morgan has worked in non-governmental, academic and consulting settings and brings to the team a strong background in multi-stakeholder consultation. Her doctoral research at the Fisheries Center, University of British Columbia/McGill examined the ecology, population dynamics and management of a small-scale, multi-species fishery in Asia. Siân participated in MSC's low trophic level workshops, which drafted the emerging standards for forage fisheries and has also drafted standards within the Aquaculture Dialogue standards related to responsible sourcing of forage fisheries and ecological consideration associated with habitat disturbance. Past projects managed by Siân include developing SeaChoice, a national seafood program for Canada, conceiving pragmatic trade tools for CITES and researching species responses to area-based management for WWF. Siân is accredited to certify to the MSC standard, the ASC standard and SA 8000.

**Dr. Carlos M. Alvarez Flores** - President of the Okeanos-Oceanides Consortium

Carlos Alvarez Flores gained a PhD in Fisheries from the University of Washington. He has devoted his professional career working in marine mammal and fish stock assessment and ecosystem impacts of fisheries. Some of his investigations involved the bycatch of dolphins in the pelagic purse seine tuna fisheries of the Eastern Tropical Pacific, the hunt of beluga whales in West Greenland, the hunt of bowhead whales in Canada, the bycatch of albatrosses in pelagic fisheries of the central Pacific and the modeling of factors that could further affect the fate of the albatross populations. More recently, Carlos has been involved with investigations examining the status and potential of fisheries for green crab in the Gulf of California and spiny lobster in the southern Mexican Caribbean. These assessments were done in the context of their work towards certification by the Marine Stewardship Council.

### 2.3 Surveillance Meeting

The surveillance audit for 2014 comprised:

1. An Audit Plan was provided to the client, fisheries management and scientists before the meeting. The opening with the client included an exchange of information relevant to the surveillance audit.
2. A meeting took place on the May 22<sup>nd</sup> 2014 with Leon Tissot Plant representing the Camara Nacional de la Industria Pesquera, Delegación Sonora (see Table 2). The discussions focused on the ongoing activities associated with the Conditions placed on the fishery and any changes that occurred since the fishery was first certified.
3. Necessary documents were presented by the client to SCS prior to and during the meeting. Follow up emails were sent to request additional information after the meeting. The surveillance audit was finalized on 15 September 2014 with a variation to the requirements granted to extend the 30 day deadline.

**Table 2. Second Annual Assessment Meeting Attendees and Organizations**

Name	Role	Affiliation
<b>Angeles Navarro C.</b>	Management	INAPESCA – Crip, Sonora
<b>Arnulfo Navarro Carillo</b>	Management	Jefe de la Oficina de Pesca de Guaymas
<b>Dana Rodriguez</b>	Management	INAPESCA – Crip, Sonora
<b>Dr. Carlos Alvarez</b>	Assessment Team member	Assessment Team Member
<b>Dr. Dana Arizmendi</b>	Biologist	INAPESCA – Crip Sonora
<b>Dr. Enriqueta Velarde</b>	Academia	University of Veracruz
<b>Dr. Exequiel Ezcurra</b>	Academic stakeholder	UC Davis, MEXUS
<b>Dr. Jorge Torre.</b>	ENGO stakeholder	Comunidad Y Biodiversidad A.C
<b>Dr. Sian Morgan</b>	Assessment Team Leader	SCS
<b>Edna María Arambula</b>	Management	CONAPESCA
<b>Elias Ortega</b>	Industry	Pesqueria Costa Rock
<b>Elvira Gonzalez Corona</b>	Management	INAPESCA – Crip Sonora
<b>Enrique Flores</b>	Industry	Selecta

<b>Gabriela Garcia</b>	ENGO stakeholder	Comunidad Y Biodiversidad
<b>Gerardo Barnetche</b>	Industry stakeholder	Industrias Barda
<b>Guillermo Morales B.</b>	Industry stakeholder	Sardinas de Sonora
<b>Jesus Padilla Serrato</b>	Management	INAPESCA – Crip, Sonora
<b>Juan Pedro Vela</b>	Fisheries stakeholder	Alianza de Ribereños y Armadores
<b>Leon Tissot Plant</b>	Client Representative	Camara Nacional de la Industria Pesquera, Delegación Sonora
<b>Luis D. Andrade</b>	Industry	Sardinas de Sonora
<b>Maria Jose Espinosa R.</b>	ENGO stakeholder	Comunidad Y Biodiversidad A.C
<b>Martin Hernandez</b>	Academia	CICIMAR
<b>Rogelio Sanchez de la Vega</b>	Industry	Pescharina de Guaymas

### 3 Results

#### 3.1 General Discussion

This is the 3rd Annual Surveillance Report prepared by SCS Global Services to meet the requirements of the MSC for annual audits of certified fisheries.

The section below provides the general information about the status of the stock, the ecosystem impacts from fishing, and management arrangements for this reporting period.

According to the terms of the Action Plan, the client has provided the following information on the work undertaken since Certification in 2011:

#### 3.2 Principle 1 - Stock Status and Harvest Strategy

The total catch of small pelagics for the 2012/2013 season was 465,486 t which is only <5 MT greater than the 2011/2012 season. Out this total, the Pacific sardine represented almost 16% of the catch (72,802 t) which is a minor decrease in the relative proportion compared with the 2011/2012 fishing season when sardines were 19% of total landings. The assessment team will follow the trend of the catch proportion during future surveillance audits.

**Table 3. Total landings (MT) of small pelagic species over the last 3 fishing seasons (data received by email, June 2013, from Leon Tissot).**

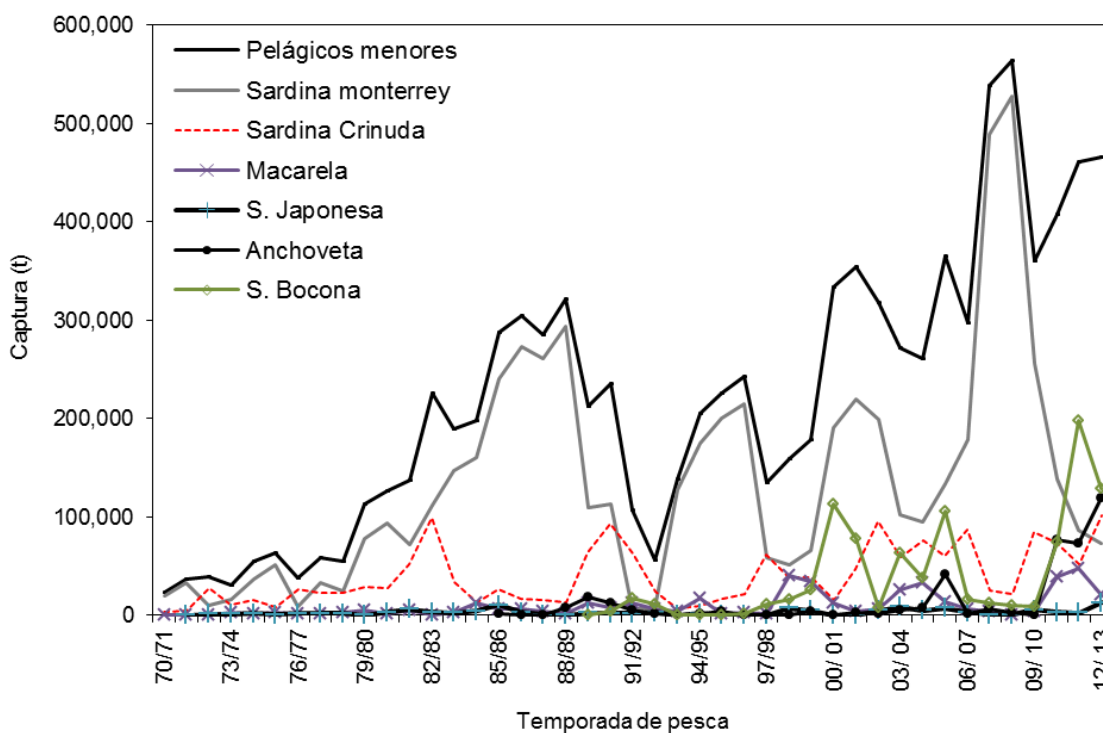
Year	Small pelagics	Monterey Sardine	Thread Herring spp.	Chub Mackerel	Red-eye round herring	California Anchovy	Bigmouth sardine	Leatherjackets	Revoltura	Nominal effort (trips)
<b>Spanish Common name</b>		Sardina Monterey	Sardina crinuda	Macarela	Sardina japonesa	Anchovet a	Sardina boconoa	Sardina piña		
<b>Latin name</b>		<i>Sardinops sagax</i>	<i>Opisthonema spp.</i>	<i>Scomber japonicas</i>	<i>Etrumeus teres</i>	<i>Engraulis mordax</i>	<i>Cetengraulis mysticetus</i>	<i>Oligoplites spp.</i>		
<b>1999/</b>	178,902	65,593	38,510	34,240	5,006	4,493	25,229	4,741	1,091	1,603

<b>2000</b>										
<b>2000/ 2001</b>	333,370	190,862	15,834	13,003	345		112,954	277	75	2,533
<b>2001/ 2002</b>	353,903	220,360	46,666	4,493	270	2,853	78,261	890	110	2,827
<b>2002/ 2003</b>	318,379	198,757	94,956	6,992	4,889	1,100	7,682	3,309	693	2,745
<b>2003/ 2004</b>	271,638	102,034	59,685	25,507	8,858	5,717	63,253	5,494	1,090	2,121
<b>2004/ 2005</b>	260,859	94,559	76,183	32,943	4,683	7,354	38,031	4,233	2,874	2,074
<b>2005/ 2006</b>	365,164	133,567	60,560	13,191	7,178	41,820	106,062	945	1,841	2,922
<b>2006/ 2007</b>	297,867	178,205	87,172	6,616	3,088	1,271	16,491	2,530	2,495	2,499
<b>2007/ 2008</b>	538,669	488,639	25,726	3,988	698	5,885	12,303	238	1,190	3,861
<b>2008/ 2009</b>	564,298	528,094	21,564	963	422	2,620	9,537	212	885	3,757
<b>2009/ 2010</b>	360,952	256,409	85,116	3,527	5,545	481	8,315	520	1,039	2,761
<b>2010/ 2011</b>	407,114	138,068	73,507	38,762	3,040	76,849	74,067	2,382	441	3,306
<b>2011/ 2012</b>	461,058	86,470	51,780	47,600	2,560	73,124	197,354	666	1,503	3,358
<b>2012/ 2013</b>	465,486	72,802	101,814	20,557	12,587	118,833	129,296	3,947	5,649	3,601

**Table 4. Percentage of total catch of small pelagic species by weight over the last 3 fishing seasons (data received by email, June 2013, from Leon Tissot).**

Year	Small pelagics	Monterey Sardine	Thread Herring spp.	Chub Mackerel	Red-eye round herring	California Anchovy	Pacific Achoveta	Leather jackets	Revolvur a
<b>Spanish Common name</b>		Sardina Monterey	Sardina crinuda	Macarela	Sardina japonesa	Anchoveta	Sardina boconoa	Sardina piña	
<b>Latin names</b>		<i>Sardinops sagax</i>	<i>Opisthonema spp</i>	<i>Scomber japonicas</i>	<i>Etrumeus teres</i>	<i>Engraulis mordax</i>	<i>Cetengraulis mysticetus</i>	<i>Oligoplites spp</i>	
<b>1999/ 2000</b>	178,902	37	22	19	3	3	14	3	1
<b>2000/ 2001</b>	333,370	57	5	4	0	0	34	0	0
<b>2001/ 2002</b>	353,903	62	13	1	0	1	22	0	0
<b>2002/ 2003</b>	318,379	62	30	2	2	0	2	1	0
<b>2003/ 2004</b>	271,638	38	22	9	3	2	23	2	0
<b>2004/ 2005</b>	260,859	36	29	13	2	3	15	2	1

<b>2005</b>									
<b>2005/ 2006</b>	365,164	37	17	4	2	11	29	0	1
<b>2006/ 2007</b>	297,867	60	29	2	1	0	6	1	1
<b>2007/ 2008</b>	538,669	91	5	1	0	1	2	0	0
<b>2008/ 2009</b>	564,298	94	4	0	0	0	2	0	0
<b>2009/ 2010</b>	360,952	71	24	1	2	0	2	0	0
<b>2010/ 2011</b>	407,114	34	18	10	1	19	18	1	0
<b>2011/ 2012</b>	461,058	19	11	10	1	16	43	0	0
<b>2012/ 2013</b>	465,486	16	22	4	3	26	28	1	1



**Figure 1. Landings in tonnes by fishing season since 1970. In 2013 overall landings were similar to the previous two seasons, but Monterrey Sardine has continued to decline in the catch since the 2008-2009 season, with the Thread Herring, the Anchoqueta and the Bocona being a significant portion of the catch relative to previous seasons. Reproduced from 2014 onsite presentation by CRIP Guaymas, Program on Small Pelagics.**

The time series of effort on small pelagics shows two well-marked, similar periods that span from season 69/70 to 89/90 and from 92/93 to 12/13. In both cases an overall increasing trend in CPUE of small

pelagics is evident, with the first period ending with a sharp decline from 90/91 through 92/93 (Fig 2). The second period ends with the latest seasons 07/08 and 08/09 showing a sharp increase in effort, followed by a decline in 09/10. However, while CPUE drops, overall effort instead increases again in 12/13 to a level close to the high in 08/09 (Fig 3; Table 3). Despite the steady increase in overall effort on small pelagics, effort on the Pacific sardine apparently declined from season 09/10 to season 12/13, while during the same seasons, effort on thread herring remained approximately stable with a slight increase in season 12/13 (Fig. 3). The opportunistic nature of the small pelagic fleet makes it difficult to interpret CPUE on a particular species, as the fleet prefers Pacific sardine, but will opportunistically capture any of the marketable species it encounters.

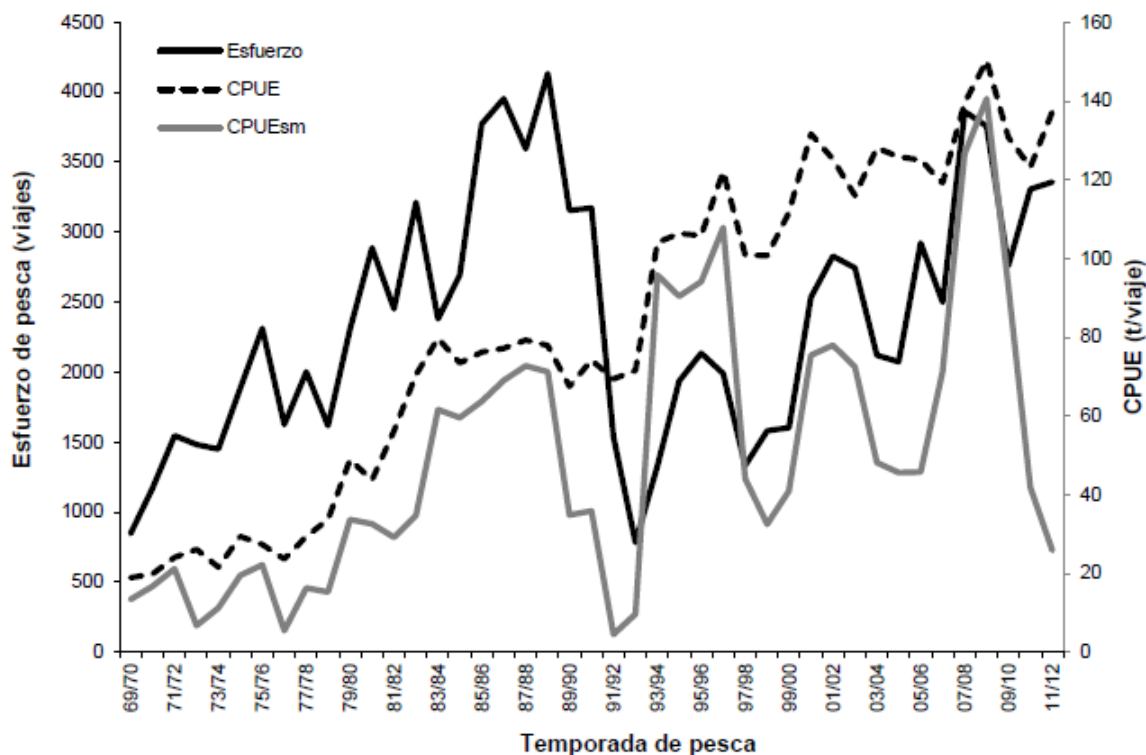


Figure 2. Nominal effort (trips), total CPUE (all small pelagics) and CPUE of Monterrey Sardine (CPUEsm) in fishing seasons 1969/70 to 2011/12. Reproduced from Nevárez-Martínez et al. (2013b).

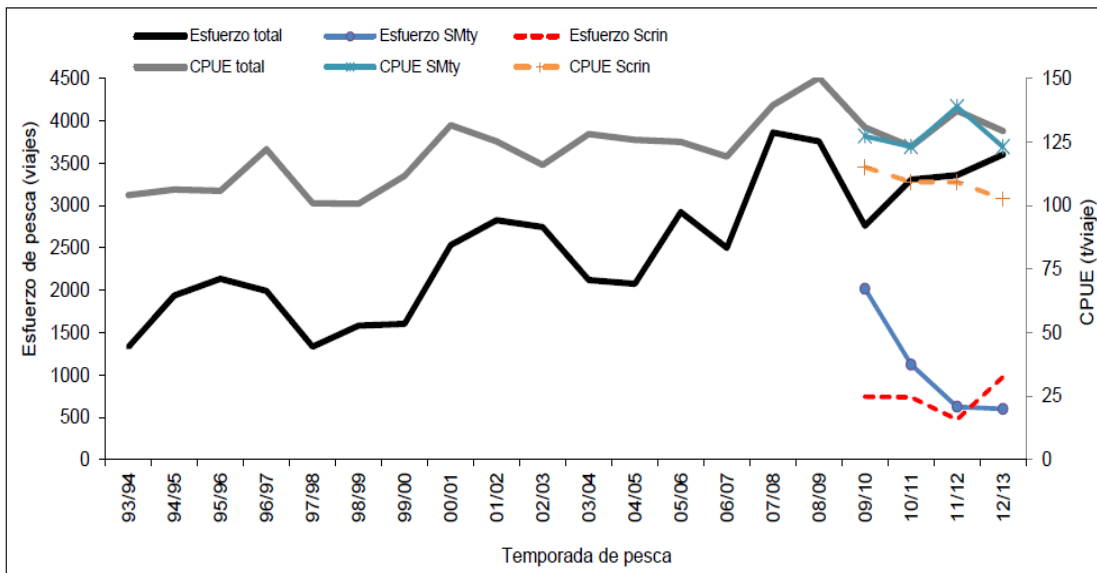


Figure 3. Nominal fishing effort (trips) on Monterrey sardine, Thread herring and total for all small pelagics from season 1993/94 to season 2012/13. Corresponding CPUEs are also shown. Reproduced from 2014 onsite presentation by CRIP Guaymas, Program on Small Pelagics.

