Catch documentation and traceability of shark products in Costa Rica

A case study report

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Contents

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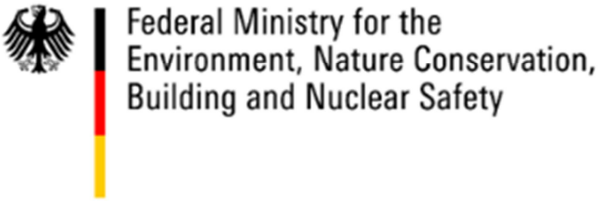

1 Executive summary

Building on two studies[1] on shark traceability commissioned by the CITES Secretariat in support of the CITES Standing Committee's work on the subject, a pilot was undertaken from Dec 2015-Feb 2016 in Costa Rica on the implementation of the OSPESCA Catch Documentation Scheme – originally developed by Costa Rica – and the traceability provisions in products of CITES-listed sharks in Costa Rica.

For that purpose, online consultations were held with all stakeholders from the private, public and the non-governmental sector to understand the current provisions and compare them to the recommendations developed in the above reports.

Furthermore, a study visit was undertaken to the main commercial port of Costa Rica, Puntarenas. In close cooperation with the fisheries authority INCOPESCA and the private sector the full process from landing to export was visited and control procedures reviewed *in situ*.

In Costa Rica, sharks are caught by the medium and large size longline fleet and the artisanal fleet[2]. Very strict control procedures on species level are in place for the medium and large fleet for all shark products; these were considered to fully implement the traceability recommendations of the report on shark traceability. For the artisanal fleet comprehensive sales documentation on aggregate ("shark") level is available to the authority; this needs to be complemented by a sample-based study of catch composition, ideally by catch-region, in order to gauge the impact of that fleet on the shark population and to decide if and what kind of traceability system is needed in with the light of that impact.

With these results of the online consultations and in-situ visits, a workshop was held on 12th Feb 2016 in Puntarenas with representations from the Scientific and Management Authority of CITES in Costa Rica, representatives from the longline and artisanal fleet, NGO and law enforcement. The meeting resulted in the agreement of the establishment of a traceability roundtable to meet for the first time on March 7th, 2016 in Puntarenas.

From the results of the workshop, the following recommendations were developed:

1. Vessel Monitoring Systems (VMS) are a pre-cursor to good fishery management and should be implemented on the whole longline fleet; an economic impact assessment and potential positive or negative subsidies should be considered.
2. In order to strengthen the processes within the CITES Management and Scientific Authority, an online consultation system is recommended.
3. An impact study of the artisanal fishery is suggested to gauge the environmental impact and the socio-economic consequences of the artisanal shark fishery.
4. Establishment of traceability roundtable with a view of using Responsive Fishery Management System. Support for outside facilitation is recommended.
5. Technical assistance should be considered for the development of a user-friendly, mobile fishery inspector data capture tool and the corresponding management

[1] Traceability study in shark products (SC66 Doc. Inf. 11) and Traceability systems in the CITES context: A review of experiences, best practices and lessons learned for the traceability of commodities of CITES-listed shark species (SC66 Doc. Inf. 12)

[2] For a definition of the terms, please see Figure 1.

database for INCOPESCA. This system could be designed to also increase transparency for other stakeholders.

6. Law enforcement needs to be strengthened to complement traceability efforts.

Results and recommendations were presented at a side event of the Second Meeting of the Signatories to the Memorandum of Understanding on the Conservation of Migratory Sharks (MOS2). The side event was attended by about half of the attendees of the MOS2 meeting and very well received. Main discussion points were:

- The role of law enforcement
- The reliability of conversion factors, in particular from wet fins to dry fins
- The implementation of Costa Rica's species specific custom codes

In a much applauded gesture, the President of the Longline Association pledged the support of the private sector to full transparency and traceability.

2 Introduction

At its 27th meeting (AC27, Veracruz April 2014), the Animals Committee discussed the implementation of Resolution Conf. 12.6 (Rev. CoP16), with an emphasis on the species that had been included in the CITES Appendices at CoP16[3]. A working group at AC27 consequently formulated several recommendations (see document AC27 WG7 Doc. 1), including the following request to the Standing Committee:

> *Directed to the Standing Committee*
>
> *The Animals Committee requests the Standing Committee, at its 65th meeting, to consider relevant matters relating to the implementation of shark listings, including the following:*
>
> *a) New legislative issues that might arise in exporting, transit and consumer countries;*
>
> *b) Issues pertaining to chain of custody, including where in the trade chain it is considered essential to be able to identify the products in trade;*
>
> *c) Issues pertaining to legality of acquisition and introduction from the sea;*
>
> *d) Existing catch documentation and product certification schemes that could assist in the implementation of Appendix II shark listings; and*
>
> *e) The role of Regional Fisheries Management Organizations.*
>
> *Both the Standing Committee and the Animals Committee should review the requirements that have been developed for the trade in processed product types of Appendix II species such as crocodile skins, caviar etc. and consider their applicability to shark products containing Appendix II species*

Based on these recommendations, the Standing Committee at its 65th meeting decided to establish an intersessional working group to address these questions, which will present its findings at the 66th session of the Standing Committee to take place January 2016 in Geneva, Switzerland.

To support the work of the Standing Committee working group in regard to paragraphs b), c) and d), the CITES Secretariat commissioned two studies on Traceability within the framework of the European Union sponsored project "Strengthening capacity in developing countries for sustainable wildlife management and enhanced implementation of CITES wildlife trade regulations, with particular focus on commercially exploited aquatic species". Traceability is most commonly defined as "the ability to trace history, application or location of an object", following the ISO 9000:2015 standard. One of the studies reviews CITES traceability schemes that have been developed for the trade in processed products of CITES-listed species, while the other study reviews the market chain and traceability systems that are in place for other commercially exploited aquatic species. Both studies are published on the CITES shark portal[4].

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[3] See documents AC27 Doc. 22.1, 22.2, 22.3 and 22.4.

[4] Traceability study in shark products (SC66 Doc. Inf. 11) and Traceability systems in the CITES context: A review of experiences, best practices and lessons learned for the traceability of commodities of CITES-listed shark species (SC66 Doc. Inf. 12)

Both documents emphasize the need to tie a traceability system to a legal origination process, ideally a Catch Documentation Scheme [see d) above]. Dr. Lehr's study also describes several options for the implementation of a traceability system for shark products and recommends to conduct a pilot project as proof of concept. According to the study, an ideal pilot project should fulfil many or all of the criteria below:

1. *It should involve at least one developing country in the technical feasibility assessment*
2. *It should involve a trading partner with a history of strong interest in (shark) conservation to provide better motivation to food business operators*
3. *Parties participating in the pilot shall already have a legal origination process; ideally they would also support electronic recording of certificates of origination (e.g. landing/catch certificates)*
4. *It shall be large enough to have a measurable impact; ideally it would cover one to three Management Authorities for a period of time (e.g. 6 months)*
5. *It should concentrate on one product only to start with. Fins would likely make a larger impact on conservation issues, while meat is a less politically contentious product.*
6. *A socio-economic impact assessment should be made that compares implementation and operation cost with the likely impact on CITES listed species*
7. *It should attempt to quantify the amount of illegal and unreported landings using indicator markets/ports and local expert knowledge*
8. *It may consider Parties first that already use risk management in export related procedures*

3 Background: Costa Rica

Costa Rica was one of the co-proponents of the successful proposal to include Hammerhead sharks (*Sphyrna lewini, S. mokarran and S. zygaena*) in Appendix II at the 16th Conference of the Parties in Bangkok 2013. However, after the entry into force of the new shark listings on 14 September 2014, Costa Rica experienced challenges in the implementation of the listings. Upon request by the Costa Rican Management Authority, the CITES Secretariat provided scientific and legal assistance to the Costa Rican Authorities and attended a national workshop to formulate an NDF with the management and scientific authorities of Costa Rica in July 2015.

The NDF document resulting from the national workshop, finalized in August 2015, proposes to suspend export of shark products from CITES-listed species for one year, mainly due to lack of data and lists a range of conditions that should be fulfilled within that timeframe (see the attached document 70, Paso 6), which would allow for more informed decision making in the future and in general improve fisheries management practices in the country.

Recommendation 6 reads: "Improve processes of traceability and communication between institutions [in shark fisheries]" (translation by the author).

