INTER-AMERICAN TROPICAL TUNA COMMISSION

5TH TECHNICAL MEETING ON SHARKS[1]

DATA COLLECTION

La Jolla, California (USA)
15-16 May 2015

REPORT OF THE WORKSHOP

INDEX

Salvador Siu, Nickolas Vogel and Alexandre Aires-da-Silva

EXECUTIVE SUMMARY

The IATTC has received funds from the FAO-GEF *Common Oceans* program for a project aimed at improving data collection for shark fisheries in the eastern Pacific Ocean (EPO). The goals of the project include identifying and describing available fishery data sources for shark species in the EPO, as well as incorporating new and existing data on shark fisheries into a database suitable for stock assessment. In addition, as part of the project, two capacity-building activites were planned, aimed at developing IATTC member countries: a first workshop on Shark Data Collection, and a second on Data-Limited Assessment Methods for Shark Species.

This report describes the work, discussions, and training activities generated during the two sessions of the workshop on Shark Data Collection: 1) a review of shark data sampling methodologies applied in the EPO region; and 2) training on an MS-Access database developed by IATTC staff in collaboration with Central American nations. The workshop was attended by 18 participants, 17 from IATTC member countries and one representative from an NGO.

New shark data collection forms, developed by IATTC member countries in collaboration with the Commission staff, were presented and discussed. In addition, the participants received training in the use of a MS Access database designed specifically to archive the information to be collected on these forms. The forms and database have been developed specifically for the Central American (OSPESCA[2]) region, where the need for better data is greatest, but some of its elements may be useful for unilateral efforts to improve data collection in other regions of the EPO. Most importantly, these materials could be used as precursors for the development of standardized shark sampling forms and a regional shark fishery database for the EPO.

Some points were considered essential by participants for strengthening existing and developing new data collection programs in the region, in addition to standardizing methodologies among member countries; one of the main points noted and discussed by participants was the need for a greater number of data

[1] Organized under the FAO-GEF *Common Oceans* program
[2] Organization for Fishing and Aquaculture in Central America

collectors and for improving their safety at work. It is critical that these shortcomings be resolved so that shark data collection programs can be developed and/or strengthened.

1. INTRODUCTION

Most shark species are highly vulnerable to fishery exploitation due to their typical life-history charateristics of slow growth rates over long lifespans, late age of maturity, and the production of limited offspring after long gestation periods. In the EPO, sharks are targeted by several multi-gear fisheries (mainly artisanal) of coastal nations and also by foreign longline vessels ; theyare also caught as bycatch in the tuna purse-seine and longline fisheries. The Antigua Convention requires that the IATTC "adopt, as necessary, conservation and management measures and recommendations for species that are affected by fishing for, or dependent on or associated with the tuna stocks" in the EPO. It is therefore within the staff's remit to provide advice to the Commission on sharks, but in order to do so it must first assess the status of the species in question.

Stock assessments are urgently needed as a basis for reliable scientific advice for managing shark fisheries in the EPO. Unfortunately, stock assessments of sharks pose several challenges. For example, fisheries statistics, such as catch, effort, and size-composition data, are either lacking or, if available, are often incomplete or grouped into categories such as 'miscellaneous' or 'other' species. As a result, long-term time series of catch and effort data are rarely available, which makes stock assessments of sharks problematic. Biological information, such as growth rates and reproductive parameters, is also quite limited for many species. The fisheries in the EPO, both those targeting sharks and those that take sharks as bycatch, are no exception to such data shortcomings.

The IATTC has received funding from the United Nations Food and Agriculture Organization (FAO) and the Global Environmental Facility (GEF) in the framework of the *Common Oceans* program, as part of the Sustainable Management of Tuna Fisheries and Biodiversity Conservation in areas beyond national jurisdication (ABNJs) project, of which one component is the reduction of the impacts of tuna fisheries on the ecosystem, and specifically on sharks. The broad goal of the IATTC project is to improve data collection for shark fisheries in the EPO, with a main focus on Central America, where much of the shark catch is landed and where the need for better data collection is greatest. Its main objectives are to identify and describe available fishery data sources for shark species in the EPO, and to incorporate new and existing data on shark fisheries into a database suitable for stock assessment. In addition, two capacity-building activities aimed at developing IATTC member countries were included in the EPO project: a first workshop on Shark Data Collection, and a second on Data Limited Assessment Methods of Shark Species.

This report describes the work, discussions and training activities generated during the two sessions of the workshop on Shark Data Collection: 1) a review of shark data sampling methodologies applied in the EPO region; and 2) training on an MS Access database which could be used to archive EPO shark fishery and biological data (see agenda; Appendix 1). The workshop was facilitated by three members of the IATTC staff: Salvador Siu (meeting chair), Nickolas Vogel, head of the Data Collection and Database Program, and Alexandre Aires-da-Silva, of the Stock Assessment Program. The workshop was attended by 18 participants, 17 from IATTC member countries (ten of whom received financial support), and one representative from an NGO.

2. NATIONAL SHARK DATA COLLECTION PROGRAMS

Participants made presentations describing the status of shark data collection and sampling methodologies (including fishery and biological data collection forms) in use in their respective countries, along with the perceived weaknesses of their data collection programs and needs for improvement. The summaries provided by participants are attached as Appendix 3; the main discussions and conclusions are summarized below.

3. REVIEW OF THE STATUS OF SHARK DATA COLLECTION IN THE EPO

There is a great variety of methodologies (mainly data collection forms) used in IATTC member countries for collecting shark fishery and biological data. In some cases, there are even differences in the data collection forms used by different government institutions in the same country. Nonetheless, there are similarities in the information collected by different countries and/or institutions, and hence there is an opportunity for standardizing data collection methods in the region.

The member countries are very aware of the importance of collecting fisheries data in general and shark data in particular; however, there are concerns about the ability to develop strong shark data collection programs, but more importantly about the difficulties of keeping these programs operational uninterruptedly for long periods of time. Financial resources for this purpose are extremely scarce.