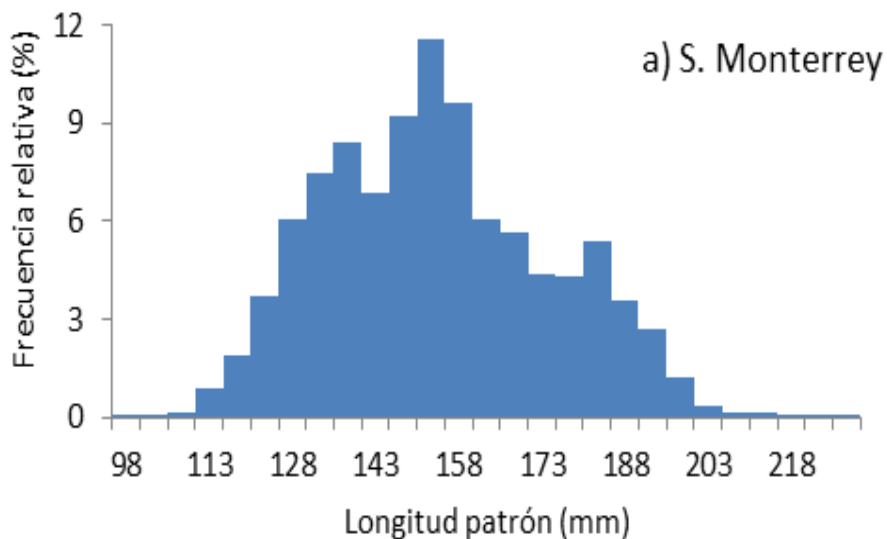


Figure 4. Size frequency distribution of Monterrey sardine during the fishing season 2012-13. Reproduced from 2014 onsite presentation by CRIP Guaymas, Program on Small Pelagics.

Size frequency distributions of the catch indicate that in the last fishing season, fish under the official minimum size limit comprised a sizeable proportion of the catch (~ 50%). Data from a 2006 report on

small pelagics (Martínez-Zavala et al. 2006) indicate that proportions above 30% of Monterrey sardine under 150 mm are quite common despite regulations and agreements regarding minimum size.

### 3.2.1 Fisheries Management Plan

A new draft version of the Small Pelagics Management Plan was published in July 2011 (Nevarez-Martinez *et al.* 2011) and the final version was passed into law in November of 2012. A relevant insertion in the Plan is the definition of guidance to establish reference points. The language doesn't identify "limit" or "target" reference points, but the equivalent are as follows. A *Biologically Acceptable Catch* (BAC) (equivalent to a LRP) is computed as a fraction of the estimated MSY. The rationale behind this approach comes from results of a simulation study finding that, for the Pacific sardine, a fishing mortality rate that is 90% of the  $F_{msy}$  "would not only produce higher economic returns and be safer biologically, but will reduce intrinsic population oscillations" (Nevarez-Martinez *et al.* 1999). Under this principle, the Plan states that the BAC is a "prudent level of catch" that can vary between 5 and 25% of the estimated biomass. To support the assumption that the BAC is equivalent to the LRP, an additional definition in the Plan states that overfishing "occurs when fishing takes place at a rate that is high enough to risk the stock's ability to continuously produce MSY on the long term". The Plan further adds, operationally, "in the fishery of small pelagics, overfishing occurs if the catch exceeds the BAC". This condition is "approximated" (i.e. met) if the predictive model projections indicate that the fishing mortality or the harvest rate will exceed the BAC over a period of two years.

In the language of the Plan, the equivalent of the Target Reference Point is called *Optimum Yield* (OY) and is defined as a "catch level that is equal or less than the BAC", but that in practice, "it *must* be smaller than the BAC as much as needed to avoid overfishing".

These reference points are required to be consistent with the MSY because the strategy is expected to be able to provide biomass levels, at least as high as the  $F_{msy}$  approach while the catch is "relatively high and consistent".

If overfishing occurs, the Plan defines "emergent actions" that are implemented "if pertinent and possible". These actions include: a) temporal or area closures applied to one or more species; b) change in the size limits or definition of new limits for one or more species in a single area or more; c) definition or change of allowable catch; d) restrictions on fishing effort.

The new FMP describes that some species are to be actively managed, while others will be passively managed. The purpose of these two categories of management is to use institutional resources as efficiently and effectively as possible to meet management goals. Species in each group are given in Table 5.

For species that are "actively managed" the Plan has added an MSY-based control rule that, based on the application of a harvest rate, forces the catch to be reduced if the biomass declines.



**Table 5. Small pelagic species categorized for two main forms of management in the November 2012 Fisheries Management Plan for Small Pelagics in the Gulf of California Mexico.**

Actively Managed	Passively Managed
Pacific sardine: <i>Sardinops sagax</i>	Japanese sardine: <i>Etrumeus teres</i>
Blue thread herring: <i>Opisthonema bulleri</i>	Bocona sardine: <i>Cetengraulis mysticetus</i>
Machelete thread herring: <i>Opisthonema medirastre</i>	Anchovy: <i>Engraulis mordax</i>
Thread herring: <i>Opisthonema libertate</i>	Charrito: <i>Trachurus symmetricus</i>
(Chub) Mackerel: <i>Scomber japonicus</i>	Pineapple sardine: <i>Oligoplites. spp.</i>

Additionally, the control rule has inserted a biomass safety minimum such that if reached, the fishery would stop operating.

The general formula is as follows:

$$C = (B - B_{min}) * \text{FRACTION}$$

Where: C is the target catch level, B<sub>min</sub> is the lowest level of estimated biomass at which the directed harvest is allowed and FRACTION is the proportion of biomass above B<sub>min</sub> that can be captured by the fishery. B is generally estimated biomass of fish age 1 and older. The purpose of B<sub>min</sub> is to protect the stock when the biomass is low. The purpose of FRACTION is to specify how much of the stock available to the fishery when B exceeds B<sub>min</sub>.

The Plan indicates that to compute C, different sources of information can be used, including catch and fishery data (catch and effort, sizes, ages and weights) as well as fishery independent data (census of eggs and larvae, hydroacoustic data etc.). After the 3d surveillance audit we were provided with a B<sub>min</sub> value in the range of 22,000 to 125,000 mt that was computed in an analysis of stock recruitment and the potential of allee effects in the sardine population (Morales-Bojorquez and Nevarez-Martinez 2005). If abundance estimated with hydroacoustic methods is assumed to be reliable (in the range of 515,000 to 711,000 mt; from the reference points document submitted by M.A. Martinez), a BAC could be computed using the control rule, but to our knowledge, this quantity has not been produced and inserted in the decision making process yet.

**Table 6. Reference points for the Monterrey sardine in the Gulf of California Mexico. Table reproduced from document sent by M.A. Martinez-Zavala.**

Reference Points	Monterrey Sardine
Tamaño mínimo del stock* (N), en Número	269 X 10 <sup>6</sup> a 1,569 X 10 <sup>6</sup>
Tamaño mínimo del stock* (N), en Biomasa (t)	22,000 – 126,000 t
Tasa de explotación (E) recomendable	0.25/año

Carta Nacional Pesquera (2012), 68-69 p.	
Tasa de mortalidad por pesca (F) Análisis de cohorte 2011/12 (CRIP)	0.189/año
Tasa de mortalidad por pesca (F) Análisis de cohorte 2012/13(CRIP)	0.218/año
Tasa de explotación (E) Análisis de cohorte (2011/12) (CRIP)	0.161/año
Tasa de explotación (E) Análisis de cohorte (2012/13) (CRIP)	0.183/año
Biomasa actual (toneladas) (estimado por acústica)	515,000 – 711,000 t

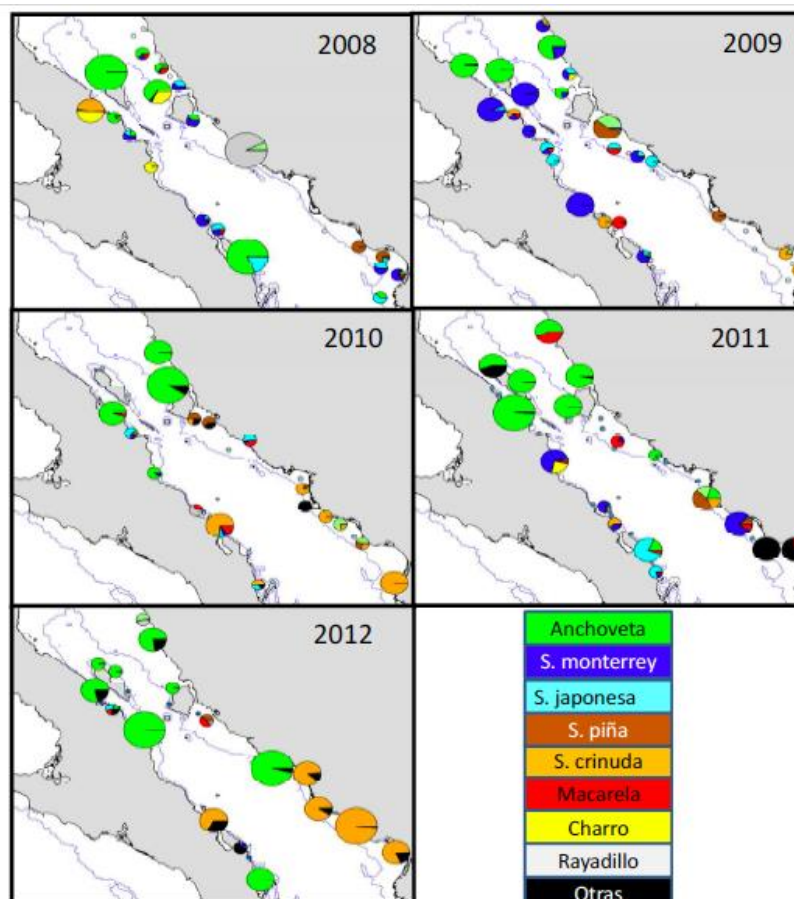
The new FMP also notes that supplemental measures have been proposed, and will be supported via official recognition of the Technical Committee for the Study of Pelagic Juveniles (CTIPM) and working Sub-committees. This involves giving legal recognition to CTIPM and the Sub-committees. Subcommittees shall have as one of their functions to develop and propose to the competent authority an *ad hoc* scheme for each stock, which must be incorporated into the Management Plan. This must include decision tables based on benchmarks chosen by consensus.

**Table 7. Conceptual correspondence among different definitions of target and limit reference points.**

Reference point	Definition	MSC	FMP	Value
Target	Desirable state	Similar in intent or outcome to maintain the stock at Bmsy or above. Can use proxy e.g. Fmsy. Consideration of S-R; Potential impacts on reproduction capacity; genetic capacity or sex composition.	Optimum yield (OY)	Fraction of BAC
Limit	Unacceptable state	Default: 0.5 Bmsy	Biologically acceptable catch (BAC)	HCR

### 3.2.2 Stock Status Considerations

**Hydroacoustic Surveys:** Fisheries independent data is being collected via hydroacoustic surveys which began in 2008.



**Figure 5. Distribution of small pelagic species captured to ground-truth hydroacoustic surveys, from different locations around the Gulf of California, Mexico, by year (Nevárez-Martínez et al. 2013).**

Findings were summarized for the period between 2008 and 2012 (Nevarez Martinez *et al.*, 2013a). The work included five acoustic surveys carried out in the Gulf of California during the month of May for the years of 2008-2012 aboard the research vessel "BIP XI". The survey itinerary was the same in all years where on the coasts of Sonora (Bahia de Puerto Obos Agiobamp) perpendicular transects were made up to the 200 m isobath and every 10 nm (mn). In the western Gulf, zigzag transects were done from Isla Angel de la Guarda to Loreto, BCS. Results indicate that there is high variability in the biomass of Pacific (Monterrey) Sardine, but also that biomass estimates differed depending on how the target strength (TS) of the signal was interpreted: interpretation and selection of appropriate target strength models is known to be a sensitivity that needs attention in hydroacoustic surveys (Demer, 2004). Findings indicate that in a relative sense there was a general biomass decrease from 2008 to 2010 and a slight increase in the last two years (Fig. 5).

INAPESCA has identified that it will be necessary to continue working on ground-truthing methods to assign the overall acoustic energy to the different species in order to generate more reliable estimates of abundance. The following are specific priorities for improving fisheries independent surveys of small pelagics:

- i) Individual measurements of TS on each haul made *in situ* with double-beam echo sounders
- ii) Measurements of TS *in situ* and experimental effects on concentrations of sardines (and other small pelagics) across a range of sizes frequencies, as well as physiological conditions of the resource.

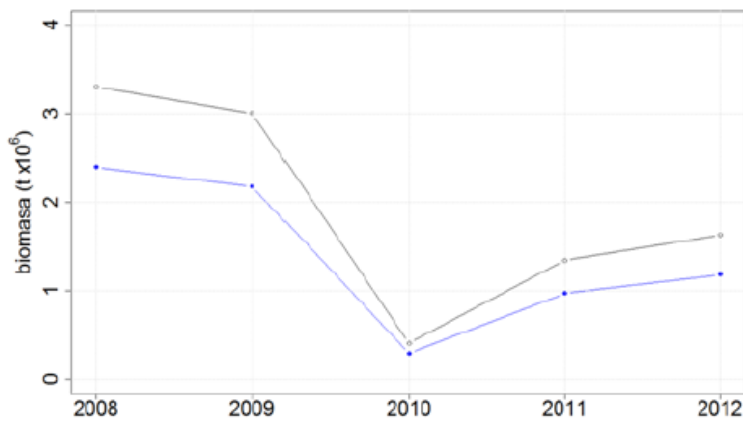
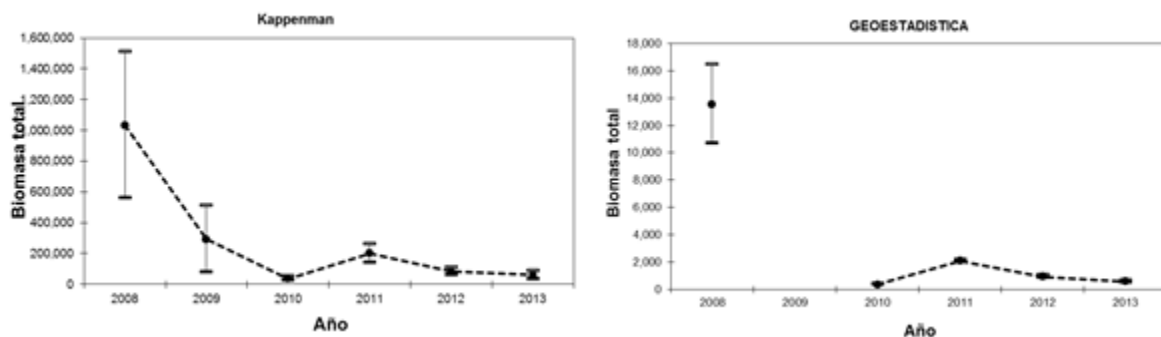
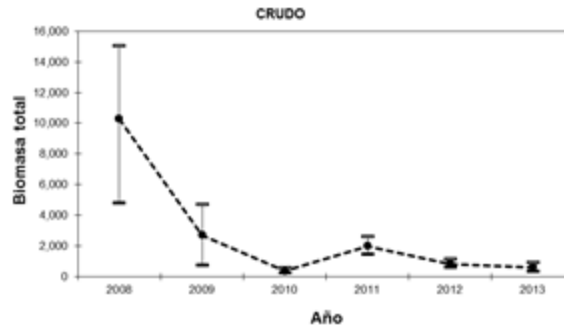


Figure 6. Estimates of Gulf of California Monterrey sardine biomass using hydroacoustics under alternative assumptions of target strength from 2008 to 2012 (Villalobos et al, 2013).





**Figure 5. Monterrey sardine biomass using acoustic data and alternative estimation procedures, as given by the title above each figure.**

The assessment team notes that Figures 6 and 7 do not show consistent trends in estimated biomass, supporting concerns about the current uncertainty in interpreting hydroacoustic data.

### 3.2.3 Potential for Re-Scoring Principle 1 in Relation to Stock Status

A key expectation in the MSC process is that the assessment team evaluate at each surveillance audit, how new information bears not only conditions, but also on existing scores. If there is evidence that outcome related performance indicators that previously scored SG >80, have fallen below this mark, this is considered a “major change” and cause for re-scoring. The relevant wording of the Certification Requirements V1.3 states:

*27.22.17.1 The CAB becomes aware of major changes in relation to the circumstances of the fishery.*

*a. A ‘major change’ is one that is likely to have a material difference on the certification status. A PI score falling below 60 or outcome PI score falling below 80, or a change that could bring about a Principle Level aggregate score to drop below 80 shall be considered material differences to certification status.*

Statements under this provision have the implication that changes can occur on one or more Principles. Also, it should be understood that in the interest of harmonize the way scores are assigned to PIs that are closely related, a change in one particular PI may also affect the score on a different PI under a different Principle.

The assessment team engaged in lengthy discussion following the 2<sup>nd</sup> annual surveillance audit as to whether action (re-scoring) was required based on ongoing declines in the catch of Monterey sardine over the last three fishing seasons.

Data in Table 3 show that starting in fishing season 2009/2010, there was a decline in the recorded catch of Monterey sardine, apparently similar to the behaviour of landings during the occurrence of past El Niño events. During presentations on May 21<sup>st</sup>, it was shown that there is no evidence of a recent El Niño that might have been expected in the context of declining Monterey Sardine catch. Dr. Carlos Robinson (UNAM) presented data supporting the hypothesis that the change in oceanographic conditions causing the decline in the sardine catch was not related to El Niño. His analysis pointed to a

change in wind patterns at a localized scale in key areas of the Gulf causing chlorophyll-a anomalies that match the trend in the catch. The hypothesis and data treatment to support this model was questioned by Dr. Enriqueta Velarde based mainly on methodological discrepancies.

The decline in the catch led to two points of discussion. First: Is the decline in catch caused by a decline in biomass (whatever the cause)? Second: Has there been a shift in the behaviour of the fishery that resulted in intentional targeting of non-Monterrey sardine species, and is there evidence to demonstrate any such change? Data in Table 3 show that if species other than Monterey sardine are pooled, there is a clear increase in the volume of the catch almost matching the decline in the catch of Monterey sardine.

In order to resolve these issues, the team felt in 2013, that at least two additional pieces of information were necessary: estimates of biomass abundance independent of the fishery (e.g. based on acoustic methods) and effort data, preferably in terms of at least trips, if not sets, and at a resolution greater than simply active boats in the fleet.

The 2013 synthesis on hydroacoustics indicated that methods are not currently sufficient to use this information to reliably estimate Monterey sardine abundance (Nevárez-Martínez et al. 2013a; Villalobos et al. 2013). There is, however, evidence that both INAPESCA and the industry are committed to the improvement of acoustic techniques to produce better indices of abundance independent of the fishery. At the time of the onsite visit in 2014, the assessment team didn't receive updated or improved data because the new survey at sea was about to begin. However, results of data analyses presented at a workshop held in October 2013 showed the outputs of alternative approaches to obtain estimates of abundance based on different ways to interpret acoustic data (Fig. 8).

During the onsite visit of 2014, the team received effort data for the season 2012/13 via results published in a dedicated report (Nevárez-Martínez et al. 2013b) (Figure 2) and an updated table not yet included in any formal report (Figure 3). Data show overall increasing trends in nominal effort (by trip) and associated CPUE for all small pelagics. However, CPUE data for Monterey sardines in the 2013 report on catch and effort (Nevárez-Martínez et al. 2013b) include a tall spike in seasons 2007/08 and 2008/09 followed by a decline to CPUE values that are the lowest in more than 15 years (Figure 2). In contrast, an effort and CPUE graph presented at the onsite in 2014 shows contradictory data about the CPUE of Monterey sardines (Figure 3). In this graph, the decline is not as pronounced and in season 2011/12 there's even a slight increase in Monterey Sardine CPUE. . This lack of consistency is of concern and should be addressed in future reviews of the data.