The Costa Rican Institute for Fisheries and Aquaculture (INCOPESCA) had during the workshop in July 2015 presented several activities that were ready to execute, but were currently not being implemented due to lack of funding. Among them is the roll-out of the Catch Documentation Scheme that was agreed in the regional fisheries body OSPESCA, which would establish a regionally agreed legal origination process for fisheries catch, including CITES listed species. INCOPESCA approached the CITES Secretariat if funding could be made available to

support these activities. Reconsidering the criteria for a pilot project identified in the consultant's study and applying them to Costa Rica, this could constitute a suitable pilot project for the following reasons:

1.) Costa Rica is a developing country that has been identified as focal country requiring support through the FAO study *Priority regions and countries impacted by the recent CITES listings of marine elasmobranchs*.

2.) As co-proponent of the hammerhead shark listings under CITES, and host of the second meeting of the Memorandum of Understanding on Sharks (Sharks-MoU) of the Convention on the Conservation of Migratory Species of Wild Flora and Fauna (CMS), Costa Rica has demonstrated a strong interest in conservation and sustainable use of sharks.

3.) INCOPESCA has already implemented a legal origination process.

4.) While not covering multiple management authorities, the proposed project would cover multiple national institutions, including INCOPESCA and thereby help to increase the institutional collaboration.

5.) Shark fins have in the past been the primary shark product exported from Costa Rica and would lend themselves as focus for this project

6.) A socio-economic baseline study has been conducted by INCOPESCA in February 2015, and another by OAS in July 2015, which unfortunately was not published in time to be taken into consideration by this project.

7.) Costa Rica has a well-developed NGO community and high availability of local expert knowledge on illegal and unreported landings

4 Objective and expected outcome

The project "Implementation of the OSPESCA Catch Documentation System and a Traceability System for CITES-listed shark species in Costa Rica " is tailored to address the expressed need for assistance of the Costa Rican CITES authorities, including INCOPESCA, in implementing the new shark listings under CITES, in particular through the joint implementation of a Catch Documentation Scheme and a traceability pilot project.

At the end of the project the regionally agreed OSPESCA Catch Documentation Scheme will be in widespread use in Costa Rica, the Costa Rican authorities involved in the catching, landing and trading of sharks will have greater awareness of their respective roles and, building on this process, a traceability pilot project will have been established that will demonstrate how shark products from Costa Rican fisheries can be traced from landing to export.

The report of the project will also be useful to inform ongoing FAO processes on guidelines for catch documentation and fisheries products traceability and FAO will be consulted throughout the implementation of the project.

5 Methodology

This pilot project was very limited in time and scope. For reasons of budget and time, the following methodology was chosen:

1. Online consultation with relevant Costa Rican organisations

2. Set up of coordination group with INCOPESCA
3. Review of all traceability relevant processes by desk review and online meetings with entities that intervene in the traceability chain
4. Visit of the productive process from the boat through processing of fins and meat in the most important fishing port Puntarenas
5. Visit of the export process through site visit of the export bureau of INCOPESCA
6. Evaluation of the availability of electronic information from the catch certificate
7. Visit of the local market
8. Workshop with all CITES-relevant stakeholders with discussion of the preliminary results, training in traceability and Catch Documentation Schemes and establishment of national roundtable for traceability of fishery products
9. Presentation of the results at a side-event at MOS2, 15-19 Feb 2016, San José, Costa Rica
10. Elaborating this report and recommendations contained therein

6 Summary of learnings

1. The control system implements the recommendations on shark traceability
2. In some areas, the implementation is much stricter than anticipated in the recommendations of SC66 Doc. Inf. 11.
3. The recommendations call for the use of risk criteria for control in order to optimise the use of resources; Costa Rica's 100% control system goes beyond that
4. The Costa Rican control system for the medium and advanced longliner fleet is considered a complete traceability system in the sense of the above cited recommendations; the verification procedures are if anything not resource effective.
5. In general, the process within the control authorities can be streamlined
6. In particular, the use of electronic means is recommended to optimise resources employed to operate the control system

Costa Rica has implemented an improved version of the OSPESCA Catch Documentation Scheme in autumn 2015, following publication in 2014 of the corresponding regulation "Procedimientos operativos desembarques especies hidrobiologicas". Since at the time of execution of the project, the regulation had already been implemented, there was less need of assistance in this matter, than originally envisioned.

After desk-review and physical visitation of the whole productive process from landing to export, the current control measures for the longline fleet, including the OSPESCA Catch Document Scheme, are considered sufficient to implement the recommendations made in the traceability study of sharks SC66 Doc. Inf. 11. This position is substantiated further in Section 7.

Longline boats upon landing have to submit documentation about the trip, temperature logs and locations and times of line settings. However, the fleet is not yet equipped with Vessel Monitoring Systems (VMS), which is considered international good practice to ensure that fishing activities are not taking place inside areas in which they are prohibited. The private sector also recognises that VMS data will be their best ally against allegations of fishing in no-take MPAs, in particular the Isla de Coco. Funding was obtained for 165 VMS systems plus the first year of operation. However, due to current litigation these systems have not yet been installed. Although all of the further reaching boats will eventually be equipped with VMS, all boats of the medium and large scale fleet should ideally have VMS for the above mentioned

reasons. The economic impact of the cost of 1,400USD for installation and about 600USD yearly subscription needs to be studied.

It must be mentioned, however, that the Catch Document Scheme as the basis for a traceability system (the "legal orgination process", as termed in the recommendations in the traceability study piloted here), is implemented only for the medium and large scale longline fleet. Provisions for the other fleets catching sharks, in particular the artisanal fleet, have not been implemented yet. This fleet by nature is much more difficult to integrate into the traceability effort. It is very important to understand the real impact of this fleet on sharks, in particular the currently CITES-listed species. Since data of first sales are already collected, catch could be estimated through a sample-based catch composition study. Such a study should include sample-based size measurements as well as a socio-economic impact study on the artisanal fleet of traceability and other measures. The quality of this estimate would be greatly increased if the study takes into account the catch areas of the respective artisanal fleets, or

Figure 1 Characterisation of the Costa Rican national fleet; Src: INCOPESCA

feasible proxies such as distance from coast.

Traceability, as outlined in the previously mentioned Traceability studies cannot address black market transactions in which both buyer and seller are aware of the illegal nature of their activity. Traceability here can have a supporting role for general law enforcement in order to tackle possible illegal trade, e.g. originating from IUU fishing or transhipment. Genetic analysis must also be considered, at least on a sample basis.

This naturally leads to the next recommendation of combining the control system with a risk management system. In the currently highly politicised environment of Costa Rica, not having comprehensive checks might not be acceptable. However, this is clearly not a good use of scarce inspection resources which could be employed elsewhere. Exporters who have shown over and over to be fully compliant and who submit consistent documentation clearly pose a lower risk than exporters with incidents in the past. (Similar arguments can be made for specific products, boats from which raw material was sourced and other risk factors.) One such

measure could be to randomly, but weighed by risk, choose shipments to sub-sample for genetic analysis (in accordance with a budget for such checks).

The recommendations in the non-detriment finding (NDF) by the Costa Rican CITES Scientific Council (CRACCITES) and discussions conducted during the workshop and side event showed a lack of awareness and trust in the traceability system by some stakeholders.

This lack of trust is partly a result of the lack of access to data because of confidentiality. INCOPESCA has full visibility of data from landings and exports, but because of confidentiality does not currently share that data in any way.

From a technical point, it would be easy, however, to create online lookup services for relevant stakeholders (including perhaps importers). Such lookup services would employ for example the export permit number and would be limited to showing non-confidential data that is necessary to verify traceability.

Such a measure could help to greatly improve transparency and trust and is therefore recommended.

To further strengthen the existing control system, catch certificates (FIDs) need to be consistently made electronic, ideally directly at landing to remove the additional effort (and source of errors) of later digitalisation. The consequent use of electronic information could streamline internal processes within INCOPESCA and reduce the workload as an additional benefit. The main benefit however would be communication with other agencies, in particular the Management Authority SENAC and Customs. A simple module was developed for demonstration purposes for Costa Rica to show how a professional database can be used with simple tools (MS Excel) and provide secure outside access to relevant information without breach of confidentiality.