The following points were considered essential by participants for strengthening existing shark data collection programs and developing new programs in the region, and for standardizing methodologies among countries. The two most important points were considered to be the need for an increased number of data collectors (ii) and for ensuring their safety at work (iv). Resolving these shortcomings is critical if shark data collection programs are to be developed and/or strengthened.

i. Governmental will and financial support for data collection programs and research on shark fisheries, which have historically not been considered a priority;

ii. Increased number of fishery inspectors/sampling personnel in major ports and/or landing sites;

iii. Continuing capacity-building actitivies for data collectors on shark species identification;

iv. Better security for data collection personnel. There are serious issues with security and violence in some major ports and/or landing sites throughout the region, and it is critical that data collectors be able to do their jobs in safety.

v. Improved synergies among govermental fishery institutions in different countries would contribute to the standardization of shark data collection methodologies in the EPO region.

4. TRAINING IN THE USE OF SHARK DATA COLLECTION FORMS AND DATABASES

New shark data collection forms (Appendix 4), prepared by IATTC member countries in collaboration with the Commission staff in recent years, were presented and discussed. In addition, the participants received training in the use of a MS Access database specifically designed by IATTC staff to archive the information to be collected with these forms. The forms and database have been developed specifically for the Central American (OSPESCA) region, where the need for better data is greatest, but some of its elements may be useful for national efforts to improve data collection in other regions of the EPO. Most importantly, these materials could be used as precursors for the development of standardized shark sampling forms and a regional shark fishery database for the EPO.

4.1. Standardized shark sampling forms for Central America: a case study

The standardized shark sampling forms for Central America present a good case study for the EPO region. They were distributed among the participarns, in digital and print formats, and presented and discussed.

It was clear from the discussions that, although these forms capture a great diversity of the information to be collected in this region, some types of data that are important to other IATTC members are missing (*e.g.*, other fleet components, gear characteristics). The IATTC staff members noted that these forms could easily be changed to accommodate that additional information, and eventually arrive at a generalized set of shark sampling forms for the entire region.

4.2. MS Access database for archiving shark fisheries data

The software tools used for archiving fisheries and biological data on sharks vary among the IATTC

member countries; in some, sophisticated data base programs are used, several use MS Excel, while in others that have no shark data collection program, or a program that is in an early stage of development, there are no electronic archives.

Participants received training in the use of a MS Access database developed by members of the IATTC Data Collection and Database Program, and copies of the manuals for using the database were distributed. Although the database was developed specifically for archiving data for Central American artisanal fisheries, all the participants expressed interest in the functionality of this tool, which could easily be adapted to the situations of other countries or even be expanded to a regional database for shark fisheries.

Appendix 1.

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AGENDA

Friday, 15 May

08:00-08:30 Registration
08:30-08:45 Opening (*Alexandre Aires-da-Silva*)

SESSION 1. Sampling methodologies applied in the EPO

08:45-11:30 Presentations by participating countries (*Moderator: Salvador Siu*)
11:30-12:30 Discussion (*Moderators: Alexandre Aires-da-Silva, Salvador Siu*)
12:30-13:30 Lunch
13:30-14:30 Case study: "Sampling forms in Central America" (*Salvador Siu*)

SESSION 2. Introduction and tutorial on the data base for the Central American forms

14:30-16:00 **GENERAL INSTRUCTIONS:** (*Nick Vogel, Salvador Siu*)

1. Tables
2. Forms
3. Queries
4. Modules

16:00-18:00 **TABLES**: (*Nick Vogel, Salvador Siu*)

5. Tables related to each form
6. Reference tables
7. Common reference tables managed by the main database coordinator
8. Initialization tables managed by each User Organization (Sede)
9. Table of ranges (used for generation of errors and warnings)
10. Relationships among tables

Saturday, 16 May

SESSION 2 (continued). Introduction and tutorial on the data base for the Central American forms

08:30-10:00 **BASIC KNOWLEDGE:** (*Nick Vogel, Salvador Siu*)

11. Access forms: UnloadingRecord and SamplingRecord
12. Comparison between Forms and database tables for both forms
13. How to handle data entry, with special keys ("ENTER", "+", "ESC", etc)

[3] Organized under the FAO-GEF ABNJ project.

10:00-10:30	Break	
10:30-12:30	**TOOLS**	(*Nick Vogel, Salvador Siu*)
	14. Detect errors	
	15. Calculated fields	
	16. Vessel information	
	17. Options – units	
12:30-13:30	Lunch	
13:30-15:30	**BASIC QUERIES**	(*Nick Vogel*)
	1. Query designer	
	2. Linking related tables in queries	
	3. Use of reference tables	
15:30-17:30	**DISCUSSION OF QUERIES**	(*Nick Vogel*)
17:30-17:45	Adjournment	(*Alexandre Aires-da-Silva*)

Appendix 2.

ASISTENTES - ATTENDEES

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Appendix 3.

BELIZE

SUMMARY OF BELIZE'S SHARK FISHERY DATA COLLECTION

Mauro Gongora
Fisheries Officer
Belize Fisheries Department

The shark fishery of Belize is artisanal and small-scale and fishing is done seasonally during the months of November to April of the following year. Shark fishing is carried out in coastal lagoon area of the Belize Barrier Reef and in the 3 atolls. The main fishing gear is 6-inch mesh size gillnets and hand lines. The fisheries regulations limit the number of gill nets per fishing vessel to a maximum of three (3) with each having a maximum length of 100 m. Gillnets cannot be joined when deployed in the fishing ground. Shark finning is prohibited and sharks need to be landed whole with the fins partially attached. No person shall take, buy, sell, possess, or export shark meat or fins during the period 1st August to 31st October in any year. The shark fishery is managed by specific shark fishery regulations that were passed into law since 2011. A National Plan of Action for the Management and Conservation of Sharks was developed in 2006 with the assistance of OSPESCA is in need of revision and updating.

Almost 90% of shark meat landed in Belize is exported to neighboring Guatemala, where people traditionally eat fish during the Lenten season. The remainder of the shark meat is consumed locally. Shark fins are also exported to Guatemala for re-export to China and other Asian markets.

