



CONSEJO NACIONAL  
DE ÁREAS PROTEGIDAS



**Estimation of biometric data and parameters to set the commercial quota for dry fins and skin of dusky sharks (*Carcharhinus falciformis*) and thresher sharks (*Alopias pelagicus*, *Alopias superciliosus*, *Alopias vulpinus*) landed on the Pacific coast of Guatemala.**

**GUATEMALA**

**Commissioned by:**

*Consejo Nacional de Áreas Protegidas -CONAP-, Guatemala*

**Prepared by:**

**Manuel de Jesús Ixquiac Cabrera**

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## TABLE OF CONTENTS

Project Details .....	3
Project Description .....	3
Objectives .....	<b>¡Error! Marcador no definido.</b>
Executive Summary.....	4
Methodology and Description of the Stages/Activities of the Study .....	5
Results .....	6
Dusky shark, <i>Carcharhinus falciformis</i> .....	6
<b>Thresher sharks, <i>Alopias pelagicus</i>, <i>Alopias superciliosus</i> and <i>Alopias vulpinus</i></b> .....	12
Conclusions and Recommendations .....	17
References .....	<b>¡Error! Marcador no definido.</b>
Annexes .....	<b>¡Error! Marcador no definido.</b>

## Project Details

### Project Description

The project consisted of making estimates of the conversion parameters for dry commercial fins of dusky sharks based on the landings of eviscerated carcasses from the Guatemalan Pacific. The intention is to use this information to make estimates leading to a shark fin export quota based on non-detriment findings (NDFs) using Guatemala's own values. The project will continue with the aim of developing estimates for thresher sharks; it has also been planned to include other shark-derived products such as the skin.

### Objectives

#### General Objective

To generate biometric parameters for fresh and dry fins of shark species of commercial importance included in CITES Appendix II.

#### Specific Objectives

To design the appropriate instruments to compile information aimed at estimating conversion parameters for fins, skin and tails of dusky sharks (*Carcharhinus falciformis*) and thresher sharks (Alopiidae family).

To generate conversion parameters for fins, skin and tails of dusky sharks and thresher sharks.

#### a. Partners

During the implementation of this project, support was provided by the officials of DIPESCA and CONAP; the author wishes to thank them for their cooperation in the fieldwork.

#### DIPESCA

Lic. Julio César Lemus  
Dirección de Normatividad de la Pesca y  
Acuicultura

Lic. Jorge Antonio Morales Aguilar  
Inspector de Pesca Marítima

#### CONAP

Ing. Juan Abel Sandoval Yat  
Dirección de Manejo de Bosques y Vida Silvestre

Licda. Kenya Melissa Díaz Espina  
Asesora profesional en enlace CONAP/UBA

## Executive Summary

Fieldwork was conducted from April 2022 to February 2023 in the landing areas of Puerto de San José and Buena Vista on the Pacific coast of Guatemala. The progress achieved in this research made it possible to generate conversion factor parameters for commercial dry fins, tails and skin according to landing volumes of dusky sharks (*Carcharhinus falciformis*) and thresher sharks (*Alopias pelagicus*, *Alopias superciliosus* and *Alopias vulpinus*). The study identified the percentages represented by the fins (i.e., first dorsal fin, two pectoral fins and lower caudal fin lobe), the dry tail and the skin, as well as the percentage of moisture loss with drying time and variations depending on specimen size. It should be noted that the information obtained for thresher sharks only refers to *Alopias pelagicus*.

According to previous studies, the size at first maturity of dusky sharks in Guatemala is estimated to be 177 cm total length for females and 167 cm total length for males. These lengths correspond to a pectoral fin length of 12.3” for females and 11.5” for males. However, the minimum size at which pectoral fins are traded is 8”, which corresponds to specimens with a total length of 124 cm. This information may be useful in the future as an indicator of the size structure of specimens traded.

This study is consistent with the activities recommended to countries by the IATTC, which established that the fin weight to carcass weight ratios for sharks would be reviewed by the Working Group on Stock Assessment and reported to the Commission in 2006 for its review, if necessary.<sup>1</sup> Moreover, the agreements of Guatemala on shark landings and the prevention of finning under the IATTC, such as Regulation OSP 05-11 on Shark Finning, establish that shark fins represent between 2% and 5% of the fresh weight of the whole carcass.