The workshop showed that the current control efforts of the longline fleet were not necessarily known outside of INCOPESCA. This lack of knowledge of the reality of the fisheries and the control measures fuels discussions that often lead to dissent. Better information would increase the chance of fact-based discussions. For that reason, it was suggested that a traceability roundtable be established. After a very successful workshop, the recommendation was adopted and a first session agreed to take place on March 7th, 2016 in Puntarenas.

During the course of this traceability pilot, the different stakeholders engaged in an open, transparent and constructive exchange that also touched on subjects only indirectly related to traceability. Some of those insights include the following:

- One observation that was frequently brought up during the project was that the current moratorium on exports, resulting from the negative NDF, under certain circumstances leads to CITES-listed species that are caught as bycatch to be discarded, used as bait or for consumption by the fishermen. While this does not fall under CITES provisions, it was remarked that this practice leads to a loss of data for management that is undesirable at best. Therefore, schemes to incentivise full reporting and/or landing should be considered, of course in the context of a proper management plan. It is highly recommended that the private sector should be closely involved in the design of such management plan, e.g. in form of a Responsive Fishery Management System (RFMS) based on Result-based Management.

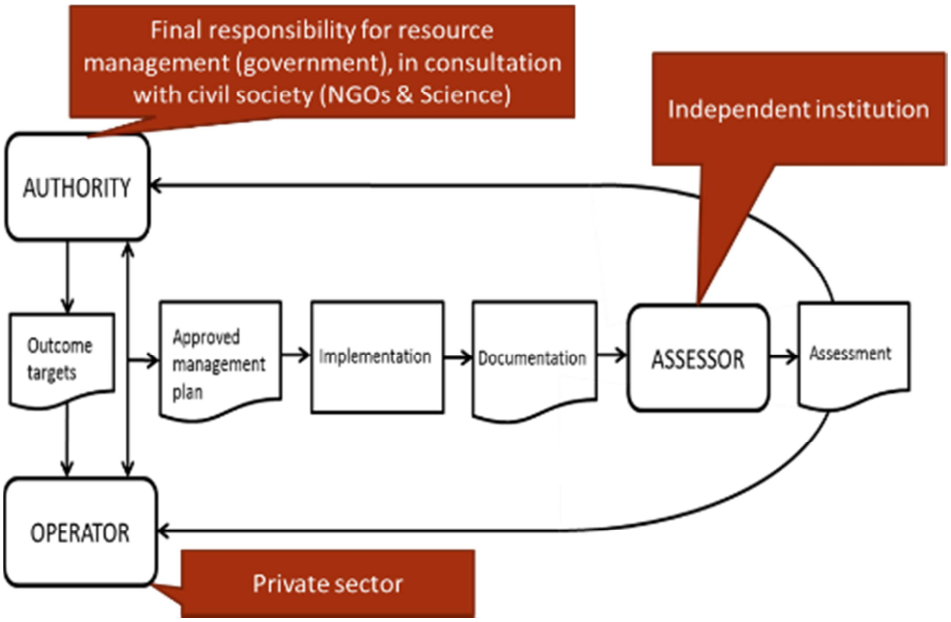

Figure 2 Responsive Fishery Management System based on Results-based Management

RFMSs, as one example of a fisheries management system, build on the idea that the Authority in consultation with the civil society, represented e.g. by NGOs, fix (measurable) outcome targets. The Operators, i.e. the private sector, then prepare and agree a management plan to meet these targets, together with an implementation plan and control measures. The implementation and controls are then assessed by a 3rd party Assessor and the assessment is fed back into both the outcome targets and the management plan for continuous improvement. This enables the Operators to implement themselves a plan, which leads to much greater acceptability and much more efficient controls.

- In the experience of the author, social pressure within peer groups is still the single most effective measure to implement rules and policies. In Puntarenas, for example, local fishermen disagreed with the practices of a particular business operator and subsequently stopped selling to the firm altogether; a very efficient implementation of “punishing” what was considered to be bad practice by the local fishing community.
- Considering the private sector in Costa Rica in decision making and building on their desire to continue operating also in the future, sustainable and within the provisions of CITES, might very well be the most promising path to a proper management of shark

populations in the country. It is highly recommended to make a socio-economic impact study in order to design good outcome targets and management plans.

7 Comparison of recommendations with existing processes

The following table compares the recommendations made in the study on traceability of shark products SC66 Doc. Inf. 11 and the control procedures applied to the medium and advanced longline fleet in Costa Rica. As can be seen from the table, the control system implements the recommendations with exception of using risk-based controls. In Costa Rica, 100% of exports of shark products are controlled.

Table 1 Comparison between the original traceability recommendations of SC66 Doc. Inf. 11 and the current status of implementation in OSPESCA and Costa Rica

Original recommendation	**Implementation status in OSPESCA/Costa Rica**
Traceability is a tool that can help avoid the entry of illegal, unregulated and unreported material into the legal supply chain. As such, traceability is a viable option to strengthen the Legal Acquisition Finding.	Traceability is well-known and implemented for all shark products, whether CITES-listed or not, for the medium and the advanced longline fleet (about 443 boats); first implementation dates back to 2013, while the current, reviewed system is in place since autumn 2015. The Legal Acquisition Finding is based on an interrupted chain from export product to catch certificate, verified by an official fishery inspector.
Traceability and in particular linking trade data to the origin of the raw materials can be used by Parties in the process of making more robust Non-Detriment and Legal Acquisition Findings.	The artisanal fleet is currently excluded from the strict landing controls. However, sales data is available; a sample-based catch composition study is recommended to obtain data for improved catch estimations. There is no stock assessment available for CITES-listed shark species and no management plan. The data gathered in the traceability system is currently not used in the elaboration of NDFs, mainly because it is not accessible.
Traceability should link the export/import permit (such as a CITES permit) or certificate to a suitable legal origination process. This legal origination process must include issuance of a uniquely identified certificate that lists the species and the quantity/mass.	The 100% controlled landings at both private and public wharfs constitutes a legal origination process for the medium and advanced longlines, documented via a catch certificate called FID. Control of exports is done through an export permit linked to the FIDs. Exporters have to link export product to incoming FIDs. 100% of all shipments of shark products are physically controlled.
It is highly recommended that such certificates of origination are recorded electronically as early as possible; they can, however, also be recorded in the export permit issuance process.	The FID is recorded by the fishery inspector and signed by him/her, the captain and the owner of the boat. For purposes of statistics, they are converted into electronic information in an isolated database, currently only accessible by selected staff inside INCOPESCA.

An attempt should be made not to place undue burden on food business operators that would discourage their buy-in. It is therefore recommended to allow exporters to use a mass balance traceability system, especially if the business operators commit, as part of their continuous improvement programs, to switch over time to a batch system or one relying on individual identification. The effort invested into the more robust traceability systems should be rewarded, e.g. by allowing marketing claims or by incentivising them otherwise (less controls, pre-approved exports, reduced export tax etc.).	All steps in the shark supply chain are exhaustively controlled. However, the private sector has accepted the extremely close controls. Fins and meat are processed by batch and Hazard Analysis and Critical Control Points (HACCP) is fully implemented. Currently in the highly politicised climate surrounding sharks in Costa Rica, operators do not openly advertise their product, especially not fins. Fin exporters make an attempt to hide their production, even if totally legal. Many operators of the supply chain are concerned about the criminalisation of their activity.
It is highly recommended to link the traceability system with a risk management system. As a result, exporters/importers shall undergo a documentary check if doubts regarding the origination arise. Results of such checks should be recorded in an exporter profile database and made available to other relevant stakeholders.	Currently there is full physical control both at origination (landing) and at export. Since November 2014, all sacks with fins are fully emptied and checked for species and compliance. Such exhaustive controls are the result of great public concern over shark products. However, they are not very efficient for the private sector operators nor for the controlling agencies which suffer from resource shortage.
Traceability will help very little when buyers and sellers operate in the black market. It is recommended to design incentives to convert illegal and unreported landings into legal and reported landings, e.g. by implementing tradable certificates. At the same time, it is recommended to implement a consistent Monitoring Control and Surveillance system to strengthen the traceability system. Requiring fins-on landings will also strengthen the proper identification of the raw material subject to CITES regulations.	Currently, there are few incentives to incentivise conversion to legal operation. Material landed from the medium and advanced fleet is very closely controlled, so laundering is difficult. Fin processors have stopped purchasing from the artisanal fleet to avoid issues. The private sector reports that CITES-listed sharks, especially if caught in international waters, may not be landed, even if dead upon haul, given the cost and time of controls. While outside CITES provisions, this may be an undesirable outcome, due to loss of data. Landing of by-catch should be incentivised, when live release is not possible. VMS for high range boats is being implemented, but legal as well as funding issues were reported. VMS for the remaining fleet should be implemented as well; a socio-economic impact study should be undertaken that studies the impact of that cost and finds either positive or negative incentives to further implementation. Strengthening Customs control and enforcement are important to attempt to