In 2014, the Belize Fisheries Department issued only 55 fishing licenses to individual fishers and 5 export licenses. Even though Belize has a high seas shark fishing fleet registered that is managed by the Belize High Seas Fishing Unit (Ministry of Finance) and which was formerly under the management of the International Marine Merchant Registry of Belize (IMMARBE), all of these fishing vessels are foreign-owned and do not carry out commercial fishing operations in the territorial waters of Belize. This report covers only the national fishery.

The Belize Fisheries Department is the government agency mandated to manage the shark fishery of Belize. The four main shark species harvested in 2014 included the Black tip shark, Great Hammer head shark, Tiger shark and Caribbean Reef shark. The three most abundant species in Belize include the Black tip shark, Caribbean Sharp Nose shark and Caribbean Reef shark.

The Belize Fisheries Department has implemented a shark fishery data collection program and has received technical assistance from Dr. Demian Chapman from Stony Brooks University of the United States. This collaboration effort continues at present and has led to the collection of shark anal fins directly from fishers. The species composition based on the analysis of anal fins suggest that the shark gillnet fishery in central Belize is mainly based on two small species, the Caribbean sharp nose shark and bonnet head shark, and but also includes a significant fraction of the larger species, including CITES-listed hammerheads. Given the success of this pilot effort fishermen are required to provide anal fins of 100% of their catch in 2014 and will attempt to sample more locations in 2015. We are also working on the size composition. Historical data analysis shows that during the period from 2007 to 2011 the two main species harvested in Belize included Caribbean sharp nose (a small-bodied species) shark and the large-bodied Caribbean reef shark.

There is need to improve shark data collection and fisheries enforcement in southern Belize where it is believed that illegal fishing and export of shark meat and fins occur every year. Funds to pay for fuel expenses to conduct regular fisheries enforcement patrols are urgently needed.

ECUADOR

INSTITUTO NACIONAL DE PESCA

RESEARCH PROCESS FOR BIOAQUATIC RESOURCES AND THEIR ENVIRONMENT

The National Fisheries Institute (INP) is a public entity created on 5 December 1960, with its own legal personality, assets and resources. It is part of the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP) and has its headquarters in the city of Guayaquil.

The mission is to offer services and advice to the fisheries-aquaculture sector through scientific-technical research and and assessment of the hydro-biological resources and their ecosystems for their sustainable management and for ensuring the quality and harmlessness of fisheries and aquaculture products in all their phases of production which correspond to it as the Competent Authority. Its vision is to be a leading institution in scientific-technical research applied to the sustainable use of the hydro-biological resources of the south-east Pacific and in rendering services, as the national and international reference body in accreditation and certification of the fisheries-aquaculture sector.

The "Research into Bioaquatic Resources and their Environment" (IRBA) process consists of two sub-processes: a) Development and Implementation of Projects (EEP) and b) Assessment of Projects on Aquatic Resources and their Environment (EPRAA). Within this reference framework the INP-2015 POA includes research projects outlined within a comprehensive vision of the country's main fisheries. These studies are directed towards the development of information on the resources and their utilisation; that is, consideration of the biological, environmental and technological aspects on which the management of activities and development of the sector can be entirely based. Within the EEP sub-process is the monitoring of the fishery for Large Pelagic Fish and its accompanying fauna which is of great importance for the artisanal and industrial fisheries sector of Ecuador. The PPG include mainly the species that support the exports of fresh frozen and canned, as well as supplying to a great extent the domestic market. On the other hand, it must be considered that within fishing operations, a significant number of sharks are captured through the use of artisanal and industrial techniques (nets and longlines), which do not select the resource to be harvested.

The conservation and management of large pelagic fish and its accompanying catch, has generated a growing polemic between the environmental and fisheries sectors, due to the divergent positions of users and relevant actors regarding certain aspects of their protection, conservation and sustainable management. However, the proper management of these resources between the conservation and fisheries sectors will achieve a better coordination of efforts among the different authorities and actors.

Within the monitoring system for artisanal fisheries through the Large Pelagic Fish program, the ports were chosen according to: volume of unloadings, variety of species, types of vessel, and fishing gears. The main tour is the fisheries form or record designed by Fallows and Contreras (1990), modified by Martínez *et al*., (1991), Contreras and Revelo (1992), Villón and Balladares (1993), Villón and Balladares (1993), Villón and Revelo (1994), Solís (1996); Villón *et al*., (1998); Solís *et al*. (1999); the data recorded contains information on technical, fisheries and economic aspects of fishing operations. The Kunzlik and Reeves (1994) formula is used for estimating the unloadings by species, year, month, gear type, and vessel. The form used contains: vessel characteristics, fishing effort, fishing areas, characteristics of the fishing gear, effort, species caught, information on other species such as turtles, mammals and birds, all the information is entered into an Excel database, also the biological record form is used for sharks and rays.

Weaknesses

Human and financial resources -The Undersecretariat of Fisheries Resources (SRP) has 76 fisheries inspectors at the national level, an insufficient staff for carrying out the monitoring, currently the process

of contracting 189 fisheries inspectors who will cover the east, the mountains, and the Galapagos Islands region in addition to the coastal region, is under way.

COLOMBIA

BYCATCHES OF SHARKS IN FISHERIES IN THE COLOMBIAN PACIFIC DURING 2013-2014

Emiliano Zambrano[1], Carlos E. Segura[1], Jhonatan Loaiza[1], Wilson Gonzalez[1], Nelson J. Martinez[1], Ángel A. Villa[2], Sergio I. Jiménez[3], Vladimir Puentes[4], Carlos J. Polo-Silva[5]

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3. Fundación FUNDEMAR (Tumaco)
4. Fundación AMANO
5. Oficina Generación de Conocimiento OGCI – AUNAP