The parameters generated will be useful for making the non-detriment findings (NDFs) that CONAP must undertake to set export quotas for parts and/or derivatives of species included in CITES Appendix II. The values obtained in this study were the following: 2.73% for dry skin, 0.68% for dry tail and 0.91% for dry commercial fins of dusky sharks. For thresher sharks, the parameters estimated were 1.94% for dry skin and 1.63% for dry commercial fins.

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<sup>1</sup> Report of Guatemala to the IATTC regarding Resolution c-05-03 on the Conservation of Sharks Caught in Association with Fisheries in the Eastern Pacific Ocean.

## Methodology and Description of the Stages/Activities of the Study

Landings were monitored in the communities of Puerto de San José and Buena Vista in Iztapa, department of Escuintla, on the Pacific coast of Guatemala. These activities were conducted with the support of the staff of the following authorities: *Dirección de Normatividad de la Pesca y Acuicultura* (DIPESCA, the fisheries authority) and *Consejo Nacional de Áreas Protegidas* (CONAP, the CITES Authority, also in charge of protected areas).

To compile information, a data collection sheet was developed in which the species, sex and length of the specimens were recorded (Annex 1). Three lengths were considered (Figure No. 1) depending on how the species was landed:

1. Total length: the distance from the anterior edge of the rostrum to the posterior end of the upper lobe of the caudal fin, always measuring the greatest length of the specimen and extending the tail horizontally.
2. Precaudal length: the length from the tip of the snout to the base of the caudal fin; also known as standard length.
3. Interdorsal length: the length from the end of the base of the first dorsal fin to the origin of the second dorsal fin, also known as interdorsal ridge. This measure was applied mainly to thresher sharks.

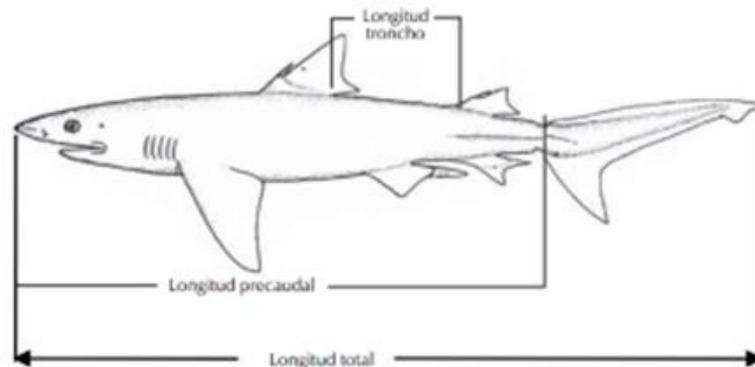


Figure No. 1. Lengths to consider when measuring sharks.

### Translation of the text of the figure

Spanish	English
Longitud troncho	Interdorsal length
Longitud precaudal	Precaudal length
Longitud total	Total length

The weight of the sharks landed was measured with a hanging scale and recorded in pounds, while the weight of fresh individual fins was recorded in grams. All the fins and fin sections were considered for the purposes of the present monitoring study. Next, commercial fins were classified into categories and the lower caudal lobe was separated from the tail in dusky sharks. It is important to note that the tail of thresher sharks does not have any commercial value and that, in most cases, the carcass is landed without it.

To classify commercial shark fins into sizes, it is necessary to measure the distance from the apex of the fin to the fin origin. This size is expressed in inches in international trade. Measurements were taken from the first dorsal fin, the two pectoral fins and the lower caudal lobe. In the caudal fin of dusky sharks, the length of the lower lobe and the length of the tail or upper lobe were considered (Figure No. 2).

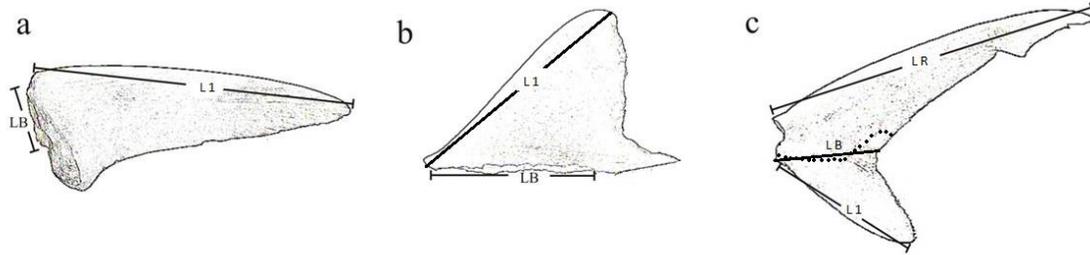


Figure No. 2. Distances to consider when measuring shark fins.