	reduce black market transactions. Fins naturally attached to body measure has been implemented in an internationally recognised procedure.
It is recommended that a neutral intergovernmental body operate a traceability system centrally. It is also recommended that such a system be implemented with the possibility in the mind that Parties (or other institutions, like RFMOs) might want to operate a node in the future. The system should be prepared to run in a distributed fashion; EPCIS is a standard that should be considered in this context.	The traceability system is operated by INCOPESCA, a government agency. Information is available internally in electronic form, but not externally. This needs to be improved to increase communication and transparency of the sector and improve the authorisation processes of the Management Authority SINAC. A simple module was developed as part of this consultancy. EPCIS while desirable, seems not feasible technologically, given that the status of IT infrastructure and personnel is rudimentary.
Finally, it is highly recommended to study the implementation of traceability as a tool for strengthening CITES process in practical detail through a pilot project involving at least also one developing country.	The traceability system was implemented on paper. For improved processes (with less associated cost), this needs to be moved to electronic means. INCOPESCA has already acquired tablets, but has issues with the capacity and buy-in of parts of the workforce. Most likely an investment in a really practical and user-friendly application for FID management (integrated with application for inspection to reduce re-typing), can help. Alternatively, it is suggested to re-locate data capture to the fishery inspection office and have other ports transmit certificate via e-mail or WhatsApp for quicker conversion to an electronic format. With an average of 20 FIDs per working day, this should be quite feasible.

8 Risk management – demo tool

In the course of this pilot project, a small demonstration database tool was developed and provided to INCOPESCA for consideration. The tool consisted of

(a) A professional, networked database that can be used free of charge for non-commercial uses (MYSQL)
(b) A connector from MYSQL to Excel, available as part of MYSQL, that allows management of data contained in the database via Excel
(c) A series of 6 tables capturing catch certificates and export permit data, using normalised species names
(d) A series of 5 reports to assess the validity of reported data and show potential areas of concern (i.e. overuse of a FID, export mass not consistent with FID masses etc.)
(e) A sample risk assessor for a particular export permit and evaluates the risk of
    a. History of permits issued to the exporter
    b. Product
    c. Stocks of available material
    d. Potential overuse of FID
(f) A restricted, non-editable table (called a View) for external verification of data, in this case FIDs without compromising the confidential nature of data stored on FID and in export permits. Since the database is automatically networked, such consultation can be enabled with minimum effort online, even for consumer use.

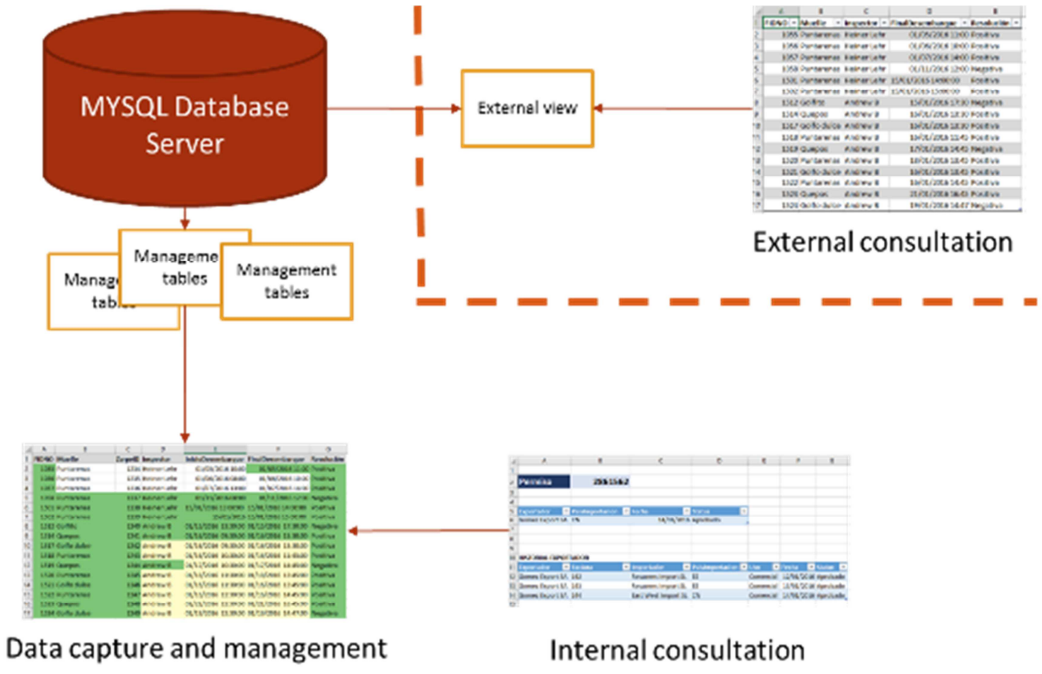

Figure 3 Schematics of the demo database tool

The tool is for demonstration purposes mainly, because more time is needed for proper analysis of all the options and more robust implementation. It was developed, however, completely without software programming and in only a few days of work. While for proper implementation a small project would need to be set up, such project does not necessarily have to be too big.

The above database can easily be distributed, so even direct capture of electronic information at the landing site could be thinkable. However, for such purpose mobile applications (for tablet or even mobile phone) are much preferable. Such applications, however, have to be tested very well for usability, because otherwise inspector will continue to use paper.

9 Recommendations

1. VMS is a pre-cursor to good fishery management and should be implemented on the whole longline fleet; an economic impact assessment and potential positive or negative subsidies should be considered.

2. Given that traceability at best has a supporting role in black market transactions and the incidental evidence of Costa Rican boats being involved in illegal fishing activities, there is a need to strengthen law enforcement activities.

3. In order to strengthen the processes within the CITES Management and Scientific Authority, an online consultation system is recommended
    a) Stakeholders in the country: in particular entities involved in CITES Scientific Authority, but also Customs
    b) Stakeholder in the importing country: validity of export certificates, validity of catch certificates [for EU]

4. An impact study of the artisanal fishery is suggested to gauge the environmental impact and socio-economic consequences of the artisanal shark fishery, based on:
    a) Sales data on aggregate level
    b) Samples of species composition of the artisanal fleet
    c) Radius of operation from home port
    d) Such a study could quantify the impact of the artisanal fleet on sharks

5. Establishment of traceability roundtable with a view to support a Fishery Management System (e.g. Responsive Fishery Management System using Results Based Management) for the inclusion of the artisanal fleet and the improvement of management of the medium and advanced fleet. Support for neutral outside facilitation should be provided to assist the process of reinitiating the conversation in the current highly politicized environment.

6. Technical assistance should be considered for the development of a user-friendly, mobile fishery inspector data capture tool and the corresponding management database for INCOPESCA. Such a tool would greatly streamline the processes, increase transparency and make the traceability system more robust. Availability of mobile tools could be extended to the artisanal fleet and its use incentivised for example by linking fuel subsidies to making data available. Such data could then be spot-checked by inspectors.

10 Appendix I: Short summary of visits/events/meetings

10.1 Online meetings

In preparation of the workshop(s), for the review of the implementation of the OSPESCA Catch Documentation Scheme and the traceability provision in place in Costa, online consultations were held with all relevant stakeholders, in particular

1. INCOPESCA – departments of inspection and marketing – part of the CITES Scientific Authority
2. Servicio Nacional de Salud Animal (SENASA) -
3. Sistema Nacional de Áreas de Conservación (SINAC) – CITES Management Authority
4. Asociación Cámara Nacional de la Industria Palangrera (private sector)
5. Misión Tiburón (NGO)

These meetings were held to (a) understand the system of controls in Costa Rica, in particular the implementation of the OSPESCA Catch Documentation Scheme – originally developed by Costa Rica – and the export control systems.