In the Colombian Pacific, sharks are part of the bycatches or part of multi-species fisheries. Although information on fishing gears that access sharks is still incomplete in Colombia, it is known that among the most important are pole-and-line and gillnets. Information is collected both for the artisanal and the industrial fisheries during 2013-2014. For the industrial fishery, bycatches of sharks were recorded in the fisheries for shallow water and deepwater shrimp, the dorado fishery (longline) and in general for pelagic fish, as well as bycatches in the medium and small industrial tuna fleet that is based in Tumaco. In the shrimp fishery eight species were reported, *Carcharhinus porosus*, *Mustelus henlei*, *M. lunulatus*, *Sphyrna corona*, *S. lewini*, *S. tiburo*, y *S. zygaena*, the most representative of which was *M. lunulatus*. In the dorado fishery two species of sharks were reported caught, *Alopias pelagicus* and *Carcharhinus falciformis*. In the fishing fleet for pelagic resources, it was established that 79% of sharks and 16.7% billfishes. The analysis of bycatches of sharks in the industrial tuna fishery showed that the catches in 2014 were not high, with the principal species being *C. falciformis* (33%), *Alopias superciliosus* (20%), *C. limbatus* (18%), and *S. lewini* (7%) among the most important. Most of the individuals caught from the incidental industrial fisheries were juveniles between 48 and 120 cm, while in the artisanal fishery three species, *M. lunulatus*, *S. lewini* and *S. corona* were caught at intermediate sizes (56-97cm TL) relative to their maximum size. All this information collected, although less than that reported by other Central American countries, gives us an indication of the percentages accounted for by various species of sharks as bycatches, and that it is the stock of juveniles and some young adults that on most exposed to being caught.

Weaknesses

Colombia has since 2010 a Shark Plan, which has three courses of action focused on Research, Management and control and Inspection and Monitoring. All the information collected in the field is stored in previously established formats which were based on the forms that are used by the IATTC and OSPESCA in order to later upload the fisheries statistics and biological data collected to the platform of the Fisheries Authority which is the Fisheries Statistical Service of Colombia – SEPEC. Unfortunately, one of the greatest weaknesses as regards monitoring fisheries statistics is the lack of sufficient personnel (observers) to cover a larger geographical area both for monitoring and for inspections (Fisheries inspectors), we are in the process of continuously improving the tools for storing data, in the program of the National Authority for Aquaculture and Fisheries (as was explained previously in the presentation) which would help in a certain way to make it possible to also migrate this information to the access base which has been proposed as a mechanism for collecting information in the entire Eastern Pacific.

COSTA RICA

COLLECTION OF INFORMATION ON THE UNLOADINGS BY LONGLINE VESSELS IN COSTA RICA

José Miguel Carvajal
INCOPESCA, Costa Rica

In Costa Rica (CR) the principal catches of highly migratory species such as tunas, dorado, sharks and billfishes, are found in the waters of the Eastern Pacific Ocean (EPO), which are unloaded mainly in the communities of: Puntarenas, Cuajiniquil, playas del Coco, puerto Quepos, Golfito and the total catches of the Caribbean zone, are being unloaded in puerto Portente.

All the catches are made mainly with surface longline fishing gear and the fleets that utilise these catches are the medium-scale commercial fleet and the advanced fleet. It must be mentioned that in Costa Rica inspections are carried out of 100% of these fleets and this information is being recorded on the Inspection and Unloading Authorisation Forms (FIAD), which were the basis for the development of the Unloading Inspection Forms (FID), which will homologated and standardised for use in the Central American countries in the framework of OSPESCA.

At the same time it is necessary to mention that a foreign-flag fleet unloads in CR, and also 100% of these vessels are inspected, that this fleet does not fish in the Costa Rican Exclusive Economic Zone (EEZ).

Because a very small fleet is operating in the Caribbean and because this is a relatively young fishery, we are implementing both the homologated forms for fisheries biological sampling, as well as the database in which the information is stored that is recorded on these forms; all this is being done in the framework of the Memorandum of cooperation between the Organización del Sector Pesquera y Acuícola del Istmo Centroamericano (OSPESCA) and the Inter-American Tropical Tuna Commission (IATTC).

INCOPESCA needs to know the fisheries that use longline gear better and to that end, wishes to have data collection by species and systematised, so that this information may serve for us to take decisions on fisheries management, in a responsible manner and in accordance with the behaviour of the fisheries and without leaving aside the necessities of the fishing communities. And at the same time use this information to comply with the different resolutions that the Regional Fisheries Management Organisations have.

Weaknesses

At INCOPESCA we are seeking mechanisms for implementing a program of fisheries biological sampling at the main ports on the Pacific coast, but we have had problems with this implementation, because we have a financial limitation for hiring technicians to carry out this data collection at these ports.

ECUADOR

INSTITUTO NACIONAL DE PESCA

RESEARCH PROCESS FOR BIOAQUATIC RESOURCES AND THEIR ENVIRONMENT

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institution in scientific-technical research applied to the sustainable use of the hydro-biological resources of the south-east Pacific and in rendering services, as the national and international reference body in accreditation and certification of the fisheries-aquaculture sector.

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The conservation and management of large pelagic fish and its accompanying catch, has generated a growing polemic between the environmental and fisheries sectors, due to the divergent positions of users and relevant actors regarding certain aspects of their protection, conservation and sustainable management. However, the proper management of these resources between the conservation and fisheries sectors will achieve a better coordination of efforts among the different authorities and actors.

Within the monitoring system for artisanal fisheries through the Large Pelagic Fish program, the ports were chosen according to: volume of unloadings, variety of species, types of vessel, and fishing gears. The main tour is the fisheries form or record designed by Fallows and Contreras (1990), modified by Martínez *et al*., (1991), Contreras and Revelo (1992), Villón and Balladares (1993), Villón and Balladares (1993), Villón and Revelo (1994), Solís (1996); Villón *et al*., (1998); Solís *et al*. (1999); the data recorded contains information on technical, fisheries and economic aspects of fishing operations. The Kunzlik and Reeves (1994) formula is used for estimating the unloadings by species, year, month, gear type, and vessel. The form used contains: vessel characteristics, fishing effort, fishing areas, characteristics of the fishing gear, effort, species caught, information on other species such as turtles, mammals and birds, all the information is entered into an Excel database, also the biological record form is used for sharks and rays.