The fins of each specimen were individually classified, and sun dried on a metal rack until they reached the necessary level of dehydration to be traded. During the drying process, the aggregate weight of the fins was recorded as well as the weight of each fin at the start and the end of the drying process.

## Results

### Dusky shark (*Carcharhinus falciformis*)

To estimate fin yield, we conducted a trial that consisted of drying wet fins completely. This report presents the drying time of the dusky shark fins, which was 10 days (i.e., 65 hours of drying). During this process, the fins were put to dry outdoors for 4 to 8 hours a day, depending on the hours of sun in Guatemala City.

The fresh fin to carcass ratio (i.e., percentage of the weight of the fins compared to that of the carcass) for all categories combined was 5.01% of the total weight of the carcass landed (after evisceration), with ranges between 4.19 and 8.11%. After drying, fin weight amounted to 1.61% of total landed weight, with ranges between 1.42 and 2.03%, which showed that the fins were dry enough to be traded (Figure No. 3). These values are consistent with estimates of the weight of fresh fins compared to that of the carcass, which range from 2% to 5%. The highest fresh fin to carcass ratios (>6%) were recorded in small specimens (<120 cm TL).

Figure No. 3 shows the decrease in the fin to carcass ratio in eviscerated dusky sharks. Red lines represent the variation in the different sizes assessed. Higher ratios (i.e., yields) were observed in smaller specimens. The variation decreased with drying time. In this case, the ratio became stable after 50 hours, a much longer period than in the coastal area, where the fins are dry enough to be traded after 16 hours.

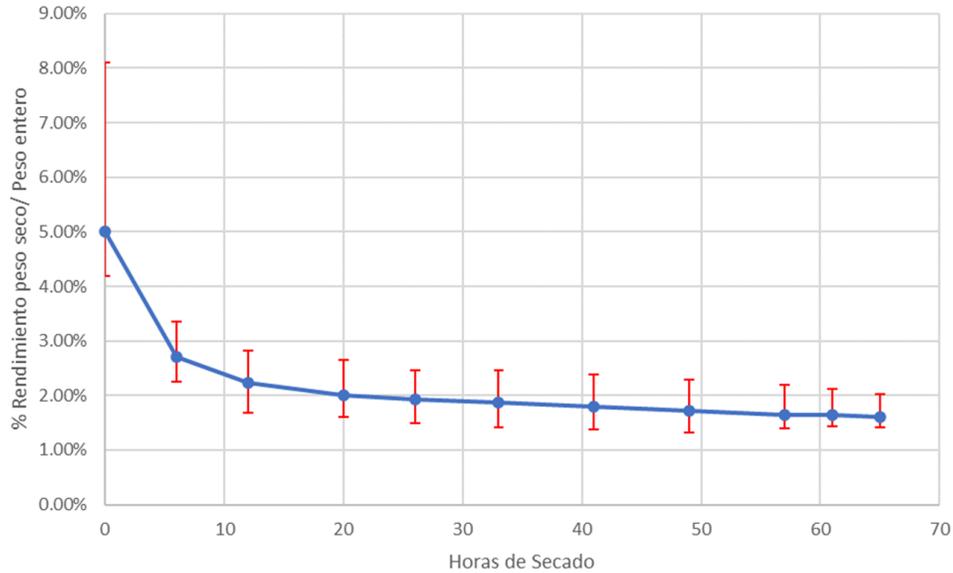


Figure No. 3. Dry fin to carcass ratio for eviscerated sharks. The set of shark fins assessed included commercial fins, non-commercial fins and the tail.

Translation of the text of the figure

Spanish	English
% Rendimiento peso seco/peso entero	Dry fin to whole carcass ratio
Horas de secado	Drying time (hours)

During the process of drying and classifying shark fins, it was confirmed that not all shark fins are traded, since ‘small’ fins – which amount to 5.6% of the weight of dry fins – do not have commercial value. Such fins are the two pelvic fins, the second dorsal fin and the anal fin. Hence, these fins should not be considered in the estimate of the final conversion parameter.