The assessment team elected in 2013 not to invoke re-scoring of PI 1.1.1, but were clear that, should declines continue, re-scoring of PI 1.1.1 would occur in 2014. This requirement would also invoke re-assessment of reference points relevant to 1.2.1 requiring definition of Bmin, which was not presented in 2013, as well as potential aspects of 1.2.3. This in turn could affect the overall score for Principle 1 which must stay above 80 in order to maintain certification status.

Results on acoustic-based abundance under three alternative estimation procedures are shown in Figure 7.

The agenda for activities planned in 2014 include:

- July/August 2014: workshop where Dr. Juan Valero of the Center for the Advancement of Population Assessment Methodology will teach a class on the use of SSIII.
- August 2014: meeting to discuss the availability of different indices of sardine abundance to be included in the SSIII framework.
- September 2014: INAPESCA technical meeting will be held to work on a first approach to evaluate results on sardine biomass estimates.
- October 2014: workshop to discuss advances in biomass estimation.

Re-scoring of P1 based on the uncertainty that the stock is fluctuating around its reference points leads to an inherent need to revise related Performance Indicators in Principle 2 and Principle 3.

### 3.3 Principle 2 – Ecosystem Impacts from Fishing

Fishing vessels capture large aggregations of small pelagic species that shoal in mid-water by surrounding these concentrations with a curtain of netting which is supported by surface floats.

Sardines in the Gulf of California are fished with purse seine nets. Compared to other fishing methods purse seine gear is relatively selective, since it is done in the open water column and directed at schools of targeted species.

#### 3.3.1 Retained Species

Other small pelagic species (*Opisthonema* spp. and *Cetengraulis mysticetus*) are retained and form a large proportion of the catch in some years. There are currently three species that, in addition to Monterey Sardine and Thread Herring - which are being fully assessed under the MSC standard as two units from this multi-species fishery, represent >5% of the catch. During full assessment, these could be classified as main retained species. During a surveillance cycle, there is no obligation to re-score performance indicators relative to these fluctuating proportions of the catch. The Client should be aware that this could be required in full re-assessment. Species comprising >5% of the catch in the last fishing season (2012/2013) were Bocona sardine (28%), Anchoveta: *Engraulis mordax* (26%), Thread Herring: *Opisthonema* spp. (22%) and Mackerel: *Scomber japonicus* (4%).

During the onsite visit for Monterey Sardines, SCS held an associated one-day onsite meeting focused on Principle 1 for Thread Herring, as both its own unit in an Expedited P1 full assessment and as a main retained species under performance indicator 2.1.1 in the sardine-targeting purse seine fishery. This

unit entered into full assessment in November 2011<sup>1</sup>, and catch landings since 1970 indicate that it has generally been the second main species captured by volume.

In the 2011/2012 fishing season and again in 2012/2013 there were notable absolute and relative increases in the catch of Bocona sardine which is a main retained species in the sardine fishery. Since 2000, Bocona sardine have exceeded *Opisthonema* species in 50% of years. This did not occur in the period between 1990/1991-2000/2001: records appear to indicate that collection of landings data for Bocona started in the 1990/1991 fishing season. In the 2012/2013 fishing season, Bocona was the dominant species in the catch by weight (28%).

**Observer Program** In 2012-2013, funding was secured from Fundación Productor and the Walton Family Foundation to develop a collaborative, multi-sectoral observer program for the fishery. In November of 2012, training began for the nine observers. Trainings included courses on identification of marine birds, marine mammals, fish and turtles. Data collected by the observer program include fishing areas, size structure, reproductive index data, abundance and mortalities. Preliminary results collected from January to April of 2013 were presented during the 2<sup>nd</sup> Surveillance Audit by both COBI and INAPESCA. Both organizations analyzed the raw data independently and results were consistent between both groups. Results were also presented to the public at the annual Small Pelagic Technical meeting in Guaymas, held June 5-7<sup>th</sup> 2013.

In 2014, results of the observer program data, analyzing all sets from January 2013 – February 2014 were presented to the assessment team. Coverage was the product of instances when captains with assigned observers chose to fish (Figure 8).

Results showed that 40% of sets occurred without catch (“Agua”), 30% captured dominantly thread herring, 7% captured Pacific sardines and a remaining 23% captured dominantly “other small pelagics” (Figure 9).

In 2013, it remained to be determined how long the observer program will continue, as it currently had a short-term funding strategy in place. Discussions during the 2<sup>nd</sup> annual surveillance audit indicated that it is possible that the program may run for one year (Nov 2012-Nov 2013). Based on the sufficiency of information, it will then be decided whether it is necessary to continue the program in subsequent years. It also remains to be determined whether the existing program with approximately 18% coverage is sufficient to generate a comprehensive understanding of the fleet’s interactions and impacts. If this is not the case, more intense or longer-term observer program monitoring may be required. The rationale and background design of the current scheme were not presented to auditors at the 2<sup>nd</sup> annual surveillance audit: auditors did receive a thorough package of the materials used by observers and

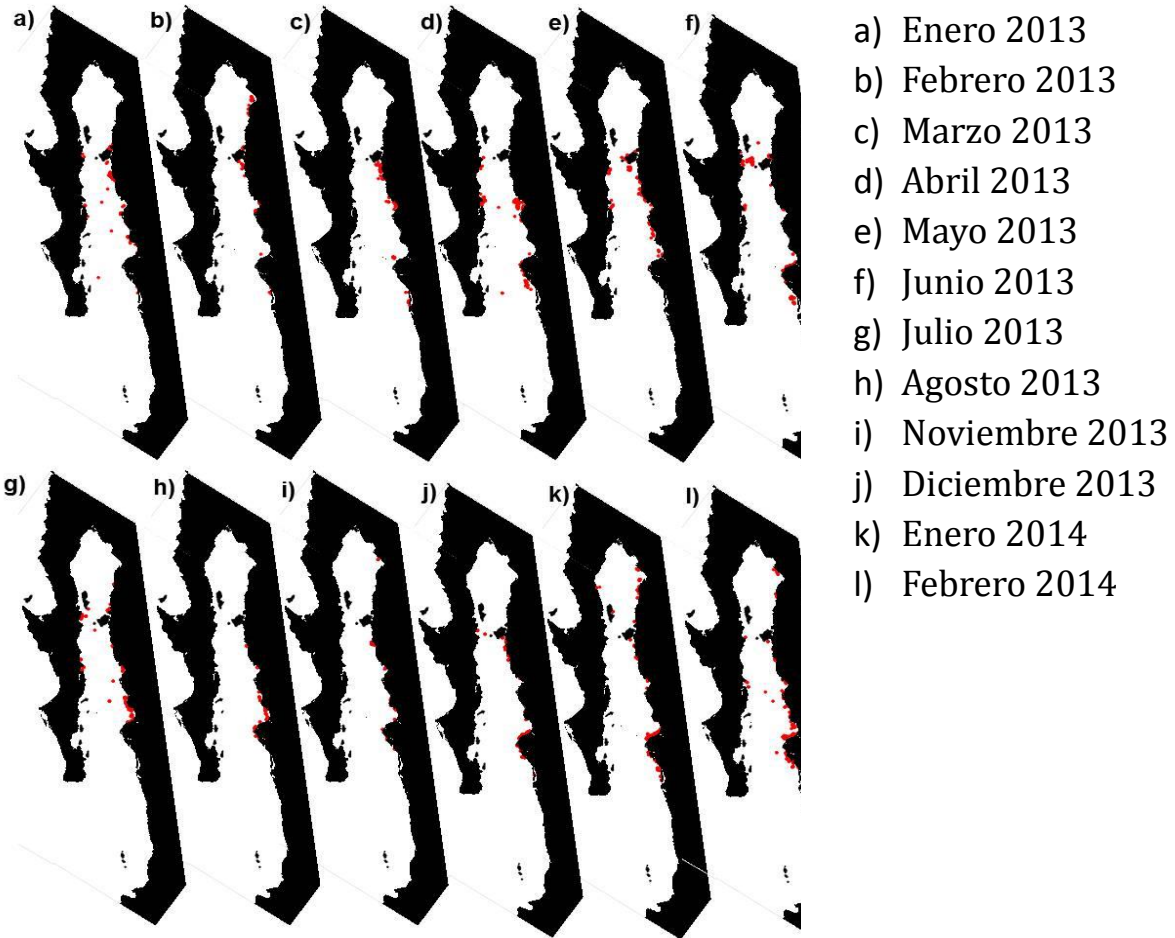
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<sup>1</sup> Recent modifications of MSC policy now allow SCS to use an Expedited P1 process (CR V1.3, Annex CL, P278) to assess Thread Herring.



evidence of observer training. The potential for onboard electronic monitoring systems is currently being explored by COBI A.C.

In the 2014 surveillance audit, the team was informed that the observer program has funding that will permit observation until August 2014. There is the intent to pursue funding through the government for ongoing observers in the fleet, but funding has not been secured. COBI indicated that further funding from philanthropic sources will not be available. The client should be aware that under at least 2.2.3. it is unlikely that it will be possible to detect increases in risk to main bycatch species, or to evaluate the efficacy of mitigation, without ongoing observer coverage.



**Figure 6. Spatial distribution of observed sets by month, analyzed by INAPESCA for 2014 3<sup>rd</sup> annual surveillance audit presentation (Nevárez-Martínez et al. 2014).**

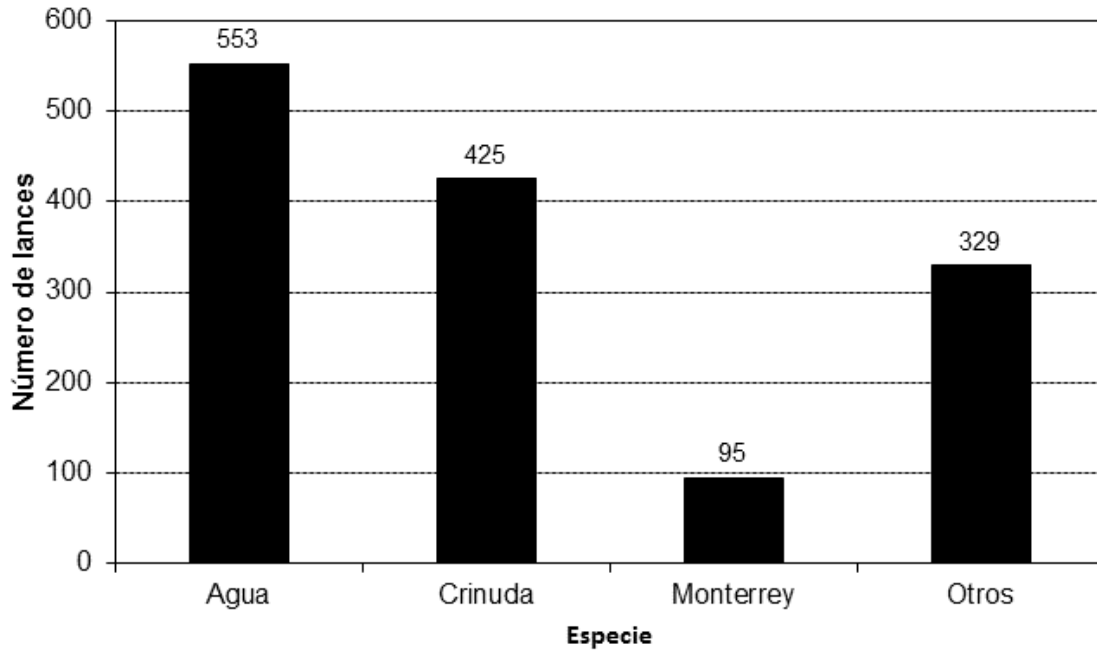
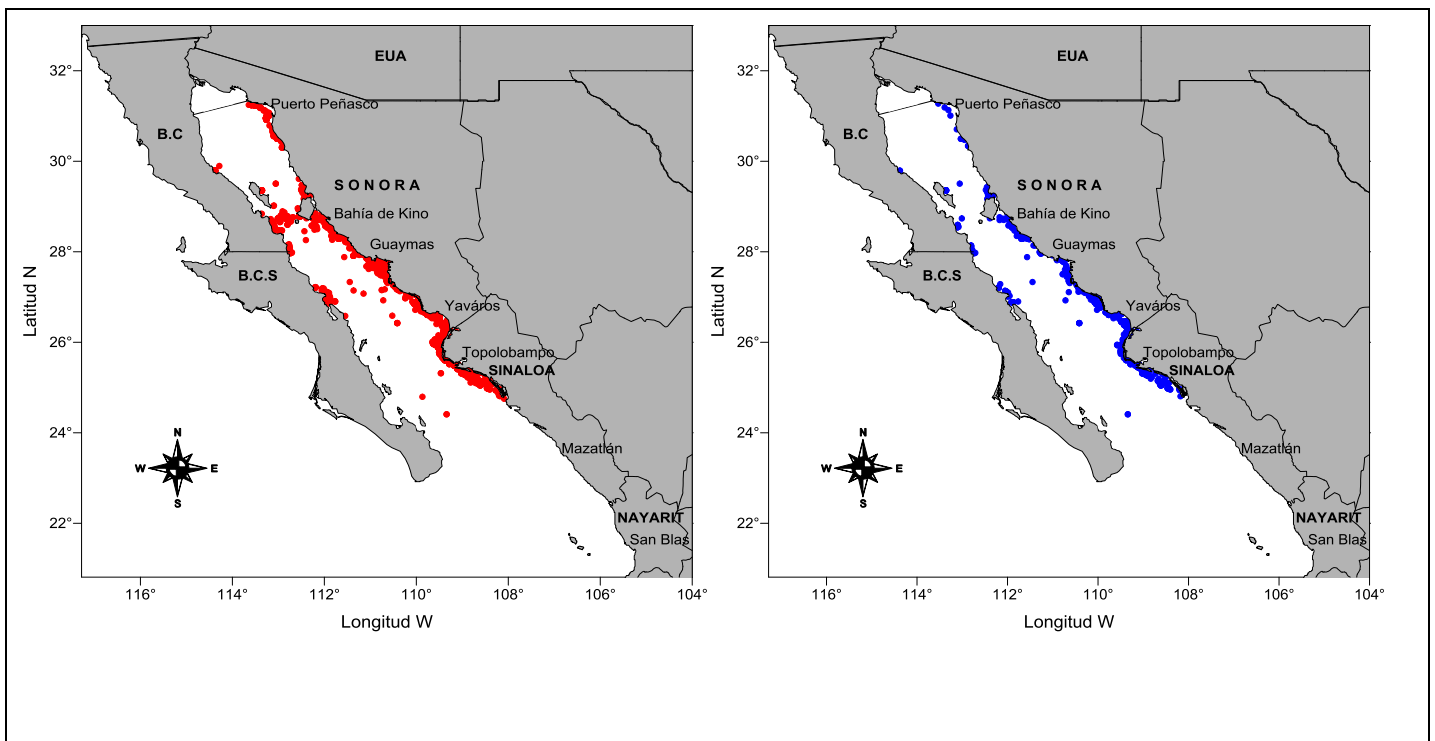
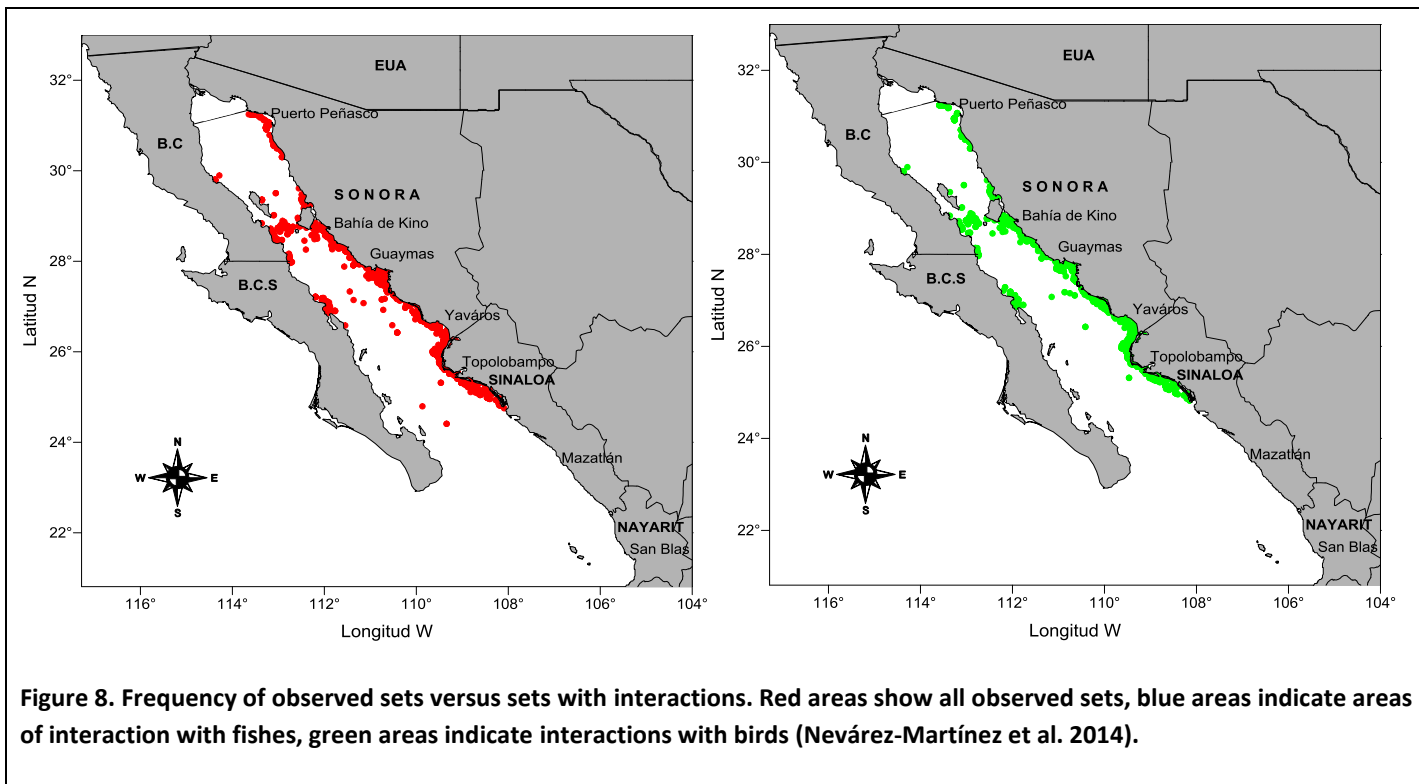


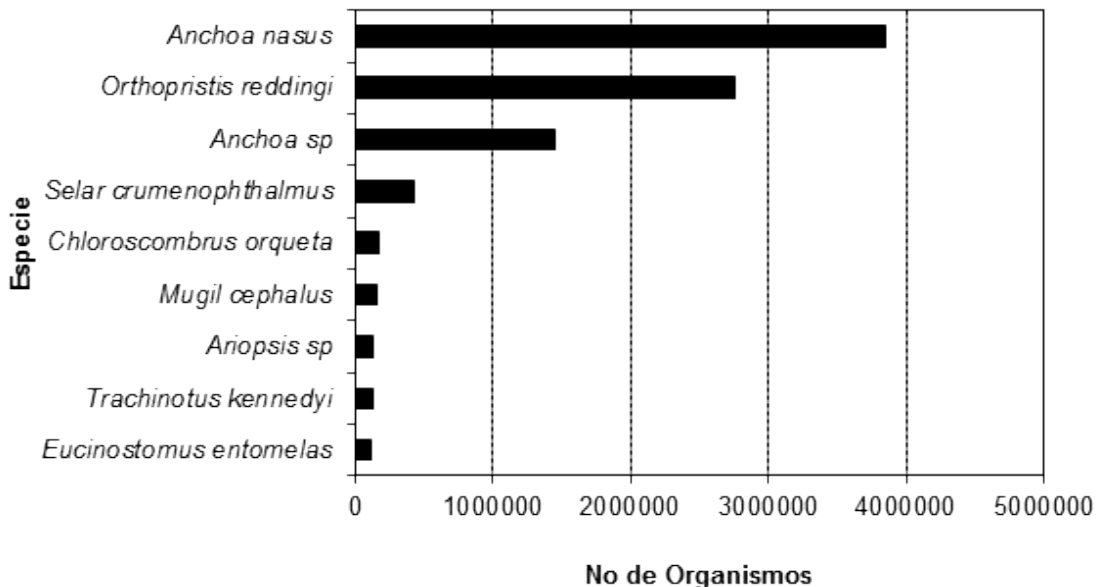
Figure 7. Frequency of main captures in all observed sets (n=1402) (Nevárez-Martínez et al. 2014).