The meetings also proved to be an opportunity for open, transparent and constructive information exchange between different stakeholders, including the private sector. Conversation centred around difficulties with the implementation of CITES listings of certain shark species, in particular hammerheads, and their buy-in into the control systems employed by INCOPESCA.

Furthermore, the conversations with the NGO Misión Tiburón were used to better understand the concerns of the civil society, as represented by the NGOs and their assessment of the control processes of INCOPESCA.

10.2 INCOPESCA senior management

Meetings were held with the Executive President of INCOPESCA, Mr Gustavo Meneses in Puntarenas, as well as with Mr Antonio Porras, General Technical Director of INCOPESCA.

The meetings served to inform the senior management of INCOPESCA about the pilot project. In both occasions, reference was made to the highly politicised situation of sharks in Costa Rica and the difficult conversation between the stakeholders.

The senior managers also made clear that INCOPESCA fully supports the objectives of the pilot study, is keen to review its processes with a view to improving them and is grateful for the support it receives from the CITES Secretariat and indirectly through the project from the Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB).

10.3 INCOPESCA wharf

Unfortunately, the visiting days of 10-14th of February were very windy. In addition, many boats had left the port just after the Christmas holidays (boats make trips between 1-12 months, depending on capacity and targeted species). Both factors together meant that there were no landings on the first days. The consultant could only be present at a landing on Saturday 13th of February.

At the wharf, the international team (Daniel Kachelriess, Marine Species Officer, CITES Secretariat and Dr Heiner Lehr, Consultant), met the group of fishery inspectors of Puntarenas, the most important of 5 ports in Costa Rica where longline vessels land sharks (and other

species, such as tuna, swordfish, merlin, mahi mahi, wahoo and other species. Most fishery officers at the Puntarenas office have many years of experience; the absence of young officers seems to indicate issues with recruitment of new officers.

One reason for that might be the low income of fishery inspectors. Informal conversations situate the income of an officer at about 500USD per month with cost of (low category) housing situated at around 200USD. The World Bank situates the Gross National Income per capita in Costa Rica at 14,420 international dollars[5] in 2014, IndexMundy using the Atlas method (current USD) at 9,550USD in 2013. By both measures, the income of a fishery inspector seems to be below national average. It should be considered whether this poses a risk.

Fishery inspectors, however, are respected in their community. The private sector has shown several times during the visit their understanding of the function of the fishery inspector and that the officers help maintaining the sector operative.

The process of data capture of a catch certificate (FID) was talked through with the inspectors.

Inspectors explained the process from the inspection request which is filed 24h in advance (where possible), the documentation required before landing (temperature record and line record) and the inspection of the landing itself.

In the case of Introduction from the Sea (IFS), the vessel operator obtains in principle the corresponding certificate before landing from the CITES Management Authority. Landing is then possible only at the INCOPESCA wharf with different authorities present (incl. Customs), similar to landing of the international fleet. While the procedures for IFS are in place, in practice no case has occurred yet in Costa Rica. It is likely that those sharks caught at high sea which are CITES listed are not landed in Costa Rica and discarded or used either as bait.

In the case of transhipment, each contribution is inspected individually. Carcasses from other boats are individually marked by a tag or similar and inspected separately from the rest. Carcasses from individual boats get their own FID; on that FID the “main boat” field holds then the name of the boat onto which the material was transhipped.

INCOPESCA offers its wharf to private operators for a small fee of about 100USD/hour. A number of companies, however, have their own private wharfs where fish can be landed. However, in case of longliners, fish can be landed only in the presence of an INCOPESCA inspector, who is notified according to the process explained above

[5] http://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD

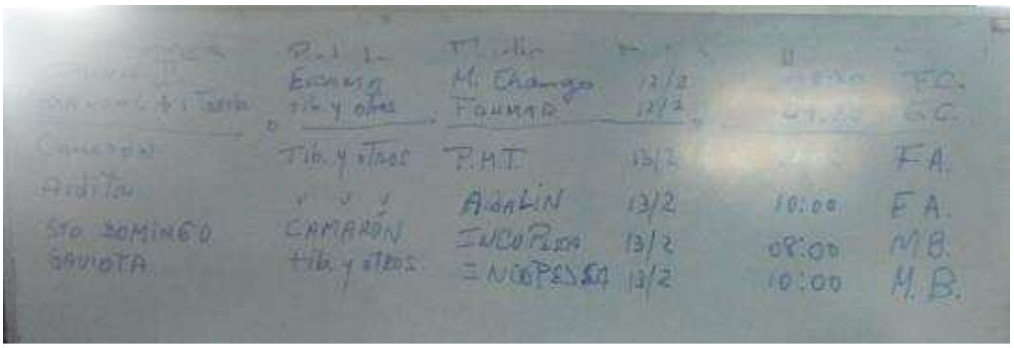

Figure 4 Whiteboard where all outstanding inspections are recorded

If the ship lands outside of working hours of the inspectorate, an inspector outside hours can be requested. Inspectors are allowed to work 4 extra hours on a work day and 8h during weekends. Most inspections happen within working hours – especially since the volume of ships and landings is much lower today than a few years ago.

If the inspection cannot be completed, the inspector seals the storage on board, so that no fish can be landed without him present.

Special rules are in place for transhipment. Transhipments have to be applied for and transhipped material has to be individually marked with a tag. Such materials are inspected separately and a separate FID is issued.

Fish is landed in presence of the buyers; for sharks, buyers of meat don't usually buy fins and therefore present at the landings are typically: (a) captain and crew, (b) owner of the ship or representative (c) inspector, (d) buyer of fins with crew, (e) buyer of meat with crew.

In Costa Rica, shark fins can only be landed if naturally attached to the body. In order to facilitate storage, in Costa Rica a partial cut is made and fins are then tied against the body

Figure 5 Fins naturally attached to frozen silky shark bodies

before freezing, so that the body obtains the shape of a torpedo.

This has a number of advantages, such as:

- It improves the bleeding of the shark, reduce the content of urea and therefore the quality of the meat
- It allows to store more shark bodies in the cold storage
- It decreases the operational health and safety risk arising from fins (which are sharp as knives when frozen)

When the shark is landed, the crew of the fin buyer first remove the fins with knives and a hook. Fins are then sorted by

(a) Species
(b) Type (pectoral, dorsal or caudal)
(c) Size – small (chips) or large

Prices for different sizes, species and types vary.

After the fins are removed, the frozen bodies are counted and weighed, before being loaded into refrigerated trucks and brought to the San José airport or a container ship. Many airlines in Costa Rica will not transport any shark product anymore, due to pressure from NGOs.

Most inspectors make notes of weights and species in notebooks. The FIDs are usually signed by the owner of the boat and the captain before the form is filled in the inspector's office.

10.4 INCOPESCA office of statistics

For the purpose of statistics, FIDs are partially converted into electronic format. At the office statistics of INCOPESCA, a person types information from the paper FID into a database. This Microsoft Access database is located on a local server and not accessible from the outside.

Seemingly it was created by a local biologist who has since passed away. Given the confidential nature of the information stored, the database has a strong security model, but unfortunately the knowledge how to adapt that model is lost.

INCOPESCA is now looking into developing and implementing a new database.

The current version is only used for statistics; a copy of the FIDs is sent to the office in principle once a month from all ports. In 2015, about 3826 FIDs were issued in Costa Rica.

Given that information is filled in after the landings (i.e. as an additional step), that some important information elements (like the trip number in case of transhipment) are missing and that the current database cannot be accessed from outside, the benefits of electronic FID information is not fully realised. In particular, the INCOPESCA office of trade ("Mercadeo") types in relevant information for its own work again – and there might be other instances where this is repeated.

Clearly, there is scope here for (a) avoidance of transcript errors, (b) optimisation of work, (c) communication to outside stakeholders in the form of validation of FIDs and/or statistical reports.

10.5 INCOPESCA office of export permits

Before products of sharks (both CITES-listed and unlisted) can be exported, a number of requisites have to be fulfilled.