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EL SALVADOR

METHODOLOGY FOR COLLECTING INFORMATION ON UNLOADINGS OF SHARKS IN EL SALVADOR.

Celina De Paz
CENDEPESCA, El Salvador

The Centro de Desarrollo para la Pesca y Acuicultura CENDEPESCA is the authority in charge of researching the fish, crustacean and mollusc species of commercial importance in El Salvador; the Division of Fisheries and Aquatic Research coordinates and carries out the monitoring of unloadings of sharks and the analysis of the data collected.

Included in the Annual Operative Plan (PAO) is the establishment of the constant monitoring in time of the fisheries for sharks and dorado, in two of the artisanal ports with the greatest unloadings in the country, in the Western zone the Artisanal Port Acajutla and in the Eastern zone the Artisanal Port of San Luis La Herradura; the visit is coordinated with the delegates for each zone and if possible a technician from the delegation accompanies the staff of the fisheries research division, the monitoring was begun in May 2015; the Fisheries Biological Unloading Sampling forms are being used.

Unloading Inspection Forms (FID) are being issued only for the industrial fleet, which unloads in the Department of La Unión, this document is a requirement for obtaining a CITES permit, for exporting shark products or sub-products; in the case of exporters who are supplied with product from the artisanal fishery, a visit is made to the processing plants and a Statement of Inspection is issued, which details the quantity, weight, species and price of the product or sub-product exported, this statement has the approval of the Scientific Authority (Ministry of the Environment) and the Fisheries Authority (CENDEPESCA), as does the FID, it is a requirement for obtaining CITES or NOT CITES permits.

Since 2014 closures have been implemented for the protection of newborn hammerhead sharks, which regulates fishing gears and bans harvesting in the months of May to August, but was implemented month-to-month, for 2014, the fishery was closed in the month of May, for 2015, the closure months are May and June; and for 2016 May, June and July are planned. Before the closure, inventories are taken in seafood restaurants and in exporters' warehouses, to verify how much product they have and check its legality; during the closure roadblocks are set up where the legality and traceability of the product that they transport is checked, also monitoring is carried out on small boats to check fishing activities.

Weaknesses.

- Human and financial resources

There is only one person at the fisheries authority for monitoring sharks, who is helped by university students who are writing their thesis or doing community service, they are people who have been trained in collecting data, but the financing necessary to pay them or cover their travel expenses does not exist.

- Security

Security in some unloading ports is nonexistent since they are territories dominated by gangs: for that reason there is no monitoring in these zones.

GUATEMALA

METHODS FOR OBTAINING BIOLOGICAL AND UNLOADING INFORMATION OF THE DIRECTORATE OF REGULATION FOR FISHERIES AND AQUACULTURE, GUATEMALA.

Eduardo Juarez
DIPESCA, Guatemala

In Guatemala the authority in charge of collecting biological and unloading information is the Directorate of Regulation for Fisheries and Aquaculture, this information-gathering is achieved with the support of the marine research and inspection areas, with the research in charge of collecting the biological information and the area of marine inspections takes care of the inspections at the time of unloading. The biological sampling forms are currently applied for the sampling of the artisanal fishing fleet with the aim of having biological data and data on the species that are caught, which will be used when the technical regulations for issuing fishing permits are developed. Weekly plans are made in which the days when they will work at points of unloading are established, after the established day they proceed to collect the catch information by vessel. For the institution it has been complicated to carry out the collection of biological data due to the fact that there are currently problems with the fishermen due to seizures of sailfish, which by law are reserved for the sport fishery. The unloading inspection forms are being used

only with the small- to medium-scale fishing fleet since they have their proper licenses, these forms certify that the product caught is legal and are used for the Certificate of Responsible Finning-Free Fishing. The procedure for the collection of unloadings data is that the fisherman or owner must request an inspection of the unloading from the fisheries inspector, the fisheries inspector verifies that the fisherman or owner has his proper fishing permit or license current, the inspector carries out the inspection verifying that all the product unloaded comes with fins attached naturally or with partial cuts, fills out the FID form, where he determines species, weight and the attachment of the fins, if the owner complies with this the inspector certifies the unloading by signing the form, together with the captain, and gives the original to the owner, if the unloading does not comply the inspector finishes inspecting the unloading and does not give the form to the owner indicating to him that he is not complying with the regulations and an administrative process against him is initiated. After obtaining the inspection form the fisherman or exporter of shark products and sub-products must request his Certificate of Responsible Finning-Free Fishing in which the interested party makes a request for that certificate from the National Register of Fisheries and Aquaculture attaching the original unloading inspection forms, the person in charge receives the request and checks the volume requested against the database of FID forms, if there is no problem the person in charge issues and gives the certificate to the interested party within three working days after the arrival of the request and if in a given case there is a problem, the person in charge of the register returns the documentation so that the interested party can clarify the difficulty and can again request his certificate of responsible fishing. It should be mentioned as an important matter that the inspection forms at the time of unloading is issued only to the fisherman or interested party that has his fisheries concession current which means that we certify only legal product, the problem or difficulty is that the artisanal fisherman because they do not have their respective fishing permit then we have not been able to obtain complete information on the exploitation of this resource.

PERU

OBTAINING INFORMATION ON SHARKS AND RAYS - PERU-

Patricia Alcantara
IMARPE, Peru

Currently, the fishery for sharks on a global scale is an activity that has awoken great scientific interest, the high biological fragility of its stocks, gave rise to a general concern, which has led international bodies such as FAO to develop a and International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks), within the framework of the Code of Conduct for Responsible Fishing, encouraging the countries to develop their own National Plans of Action.

In Peru, the National Plan of Action for the Conservation and Management of Sharks, Rays and Ratfish in Peru (PAN Sharks-Peru) by means of Supreme Decree No. 002-2014-PRODUCE in July 2014, the document ratifies the commitment of the government to the various international treaties signed relating to the conservation of the environment, species and the natural and cultural heritage. It is planned to design a fisheries management plan, a system of information, monitoring, and assessment of sharks.