### 3.3.2 Bycatch

Bycatch (of non-ETP species) in the Gulf of California, Sonoran small pelagic fishery comprised 79 fish species, 5 crustacean species, 3 mollusk species, 1 cnidarian species, 17 bird species, and a number of ETP species in different taxa given in Table 8. The most abundant fish species encountered are given in Figure 11, the most abundant bird species encountered are given in the top half of Figure 12 and the greatest bird mortalities in the bottom half of Figure 12.



**Figure 9. Captures of fish, by abundance, as bycatch in the small pelagic purse seine fishery January 2013 – February 2014 (Nevárez-Martínez et al. 2014).**

In the 2012 Fisheries Management Plan (SAGARPA 2012) the following species are cited as comprising bycatch and/or discards in the small pelagic fishery, but none are amongst species that are numerically common, as noted by observers (Figure 11):

Rayadillo (*Orthopristis* spp.)

Sierra (*Scomberomorus* spp.)

Yellowtail (*Seriola* spp.)

Skipjack (*Katsuwonus pelamis*)

Giant squid (*Dosidicus gigas*)

Cochito (*Balistes polylepis*)

The audit team did not receive any information in 2014 to explain whether captures represented a population level risk to any of the finfish bycatch species.

Of the 17 bird species captured, 10 represent bycatch species, while the remaining 7 are listed under NOM-059 and constitute ETP species under the MSC system (see Table 8): a total of 227 birds died in the 1402 observed sets. Water spraying birds to keep them out of nets as they are being drawn in, has been proposed and practiced to some degree since July of 2013 (see Mitigation below). No data were available on efficacy.

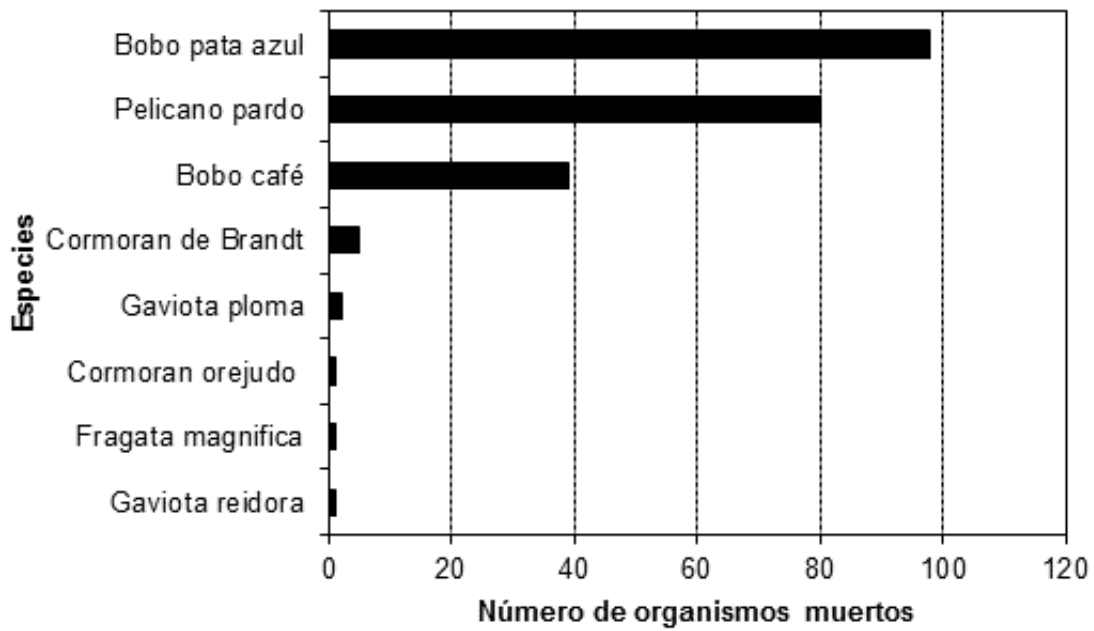
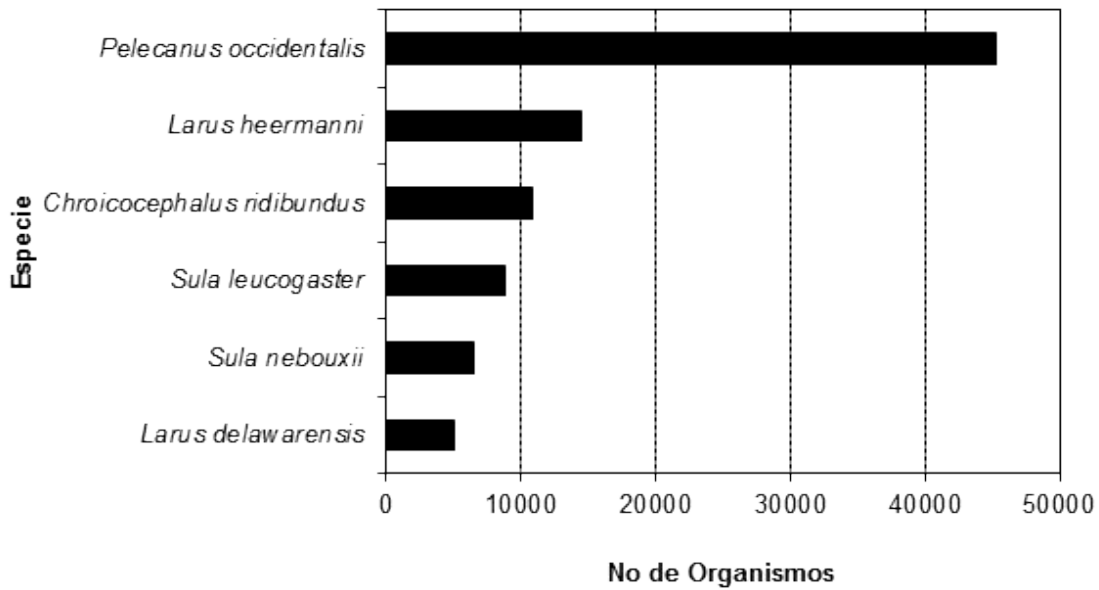


Figure 10. Bird species that were observed interacting with purse seine vessels (not necessarily in nets) in the top figure, and bird species that were mortalities in all observed sets (n=1402) (Nevárez-Martínez et al. 2014).

### 3.3.3 Endangered, Threatened or Protected (ETP) Species

There was discussion between stakeholders, INAPESCA and the audit team about potential population level risk to California Brown Pelicans and Blue-footed Boobies, given the high rate of encounters: encounters given in Figure 12 may over-represent rates, as these include sightings outside of nets as well as animals inside nets. Concern was expressed by Dr. Enriqueta Velarde that both direct and indirect mortality may cause population level threats to California Brown Pelicans and Blue-footed Boobies: both species are listed on NOM 059 and on the Migratory Species Act. The team was presented with total mortalities from observed sets, but no estimates of total mortalities by the fleet or how these relate to effective population size.

Seabirds are long-lived species with a high juvenile mortality rate and low adult mortality, late sexual maturation, low breeding rates and the capacity to skip breeding in years of poor food conditions, which confers relative stability on the size of adult populations. Any increase in the mortality of the adult population has the potential to alter the population structure and rate of population increase, which may alter the effective population size (Appendix 1).

It was discussed that the greatest impacts of the fishery may be oiling of birds inside nets which may cause indirect mortality: evidence from birds oiled in effluent from processing plants was cited as evidence (Jaques 2014). In these cases (which may, or may not have the same impacts as oiling in nets), birds were vulnerable to drowning, hypothermia, increased vulnerability to starvation and predation through loss of plumage and diminishment of insulation.

One sea lion mortality occurred and there were reports of 28 dolphin mortalities in two sets, both captured by the same captain who has had additional training by the Industry since these events. Turtles that were captured were released alive and presumed to survive.

Other interactions that pertain to ETP scoring and were presented in the 2013 surveillance audit included three types of large pelagic teleosts allocated to sport fishing (swordfish, sailfish, marlin), and one type of threatened fish (“*Amenazada*”). Three non-fatal interactions with whale sharks were also observed. None of these species was reported by INAPESCA in this year’s surveillance audit, despite the fact that observer data covered the initial period reported in 2013.

**Table 8. ETP species captured in observed purse seine sets from January 2013 – February 2014. Columns give the species common name, Latin name, observed sets, percentage of observed sets, total number of organisms, and the number of organisms affected (mortalities) (Nevárez-Martínez et al. 2014).**

Nombre común	Especie	Lances observados	% lances observados	No. Org.
<b>Peces</b>				
Caballito de mar	<i>Hippocampus ingens</i>	4	0.28	5
Tiburón martillo	<i>Sphyrna lewini</i>	7	0.5	7
Tiburón ballena	<i>Rhincodon typus</i>	1	0.07	1

<b>Tortugas</b>				
Tortuga golfina	<i>Lepidochelys olivacea</i>	2	0.14	2
Tortuga prieta	<i>Chelonia agassizii</i>	3	0.21	3
<b>Aves</b>				
Pardela pata rosada	<i>Puffinus creatopus</i>	14	0.99	34
Pardela mexicana	<i>Puffinus ophistomelas</i>	23	1.6	43
Bobo pata azul	<i>Sula nebouxii</i>	144	10.3	8,864
Pelicano pardo	<i>Pelecanus occidentalis</i>	785	56	45,313
Gaviota ploma	<i>Larus heermanni</i>	329	23.5	14,438
Gaviota pata amarilla	<i>Larus livens</i>	35	2.5	383
Charran elegante	<i>Thalasseus elegans</i>	12	0.85	135
<b>Mamíferos</b>				
Delfín	<i>Delphinus spp</i>	57	4.06	725
Lobo marino	<i>Zalophus californianus</i>	581	41.4	5,295

## Mitigation Measures

In a PowerPoint presentation to the assessment team, the following initial mitigation measures were proposed to minimize/reduce bycatch rates:

### Birds

“-Scaring, by spraying water with a pressure hose to keep birds away from the buoy line of the net. ,

- Reproduction of sounds that indicate a hazard. These could simply be loud noise blanks or sounds associated with natural predators in the area (osprey, falcons, hawks).
- Use of buoys printed with markings to resemble the eyes of predators

### Turtles and sharks

- Avoid setting on turtle or shark aggregations

### Marine Mammals

- Avoid setting on dolphins.
- Undertake backdown to release marine mammals (dolphins) that may be left inside the net.



*Backdown occurs when a boat starts moving backwards after loading about two thirds of the net, and tying off the net. The weight of the net weighs down the ship, depressing the buoyline near the hull and allowing the release of captured dolphins, but without losing fish.”*

### **General**

*- Undertake discussion each quarter with the crew of the purse seine fleet, with the following objectives: a) Crewmembers be able to identify species that are under some protection scheme. b) Explain mitigation measures for different groups, in order to reduce or eliminate involvement. c) Submit quarterly the Industrial Sector, the results obtained from the implementation of mitigation measures.”*

### **3.3.4 Habitats**

The purse seine fleet in the Gulf of California small pelagics fishery operates in mid-water between 40 and 100 meter depths and generally avoids bottom contact. Contact is intentionally avoided as the small mesh nylon netting is easily damaged. Interviews with fishermen during the site visit indicate that in the rare event when gear is lost, it is retrieved due to its high monetary value. In addition, abandoned purse-seine gear has limited capacity to continue fishing because it achieves full functionality only when used at the surface. Gear drift due to bottom currents may occur, although displacement should be limited because of its weight. Therefore, some localized damage of benthic structure and communities may occur. However, gear loss occurrences are very rare. There is no documented evidence that this fishing activity or any purse seining has had irreversible effects on any marine habitat.

The Client has been transparent about bottom contact by gear which has occurred in isolated instances in the past. The assessment team notes that there are appropriate sanctions in place and that these sanctions are regularly enforced by management.

### **3.3.5 Ecosystem Considerations**

At the 2013 2<sup>nd</sup> annual surveillance audit, stakeholders indicated in their comments to the presentation by Dr. Robinson that “other ecosystem components, such as several seabird species, have had excellent breeding success and colony productivity during 2011 and 2012, in accordance with the lack of chlorophyll-a reduction for these last years.” (Drs. Velarde, Ezcurra, Santamaria del Angel and Anderson). The assessment team understands that stakeholders are interested on preserving an important fraction of the sardine biomass because it is assumed that a decline in sardine abundance could disrupt the energy flow in the ecosystem and that this process would be reflected in low survival and/or fecundity in species such as sea birds. The relationship is assumed to be strong enough that a model was developed allowing prediction of the sardine catch based on the proportion of this fish in the diet of elegant terns, the reproductive success of Hermann’s gulls and springtime SST (Velarde *et al.* 2004). The immediate conclusion would be that if researchers report “excellent breeding success and colony productivity”, then there must be excellent conditions in the stock of sardines, at least in the area where the birds are feeding and the data are being collected.

There is evidence that there is an unexpected ecological process taking place in the Gulf of California. The advent of such events may be taken as normal components of the natural uncertainty of biological processes. It also raises the question as to whether the event is rare, or, whether previous observation systems have been insufficient to detect environmental fluctuations. It is also possible that research results that may be used to understand fluctuations are sufficiently disaggregated at present, that the necessary research capacity has not yet been aggregated for the coherence necessary to understand large scale ecosystem dynamics.

For these reasons, we **recommended** in 2013 that the Client convene interested parties to a workshop specifically aimed at improving the monitoring system of the fishery, consolidating existing information relevant to population dynamics, and identifying key gaps in this knowledge. Results of the workshop should be presented at the third annual audit surveillance in 2014 and include realistic recommendations to improve the collection of fisheries data, to better synthesize information needed to understand ecosystem-wide parameters controlling Monterrey sardine dynamics, as well as mechanisms to incorporate results into the management system.

At the onsite visit of 2014, the Client presented the minutes of two workshops that took place in October 2013 and in January 2014. The first workshop was aimed to discuss procedures to insert acoustic data and an egg and larvae based index of abundance into the SSIII analytical framework. During this workshop, Dr. Enriqueta Velarde proposed including a seabird-based index as well, and attendees convened in a January workshop to discuss how a bird index could be implemented to work in SSIII.

### **3.4 Principle 3 – Management and Regulation**

A new draft version of the Small Pelagics Management Plan was published in July 2011, and passed into law in November 2012. For further details, refer to Principle 1 Background, p. 9-11.

The surveillance team confirmed that the website for a variety of aspects related to the fishery is fully functional at <http://sardinagolfodecalifornia.org/>. The site has links to most technical documents used towards certification, minutes of post-certification workshops, technical meetings, the management plan and other relevant documents. It was noted in one of the documents that during the last regular meeting of the technical committee stakeholders attended the meeting.

In 2011, it was identified that a new version of the Carta Nacional Pesquera including small pelagics was in the process of evaluation by the Federal Government for publication: in 2013 the estimated release date of this overarching legislation for all fisheries in Mexico was 2014. In 2014 no updated information was available on the progress of the CNP revision.

A new version of the NOM-0003-PESC-1993 for the national small pelagic fishery is under revision at the COFEMER (Federal Commission for the Regulations Improvement), as indicated in the 1<sup>st</sup> annual surveillance report. The Client update at the 2<sup>nd</sup> annual surveillance indicated that release dates are not

determined. In this year's 3<sup>rd</sup> surveillance audit the Client indicated the revised NOM may be published late in 2014.

In the 2012 Management Plan, it is noted that content as follows has been proposed for the updated NOM:

- capture of pilchard, anchovy or thread herring below the minimum catch size does not exceed 30% of the number of organisms per fishing season by region.
- there will be no further authorization for the entry of more vessels, except for replacement of existing vessel and that existing vessels have good cooling systems and that existing vessels do not increase the current carrying capacity.
- that INAPESCA, based on scientific research carried out with a view to ensuring optimal resource utilization and conservation, undertake monthly reviews of the cumulative percentage of bycatch to determine when it has reached the allowable percentage (bycatch), at which point there will be the requirement to notify the National Commission of Aquaculture and Fisheries.

The annual Technical Research Committee for small pelagic fisheries was scheduled and held on June 5-7 2013. The surveillance team has seen evidence that invitations, including the workshop program, were sent to the stakeholder group. Members of the original objector group, including Anayeli Cabrera (COBI) and Enriqueta Verlarde (Universidad Veracruzana, Jalapa), attended and presented talks at the workshop.

SCS has received an updated vessel list, as part of the requirements of the standard, which can be found in Appendix 2.

In early June 2013, the Client held an educational outreach session with fishing vessel operators (vessel managers) to discuss the value of certification, the importance of good fishing practices and measures to limit the effects of the fleet on particular bycatch species. Evidence of attendance, presentation materials and diplomas issued to participants was received by SCS. In 2013-2014, one vessel captain who had twice set on dolphins was given additional instructions to avoid this practice.

## 4 Conclusions and Recommendations

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It is SCS's view that the Fishery continues to meet the standards of the MSC and to comply with the 'Requirements for Continued Certification'. SCS recommends the continued use of the MSC certificate through to the 4th surveillance audit. Two scores were increased to reflect improved performance and one of these improved scores closed a condition (2.2.3).

Five performance indicators were found behind target (2.1.1., 2.1.2., 2.2.2, 2.3.1, 2.5.2) and progress will need to be demonstrated throughout the next year and as part of the next surveillance audit. Four additional performance indicators were re-scored below 80, acquired conditions, and will need a

responsive Client Action Plan. The Client should note that any conditions that remain behind target at the next surveillance audit will result in certificate suspension or withdrawal.

## 5 Status of Previously Raised Conditions

<b>1.1.1</b>		
<b>The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing</b>		
<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>
It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired. The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired. There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.

**Score: 75 (Re-scored from 90)**

**Condition 1.1.1:** By the fourth surveillance audit, the client should provide evidence that the stock is at or fluctuating around its reference points such that recruitment is not imperiled by overfishing.