The following documents are relevant for the current discussion:

1. (for CITES-listed species) CITES export permit issued by SINAC (CITES MA)
2. Sanitary certificate issued by SENASA
3. Export application
4. Commercial invoice
5. All FIDs related to the exported goods

6. A document declaring which amounts of each FID were purchased by the exporter/processor
7. A relationship (in weight) between FIDs and final product

INCOPESCA operates a spreadsheet where the use of FIDs is monitored to avoid overuse of the landed quantities. This is implemented using a local spreadsheet residing on a local server at INCOPESCA. This spreadsheet is inaccessible from the outside, so that Customs in Costa Rica or the importing country cannot use the resource to confirm validity of export papers.

Companies have to state the precise weight relationship between the exported goods and the individual species on each FID. This is done via a table which conceptually looks like this:

Table 2 Conceptual listing of fin origins for a particular export consignment

Date of landing	Data ship	Fin weight species 1	…	Fin weight species N	FID

The weights referred to are wet weights; weights in the above table must correspond to weights in the landing certificates; total weight per species must be equivalent to the dried export weight after having been multiplied by the conversion factor of 0.38[6].

In effect, companies have to list how many kilograms of fins from a particular landing and species went into a particular export consignment.

This greatly simplifies the work of INCOPESCA, but does probably not reflect the operational reality in the case of fins where material from different FIDs is mixed to obtain full sacks per species, type of fin and size.

With this information, INCOPESCA can reduce the landed amount of fins of a particular species on a particular FID by the amount listed in the above table. If a second export shipment then refers to the same FID and species, INCOPESCA can check whether enough material is still "available". If that is not the case, the export permission is refused.

However, fins are traded by species, type and size, but in whole sacks. Therefore, operationally, it is often necessary to mix materials between different landings in order to fill up sacks of a particular, species, type and size combination. This means that fins belonging to a number of landings are actually mixed and the direct link between a sack and the contributing landings is lost. In traceability terminology one would say that a number of landings together constitute a production batch; a sack would then typically have a reference to a production batch, but not to an individual ingredient batch.

The current relationship is unnecessarily detailed; the recommended system here is the creation of a stock relationship for the exporters.

Exporters notify a record of purchase that contains the information shown in the below Table 3. Such notification can be made together with the export process or before; this is equivalent

[6] For each 100kg of landed wet fins, 38kg of dried fins can be exported.

to submitting the purchase documents[7] as is current practice. Ideally exporters could lodge such communications electronically.

On the other hand, quantities to be exported are reported as is current practice by species (and commercial category).

This information can then be compared in a table as shown in Table 4.

Reporting in this way does not require internal traceability and better reflects the mixing (and loss of direct relationship) between material from different FIDs.

[7] Constancia de venta de producto in Spanish

Table 3 Suggested reporting format for purchases of raw material

Buyer	FID	Date of landing	Date purchase	Species	Product	Landed weight	Purchased weight
XXXXX	3155	14/11/2015	14/11/2015	Tiburón Gris	Fin	0.5	0.5
XXXXX	3155	14/11/2015	14/11/2015	Tiburón Zorro pelágico	Fin	22	22
XXXXX	3179	19/11/2015	19/11/2015	Tiburón Azul	Fin	147.8	147.8
XXXXX	3179	19/11/2015	19/11/2015	Tiburón Zorro pelágico	Fin	38.7	38.7
XXXXX	3344	15/12/2015	15/12/2015	Tiburón Gris	Fin	141.5	141.5
XXXXX	3344	15/12/2015	15/12/2015	Tiburón Zorro pelágico	Fin	3.5	3.5
XXXXX	3390	22/12/2015	22/12/2015	Tiburón Azul	Fin	77.5	77.5
XXXXX	3390	22/12/2015	22/12/2015	Tiburón Gris	Fin	272.9	272.9
XXXXX	3390	22/12/2015	22/12/2015	Tiburón Zorro pelágico	Fin	1.1	1.1
XXXXX	3394	22/12/2015	22/12/2015	Tiburón Gris	Fin	20.4	20.4
XXXXX	3394	22/12/2015	22/12/2015	Tiburón Zorro pelágico	Fin	11	11
XXXXX	3411	24/12/2015	24/12/2015	Tiburón Gris	Fin	7	7
XXXXX	3411	24/12/2015	24/12/2015	Tiburón Zorro pelágico	Fin	14	14
XXXXX	3423	29/12/2015	29/12/2015	Tiburón Gris	Fin	9	9
XXXXX	3441	28/12/2015	28/12/2015	Tiburón Gris	Fin	7	7
XXXXX	3441	28/12/2015	28/12/2015	Tiburón Zorro pelágico	Fin	6.5	6.5
XXXXX	3442	28/12/2015	28/12/2015	Tiburón Zorro pelágico	Fin	1	1
XXXXX	3449	29/12/2015	29/12/2015	Tiburón Gris	Fin	12.7	12.7
XXXXX	3449	29/12/2015	29/12/2015	Tiburón Zorro pelágico	Fin	22.7	22.7

Table 4 Comparison between existing stocks and material exported. In the example the company has not purchased or exported whole carcasses (left side of the table).

Exporter	XXXXX

Species	Whole	Factor	Res. Weight	Exported weight	Status	Fin	Factor	Res. Weight	Exported weight	Status
Tiburón Azul	-	1.00	-	-	OK	230.30	0.38	87.51	87.51	OK
Tiburón Gris	-	1.00	-	-	OK	4,863.30	0.38	1,848.05	197.64	OK
Tiburón martillo rosado	-	1.00	-	-	OK	-	0.38	-	-	OK
Tiburón martillo blanco	-	1.00	-	-	OK	-	0.38	-	-	OK
Tiburón Mako	-	1.00	-	-	OK	-	0.38	-	-	OK
Tiburón Perro	-	1.00	-	-	OK	-	0.38	-	-	OK
Tiburón Zorra	-	1.00	-	-	OK	-	0.38	-	-	OK
Tiburón Zorro pelágico	-	1.00	-	-	OK	163.60	0.38	62.17	46.40	OK
Tiburón Punta Negra	-	1.00	-	-	OK	-	0.38	-	-	OK
Tiburón Tigre	-	1.00	-	-	OK	-	0.38	-	-	OK

The above system has no cut-off date for the stock; however, fins have a limited shelf-life (up to two years) and therefore FIDs older than a certain time should be disregarded. In order to strengthen this, exporters can be asked to either provide directly all FID numbers used in product to be exported (without weight) or as a substitute production dates (where the assumption can be made that only FIDs purchased a few days before production should be taken into account).

It should be emphasised that the system as practiced does not have any "holes". It does however insinuate that companies can identify the exact contributing landings for a particular export shipment. Since fins are mixed for operational purposes in order to pack full sacks by species, type and size, the exact relationship to individual FIDs is lost. Table 2 which currently needs to be submitted insinuates therefore more internal control than really is present.

The system described above reflects that reality better and eases the reporting requirements of the private operators.

It should be noted that the above comments do not refer to the conversion factor between wet fins and dry fins which has been established at 0.38 dry weight/wet weight.

10.6 Meeting with Association of long liners

A meeting was held with Mauricio Gonzalez Gutierrez, president of the Asociación Cámara Nacional de la Industria Palangrera where the topic of fishing in illegal areas was discussed.

The longline fleet is being equipped with VMS. 165 equipments are ready to be purchased but the procurement decision after a public tender is currently being contested in court. The remaining about 280 boats of the medium (350 boats) and advanced (93 boats) fleets, which are yet to be equipped, are of shorter range and cannot reach important marine protected areas (MPAs), such as the Isla de Coco. The Association is currently trying to identify donors to increase VMS coverage to the remaining fleet.

VMS is a central pillar of all good fishery management as it allows to control movements of the boats but also obtain catch data in function of fishing location. Having a VMS allows the fishermen to demonstrate that they have fished in legal grounds, i.e. not in contravention of national law.

A VMS costs about 1,400USD as initial investment and 600USD annual subscription. It is recommended to study what economic impact such a measure has on the smaller operators and subsequently implement either positive incentives (subsidies for purchase and/or operation) or negative incentives by raising taxes or lowering fuel subsidies for all those that do not have a VMS.

Mr Gonzalez mentioned the strong reduction of the Costa Rican longline fleet. Most boats – as could be observed easily – lie idle in the port. The activity in Puntarenas has decreased dramatically due to political pressure on the shark fishery.

Costa Rica has implemented in 2014 a zoning plan to improve the access of its longline fleet to tuna as an alternative to shark. The new exclusive zones for Costa Rican longlines in the EEZ has yielded excellent results until larger international boats intercepted the flux of tunas into that exclusive zone. New plans are being discussed.