For now, in our country, there is little awareness of the current state of sharks, in this scenario, IMARPE has been carrying out since the year 2000 to date, a pilot monitoring aimed exclusively at collecting information on sharks in Pucusana (south of Lima), the main unloading zone for sharks on the central coast of Peru. The main species monitored are the blue shark, *Prionace glauca*, the shortfin mako shark, *Isurus oxyrinchus*, and the hammerhead shark, *Sphyrna zygaena*, thanks to a project directed at the Artisanal Fishery and the need to implement the above-mentioned PAN Shark-PERU, currently the monitoring is being replicated in the north and south of the Peruvian coast where other species of sharks are also included.

In order to record biological data week-long trips are made monthly, in which data are collected by vessel on the species caught, with the following activities carried out: determination of species, biometric, sex,

characteristics of sexual maturity, and the total weight of the individual whenever possible. Regarding fisheries data, the date, type of gear, fishing area, target species, fishing effort and associated fauna are recorded.

Among the difficulties that arise in the monitoring, is that the fishermen and traders occasionally do not allow the samples to be handled, also a large part of the sharks that they unload have been beheaded and gutted.

The biological and fisheries information obtained is entered into the Microsoft Excel 2010 program (in database format), which is updated monthly after each trip. Additional information is obtained from another IMARPE project aimed at recording the unloadings of the artisanal fishery at the species level over a large part of the Peruvian coast, in which sharks and rays are also included.

This workshop is important because it enabled us to know about the different ways of systematising and storing information in the countries of the region; also the need to work with database programs (Microsoft Access) was reaffirmed, which would make it possible, if it occurs, to make the information on sharks in the region uniform and standardised.

It is important to point out that training, technical assistance, and efficient communication is of vital importance for optimum handling of the Access program used by the IATTC, in the database and information forms that are currently used in Peru.

MEXICO

SYSTEM FOR RECORDING BIOLOGICAL AND FISHERIES INFORMATION OF MEXICO

Javier Tovar Ávila
INAPESCA, Mexico

The Official Mexican Regulations for Sharks and Rays (NOM-029) regulate the harvesting of these species in Mexican waters, establishing as obligatory for permit holders (persons who have a fishing permit) filling out and submitting monthly logbooks of catches by species from May 2007. In the case of vessels in the larger size logbooks by fishing set are also required. Before that date the recording of catches was based only on the information contained in the Notice of Arrival, which is the official document that legalises the catch. Currently both documents are submitted. The notice of arrival groups the catch generally into two categories: sharks (>1.5 m) and juveniles (<1.5 m), but is on occasion broken down in accordance with the judgement of each fisherman or permit holder

The logbooks were designed for the different types of fleet of the Sharks in Mexico: small vessels (length <10 m), medium (length 10-27 m) and high seas (length>27 m). There are also forms for each coast, since the species captured are different. The most important species (with the most-used common names) are included in the logbooks, with those uncommon species grouped in the category of other sharks. There is, however, no such category for rays. Some species are even grouped globally, such as hammerhead sharks.

There are also forms for recording catches and biological information collected by the on-board Observer Program aboard medium vessels. The information collected includes size, weight, sex and reproductive state and of maturity from a sample of the animals captured, in addition to the catch by set by species, as well as technical information about the vessels, catching systems and position of catch.

On the other hand, each research program implemented by the National Fisheries Institute (INAPESCA) has its own forms for collecting biological and fisheries information, in accordance with the stated objectives for each project.

Although NOM-029 establishes the development of a national scientific information system, which would contain all the information recorded in the logbooks, notices of arrival, observer and scientific programs, until now the information is entered and protected by various institutions, including the National Fisheries

and Aquaculture Commission Commission (CONAPESCA), the Research Trust for the Development of the National Program for the Utilisation of Tuna and Protection of Dolphins and others regarding Protected Aquatic Species (FIDEMAR) and INAPESCA

For now the technical support of the IATTC is needed for the research programs that need to transfer their current databases from Excel to Access, it is necessary to ask other Mexican institutions in charge of the catch databases (CONAPESCA) and the observer programs (FIDEMAR) if they require any type of support.

PANAMA

METHODOLOGY FOR RECORDING DATA ON UNLOADINGS OF SHARKS IN PANAMA

Carlos La Casa
ARAP, Panama

The shark fisheries resource is in the Republic of Panama under the jurisdiction of the Authority for Aquatic Resources of Panama, in the Directorate General of Research and Development, Department of Assessment of Aquatic Resources, this collection of unloadings data, monitoring and sampling of the biological resource, is done in support with the Directorate General of Inspection, Surveillance and Control, with its inspectors in addition to the Regional Directorates in each province. Depending on the place and the province, it is not possible to get to all the unloadings sites due to distance, lack of personnel, logistics and security problems. Two or three areas of unloadings by province are being selected where it is possible to cover and collect information constantly. The inspectors from each province have been trained in the collection of data through the FID (Unloading Inspection Form), but we will now mention the various factors that influence record-gathering in Panama. Among our strengths we apply the OSPESCA systems and forms, for all the unloadings of sharks and other species in all provinces, we are in the process of hiring more personnel who in each port will verify and collect data on shark measurements, with the entry into CITES we have more of the country's institutions reviewing the subject of sharks, we are finally in a position to reduce the authorised unloading points for sharks to two or three per province. Among the opportunities we will be able to reduce from 275 points of unloading for sharks, to about 20 in the country, this will allow us to limit incidental fishing for sharks and manage unloadings, create a systems for differentiating DNA, for the species on the CITES list, identification of the real areas of greatest frequency of fishing for sharks in the Panamanian Pacific, a project for informing and supporting artisanal fisherman, and be able to confirm a "no take" area for banning fishing for sharks.

Weaknesses

Among our weaknesses we have a basic lack of trained personnel to cover all the unloading areas, exchange of information with the environmental authority, too many databases you personnel is to gather the information and the economic capacity to appoint personnel we have a concern that before we finish organising ourselves we have the threats of a collapse of the *Sphyrna sp*. species, not being able to cover the unloadings of Panamanian-flag vessels from different oceans of the world, separating the unloadings of species in the country's EEZ with the unloadings of fishing outside the national territory, lack of budget for implementing the plans programs that we have on the agenda. Finally Panama maintains the SIERAC (Systems for Assessing Aquatic Resources), which maintains a database using the same OSPESCA forms.