<b>Action Plan</b>	<b>By Who</b>	<b>Due</b>
<p>1.1 La Información independiente de la pesquería (hidroacústica, área de barrida y otros) continuará siendo analizada para obtener los mejores índices.</p> <p>1.2 Se realizaran talleres para mejorar la metodología para la evaluación del stock: “Evaluación de poblaciones de pelágicos menores basados en modelos estructurados por edad” y “Evaluación de recursos pesqueros con la plataforma de modelado Stock Synthesis”.</p> <p>1.3 Se realizará la evaluación de la población de sardina, que incluirá índices independientes de la pesca (hidroacústica, área de barrida, huevos y larvas, y otros). Los índices permitirán afinar la evaluación de</p>	<p>Client</p> <p>Instituto Nacional de Pesca (INAPESCA)</p> <p>Ángeles Martínez y Manuel Nevárez</p> <p>Technical Research Committee</p>	<p>1.1 By the fourth surveillance audit, It will provide evidence to the CAB (in an research report).</p> <p>1.2 We will provide evidence to the CAB, that Workshops were made August (1) y September (1) 2014.</p> <p>1.3 By the fourth surveillance audit, the stock assessment estimate will be presented to the CAB.</p>

<p>la población de sardina.</p> <p>1.4 Se realizará una revisión por pares de los resultados de evaluación de la población de sardina.</p> <p>1.5 Se revisará la condición PI 1.1.1 a la luz de los resultados de la evaluación de la población de sardina.</p> <p>1.6 La estimación de biomasa de sardina obtenida se utilizará para aplicar la regla de control del RMS y la Captura Biológicamente Aceptable (CBA), acorde con el Plan de Manejo Pesquero.</p> <p>1.7 Se evaluará la aplicación de la regla de control y la captura permisible (CBA), de ser necesario se implementarán medidas de manejo adicionales y/o emergentes.</p> <p>1.8 A partir de información documentada de la sardina del golfo de California, se mostrará evidencia de que las variaciones de la captura (magnitud y distribución) están influenciadas por la variabilidad ambiental. Lo que también permitirá mostrar que el esfuerzo pesquero de la flota varía en relación a la accesibilidad/disponibilidad de la sardina, aunque las otras especies de pelágicos menores, influyen en esta variación.</p>	<p>for Small Pelagic Fish</p>	<p>1.4 By the fourth surveillance audit, We will provide evidence to the CAB.</p> <p>1.5 By the fourth surveillance audit, We will provide evidence to the CAB.</p> <p>1.6 By the fourth surveillance audit, We will provide evidence to the CAB.</p> <p>1.7 By the fourth surveillance audit, We will provide evidence to the CAB.</p> <p>1.8 By December 2014, We will provide evidence to the CAB (in a technical report)</p>
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**Progress on Condition:** This PI was originally scored above the 80 level and therefore no condition was associated with it. At the second surveillance audit, it was noted that, should the declining trend in catch continue, re-scoring would take place. Although the decline in the catch slowed down, landings were still smaller than in the previous season. Additionally, the team did not received new evidence showing that despite the steep drop in the catch, the stock would still be above a level where recruitment is imperiled. Evidence provided at the onsite visit led the team to conclude that:

- Effort on nominal trips and boats is increasing.
- Overall catch of small pelagics is increasing.
- Catch of Monterrey sardine is declining.

- Catch of Monterrey sardine may be following a regular pattern.
- Catch of other small pelagics is increasing and also following a regular pattern.
- If catch of Monterrey sardine reflects abundance and is reaching Bmin, the management system is not applying the control rule when may be needed the most. This, despite the control rule has been in effect since 2012. No notification of any alternative action either.

Part of the evidence provided since the onsite visit of 2013 is the estimated trend of biomass based on hydroacoustic data. The authors discussed that the results need considerable revision by resolving technical acoustic questions; we therefore considered the data still unusable to draw reliable conclusions about the state of the stock. Further development of the acoustic estimates of abundance show important variations in the estimated biomass. Nevertheless, the CRIP updated the series in the 2013 reports and presented the Monterrey sardine abundance to be in the range of 512,721 to 707,752 tons in 2013. A document provided included a “Minimum biomass” as a reference point computed in a stock recruit analysis to determine if this sardine stock could be influenced by an Allee effect (Morales-Bojórquez 2005). This value is considered the lower limit in the amount of breeders that would be necessary to prevent the collapse of recruitment. The provided quantities are encouraging but far from conclusive given the uncertainties in the estimated biomass. Also, having both estimates of current biomass and an estimate of Bmin, no allowable catch has been computed and implemented into the management system. In addition, during the presentations, a chart showed a trend in CPUE of Monterrey sardine from 2009/10 to 2012/13 that differs from the CPUE for the same species in the catch and effort report of 2013 (Nevárez-Martínez et al. 2013b). In the same chart, effort in nominal trips on Monterrey sardines declined and remained about the same in seasons 2011/12 and 2012/13. Integrating all this information, it may be suggested that the catch declined with declining effort, which was not related to low abundance but rather to low availability and greater cost effectiveness of applying effort to catch other species which indeed presented an increase in the catch and must absorb the increase in effort. While this is a viable hypothesis, several pieces of information need to be either revised or explained further and the hypothesis needs to be built and presented in a formal document. This process ideally should also include discussion of other viable alternative hypotheses.

The team re-scored PI 1.1.1 considering that the evidence suggests the stock is undergoing a change in status that may represent a risk to recruitment and the ecosystem. Evidence that may indicate that biomass is still above the level of serious damage to recruitment needs further discussion and revision. Additional supporting evidence included the fact that effort in nominal trips has been increasing since the early 90s despite regulation prohibiting such increase; however, effort on Monterrey sardines specifically may have declined in the last four years. Subsequent to the surveillance audit, the team received a revised estimate of fishing mortality, 0.22, under the 0.25 reference point. Also, the size distribution of the fish at the end of fishing seasons shows >30% of the catch under 150 mm which is also a reference point given by the CNP and in the FMP.

**Status of Condition 1.1.1: Open – on target**

**1.2.4**

**There is an adequate assessment of the stock status.**

SG 60	SG 80	SG 100
<p>The assessment estimates stock status relative to reference points.</p> <p>The major sources of uncertainty are identified.</p>	<p>The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points.</p> <p>The assessment takes uncertainty into account.</p> <p>The stock assessment is subject to peer review.</p>	<p>The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.</p> <p>The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.</p> <p>The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.</p> <p>The assessment has been <u>internally and externally</u> peer reviewed.</p>

**Score: 75 (No change)**

**Condition 1.2.4:** By the second surveillance, the client should provide evidence that fishery – independent data has been collected. In addition, the client should provide some proof by the fourth surveillance audit, that this data has been incorporated into the stock assessment of the sardine fishery in addition to fishery-dependent data.

Action Plan	By Who	Due
<p>Fishery-independent data of stock size, using hydro-acoustic measurements, has already been collected during the last three research cruises. The plan is to continue collecting fishery-independent data twice annually. These data will be used for fisheries management because it will be used for tuning the stock assessment analysis, which today use fishery-dependent data. Preliminary results for the biomass of sardine, obtained by hydroacoustic methods for</p>	<p>Technical Research Committee for Small Pelagic Fish, that will incorporate all stakeholders interested in the certification of the fishery, that will be chaired by a member of academia elected by the participants and its technical secretary will be a</p>	<p>At the second surveillance audit in 2012, this data will be presented to the CAB.</p> <p>By the fourth surveillance audit in 2014, proof will be provided that this data has been incorporated into the stock</p>

<p>the last three years were very similar to estimates obtained from virtual population analysis. In addition, the evaluation model will also include environmental indices. At the second surveillance audit this data will be presented to the CAB.</p>	<p>representative from INAPESCA</p> <p>Sardine fishery scientist (Manuel Nevárez, INAPESCA)</p>	<p>assessment. This data will be used to establish harvesting rules.</p>
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**Progress on Condition:** In 2013, SCS received a copy of the main report from INAPESCA summarizing the development of hydroacoustic methods and preliminary results based on work from 2008-2012. Additional informal findings were presented by INAPESCA at the 2014 3<sup>rd</sup> surveillance audit. There remains work to be done to ground-truth the target strength signal in order to understand how it relates to the abundance and resolution of different species in the catch. The assessment team understands that this work is underway: results were presented in a timely manner, to close out the year two portion of the Client Action Plan.

Evidence was presented at the third surveillance audit indicating that progress is being made in the development of indices independent of the fishery. These indices include hydroacoustic estimates of biomass, an index based on eggs and larvae and auxiliary data based on bird diet. The indices and related data are being worked out to be inserted in the Stock Synthesis III model. To this end, a workshop is expected to take place within the next month where an expert on SSIII will assist the participants in the use of the software. The workshop will be followed by actual application of the model with the available data. Inserting indices independent of the fishery is consistent with recommendations made at the second surveillance audit and this condition shows favorable progress: it is on target.

The team re-iterates that next year the team will evaluate performance at the SG 80 level, based on whether: a) the assessment is appropriate for the stock and for the harvest control rule, b) is evaluating stock status relative to reference points, c) takes uncertainty into account and d) is subject to peer review. These factors will be assessed in Year 4 in order to close the condition.

**Status of Condition 1.2.4: Open – on target**



<b>2.1.1</b>		
<b>The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.</b>		
SG 60	SG 80	SG 100
<p>Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.</p> <p>If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.</p>	<p>Main retained species are <u>highly likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy of demonstrably effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.</p>	<p>There is a <u>high degree of certainty</u> that retained species are within biologically based limits.</p> <p>Target reference points are defined and retained species are at or fluctuating around their target reference points.</p>

**Score: 75 (No change)**

**Condition 2.1.1:**

By the third annual surveillance provide evidence to the CAB that the main retained species (*Opisthonema* spp. and *Cetengraulis mysticetus*) are highly likely to be within biologically based limits, or if outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.

<b>Action Plan</b>	<b>By Who</b>	<b>Due</b>
<p>Annual Projects at INAPESCA have the objective, amongst others, to determine the effect of the fisheries on small pelagic populations, for which systematic biological sampling is conducted, and gathering of catch and fishing effort data. This information will make the stock assessment individually for the main small pelagic species. This will provide the fishing mortality estimates specific to each size (Fsize), average fishing mortality (Fa) and abundance of size (Nsize). In addition, changes in future fish yields (Y) and average biomass</p>	<p>Instituto Nacional de Pesca, Manuel Nevárez.</p>	<p>By the third surveillance audit, we will provide evidence to the CAB (in an annual research report) that the main retained species are highly likely to be within biologically based limits, or if are outside the limits there are a partial strategy</p>

<p>of populations for the main small pelagic species that are retained as part of this fishery, will be explored individually with a predictive model, which will allow us to estimate the maximum sustainable yield (MSY), and mortality associated with that fishery yield (<math>F_{MSY}</math>). These results will be presented in an annual research report.</p> <p>The Fisheries Management Plan (FMP) for small pelagic fish, which is currently being developed, defined control rules for all species included in the FMP, including <i>Opisthonema</i> spp. and <i>Cetengraulis mysticetus</i>. It also includes emerging management actions, which are the management actions we can take, if one or more reference points are reached or exceeded. Any management option that we consider will aim to maintain (or return) the fishery resource and non-critical (sustainable).</p>		<p>of demonstrably effective management measures in place, such that the fishery does not hinder recovery and rebuilding.</p>
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**Progress on Condition:** INAPESCA is working with predictive models to obtain estimates of the maximum sustainable yield (MSY) for all main retained species and this work is being complimented by fisheries independent data collected through system hydroacoustic surveys. A formal report, describing the methods was produced in 2012, but does not indicate that hydroacoustic methods are sufficiently developed yet to provide robust species-based estimates of abundance. Informal results examining differences in biomass estimates using various different methods for transforming signal data were presented to the assessment team at the onsite meeting in 2014.

Evidence has been presented that the status of the *Opisthonema* stock is within biologically based limits. The estimated biomass trajectory shows an upward trend suggesting that the stock is healthy and producing a surplus large enough to allow for the increase in biomass. Additionally, the estimated history of fishing mortality is for the most part below the estimated level of fishing mortality that produces the optimal catch ( $F=0.621$ ) and under the reference point declared in the FMP ( $F=0.25$ ).

In addition, if Bocona sardine continues to be managed passively as per the current designation in the Fisheries Management Plan, the Client will need to develop evidence to demonstrate that either the stock is within biologically based limits, or if outside, demonstrate that measures that constitute at least a partial strategy have been defined, **are in use** and provide a high likelihood of maintaining the population within biologically based limits.

**Status of Condition 2.1.1: Open – Behind Target**

At the fourth surveillance audit, the Client must provide evidence to the CAB that *Opisthonema* spp. and *C. mysticetus* are highly likely to be within biologically based limits (or if they are outside the limits, that

there is a partial strategy of demonstrably effective management measures in place, such that the fishery does not hinder recovery and rebuilding). Note that the focus of this performance indicator is on the stock status (**outcome**) of the retained species. Therefore, to close this condition, it will be necessary that management measures have quantities associated with them and that there is evidence that **measures commensurate with these values have been implemented in practice**. This behind target will manifest in certificate suspension or withdrawal if changes are not addressed by May 2015.

**2.1.2**

**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.**

SG 60	SG 80	SG 100
<p>There are <u>measures</u> in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.</p> <p>The measures are considered <u>likely</u> to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).</p>	<p>There is a <u>partial strategy</u> in place, if necessary that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.</p> <p>There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or species involved.</p> <p>There is <u>some evidence</u> that the partial strategy is being <u>implemented successfully</u>.</p>	<p>There is a <u>strategy</u> in place for managing retained species.</p> <p>The strategy is mainly based on information directly about the fishery and/or species involved, and <u>testing</u> supports <u>high confidence</u> that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being <u>implemented successfully</u>, and intended changes are occurring.</p> <p>There is some evidence that the strategy is <u>achieving its overall objective</u>.</p>

**Score: 70**

**Condition 2.1.2:**

By the 3<sup>rd</sup> annual surveillance audit provide basis for confidence to the CAB that the partial strategy will work. In order to do so the client shall consider setting harvest rates and assessments for individual species and incorporate these into the management plan.

Action Plan	By Who	Due
The Fisheries Management Plan (FMP) for small pelagic fish, which is currently being developed, defined control rules for all species included in the FMP, including <i>Opisthonema</i> spp. and <i>Cetengraulis mysticetus</i> . It also includes emerging management actions, if one or more reference points reached or	Instituto Nacional de Pesca,  Manuel Nevárez.	By the 3 <sup>rd</sup> annual surveillance audit provide basis for confidence to the CAB that the partial strategy will work.

exceeded.		
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**Progress on Condition:** A Fisheries Management Plan for Small Pelagics was formalized into law in November of 2012 that includes a harvest strategy and precautionary reference points. The current fisheries management plan does not include *Cetengraulis mysticetus* as an actively managed species, despite the fact that it comprises a significant proportion of catch and has become increasingly abundant in catches since 2000.

In order to meet this condition, the client will have to assure that *Opisthonema* species are being actively managed using the harvest control rules specified in the updated fisheries management plan: this is not currently occurring; however, all quantities have been computed to a minimum of confidence and could be used to compute the biologically acceptable catch.

In addition, if Bocona sardine continues to be managed passively, the Client will need to develop evidence to demonstrate that there is a **partial strategy in place**, if necessary, that is expected to maintain the species at levels that are highly likely to be within biologically based limits. There will need to be some **objective basis for confidence** that the partial strategy works, based on some information directly about the fishery and/or species involved (scoring issue b). Finally there will need to be **some evidence** that the partial strategy is being **implemented successfully** (scoring issue c). The current management plan, associated fisheries regulations and procedures, do not have Bocona-specific measures for the team to score.

**Status of Condition 2.1.2: Open – Behind target**

At the third annual surveillance audit there was evidence that, while there are elements in the Fisheries Management plan defining active management for Thread Herring, the partial strategy remains to be implemented into a **functional design through numerical definition**; however, all elements of the harvest control rule are already available and even if some of them are still preliminary, the rule can be computed and implemented. Similarly, for Bocona sardines the team did not see evidence that the partial strategy for passive management had any implementable measures in place to keep the species within biologically based limits. The team reiterates from last year’s audit that methods that could be used to make the case for any measures put in place could include simulation modeling, or other forms of prediction. Note that the focus of this performance indicator is on **designing clear, quantified, reasonable management strategies** for the two retained species, while scores in PI 2.1.1. relate to effective implementation (outcome). This behind target will manifest in certificate suspension or withdrawal if changes are not addressed by May 2015.

**2.2.2**

**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations.**

SG 60	SG 80	SG 100
<p>There are <u>measures</u> in place, if necessary, which are expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.</p> <p>The measures are considered <u>likely</u> to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).</p>	<p>There is a <u>partial strategy</u> in place, if necessary, for managing bycatch that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.</p> <p>There is <u>some objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or the species involved.</p> <p>There is <u>some evidence</u> that the partial strategy is being implemented successfully.</p>	<p>There is a <u>strategy</u> in place for managing and minimizing bycatch. The strategy is mainly based on information directly about the fishery and/or species involved, and testing supports <u>high confidence</u> that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>

**Score: 70 (No change)**

**Condition 2.2.2:**

By the 3<sup>rd</sup> annual surveillance audit, provide some evidence, if necessary, that the main bycatch species are highly likely to be within biologically based limits, or if outside such limits develop a partial strategy of demonstrably effective mitigation measures and provide some evidence to the CAB that the strategy has been implemented successfully.

Action Plan	By Who	Due
The study mentioned in 2.2.3 will provide baseline data on bycatch species of the Gulf of California Sardine Fishery. Once the composition and biomass of bycatch species are known (by the second surveillance audit) we will have a very good idea as to the	Technical Research Committee for Small Pelagic Fish (as detailed under cond. 1.2.4)	By the third surveillance audit, there will be provided some evidence, to the CAB, that main bycatch species are highly likely to be within biologically based limits, or if outside such limits development of a partial strategy of demonstrably effective mitigation measures will

<p>steps taken as to determine if they are within biological limit or if not to take the necessary mitigation measures.</p> <p>In others words, there should be sufficient information as to take the necessary steps to mitigate the effect of the fishery on other species, or if necessary to do more research to satisfy the CAB and achieve the required score for this indicator.</p>		<p>be presented to the CAB.</p>
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**Progress on Condition:** There has been strong progress on developing a scientifically defensible and comprehensive monitoring and reporting system for bycatch species since the first annual surveillance audit. There is evidence that the Client and collaborators met the obligation of the 2012 condition to provide evidence that the observer program has been implemented successfully. Funding from Fundación Productor and the Walton Family Foundation was used to develop and implement a functional observer program for the fishery, with 9 new observers. Funding is being administered by Community and Biodiversity, AC (COBI). In November 2012, a series of workshops were held to train observers in seabird, marine mammal and teleost identification, as well as vessel safety and protocols. The observer program started to generate quantitative and qualitative information in January 2013 and results analyzing data from January 2013-February 2014 were presented to the audit team at the 3<sup>rd</sup> annual surveillance audit.

At the third surveillance audit the Client did not provide evidence to the CAB that main bycatch species are highly likely to be within biologically based limits. INAPESCA presented proposed mitigation measures, but these have not been tested or evaluated for efficacy, nor have spatial or temporal means of mitigation been considered.

In 2013, the team noted that meeting this requirement in 2014 could be challenging given that first information on interactions began in January 2013 and that closing the conditions **also would require knowledge of the how bycatch will/won't impact population limits**. The team will accept reasonable arguments, but will require more sophisticated exploration for species where catches are high, species are vulnerable, have limited distributions, or there are other valid reasons to suspect that **direct or indirect impacts pose a risk of serious or irreversible harm** to bycatch species.