In the meeting Mr Gonzalez expressed his concerns with the highly politicised discussion about sharks and the reservation of the sector to further list silky and thresher sharks, given the

difficulties encountered in the implementation of the listings, which resulted in a 1-year moratorium on exports. The sector is concerned that listing in Appendix II – sustainable use – effectively will be used to fully stop trade, i.e. an implicit listing in Appendix I. He also made mention to Costa Rica being much stricter than some adjacent countries and called for a levelled playing field.

One of the consequences of the strict handling of hammerheads is – according to Mr Gonzalez – that most fishermen don't bring hammerheads back, in particular if caught in international waters and therefore requiring an Introduction from the Sea certificate. According to him, this results in a total lack of data and waste of the resource.

10.7 Fish marketer

A visit was made to a landing of an artisanal boat at a private wharf. Landings of the artisanal fleet do not require the presence of the fishery inspector; no FIDs are generated. The wharf owner confirmed, however, that landings of the medium and advanced longline fleet follow the same procedures at a private wharf than at a public wharf.

However, INCOPESCA obtains a copy of the bill of purchase of each transaction with name of the boat, captain, species (group), weight and value. Species are grouped in commercial categories. Sharks, for example, are not differentiated between species.

However, even if on an aggregate level, this data could be used for a preliminary assessment of the impact of the artisanal fishing fleet on the CITES-listed shark species. It is therefore recommended to make a country-wide, sample-based study of the catch composition of the artisanal fleet. With an approximation of the catch composition and the catch volumes, the impact of the artisanal fleet could be quantified in order to address the concerns raised by the negative NDF regarding the impact of the artisanal fleet, especially with respect to juvenile specimens of hammerheads.

The wharf owner only markets the meat, not the fins of sharks. In Puntarenas, there is currently only one company commercialising Costa Rican fins. Another fin exporter only exports fins from imported material (in particular from Belize).

10.8 Fish marketer (with landing)

Finally, on Saturday 13th of February a landing of sharks could be observed at a private wharf which is currently rented out.

After a disagreement with local fishermen, the wharf owner imports material mainly from Belize to export fins. At the private wharf the decommissioned vessel Tarzan XII could be observed, which was previously blacklisted[8]. Seemingly, the company once employed 400 people and has shrunk now to about 20.

The wharf operator only commercialises shark (and other) meat. The fins of the landed silky

Figure 6 Processing plant. (c) Maylor Calderón

sharks were purchased by a local company.

The general manager of the wharf operator was very helpful; however, due to prior bad experience, he felt he could not give permission to take photographs, but kindly supplied photographic material afterwards.

The frozen shark carcasses are either exported whole or sold into the local market, either whole or processed. The wharf operator has a small processing plant; see Figure 6.

Sharks are landed in presence of the INCOPESCA fishery officer. Fins are separated after landing from the carcasses by fin trader. Carcasses are put into bins. Each bin is identified with the boat name and the data of landings. Bins are stored directly in the cold store and processed always together – as is the usual practice of fish processing plants. The bin identification number therefore is identical to the lot number; see Figure 7.

The boat landed about 750kg of yellowfin tuna, 6t of silky shark and a few specimens of other species (merlin and swordfish) after a one-month trip. A very approximate calculation with

Figure 7 Silky shark meat for ceviche or other dishes

data kindly provided by the wharf operator and the captain, seems to indicate that such an operation is barely economically feasible; as such fishermen must act very economically focused to guarantee the survival of their operation.

An interesting point that was raised in the discussions was the possible use of sharks, including CITES-listed sharks, as bait. The argument was raised, however, that alternative baits such as sardines or escolar (Lepidocybium flavobrunneum) are better choices as bait, since their landing value may well be below that of sharks. Escolar sells for about 700 colón (ca. 1.30USD).

Such economic arguments could very well shed light on the shark business; it is therefore recommended to make a socio-economic study of the medium and advanced fleets. Such a study should look at sales prices for which data is already available at INCOPESCA for the artisanal fleet. Greater knowledge of the economics of the shark business would allow better control measures to be taken.

10.9 Shark fin processor

There is only one marketer of Costa Rican shark fins in Puntarenas. The company sells a simple product, dried, whole fins. Due to pressure from the outside, the company only buys from longliners, i.e. against a FID. It also does not currently buy hammerhead fins since the negative NDF and subsequent export ban. The company has 20 employees; its revenue has been greatly reduced due to the international pressure on shark fin trade and the resulting decreased demand and price.

Figure 8 Production process

Fins are sold by species, type of fin (pectoral, dorsal or caudal) and size (small, medium and large). In the grading processes (see Figure 8), fins from different FIDs are potentially mixed. Species and sizes are, however, never mixed. Some clients also have a preference on the humidity of the material.

Dried fins have a shelf life about 2 years, but need to be processed relatively quickly. They are dried using the sun (under a roof) two days a week.

After drying, fins are packaged in sacks of about 30kg by species, fin type and size. Clients always have to order full sacks. Sacks are uniquely identified with a sack number.

Records exist linking the sack number with the in-going FIDs (those of the drying lot). Between wet and dry weight, a conversion factor of 0.38 is applied, i.e. 100kg of wet weight correspond to 38kg of dry weight. This factor was established by INCOPESCA. Biery and Pauly[9] in their global review, estimate the mean wet mass to dry fin mass conversion factor[10] to be 0.43 +/- 0.01.

Given bad previous experience, no photos could be taken during the visit.

10.10 Wholesale market

Shark for the local market is marketed either directly or through the wholesale market in San José, the Centro Nacional de Abastecimiento y Distribucion de Alimentos (CENADA). INCOPESCA operates its office for marketing on the site. The most important market days are Monday and Friday, starting in the early hours of the morning. At 4am the market was bustling.

Shark are sold either chilled or frozen, usually whole. There are three weight categories

Table 5 Size categories of sharks

Category	Approximate weight	Main use
Cazón	1-1.5kg	Ceviche

[9] Biery, L., & Pauly, D. (2012). A global review of species-specific shark-fin-to-body-mass ratios and relevant legislation. Journal of Fish Biology, 80(5), 1643–1677. http://doi.org/10.1111/j.1095-8649.2011.03215.x

[10] Where the conversion factor equals dry weight divided by wet weight

Bolillo	<25kg	Cutlets, Ceviche
Posta	>25kg	Cutlets

Prices vary with the species and the size. Typically, larger fish carry a lower price, because the meat is harder. For Ceviche, small sharks are preferred ("cazón") because the meat is more tender. Tenderness of the meat is a function of age of the fish, but also of handling; better handling could mean that larger fish would be more acceptable, thereby reducing the pressure on juvenile sharks. Cazón-type sharks are almost exclusively caught by the artisanal fleet.

Fresh fish sells at a somewhat higher price.

Table 6 Ad-hoc prices at wholesale market on 15/02/2016

Species	Size category	Type	Price/kg (colón)	Price/kg USD[11]
Silky shark	bolillo	Frozen	1350	2.50
Silky shark	Cazón	Chilled	1200	2.26
Silky shark	bolillo	Chilled	1550	2.92
Blue shark	bolillo	Frozen	850	1.60
Thresher	Bolillo	Chilled	800	1.51
Hammerhead	bolillo	Frozen	<530	<1
Hammerhead	Cazón	Chilled	Higher price	

There is also a category called "gelatine" which makes reference to the meat quality. For this category the price is lower.

Chilled silky shark is caught mainly by the medium fleet whose trips are short enough to use chilling. The artisanal fleet does not catch usually silky shark.

Export prices to Mexico are about 10% higher than prices listed in Table 6.

Sharks are marketed either whole or processed. At the market there are small processing lines, mainly for cutlets, but also for small cubes for ceviche. The skin is sold to Chinese for exports to China, mainly for gelatine production.

Shark meat is targeted at the lower end of the market. It competes directly with tilapia (90% imported) and pangasius (100% imported). Consumers prefer shark meat over other fish because of its price and because of the convenience factor (no spines).

Product going to the local market has no traceability requirement. Fish is transported in SENASA-licensed refrigerated vans and have shipping documentation, but in that documentation there is no information that would link the material on the lorry to catch certificates. When product is sold to clients, such as supermarkets, other

Figure 9 Example of fish label in European supermarket with approximate catch location

[11] 1 USD = 530 colón

regional markets or fish shops, traceability is lost. There is no requirement in Costa Rica to expose information about the origin of the fish at retail outlets.