VENEZUELA

REPORT OF THE OBSERVER PROGRAMES IN VENEZUELA

Manuel Correia
Asesor Científico de FUNDATUN, Venezuela

INSOPESCA (Socialist Institute for Fisheries and Aquaculture), is an autonomous institute attached to the Ministry of Popular Power for Agriculture and Land (MPPAT). It is the executive branch of all the actions that are aimed at managing the country's fisheries and aquatic resources. In conjunction with the Foundation for Responsible Tuna Fishing (FUNDATUN), they run the National Observer Program of Venezuela (PNOV) in the Pacific, which is authorised by the Agreement on the International Dolphin Conservation Program (AIDCP). The Venezuelan tuna fleet that operates in the waters of the EPO is made up of purse-seine vessels, although, on the IATTC Regional Register a longline vessel appears that has not been operating for a long time. The fleet started to operate in the year 1973 with one sole tuna vessel. Later other vessels were incorporated, although temporarily and it was only after 1976 that there was permanency in these waters. This presence gave Venezuela the right to greater catch quotas when it was affiliated in 1991 as a Cooperating member of the IATTC.

Since the year 2011, INSOPESCA initiated the implementation of another on-board Observer Program, with a coverage of between 5 and 8%, directed at the industrial fishing fleet that operates in the Caribbean Sea and the Atlantic Ocean, although it was in the year 2012 that the first boardings of vessels were initiated. The first actions for putting the Program into action had the advice of the staff of FUNDATUN: it was initiated with the establishment of the scope and design of the instruments for collecting information, of the database and the training of the technical personnel that would participate in fishing trips in the role of On-Board Observers. The fishing fleets monitored by this program are directed at catching tunas and other incidental highly migratory fish such as billfishes, sharks, among others, with the use of different fishing gears such as purse-seine nets, longlines, pole-and-line.

As was indicated above, although Venezuela does not have any longline vessels currently fishing in the EPO; participation in these workshops enable us to be prepared. They are also useful for exchanging experiences acquired in other latitudes, with the aim of unifying, in the near future, the databases of the sampling programs in the country both on-board and in unloading ports. Also, Venezuela is a signatory to ICCAT since 1961, as it is to the IATTC, tuna fisheries statistics are handled in compliance with TASKS I, II and III with the recording forms adjusted to these tasks.

The first results obtained from this experience was published by ICCAT at the following link: http://www.iccat.int/Documents/CVSP/CV070_2014/n_5/CV070052207.pdf

In the year 2013, the National Plan of Action for the sustainable utilisation of Sharks in Venezuela was developed through consultations and joint work with a team of experts convened by the National fisheries administration, the document can be seen at the following link: http://www.insopesca.gob.ve/files/tiburon.pdf

Gradually, in the Caribbean. Other projects and monitoring have been carried out on vessels classified as High Seas Multi-Purpose Fishing according to the Official Gazette of the Bolivarian Republic of Venezuela no. 39.295, page 372.619: "are those that harvest different species of marine fish with the use of more than one mechanised fishing year, they have at least one longline of no more than 700 hooks, maximum 100 fish traps, and an undefined number of handlines. The percentages of maximum catch volume should not exceed 10% for tunas, 5% for billfishes and 3% sharks; the use of live bait is not permitted". In practice, its effort is directed more at what is caught as incidental fauna in the industrial longline tuna fishery.

General recommendations for the development of sampling programs in Latin America on the basis of the most notable weaknesses:

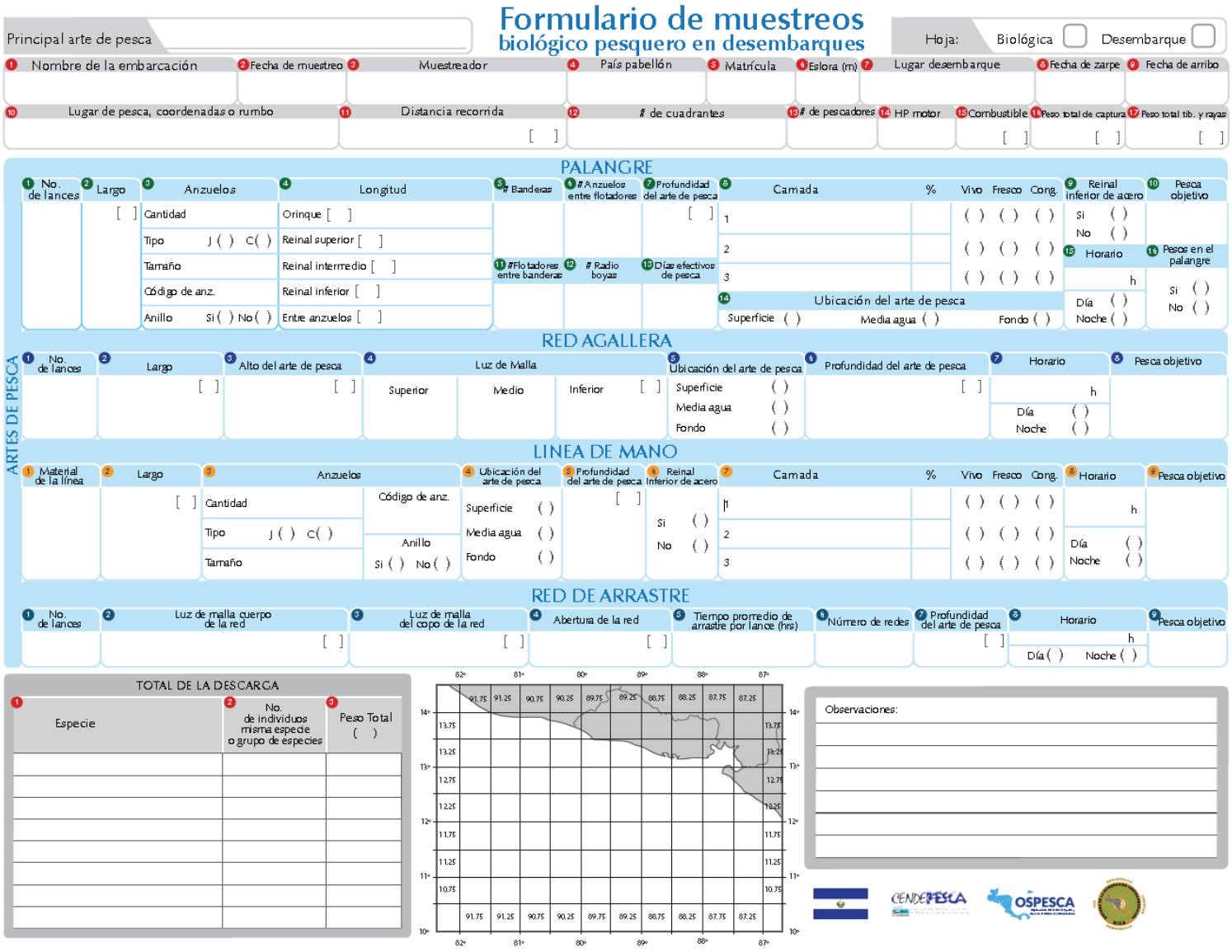
*Attempt to promote that fishermen form cooperatives that work with the government sector in implementing conservation measures, in Mexico. There are some trials, I suggest this link where the book on successful cooperatives can be downloaded:
http://issuu.com/mochimerosrl/docs/cooperativaspesquerasexitosas/1