**Status of Condition 2.2.2: Open – Behind Target**

**2.2.3**

**Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.**

SG 60	SG 80	SG 100
<p><u>Qualitative information</u> is available on the amount of main bycatch species affected by the fishery.</p> <p>Information is <u>adequate</u> to <u>broadly understand</u> outcome status with respect to biologically based limits.</p> <p>Information is adequate to support <u>measures</u> to manage bycatch.</p>	<p><u>Qualitative information and some quantitative information</u> are available on the amount of main bycatch species affected by the fishery.</p> <p>Information is sufficient to estimate outcome status with respect to biologically based limits.</p> <p>Information is adequate to support a <u>partial strategy</u> to manage main bycatch species.</p> <p>Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</p>	<p><u>Accurate and verifiable information</u> is available on the amount of all bycatch and the consequences for the status of affected populations.</p> <p>Information is <u>sufficient</u> to quantitatively estimate outcome status with respect to biologically based limits with a <u>high degree of certainty</u>.</p> <p>Information is adequate to support a <u>comprehensive strategy</u> to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective.</p> <p>Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.</p>

**Score: 80 (Re-scored from 70)**

**Condition 2.2.3:**

By the third surveillance audit, assure that information is sufficient to estimate outcomes status with respect to biologically based limits and that sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).

Action Plan	By Who	Due
We have planned two programs:	Technical Research Committee for Small	At the second surveillance audit, this data will be



<p>1) <del>the first one a study that will be conducted by the post graduate student Sergio Macias, at CIBNOR La Paz Mexico, and will provide a base line and estimates on composition and biomass of bycatch species caught in the sardine fishery. According to the work plan raised the fishing trips will be performed three times during the fishing season (July, November/December, February/March), and the trips will last from one to one and a half weeks. The bycatch species will be collected, photographed and identified.</del>  <span style="color: red;">(Removed at 2<sup>nd</sup> surveillance audit. Student no longer working on project)</span></p> <p>2) The second is an observer program that will be implemented from October of 2010, for one year, and will be done by three technical staff working full time. These technicians will be working onboard of the sardine fishery vessels, and at fishing landing sites. During these activities data of bycatch species will be obtained and interactions between the fishery and endangered, threatened and protected (ETP) species will be monitored and recorded. The work will continue if more information is required.</p> <p>This program will be important part of INAPESCA effort to gather sufficient information about the bycatch species and of the interaction with the ETP species, to further understand, identify and develop management measures oriented to mitigate potential issues of the bycatch and about the ecosystem issues. The results will be presented to the CAB on the second surveillance.</p>	<p>Pelagic Fish (as detailed under cond. 1.2.4)</p> <p>Industry, Cámara Nacional de la Industria Pesquera</p> <p>Instituto Nacional de Pesca.</p> <p>Supervised by Manuel Nevarez,</p> <p>INAPESCA</p>	<p>presented to the CAB.</p> <p>There will be sufficient information to take the necessary steps to treat in an informed way the bycatch situation.</p>
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**Progress on condition:** There has been strong progress on developing a scientifically defensible and comprehensive monitoring and reporting system for bycatch species since the first annual surveillance audit. There is evidence that the Client and collaborators met the obligation of the 2012 condition to provide evidence that the observer program has been implemented successfully. Funding from Fundación Productor and the Walton Family Foundation was used to develop and implement a functional observer program for the fishery, with 9 new observers. Funding is being administered by Community and Biodiversity, AC (COBI). In November 2012 a series of workshops were held to train observers in seabird, marine mammal and teleost identification, as well as vessel safety and protocols. The observer program started to generate quantitative and qualitative information in January 2013 and

results analyzing data from January 2013-February 2014 were presented to the audit team at the 3<sup>rd</sup> annual surveillance audit.

Evidence presented at the 2014 3<sup>rd</sup> annual surveillance audit indicate that there is now a full season of qualitative information and quantitative information available on the amount of main bycatch species affected by the fishery. This information will be is sufficient to estimate outcome status with respect to biologically based limits for retained, bycatch and ETP species.

**Status of Condition 2.2.3: Closed**

**The team cautions the Client to note that in order to maintain an 80 score, it will be necessary to assure that sufficient data continue to be collected to detect any increase in risk to main bycatch species. This should be given careful consideration, given that funding currently only exists to continue monitoring until August 2014. Ongoing observer coverage will be needed to detect any increase in risk to main bycatch species.**

<b>2.3.1</b>		
<p><b>The fishery meets national and international requirements for protection of ETP species.</b>  <b>The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.</b></p>		
SG 60	SG 80	SG 100
<p>Known effects of the fishery are <u>likely</u> to be within limits of national and international requirements for protection of ETP species.</p> <p>Known direct effects are <u>unlikely</u> to create <u>unacceptable impacts</u> to ETP species.</p>	<p>The effects of the fishery are known and are <u>highly likely</u> to be within limits of national and international requirements for protection of ETP species.</p> <p>Direct effects are <u>highly unlikely</u> to create <u>unacceptable impacts</u> to ETP species.</p> <p>Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.</p>	<p>There is a <u>high degree of certainty</u> that the effects of the fishery are within limits of national and international requirements for protection of ETP species.</p> <p>There is a <u>high degree of confidence</u> that there are <u>no significant detrimental effects (direct and indirect)</u> of the fishery on ETP species.</p>

**Score: 75 (No change)**

**Revised Condition 2.3.1:**

By the third annual surveillance audit provide information to demonstrate that the effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species. There is evidence that both direct and impacts are highly unlikely to create unacceptable (serious or irreversible) impacts on populations of affected ETP species. The client will also need to specify definitions that they are following for ETP species under national law.

**Progress on Condition:** There has been strong progress on developing a scientifically defensible and comprehensive monitoring and reporting system for bycatch species since the first annual surveillance audit. There is evidence that the Client and collaborators met the obligation of the 2012 condition to provide evidence that the observer program has been implemented successfully. Funding from Fundación Productor and the Walton Family Foundation was used to develop and implement a functional observer program for the fishery, with 9 new observers. Funding is being administered by Community and Biodiversity, AC (COBI). In November 2012 a series of workshops were held to train observers in seabird, marine mammal and teleost identification, as well as vessel safety and protocols.

The observer program started to generate quantitative and qualitative information in January 2013 and results analyzing data from January 2013-February 2014 were presented to the audit team at the 3<sup>rd</sup> annual surveillance audit.

Action Plan	By Who	Due
<p>The study mentioned in 2.2.3 will provide baseline data on the impact of the Gulf of California Sardine Fishery on ETP species. As was mentioned in 2.2.3., during these activities data of bycatch species will be obtained and interactions between the fishery and endangered, threatened and protected (ETP) species will be monitored and recorded. The work will continue if more information is required.</p> <p>This program will be important part of INAPESCA effort to gather sufficient information about the bycatch species and of the interaction with the ETP species, to further understand, identify and develop management measures oriented to mitigate potential issues of the bycatch and about the ecosystem issues.</p>	<p>Technical Research Committee for Small Pelagic Fish (as detailed under cond. 1.2.4)</p> <p>Industry, Cámara Nacional de la Industria Pesquera</p> <p>Instituto Nacional de Pesca.</p> <p>Supervised by Manuel Nevarez,</p> <p>INAPESCA</p>	<p>At the second surveillance audit, this data will be presented to the CAB.</p> <p>There will be sufficient information to take the necessary steps to treat in an informed way about the interaction between the fishery and the ETP species.</p>

At the 3<sup>rd</sup> annual surveillance in 2014 evidence was not presented to the team that information from the observer program had been used to generate a reasoned understanding of direct and indirect impacts of the fishery on ETP species, which would require reasoning based on overall population size and status of ETP species relative to direct or indirect impacts exerted by the fishery. Preliminary mitigation measures were described by INAPESCA, with evidence of partial implementation (re-education of captains and water curtains) but these had not been translated into formal management procedures, nor was there evidence that mitigation measures had been conceived based on a reasoned understanding of the relative threat to species most detrimentally impacted by the fishery.

**Status of Condition 2.3.1: Open – Behind Target**

**Minor non-conformance 2.2.3**

Before the 3<sup>rd</sup> annual surveillance provide evidence to the CAB that the observer program has been implemented successfully, has been used to generate an accurate understanding of direct and indirect impacts of the fishery on ETP species, and as per the Client Action plan, necessary measures have been identified by INAPESCA in management procedures.

<b>2.5.1</b>		
<b>The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.</b>		
SG 60	SG 80	SG 100
The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.

**Score: 60**

**Condition 2.5.1:**

By the fourth annual surveillance audit, the client should present evidence that the fishery is highly unlikely to disrupt the ecosystem structure to a point where there would be serious or irreversible harm.

Action Plan	By Who	Due
<p>An ecosystem model will be built to understand what is the portion of biomass that the ecosystem requires to maintain its structure and functioning (Bmin-ecosystem). To do so, previous ecosystem models on small pelagics developed for the Gulf of California will be used and updated.</p> <p>This estimation will compared to current Bmin.</p>	<p>COBI</p> <p>Francisco Arreguín</p> <p>INAPESCA</p>	<p>May 2015</p>

**Progress on Condition:** This PI was originally scored at the 80 level and therefore no condition was associated with it. At the second surveillance audit it was noted that, should the declining trend in catch continue, re-scoring of PI 1.1.1 and related indicators would take place. Special attention was given to the question of how the Bmin parameter in the harvest control rule would be obtained. At the time of the third surveillance audit the catch was still declining, no sufficient explanation about the decline other than anecdotic accounts of changes in fish availability, and no reliable information on biomass was

offered. The team considered that the fishery required utilization of the HCR accounting for the current state of the stock to adjust the catch, preventing the biomass to go under the level that would maintain the functional structure of the ecosystem. This requires the formal definition of Bmin which may have been included in a table but without explanation of the source and confirmation that it is the quantity required by the control rule. Under these circumstances, it was considered that the HCR cannot serve one of its primary purposes to prevent damages to the ecosystem structure, leading to re-scoring of PI 2.5.1. At SG80, this PI includes only one scoring issue, because of this, if requirements are not met, the score automatically drops to 60.

**Status of Condition 2.5.1: Open – On target**

2.5.2		
There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
SG 60	SG 80	SG 100
<p>There are <u>measures</u> in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.</p> <p>The measures are considered likely to work, based on <u>plausible argument</u> (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</p>	<p>There is a <u>partial strategy</u> in place, if necessary, that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The partial strategy is considered likely to work, based on <u>plausible argument</u> (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</p> <p>There is <u>some evidence</u> that the measures comprising the partial strategy are being implemented successfully</p>	<p>There is a <u>strategy</u> that consists of a <u>plan</u>, containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p> <p>The measures are considered likely to work based on <u>prior experience</u>, plausible argument or <u>information</u> directly from the fishery/ecosystems involved.</p> <p>There is <u>evidence</u> that the measures are being implemented successfully.</p>

**Score: 85 (Re-scored from 75)**

**Condition 2.5.2:**

By the third annual surveillance audit, develop a strategy to restrain impacts of the Sardine fishery on the Gulf of California ecosystem and provide evidence to the CAB that the strategy has been implemented successfully.

Action Plan	By Who	Due
<p>Because the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function, no strategy has been in place to restrain impacts of the fishery on the ecosystem. However, in the Fishery Management Plan (FMP), that is currently being developed, proper and formal consideration of the role of the resource on the maintenance of the ecosystem, particularly as food for other species shall be included. It also includes research requirements for determining ecosystem interactions with the aim of reducing fishery impacts. So from the FMP be developed and implemented the strategy for reducing the impacts of fishing on the ecosystem.</p> <p>We know that the INAPESCA in conjunction with other academic institutions have plans to develop ecosystem models for fisheries management, but we have no information about their status.</p>	<p>Technical Research Committee for Small Pelagic Fish (as detailed under cond. 1.2.4)</p> <p>Instituto Nacional de Pesca,</p> <p>Manuel Nevárez.</p>	<p>By the third surveillance audit, we will provide some evidence, to the CAB, that the strategy has been implemented successfully.</p>

**Progress on Condition:** The Small Pelagics Management Plan was published in November 2012. It includes considerations of the resource on the maintenance of the ecosystem and specifies research priorities to inform ecosystem-based management. The management plan highlights the need to develop models taking into consideration the ecosystem approach. One approach will be the use of information produced by the on-board observer identifying and quantifying bycatch associated with fishing operations. During the second annual surveillance audit in 2013, there was discussion about the role that COBI may choose to play in facilitating the development of ecosystem models either directly, or indirectly.

In 2013, the fishery was informed that in order to fulfil scoring requirements at the SG 60 and SG 80 levels, it would be necessary to demonstrate to the assessment team in the third surveillance audit that existing knowledge has the ability to identify “**key elements**” of the ecosystem, has a partial strategy in place that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem, and some evidence that this partial strategy has been implemented. The team also cautioned that this will represent a significant amount of work over the next year, and we cautioned that this work should begin immediately in order to have the time to understand the key elements of the system and then implement any necessary strategy by the 3<sup>rd</sup> surveillance audit.

At the 2014 surveillance audit, information on key elements of the ecosystem was not presented to the team, although the team did receive information for the Expedited P1 assessment of thread herring, as

another species in this multi-species fishery, giving the relative contribution of various small pelagics to the diet of higher trophic level species in the ecosystem. This work was intended to define whether thread herring classified as key or non-key low trophic level species for P1 scoring purposes.

Given that the condition required that the Client “develop a strategy to restrain impacts of the Sardine fishery on the Gulf of California ecosystem and provide evidence to the CAB that the strategy has been implemented successfully”, and that this objective is addressed in the Fisheries Management Plan through the Harvest Control Rule, the team evaluated the current score based on progress towards developing a numeric value for Bmin and showing (Scoring Issue c at SG 80) “*that measures comprising the partial strategy are being implemented effectively*”. This value was numerically defined for sardines based on a previous investigation on the stock-recruit relationship and the potential of an Allee effect that could place the recruitment at risk under low biomass levels. .

#### **Status of Condition 2.5.2: Closed**

**The team cautions the Client to note that in order to maintain a score above 80, it will be necessary to show that the HCR has been computed and implemented as a functional element of the management system for the purposes of ecosystem management. This will be necessary to fulfill the requirement in the previous paragraph “that measures comprising the partial strategy are being implemented effectively”. If Bmin is being used only to manage stock health, this will not constitute a partial strategy to address ecosystem needs.**



**3.2.1**

**The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.**

SG 60	SG 80	SG 100
Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>implicit</u> within the fishery management system.	Short and long term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>explicit</u> within the fishery management system.	Well defined and measurable short and long term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>explicit</u> within the fishery management system.

**Score: 80**

**Condition 3.2.1:**

By the 2<sup>nd</sup> annual surveillance audit evidence should be provided, that the short and long term objectives are explicit within the fishery's management system and consistent with achieving the outcomes expressed by MSC's Principles 1 and 2. Therefore the specific Management Plan for the fishery shall be completed and shall include proper and formal consideration of the role of the resource on the maintenance of the ecosystem and these considerations shall be incorporated into the harvest control rules.

Action Plan	By Who	Due
<p>A comprehensive Fishery Management Plan (FMP) is in its final draft stages as of June 2010 and shall be adopted by the second annual surveillance. The FMP is designed to cover most of the requirements stated in the specific conditions.</p> <p>There are two additional regulatory instruments used to control guidelines and management decisions about fisheries in Mexico. These are 1) the Carta Nacional Pesquera which by law is to be updated every two years, and 2) NOM-003-PESC-1993, currently under revision. These instruments will collectively determine fishing methods, gear types, open/closed fishing areas, TAC's, size, ecosystem provisions etc.</p> <p>The comision Federal de Mejora Regulatoria (COFEMER) is a government body engaged in advisory oversight and advocacy</p>	<p>Technical Research Committee for Small Pelagic Fish (as detailed under cond. 1.2.4)</p> <p>Instituto Nacional de Pesca.&amp; Comisión Nacional de Acuacultura y</p>	<p>We expect this to be published by 2012 - 2013.</p>

<p>functions on regulatory reform matters with the objective to promote transparency in the design and implementation of regulations. The FMP will be put on COFEMER website for ample consultation by any interested party.</p> <p>The Instituto Nacional de Pesca (INAPESCA) whose decisions on fishery management are final holds yearly workshops for coordination of research by the various institutions involved in fishery research.</p>	<p>Pesca (CONAPESCA)</p> <p>They are responsible for its publication</p>	
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**Progress on Condition:** The new version of the Small Pelagics Fishery Management Plan includes a Research Plan for small pelagics and was published in November 2012 and was open for public comments through several meeting at the different ports where this fishery is carried out (Guaymas March 16-18; Guaymas April 26-29; Ensenada May 26-27; and Guaymas June 21-24). The management plan invokes two main categories of management, a new harvest control with a Bmin terms to potentially reserve biomass for ecosystem function, and lists details on specific lines of research that include Populations Dynamics, Stock Assessments, Ecosystem Approach, Predicting Models, Habitat, Socio-economics, and Exploratory Fishing. There is evidence that the 2012 Fisheries Management Plan for Small Pelagics short and long-term objectives associated with the research plan and also contains proper and formal consideration of the role of the resource on the maintenance of the ecosystem and evidence that these considerations have been incorporated into the harvest control rules.

The latest meeting for the Technical Research Committee for small pelagic Fisheries was scheduled for June 5-7<sup>th</sup>, 2013. The surveillance team has seen evidence that invitations were sent to the stakeholder group and that members of the public sector and objector group attended and participated openly in the meeting.

The assessment team notes that the core commitment in the Client Action plan has been fulfilled, but would appreciate receiving the updated 1) the Carta Nacional Pesquera 2) NOM-003-PESC-1993 upon availability.

**Status of Condition 3.2.1: Closed 2013**

**3.2.2**

**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives and has an appropriate approach to actual disputes in the fishery under assessment.**

SG 60	SG 80	SG 100
<p>There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.</p> <p>Some information on fishery performance and management action is generally available on request to stakeholders.</p>	<p>There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p>Decision-making processes use the precautionary approach and are based on best available information.</p> <p>Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p>	<p>Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p>Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p>

**Score: 70**

**Condition 3.2.2:** By the fourth surveillance audit, the client should present evidence that the fishery management’s decision-making process responds to serious and other important issues identified in relevant research, monitoring, evaluation and consultation in a transparent, timely and adaptive manner and takes some account of the wider implications of decisions. The decision-making process must also use the precautionary approach and should be based on the best available information. Information should be available and explanations provided for any actions or lack of action.

Action Plan	By Who	Due

<p>1.1 Se aplicará la regla de control del RMS y la captura permisible (CBA), obtenidas a partir de la estimación de biomasa de sardina.</p> <p>1.2 Se evaluará la aplicación de la regla de control y la captura permisible (CBA), de ser necesario se implementarán medidas de manejo adicionales y/o emergentes.</p> <p>1.3 Se revisará el proceso de toma de decisiones en relación con las acciones de la pesquería que podría afectar negativamente a la población.</p> <p>Se implementarán acciones conducentes a mitigar la afectación de la actividad pesquera.</p>	<p>Client</p> <p>Comisión Nacional de Acuacultura y Pesca (CONAPESCA)</p> <p>Instituto Nacional de Pesca (INAPESCA)</p>	<p>By the fourth surveillance audit, this evidence will be presented to the CAB.</p>
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**Progress on Condition:** This PI was originally scored at the 85 level and therefore no condition was associated with it. At the second surveillance audit it was noted that, should the declining trend in catch continue, re-scoring of PI 1.1.1 and related indicators would take place. In particular, as the catches plummeted, there appeared to be no response in the system to enforce the application of the HCR to adjust the catch to possible low biomass levels. This means the decision-making process is not responding in a timely manner to a serious issue that has been identified by research and monitoring, nor do a precautionary set of measures appear to be applied to prevent serious harm to the stock and the ecosystem. Additionally, explanations for lack of management action are based on the assumption that perception about the current state of the stock is reliable from abundance estimates based on acoustic surveys. This however is weak evidence based on the authors’ own discussion about problems that need to be resolved to produce better estimates. On these grounds the team decided to re-score PI 3.2.2 to 70. The team highlights the nature of this PI in the sense that it pertains to the effectiveness of the decision making process, not the quality of the measures or the state of the stock.