In Europe, the catch area has to be shown at retail[12]. The catch area for fish caught at sea is the FAO area, sub-area or division where the fish were caught. Fish caught in the Northeast Atlantic and Mediterranean and Black Sea must display the name of the sub-area or division, along with a name that is easy for the consumer to understand, or a map or a pictogram. This replaces the name of the area. For the rest of the world, only the name of the area must be displayed. The list of areas, sub-areas and divisions (ICES) is published by the FAO[13].

However, some national guidance requires only declaration of one of the following 12 areas: North-West Atlantic, North-East Atlantic, Central-Western Atlantic, Central-Eastern Atlantic, South-West Atlantic, South-East Atlantic, Baltic Sea, Mediterranean Sea, Black Sea, Indian Ocean, Pacific Ocean and Antarctic.

The rules apply to the following categories of fish, whether sold loose or pre-packed: live, fresh, chilled or frozen fish; fish fillets and other fish meat; smoked, dried, salted or brined fish; crustaceans and molluscs. The rules do not apply to processed fish products (for example, canned fish), or to fish products sold by caterers which are ready for consumption without further preparation.

10.11 Supermarket

At a lower cost supermarket (masxmenos), the following prices were found:

Product	Type	Price/kg (colón)	Price/kg USD[14]	PPP price Spain[15] €
Shark cutlet	Fresh/Thawed	4495	8.48	9.78
Cazón cutlet	Fresh/Thawed	4495	8.48	9.78
Red snapper fillet	Fresh/Thawed	6000	11.32	13.06
Pangasius fillet	Fresh/Thawed	6000	11.32	13.06
Tilapia fillet	Fresh/Thawed	8000	15.09	17.41
Salmon fillet	Fresh/Thawed	12500	23.58	27.20

It was interesting to note that the fish offer was quite limited compared to European supermarkets for example in Spain. For a country with an active fishery sector one would have expected a much larger offer. Also interesting to see that main product was fillet or fillet-like cutlets and not more complex offerings, e.g. whole fish.

The second observation to make are the very high prices. These prices do not correspond in any way to prices for fish e.g. in Spain where pangasius is sold for around 4-6 €/kg and even wild salmon is available much below the prices listed above. Please note that the World Bank situates Price level ratios of PPP conversion factors (GDP)[16] at 0.7 for Costa Rica and 0.9 for Spain (with respect to the US dollar) and therefore prices in Costa Rica should be lower than in Spain.

[12] http://ec.europa.eu/fisheries/documentation/publications/eu-new-fish-and-aquaculture-consumer-labels-pocket-guide_en.pdf

[13] http://www.fao.org/fishery/ cwp/handbook/h/en

[14] 1 USD = 530 colón

[15] Calculated using purchasing power parity conversion factors from the World Bank and exchange rate of 1 USD = 0.8972 EUR

[16] http://data.worldbank.org/indicator/PA.NUS.PPPC.RF

Finally, one should note that shark cutlets are clearly the cheapest product available at a good 25% below the price of the cheapest alternatives. Removing sharks from the market altogether therefore might have a socio-economic impact on the most vulnerable part of society.

10.12 Stakeholder Workshop

12/02/2016

AGENDA

Hora	Actividad	Persona
08:00 – 09:00	Registro de participantes	
08:30-09:00	Bienvenida Palabras de bienvenida	Presidente Ejecutivo INCOPESCA
09:00-09:30	Objetivo del taller y discutir la agenda	Heiner Lehr Consultor CITES
09:30-10:00	Café	
10:00-10:30	El comercio de productos de tiburón	Heiner Lehr Consultor CITES
10:30-11:30	Sistemas de trazabilidad en CITES y en agricultura	Heiner Lehr Consultor CITES
11:30-12:00	Situación actual del DNP en Costa Rica	José Joaquín Calvo SINAC - MINAE
12:00-13:00	**Almuerzo**	
13:00-13:20	Los procedimientos de control de CITES en Costa Rica	Dr Rolando Ramirez José Miguel Carvajal INCOPESCA
13:20-14:20	Propuesta de un sistema de trazabilidad para productos de tiburón en comparación con los procedimientos en Costa Rica, incluyendo demostración	Heiner Lehr Consultor CITES
14:20-15:45	Discusión	Facilitada por Heiner Lehr
15:45-16:00	Resumen	Heiner Lehr
16:00	Final del taller	

For the presentations, please see https://www.dropbox.com/sh/wn2cj6d9oou5wcg/AAAXG_brCxbhUGvBw-6kWcqKa?dl=0.

In the workshop, participants declared their satisfaction with the traceability system implemented by INCOPESCA; SENASA also realised that there is unnecessary overlap with their internal processes and highlighted that they could potentially streamline their internal checks. A certain understanding was developed that all stakeholders need to work together in order to address all concerns and implement the CITES listing in a socio-economically acceptable way.

It was suggested to establish a national roundtable on traceability as a forum to discuss traceability matters and jointly find solutions to pressing questions, such as the inclusion of the artisanal fleet.

The group agreed and a first roundtable meeting was fixed for March 7th in Puntarenas.

10.13 Training of young costal management students

A master class was given at the Universidad Nacional de Costa Rica on Saturday 13/02/2016. In the masterclass traceability in the fishery sector, including Catch Documentation Schemes and

post catch traceability were dealt with. The training session was attended by 12 students as lasted for about 2h.

The presentation is available under “Masterclass” at https://www.dropbox.com/sh/wn2cj6d9oou5wcg/AAAXG_brCxbhUGvBw-6kWcqKa?dl=0.

10.14 MOS2 side event

(Hotel Park Inn, 17/02/2016)

13:30-13:40	Welcome Daniel Kachelriess, CITES Secretariat
13:40-13:50	Control processes in Costa Rica José Miguel Carvajal Rolando Ramírez Villalobos, INCOPESCA
13:50-14:15	Traceability of CITES-list sharks Dr Heiner Lehr, CITES consultant
14:15-14:30	Discussion
14:30	Closing Daniel Kachelriess, CITES Secretariat

The side events at MOS2 was very well received; the room needed to be enlarged because the 40 seats were immediately filled. In the end, probably 60-70 persons attended, representing more than half of the attendees of the MOS2 meeting.

The presentations were equally well received with main discussion points being:

- The role of law enforcement
- The reliability of conversion factors, in particular from wet fins to dry fins
- The implementation of Costa Rica’s species specific custom codes

In a much applauded gesture, the President of the Longline Association pledged the support of the private sector to full transparency and traceability.

After the presentation the author was approached by the national park guard of the Cocos Island who showed a short movie on findings of cut fins – probably for use as bait or for transhipment at high sea. Clearly there is some illegal activity, but as exposed during the workshops, traceability is not the right tool to detect activities where both the buyer and the seller agree on illegal transactions. The purpose of traceability is to avoid entering such illegal material into legal chains (“laundering”). The CITES representative was approached after the meeting by the private sector, asking for support in mediation. The feeling of the private sector is that an outside, neutral position is needed to facilitate a fruitful discussion between the different governmental institutions, the NGO sector and the private sector. This was added to the recommendations. The CITES representative was further approached by representatives of a local NGO, highlighting potential instances of past illegal trade and a potential capacity building need on the side of customs and enforcement, including on the use of the species-specific custom codes developed by Costa Rica for the CITES listed species, as well as to address potential illegal trade.

Figure 10 Impressions from the MOS2 side event

11 Outputs

This short project has generated the following outputs which are available at https://www.dropbox.com/sh/wn2cj6d9oou5wcg/AAAXG_brCxbhUGvBw-6kWcqKa?dl=0.

1. Case Study Report (this document)
2. Presentations stakeholder workshop
    a. Objectives
    b. Shark trade
    c. Traceability systems in CITES and elsewhere
    d. Proposal for a traceability system for products from CITES-listed sharks
3. Demonstration database for risk management in CITES management
4. Sample excel sheet for improved stock management
5. Training materials for master class
    a. Presentation "Traceability in the fishery sector"
6. Side event MOS2
    a. Flyer
    b. Presentation

Figure 11 Flyer of the MOS2 side event