* We intend to assess the levels of security at the different unloading ports, with the aim of investigating the relationship between unloadings security levels, and thus establish geographical points to carry out more sampling in areas that mean less danger for the inspectors. It is recommendable to seek medium-term strategies for improving security in those dangerous sports with the support of both the community and the government.

*Promoting information on conservation measures for endangered species is required, but designed in colloquial and educational language for the fishermen. Hence the need to carry out workshops continually and closer to the actual fishing communities.

*It is necessary to coordinate financial support both for promoting the workshops and for hiring more inspectors, even if only temporarily. In this regard, an initial financial boost could be obtained from some national or international project, and later, seek support from the community. Once the workshops that create confidence among the fishermen have been carried out, they could collaborate in the sampling with few inspectors, or at least guarantee their security. In turn, it becomes necessary to coordinate travel among the different communities in the same geographical zone.

Appendix 4. Standardized shark sampling form for Central America**.**



Appendix 4. (cont.).

Instituto Costarricense de Pesca y Acuicultura (INCOPESCA)

Formulario Inspección de Desembarque (FID) Recursos Hidrobiológicos

Incopesca
Instituto Costarricense de Pesca y Acuicultura

1 Pacífico ☐ Caribe ☐ FID No.

2 Nombre de la embarcación	3 Matrícula	4 País Pabellón

5 Muelle Centro Acopio o Comunidad Pesquera	6 Fecha de Zarpe	7 Fecha de Arribo
	8 N° Zarpe	9 Eslora (m)

10 Flota comercial tipo:
Pequeña Escala ( ) Mediana Escala ( ) Avanzada ( )
Semi Industrial ( ) Industrial ( )

11 Barco Principal: Si ( ) No ( ) Correlativo No. FID: 12

13 Cuadrantes en el mapa donde realizó la pesca:

14 # de Lances | 15 Palangre ( ) Linea de Mano ( ) | 16 Reinal de Acero Si ( ) No ( )

17 # Red de arrastre	Red de Cerco	Red de Enmalle	18 Luz de malla
( )	( )	( )	__/__/__ Pulgadas

1 Especies Tiburón	2 Número cuerpos	3 Peso Cuerpos	4 Peso Aletas
Tiburón Azul *Prionace glauca*			
Tiburón Gris *Carcharhinus falciformis*			
Tiburón martillo rosado *Sphyrna lewini*			
Tiburón martillo blanco *Sphyrna zygaena*			
Tiburón Mako *Isurus oxyrinchus*			
Tiburón Perro *Carcharhinus longimanus*			
Tiburón Zorra *Alopias supercilliosus*			
Tiburón Zorro pelágico *Alopias pelagicus*			
Tiburón Punta Negra *Carcharhinus limbatus*			
Tiburón Tigre *Galeocardo cuvier*			
Total			

5 Los cuerpos de los tiburones vienen con las aletas

Adheridas naturalmente	Adheridas naturalmente con corte parcial
Si ( ) No ( )	Si ( ) No ( )

Separadas
Si ( ) No ( ) Número_____ Peso_____ ( )

6 Otras Especies	7 Número cuerpos	8 Peso
Dorado *Coryphaena hippurus*		
Espada *Xiphias gladius*		
Marlin Blanco *Makaira mazara y M. Indica*		
Marlin Azul *Makaira Indica*		
Marlin Negro *Makaira Indica*		
Marliln Rosado *Kajikia audax*		
Vela *Istiophorus platypterus*		
Wahoo *Acanthocybium solandri*		
Atún Aleta Amarilla *Thunnus albacares*		
Atún Patudo (big eye) *Thunnus obesus*		
Atún Barrilete *Euthynnius lineatus*		
Total		

9 El desembarque de acuerdo a resolución OSP-OS-11
CUMPLE ( ) NO CUMPLE ( )

10 Observaciones o Recomendaciones: _____

ESPACIO USO EXCLUSIVO AUTORIDAD DE PESCA - NULO SIN LA FIRMA DEL INSPECTOR

1 Nombre del Propietario:	2 No. de Identificación
3 Nombre del Capitán:	4 Firma
5 Nombre del Inspector:	6 Firma

7 Fecha Inicio de Desembarque:	8 Hora Inicial	9 Fecha Final Desembarque:	10 Hora Final
11 Total Horas de Inspección:	12 Horas Ordinarias	13 Horas Extraordinarias	

Original: Armador Copia amarilla: Oficina de Pesca Copia verde: Oficina Regional