**Status of Condition 3.2.2: Open – On Target**

**3.2.3**

**Monitoring, control and surveillance mechanisms ensure the fishery’s management measures are enforced and complied with**

SG 60	SG 80	SG 100
<p>Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.</p> <p>Sanctions to deal with non-compliance exist and there is some evidence that they are applied.</p> <p>Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.</p>	<p>A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.</p> <p>Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.</p> <p>Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.</p> <p>There is no evidence of systematic non-compliance.</p>	<p>A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.</p> <p>Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.</p> <p>There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.</p>

**Score: 70**

**Condition 3.2.3:** By the fourth surveillance audit, the client should present evidence that the fishery’s management measures are enforced and complied with.

Action Plan	By Who	Due

<p>1.1 Se mantendrá el monitoreo biológico de la flota pesquera.</p> <p>1.2 Se vigilará el cumplimiento de las medidas de manejo vigentes emitidas en la Norma Oficial, Carta Nacional Pesquera y Plan de Manejo, principalmente en lo referente a la talla mínima de captura y proporción permisible.</p> <p>1.3 Se mostrará que las medidas dirigidas a limitar el esfuerzo pesquero se están implementando.</p> <p>1.4 Se solicitará a CONAPESCA la supervisión, control y vigilancia que se ha aplicado en la pesquería, así como la implementación de mejoras al respecto.</p> <p>1.5 Se mostrará que no hay evidencia de incumplimiento sistemático, y que las sanciones para hacer frente a incumplimiento existen.</p> <p>1.6 Se aplicarán las medidas de manejo derivadas de la estimación de biomasa (captura permisible), y de ser necesario se aplicarán medidas adicionales y/o emergentes.</p> <p>Se revisará el proceso de toma de decisiones en relación con las acciones de la pesquería que podría afectar negativamente a la población de sardina.</p>	<p>Client, CONAPESCA INAPESCA</p>	<p>By the fourth surveillance audit, this evidence will be presented to the CAB.</p>
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**Progress on Condition:** This PI was originally scored at the 80 level and therefore no condition was associated with it. At the time of the third surveillance audit, the team noted that the trend in effort continues to show a sustained increase in nominal trips. The proportion of fish in the catch at the end of the fishing year is still at levels that are in excess of the 30% established in regulatory documents and the team noted that this trend is persistent in several available reports. Both the increase in effort and proportions of juvenile fish in excess of a predetermined limited are prohibited in documents such as the Carta Nacional Pesquera, the NOM-03-PESC and the Fishery Management Plan. Lack of compliance and enforcement of these regulations led the team to re-score PI 3.2.3 to a level of 70.

**Status of Condition 3.2.3: Open – On Target**

**3.2.4**

**The fishery has a research plan that addresses the information needs of management.**

SG 60	SG 80	SG 100
<p><u>Research</u> is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>Research results are <u>available</u> to interested parties.</p>	<p>A <u>research plan</u> provides the management system with a strategic approach to research and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>Research results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion.</p>	<p>A <u>comprehensive research plan</u> provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>Research <u>plan</u> and results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion and are <u>widely and publicly available</u>.</p>

**Score: 90 (Originally 70, re-scored to 80 when website went live Sept 2013)**

**Condition 3.2.4:**

By the first annual surveillance audit, evidence shall be provided to the CAB that information from the fishery (including data, analysis and minutes from the technical bodies) have been disseminated in a timely fashion to all interested parties. In addition, a research plan shall be made available to the public that includes a strategic approach to research and reliable information that is sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.

Action Plan	By Who	Due
<p>By the first surveillance audit evidence will be provided that the specific INAPESCA webpage, that was set up to facilitate access to all of the information regarding the fishery and its management, will be updated on a regular basis (<a href="http://www.inapesca.gob.mx/index.php?option=com_content&amp;task=view&amp;id=306&amp;Itemid=306">http://www.inapesca.gob.mx/index.php?option=com_content&amp;task=view&amp;id=306&amp;Itemid=306</a>)</p> <p>This will include a draft master research plan for all the pelagic fisheries that will also be made available for consultation by interested parties prior to the 1<sup>st</sup> annual surveillance. In addition, minutes of quarterly meetings between fisheries administrators and industry with updated information on effort by researchers from INAPESCA will be made available on the website. These meetings are used to inform decisions on the maintenance and status of fisheries.</p>	<p>Instituto Nacional de Pesca &amp; Comisión Nacional de Acuicultura y Pesca (CONAPESCA)</p>	<p>To be updated on regular basis.</p>

<p>In May of this year INAPESCA instituted a new organization, Red Nacional de Información e Investigación en Pesca y Acuicultura (RNIIPA), that will be responsible for centralizing information on and research in fisheries and aquaculture in Mexico in order to make it more readily available to all interested parties. RNIIPA will also facilitate procurement of research funding and establish research priorities with the objective of sustainability of marine resources.</p>	<p>They are responsible for its updating</p>	
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**Progress on Condition:** In 2013, there was evidence that information from the fishery was not being disseminated in a timely fashion to all interested parties. The industry website has not been updated since November 2011. In the 2012 first surveillance audit, the client had agreed that the information would be updated before July 2012. While this responsibility was ultimately the Client’s, their ability to fulfill this commitment was hampered by management of the website by CONAPESCA and lack of government resources for staffing. In 2013, when the condition was upgraded to a Major, and carried with it the weight of potential certificate suspension or withdrawal if the condition was not met within 90 days (see Section 7.4 in the Certification Requirements V1.3, p. 32). COBI offered to host the relevant website and associated documents.

The team required that the site be functional, accessible to the public and contain a full suite of associated documents within 3 months (Sept 1<sup>st</sup>, 2013). INAPESCA was also reminded of their obligations in the Client Action Plan to provide quarterly updates for uploading: in this case providing these documents to COBI. The website was created and went live by the September 1<sup>st</sup> 2013 deadline and remains functional with stakeholder pleased by its implementation. The website can be found here: <http://sardinagolfodecalifornia.org/>.

During 2013 the Client submitted an updated vessel list that addressed this request and which can be found in Appendix 2.

In 2014, the score for PI 3.2.4 was adjusted to reflect significant progress in the execution of research and in the collaborative use of research results as various parties collaborate to include fisheries independent indices in an upcoming Stock Synthesis III model. This performance indicator was rescored from a 70 (May 2014) to an 80 (Sept 2013) to a 90 (2014).

**Status of Condition 3.2.4: Closed**



**Table 9. Scores for the Gulf of California Sonoran sardine fishery in 2014. Scores in red indicate performance indicators under SG 80 performance and with conditions. New scores issued in 2014 are indicated in blue in the Y3 Score column. Some blue values have increased and others have decreased: those that have decreased have new associated conditions.**

Prin- ciple	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Weight				FA				Contribution to		
						Wt (L3)	Weight in			Score	Y1	Y2	Y3 Score	Principle Score		
						Either	Or							Either	Or	
One	1	Outcome	0.5	1.1.1	Stock status	0.5	0.25	0.333	0.1667	90	90	90	75	18.75	12.50	
				1.1.2	Reference points	0.5	0.25	0.333	0.1667	85	85	85	85	21.25	14.17	
				1.1.3	Stock rebuilding			0.333	0.1667						0.00	
		Management	0.5	1.2.1	Harvest strategy	0.25	0.125			80	80	80	80	10.00	10.00	
				1.2.2	Harvest control rules & tools	0.25	0.125			80	80	80	80	10.00	10.00	
				1.2.3	Information & monitoring	0.25	0.125			90	90	90	90	11.25	11.25	
				1.2.4	Assessment of stock status	0.25	0.125			75	75	75	75	9.38	9.38	
Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.0667			75	75	75	75	5.00	5.00	
				2.1.2	Management	0.333	0.0667			70	70	70	70	4.67	4.67	
				2.1.3	Information	0.333	0.0667			90	90	90	90	6.00	6.00	
		Bycatch species	0.2	2.2.1	Outcome	0.333	0.0667			80	80	80	80	5.33	5.33	
				2.2.2	Management	0.333	0.0667			70	70	70	70	4.67	4.67	
				2.2.3	Information	0.333	0.0667			70	70	70	80	5.33	5.33	
		ETP species	0.2	2.3.1	Outcome	0.333	0.0667			75	75	75	75	5.00	5.00	
				2.3.2	Management	0.333	0.0667			80	80	80	80	5.33	5.33	
				2.3.3	Information	0.333	0.0667			80	80	80	80	5.33	5.33	
	Habitats	0.2	2.4.1	Outcome	0.333	0.0667			95	95	95	95	6.33	6.33		
			2.4.2	Management	0.333	0.0667			95	95	95	95	6.33	6.33		
			2.4.3	Information	0.333	0.0667			95	95	95	95	6.33	6.33		
	Ecosystem	0.2	2.5.1	Outcome	0.333	0.0667			80	80	80	60	4.00	4.00		
			2.5.2	Management	0.333	0.0667			75	75	75	85	5.67	5.67		
			2.5.3	Information	0.333	0.0667			85	85	85	85	5.67	5.67		
	Three	1	Governance and policy	0.5	3.1.1	Legal & customary framework	0.25	0.125			95	95	95	95	11.88	11.88
					3.1.2	Consultation, roles &	0.25	0.125			85	85	85	85	10.63	10.63
					3.1.3	Long term objectives	0.25	0.125			100	100	100	100	12.50	12.50
3.1.4					Incentives for sustainable fishing	0.25	0.125			85	85	85	85	10.63	10.63	
Fishery specific management system			0.5	3.2.1	Fishery specific objectives	0.2	0.1			75	70 (80)	75	75	7.50	7.50	
				3.2.2	Decision making processes	0.2	0.1			85	85	85	85	8.50	8.50	
				3.2.3	Compliance & enforcement	0.2	0.1			80	80	80	70	7.00	7.00	
		3.2.4		Research plan	0.2	0.1			70	70	70	90	9.00	9.00		
		3.2.5		Management performance	0.2	0.1			85	85	85	85	8.50	8.50		
<b>Overall weighted Principle-level scores</b>													Either	Or		
Principle 1 - Target species						Stock rebuilding PI not scored						80.6				
						Stock rebuilding PI scored						67.3				
Principle 2 - Ecosystem													81.0			
Principle 3 - Management													86.1			

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## 6 Appendix 1. Stakeholder Submissions and Team Response

### 6.1 Stakeholder Submissions



Universidad Veracruzana  
Dirección General de Investigaciones  
Instituto de Ciencias Marinas y Pesquerías  
22 May 2014

**CAMPUS  
VERACRUZ**

Calle Hidalgo No. 617  
Colonia Río Jamapa,  
C P 94290,  
Boca del Río,  
Veracruz,  
México

**Teléfonos**  
(229) 956 70 70  
956 72 27

Calle Independencia  
No. 30 (antes 38)  
Piso 1 y 2  
Colonia Centro,  
CP 94290,  
Boca del Río,  
Veracruz,  
México

**Teléfono**  
(229) 202 28 28

Siân Morgan, Ph.D.  
Project and Program Development Manager, Lead Auditor, Sustainable Seafood  
Natural Resources Division  
SCS GLOBAL SERVICES  
2000 Powell Street, Ste. 600  
Emeryville, CA 94608

Dear Dr. Morgan

Thank you so much for your invitation to participate in this third surveillance meeting. As you may remember I could not attend the last meeting because I was doing field work as part of my research with seabirds here in the Gulf of California. This time of the year is the normal breeding season and it was impossible to attend last meeting. In contrast, in this occasion I am able to attend due to the massive breeding failure of the seabirds in the whole region, apparently due to a generalized lack of food resources.

I would like to express that some progress has been made towards the objectives drawn in the agreement reached during the meeting between the industry and INAPESCA with the objection group in 28 June 2011. An initial observers program is now under way and some meetings have been held to determine a method to estimate the Pacific sardine stock of the region. COBI has been instrumental in this progress and all participants have been cooperating in this direction. Data have been provided by all the different research sectors (hydroacoustic, egg and larvae and seabird studies) which will provide fisheries-independent data for the stock estimate in the future. Some of the initial concerns are still valid though, and I believe they need to be considered here for future work, in the view to continue in the path of common work towards achieving a sustainable fisheries.

Some of the concerns are: 1. Large by-catch of some species (particularly some in the protected list NOM-059-SEMARNAT-2010). In the area of my experience I can talk about seabirds in particular, and my concern is mainly for the California Brown Pelican and the Blue-footed Boobie (*Pelecanus occidentalis californicus* and *Sula nebouxii*) which have been observed to have the highest effects as part of the by-catch in the sardine fishing operations. Let me note that seabirds have an extremely low breeding rate and are very susceptible to factors that may affect their survival (particularly adult survival).



Universidad Veracruzana  
Dirección General de Investigaciones  
Instituto de Ciencias Marinas y Pesquerías

**CAMPUS  
VERACRUZ**

Calle Hidalgo No. 617  
Colonia Río Jamapa,  
C P 94290,  
Boca del Río,  
Veracruz,  
México

**Teléfonos**  
(229) 956 70 70  
956 72 27

Calle Independencia  
No. 30 (antes 38)  
Fiso 1 y 2  
Colonia Centro,  
CP 94290,  
Boca del Río,  
Veracruz,  
México

**Teléfono**  
(229) 202 28 28

Seabirds are long lived species, with a high juvenile mortality rate, low adult mortality rate, late sexual maturation, low breeding rate, and the capacity to skip breeding in years of poor food conditions, which allow for a relative stability of their adult populations. This is due to several reasons, one of which is the experience needed to learn to find adequate amounts of food before being able to feed themselves and raise chicks. All these characteristics confer seabirds with a high degree of susceptibility to factors which increase adult mortality, such as that which occurs in the fisheries by-catch. This recent increase in the mortality of the adult population can severely unbalance the population's structure and rate of population increase, causing a gradual decrease in the effective population size, which will be evident after a few years.

The highest effect with the sardine fishing operations is through the oiling of the seabirds. Some experts have determined that oil coating the feathers of birds can cause drowning, hypothermia, and increased vulnerability to starvation and predation though loss of plumage isolation properties due to the viscous oil. Oiled seabirds can rapidly reach hypothermia when exposed to cold water temperatures. These seabirds, if they are able to swim to shore, may sit there for hours or days without being able to feed and, with energy reserves rapidly exhausting, finally die from starvation (Jaques 2014).

The two most important seabird species found in the sardine fisheries by-catch, namely the California Brown Pelican and the Blue-footed Boobie are two species included in the Mexican official Norm for protected species (NOM-059-SEMARNAT-2010) under the categories of THREATENED and UNDER SPECIAL PROTECTION, respectively. These are also migratory species that move to the Pacific Northwest during their non-breeding season and are listed under the Migratory Species Act. It is of outmost importance to implement preventive measures that help greatly reduce the impact of the sardine by-catch of these and other species.

Also of concern is the fact that the sardine fishery has not implemented control measures to the catch. This has lead to drastic falls in catch volume repeatedly in the last decades. For example, catches have been decreasing drastically since the 2009 record catch from over 500,000 metric tons (MT) to the 1,000 MT in the first 6 months of the present fishing season, this is a reduction of over 99% in four years. However, no control measures were implemented to reduce this fall and the fleet continued operating, with no evident attempt to reduce fishing effort on the Pacific sardine. My belief is that there should be some indicators that are taken into consideration for the control of the fishing effort in years when the target species is seen to fall. In some regions of Europe indicators such as those obtained from seabirds or other predatory species are used regulate fishing effort. This type of methods could be used in our case.



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Dirección General de Investigaciones  
Instituto de Ciencias Marinas y Pesquerías

Another recommendation that I would like to make is that the Technical Research Committee is incorporated to the review of the management plan for small pelagic fishes in its next review session. There is a lack of ecosystem considerations in the existing plan and it is my belief this aspect now needs to be considered and included in the reviewed version.

I also would recommend a swifter advance in the evaluation of the stock, if the times committed are to be met.

Again, I thank you for your attention and consideration of these observations and considerations.

Best,

A handwritten signature in blue ink that reads "Enriqueta Velarde".

Enriqueta Velarde  
Researcher

**CAMPUS  
VERACRUZ**

Calle Hidalgo No. 617  
Colonia Río Jamapa,  
C P 94290,  
Boca del Río,  
Veracruz,  
México

**Teléfonos**  
(229) 956 70 70  
956 72 27

Calle Independencia  
No. 30 (antes 38)  
Piso 1 y 2  
Colonia Centro,  
CP 94290,  
Boca del Río,  
Veracruz,  
México

**Teléfono**  
(229) 202 28 28

UNIVERSITY OF CALIFORNIA

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

**UC MEXUS**  
THE UNIVERSITY OF CALIFORNIA INSTITUTE  
FOR MEXICO AND THE UNITED STATES  
**Ezequiel Ezcurra, Ph. D.**  
Director

UNIVERSITYWIDE HEADQUARTERS  
3324 Olmsted Hall  
RIVERSIDE, CA 92521-0147  
TEL: (951) 827-3519 FAX: (951) 827-3856  
<http://ucmexus.ucr.edu>

May 19, 2014

Siân Morgan, Ph.D.  
Project and Program Development Manager,  
Lead Auditor, Sustainable Seafood  
Natural Resources Division  
SCS GLOBAL SERVICES  
2000 Powell Street, Ste. 600  
Emeryville, CA 94608  
USA  
+1.510.452.6392 direct  
+1.510.452.6884 fax  
+1.415.613.1519. mobile  
skype: sian.morgan

Jim Humphreys  
Fisheries Director – Americas  
Brad Ack  
Director of Special Projects  
MSC Regional Office - Americas  
2110 N. Pacific Street,  
Suite 102  
Seattle, WA 98103  
Tel: + 1 206 691 0188  
Fax: +1 206 691 0190  
e-mails: "Brad Ack" <Brad.Ack@msc.org>, "Jim  
Humphreys" <Jim.Humphreys@msc.org>

Dear Dr. Morgan,

I want to thank the MSC and SCS for inviting me to the Third Annual Surveillance Audit for the Gulf of California Mexican Sardine Fishery. Unfortunately, I am swamped by obligations related to my work as UCMEXUS Director and won't be able to attend. Taking that into consideration I want to highlight some opinions about the progress of this fishery.

Last year Dr. Enriqueta Velarde and I sent a letter to you with concerns at that time about this fishery. I do hope those criticism were taken into consideration. I will not re-write all those points, which were clearly stated in the letter, but let me at this point state that some of those apprehensions are still valid.

The actions agreed upon during the certification process (Conditions 1.2.4, 2.2.2, 2.2.3, 2.5.2, 3.2.1, and 3.2.4) hinged primarily around the Technical Research Committee for Small Pelagic Fishes, which would in turn work collaboratively with the objecting parties to strengthen and consolidate the sustainability of the fishery and the monitoring and adequate management of the stock. Some progress has taken place since the second review: The objecting scientists and NGOs have now been invited into the Technical Research Committee for Small Pelagic Fishes, and I am grateful for that.

— 2 —

Also, a program of nine on-board observers has been working during the last 17 months, which is a partial achievement to fulfill conditions 2.2.2 and 2.2.3: Participation of NGOs and scientists in the design and external evaluation of a program for observers on board to generate information on all by-catch species, fishing areas, impacts on the environment and on other fisheries. At this point there are results for over a year of observations by nine observers in a certified fleet of 36 boats, plus a number of other uncertified boats and it is my belief that there is a need to increase the coverage, ideally to 100% of the boats, on a permanent basis. This recommendation is based on the general results of the analysis that has just been shared with me by the objection group, in relation to the high number of individuals of some of the protected species that are part of the by-catch of the sardine fishing operations.

As a follow-up to the previous points, and in relation to Condition 2.5.2, it is quite evident that there is an urgent need for the development (with the participation of NGOs and scientists) of a strategy to lower environmental impacts of this fishery in the Gulf of California ecosystem and functions, as well as the development of studies and projects geared towards the design of this strategy. An example of this would be the development and implementation of methods to prevent the catch of species that are not part of the fishery's targets, such as seabirds, marine mammals, turtles, invertebrates and other fish, some of which are also commercially important. I believe it is much more convenient to develop these preventive mechanisms, than to have to develop remediation programs such as those for the rehabilitation of fish-oiled seabirds which would be much more costly and would require the development of infrastructure and a trained rescue team (Jaques, D. 2014. Brown Pelican Injury Prevention Project: Northern California Harbors. Pacific Eco Logic report to the Kure/Stuyvesant Trustee Council, pp. ii and 33.).

Also geared to these conditions, is the development of a program (again, with the participation of the NGOs and scientists) that analyzes the role of the sardine in the ecosystem. There are studies that demonstrate that the Pacific sardine is particularly valuable in the health of the different species that prey on it, such as in the maintenance of a high reproductive success (D. Aurióles, pers.com.). Also, these small pelagic fish are known to be key species in the stability of the pelagic ecosystem, and affecting their populations will create severe imbalances in it. For example, sardines have been found to maintain their nutritional value even after spawning, a unique characteristic of this species, which makes it a valuable food source for predators depending on it (Rodríguez V., M.T. 2009. Contenido energético y ácidos grasos biomarcadores en dos rutas tróficas que llegan al lobo marino, *Zalophus californianus*. M.S. Thesis, CICIMAR-IPN). Therefore, the management of the stocks of small pelagic fishes, but particularly the Pacific sardine, should follow a **most** precautionary approach (Cury, P.M. et al. 2000, Small pelagic in upwelling systems: patterns of interaction and structural changes in "wasp-waist" ecosystems. ICES J. Mar. Sci. 57: 603-618). This part of the conditions has, to my knowledge, not yet started and is a crucial point in the final decision for the renewal of the certification.



— 3 —

On the other hand, joint work that was agreed upon has not yet taken place in some topics, or has progressed at an extremely slow pace in others. This joint work included (a) the participation of NGOs and scientists in the revision of the Management Plan of the fishery, to allow the inclusion of specific actions related to the achievement of objectives of Principles 1 and 2 of the MSC standard, and, (b) the participation of the NGOs and scientists in the communication to all interested parties, of the information generated, and in the development of the research plan to fulfill the requirements of the MSC.

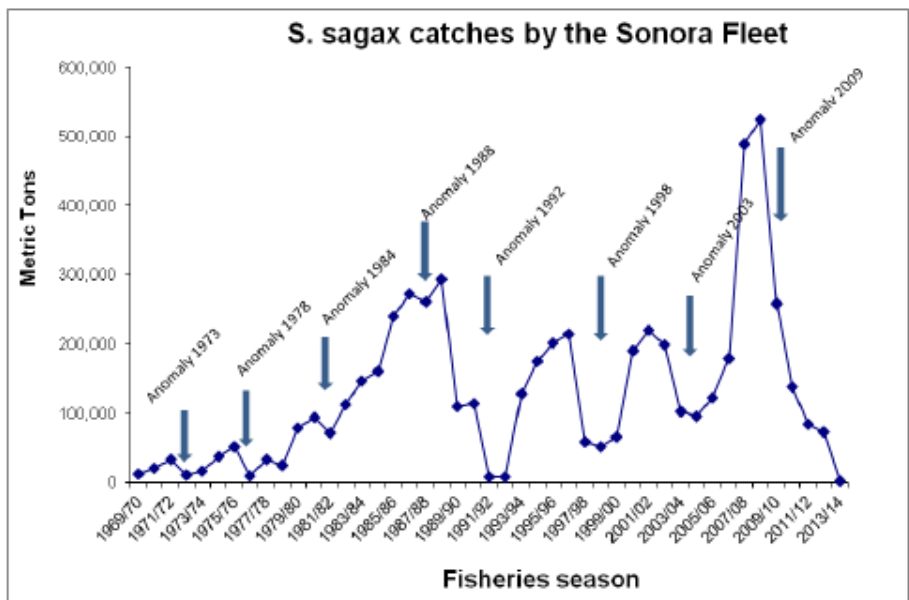
In relation to Condition 1.2.4: to the best of my knowledge, the scientists and NGOs that objected the certification, together with the Technical Research Committee for Small Pelagic fishes, that was agreed as part of the certification process, have started an exercise with the fisheries parties aimed at the stock modeling.

Additionally and in relation to Condition 3.2.1, the NGOs and scientists have not been involved implementation of the Management Plan of the fishery. At this moment there is no revision of quota or other control management action, and the sardine catches of the fleet are now reduced to much less than 1% or their 2009 value. It has been demonstrated that many species aggregate as their population decline in such a way that the Catch Per Unit Effort (CPUE) values are extremely inconsistent with, and uninformative of the state of the stock (Rose, G.A. and Kulka, D.W. 1999. Hyperaggregation of fish and fisheries: How catch-per-unit-effort increased as the northern cod (*Gadus morhua*) declined. Can. J. Fish. Aquat. Sci. 56: 118-127), and this seems to be the case for the sardine. It is quite evident that there should be a quota fixed for the sardine fishery, and other small-pelagic fishes to prevent a possible crisis.

Finally, Condition 3.2.4 dealt with transparency and openness in information access. In this case, it was agreed that the client and INAPESCA would give all support to communicate the information generated to all interested parties in the sardine MSC certification process. As a result of this agreement, INAPESCA opened a webpage where information about landings and CPUE of small pelagic fisheries in the Gulf of California are to be uploaded. In addition there is the website open [www.sardinagolfodecalifornia.org](http://www.sardinagolfodecalifornia.org).

I want to stress with this letter the original contention when this certification process started: In an open society, a certification should play the role of informing the public that the certified product has achieved a certain level of quality in its production, coupled with rigorous and verifiable standards. The public should be able to check at any time the sources of information that support the certification. The client and INAPESCA made a series of firm commitments with regards to the fishery and its transparency that have not been fully met.

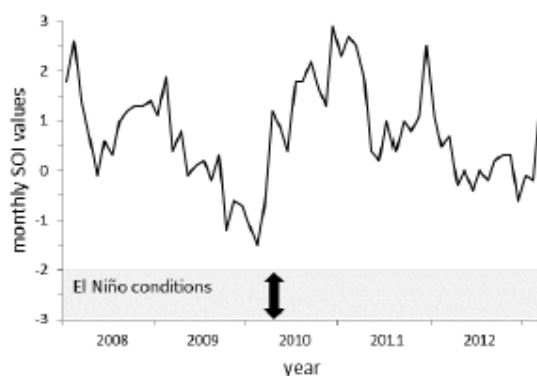
Furthermore, there are reasons for concern about the way this fishery is being managed. Sardine landings in the Gulf of California have been rapidly declining since year 2009, when the fishery surpassed half a million tons, to its current level of less than one thousand. The decline in landings has been of more than 99%, an overwhelming collapse in productivity that has forced the fleet to switch to thread herrings as an alternate target species, and to start directing its efforts in a southward direction, where this species is more abundant.



In previous decades, strong declines such as the one observed between 2009 and 2014 have been attributed by the fishery scientists to the emergence of El Niño conditions. This time, however, it is difficult to ascribe the collapse to such conditions. According to the Southern Oscillation Index (SOI) estimates, the index never hit monthly values lower than -2, when it is generally accepted that El Niño conditions start and the warm-phase anomaly hits the sardine populations.

— 5 —

Interestingly, between 2009 and 2013, the SOI index showed significant cold-phase anomalies at least three times, when it rose above 2 (La Niña conditions), but the variation towards negative values (El Niño) never reached the critical threshold. That is, during the period in which the decline occurred, oceanographic conditions were on average good to excellent, and there is little indication that an external environmental/oceanographic force could have been acting in detriment of the sardine stock until the present date (April 2014):



So, what is happening with this decline? If we had the fishery-independent estimation of the stock, as promised during the certification process, perhaps we could test a number of alternative hypotheses. At this stage, however, the only thing we can say is that many of the fears I expressed during the certification process seem to be justified: The sardine fishery does not seem to be doing well, and the impacts on other ecosystem components are quite perceptible, as we have discussed in detail in a recent paper published in *Nature* magazine's open-access journal *Scientific Reports*: (Velarde et al. 2013, Seabird diets provide early warning of sardine fishery declines in the Gulf of California. *Scientific Reports* 3, doi:10.1038/srep01332; <http://www.nature.com/srep/2013/130225/srep01332/full/srep01332.html>). Fisheries have been shown to increase stock fluctuations and this is exactly what we have been observing here (Anderson, C.N.K. et al. 2008. Why fishing magnifies fluctuations in fish abundance. *Nature* 452: 835-839, and Hsieh, C. et al. 2006. Fishing elevates variability in the abundance of exploited species, *Nature* 443: 859-862).

— 6 —

The three general principles that should govern third-party certifiers in determining whether a fishery is sustainable under MSC standards are (a) that the target fish stock must be sustainable, (b) that the operations must have low impacts on the ecosystem, and (c) that the fishery must be transparently and effectively managed. Three years after the certification, I only see a declining fishery, declining catches of predatory (sardine feeding) fishes, normally caught by artisanal fisheries, seabirds moving rapidly to other food items or, worse still, to other nesting grounds, high catch of seabirds and marine mammals observed by independent observers, and a management system that is slow to deliver and respond. The pledges made by the client and INAPESCA on June 28, 2011, in the minutes of the Guaymas meeting, need to be satisfactorily met.

I thank the Marine Stewardship Council and Scientific Certification Systems for their attention to these issues, and hope once again that you may appreciate my concerns about the process.

Yours truly,



Ezequiel Ezcurra  
UC MEXUS  
University of California, Riverside

## 6.2 Team Response

Dear Drs. Ezcurra & Velarde,

At the May 22nd 2014 meeting the content of your letter was discussed with the attending Client, INAPESCA staff and other stakeholders (both ENGO and academics) by the audit team attending.

The first main item of concern related to coverage of the observer program, which you would like to see increased to 100%. While this would be ideal, the team considers the current 20% coverage a meaningful improvement that is providing valuable documentation of encounters, mortalities, temporal and spatial encounters that will allow INAPESCA to consider whether encounter rates pose population level threats and suitable mitigation strategies. Whether these are considered sufficient will be examined at next year's fourth annual surveillance audit meeting.

Your second main point relates to the importance of Monterrey sardine (and other small pelagics) in the Gulf of California ecosystem. Last year we **recommended** that the Client convene interested parties to a workshop specifically aimed at improving the monitoring system of the fishery, consolidating existing information relevant to population dynamics, and identifying key gaps in this knowledge. Two such workshops were held in 2013 and different sources of data are being incorporated into upcoming work to build a Stock Synthesis III model for management, as noted in Dr. Velarde's letter. While this may not satisfy all of your aspirations, the team is comfortable that genuine efforts and meaningful progress has been accomplished and that further work is to come. The team has considered some of the ecosystem considerations, which you allude to from a research perspective, from an outcome perspective by decreasing scores on PI 2.5.1, ecosystem outcomes. This score has been decreased from an 80 to 60, based on the fact that the fishery has not defined and implemented a Bmin value for the harvest control rule, designed to reserve biomass for ecosystem needs in the Gulf of California.

As per our response last year, we reiterate that with respect to participation in revision of the fisheries management plan, that while the MSC process supports inclusion, it also respects the governance processes of nation states relevant to management of sovereign resources. Revisions of Fisheries Management Plans for example, falls within the mandate of staff at INAPESCA/CONAPESCA, and the process includes a comment period for public participation that was respected in the revision process. The assessment team received evidence of invitations and meetings that occurred at different ports where this fishery is carried out in 2011 (Guaymas March 16-18; Guaymas April 26-29; Ensenada May 26-27; and Guaymas June 21-24).

In terms of "the information generated", we invite you to explain further to both COBI and Mr. Tissot over the upcoming year, which information specifically you would like shared. Where this is relevant to aspects of the standard, the team will confirm whether such information has been posted to the small pelagics public website. Thank you for the acknowledgement of the website and its functionality in your letter.

In terms of a research plan, the team is satisfied that the existing research plan in the 2012 Fisheries Management Plan represents a strong step forward for the department, and we are pleased by the activity on a number of fronts demonstrated by INAPESCA (observer program, ongoing work to model reference points, attempts to quantify values for the harvest control rule, development of a stock synthesis III model, ongoing hydroacoustic surveys to quantify fisheries independent measures of biomass). We agree that some of these initiatives are proceeding more slowly than anticipated, and for these reasons, the team has issued a number of behind targets in this year's surveillance audit.

We agree with your concerns related to declining catch of sardines, in the absence of measures to control effort. For this reason, we have adjusted a number of scores and the fishery is behind target on a number of performance indicators. The client has been informed that unless these issues are resolved, including definition and implementation of the harvest control rule, the fishery faces suspension and withdrawal of the certificate in 2015.

In terms of declines associated with predatory fishes and potential population level threats presented by indirect mortalities to oiled birds: we issued a behind target to the client based on the fact that the take of bycatch species (fishes, birds and mammals as well as ETP species) had not been analyzed to consider whether the sardine fishery may have population level impacts. INAPESCA has confirmed that they will move forward with this work over 2014-2015.

The assessment team has seen meaningful progress achieved through the collaborative efforts between the Client, INAPESCA and the objectors, particularly related to the observer program given the original resourcing challenges that underpinned timelines. We recognize that while work is behind timelines (and hence behind target), a commendable amount of work has occurred in the past year and there is sufficient information to begin quantitative exploration of fundamental bycatch issues and how to best mitigate any population-level threats (bearing in mind that the MSC standard considers only these types of concerns related to retained/bycatch and ETP species).

We remain concerned about the unprecedented decline in sardines, in the absence of an ENSO event, without sufficient confirmation of methods to know whether hydroacoustic work indicating the presence of sardines in deep waters is, or is not, reliable. For these reasons we have taken strong measures through scoring, to encourage all parties to assure that appropriate analysis, regulations and sanctions are put into practice to control effort, and to assure that effective sanctions are in place, by next year's audit.

We hope you will agree that the parties involved (yourselves included) should be congratulated for the significant progress over the past year which represents meaningful progress on a number of different fronts. We thank you for the effort involved in engaging in the process and invite you to continue submitting comments for future surveillance audits.

Sincerely, Dr. S. Morgan

Dr. C. Alvarez Flores

## 7 Appendix 2. Updated Vessel List

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**Cámara Nacional de la Industria Pesquera**

**Canainpesca**

**DELEGACION SONORA**

Guaymas, Sonora, México., 22 Noviembre, 2013.

**Sian Morgan**  
**Scientific Certification Systems.**

Dear Sian:

This letter is to formally request that the vessel PORTOLA I, PORTOLA II, and PORTOLA III be included in the certification unit for the Monterey sardine in the Gulf of California.

In the attached list you will find more information for this vessels.

This vessels belong to a well-established and respected company that has been in the tuna fishery for over 30 years and now they are investing in the sardine fishery I order to eventually can the Monterey sardine.

Thanking you in advance.

  
Leon Tissot Plant.   
DELEGACION SONORA

AVE. SERDAN #75, EDIFICIO LUEBBERT, INT. 2 ALTOS, COL. CENTRO.  
TEL. Y FAX 222 05 22 Y 222 18 09, GUAYMAS, SONORA.



## Cámara Nacional de la Industria Pesquera

### Canainpesca

### DELEGACION SONORA

LIST OF VESSELS THAT ARE COVERED UNDER THE UNIT OF CERTIFICATION  
FOR SARDINOPS  
NOVIEMBRE, 2013

OWNER	BOAT NAME	PERMIT No.	CONCESION 20 YEAR
*PESQUERA SANTA MONICA S.A. DE C.V.	B.M SARDINA VI	12604779334	
	B.M PROPEMEX PM 2-S	12604779351	
*HERNANDEZ Y PTANIK SA DE CV	BM DON ISAAC	10203079307	
*PESQUERA PROESA S.A. DE C.V.	BM PROCESA I	10203079308	
PESQUERA SIGLO S.A. DE C.V.	COZAR III	12604779355	
	CHUYITO XXX	12604779357	
	COZAR XI	12604779356	
	KORE	12604779002	
	JUAN PABLO I	12604779377	
	MANOLO	12604779325	
PESQUERA COSTA ROCA S.A. DE C.V.	PESCADOR II	12604779358	
	NENE CONDE	12604779363	
	LAZARO CARDENAS III	12604779322	
	SANDOKAN	12609679314	
	SALGARI	10203079320	
	DELTA YAQUI	12604779337	
	ONTAGOTA	10203004520	
	BAKATETE	12604779380	
*SARDINEROS LA PITAHAYOSA S.A. DE C.V.	SELECTA	12604779361	
	SELECTA I		CP-400/2000
	SELECTA II	12604779332	
	SELECTA III	12604779328	
	PP-1-S		CP-296/2000
*SELECTA DE GUAYMAS S.A. DE C.V.	SELECTA V	12604779001	
	PP-2-S		CP-292/2000
	SARDINA IX		CP-293/2000
NAVIERA Y PESQUERA DEL PACIFICO S.A. DE C.V.	PESCADOR IV	12609679311	
	PESCADOR V	12647793012	
	DON ELIAS	10305379301	
INDUSTRIAS BARDA S.A. DE C.V.	BARDA I	12604779366	
	BARDA III	12604779319	
	ISLA DE CEDROS	12604779320	
	ZENIT II	12609679315	
*PESCA E INDUSTRIALIZACION DEL PACIFICO S.A. DE C.V.	PISA I	12604779329	
	PISA II	12604779364	
*PESQUERA CASRALES S.A. DE C.V.	AZTECA	10203079316	
MAZ SARDINA S.A. DE C.V.	PORTOLA I	125080793082	
	PORTOLA II	125080793081	
	PORTOLA III	125080793083	

*Leon Tissot Plant*  
ING. LEON TISSOT PLANT.



AVE. SERDAN #75, EDIFICIO LUEBBERT, INT. 2 ALTOS, COL. CENTRO-  
TEL. Y FAX 222 05 22 Y 222 18 09, GUAYMAS, SONORA.



## 8 Appendix 3. Surveillance Audit Frequency

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The surveillance audit frequency is “normal” for this fishery, meaning annual. This is in accordance with Tables C3 and C4 in the MSC Certification Requirements. The fishery scores >2 in table C3 and therefore does not qualify for reduced or remote surveillance audits.

--End Report--