Figure No. 4. shows the percentage of dry weight of each fin type of compared to the weight of all the fins combined for dusky sharks (*Carcharhinus falciformis*). Of the total weight (i.e., 100%), 5.8% corresponded to small fins (i.e., pelvic fins, second dorsal and anal fin), which have no commercial value; 33.7% corresponded to the tail or upper lobe of the caudal fin, which sometimes has commercial value but it is always lower than that of the set of commercial fins; and 60.5% corresponded to the set of commercial fins. For a set of fins to have commercial value, the first dorsal fin must have a length of eight inches or more. In this group, the first dorsal fin amounted to 10.4% of the weight, the pectoral fins represented 17.9 and 17.5% of the weight each and the lower lobe of the caudal fin amounted to 14.7%.

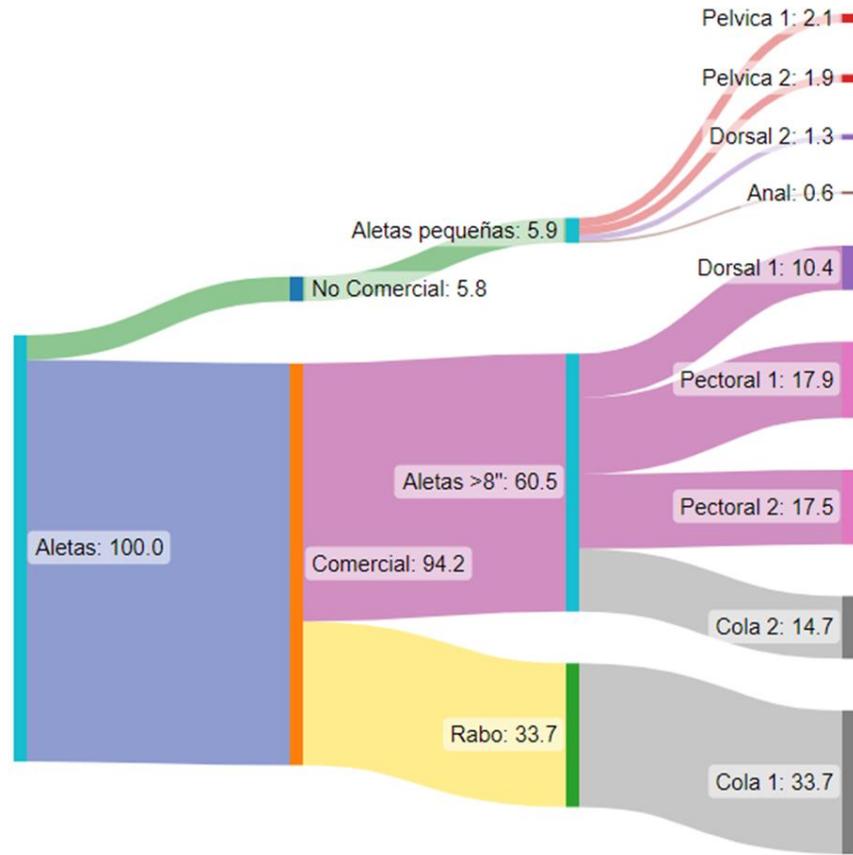


Figure No. 4. Breakdown of the proportional weight of the fins of dusky sharks (*Carcharhinus falciformis*).

Translation of the text of the figure

Spanish	English
Aletas	Fins
Aletas pequeñas	Small fins
Pelvica 1	First pelvic fin
Pelvica 2	Second pelvic fin
Dorsal	Dorsal
Anal	Anal
Comercial	Commercial
No comercial	Non-commercial
Pectoral	Pectoral
Cola	Tail
Rabo	Tail

Considering that dusky sharks (*Carcharhinus falciformis*) are the shark species most landed on the Pacific coast of Guatemala, we reconstructed weights and sizes from the parameters of the size-to-weight ratio developed by Ruiz & Ixquiac (2000) from 475 records of dusky shark, estimating an intercept of  $a=0.000006$  and a slope of  $b=2.9714$  in an exponential regression. Using these parameters, we developed an estimate of sizes corresponding to commercial classifications with the

following order: small specimens – landing weight lower than 10 lb (4.5 kg) and a total length of less than 95 cm; medium-sized specimens – landing weight between 10 and 20 lb (4.5 and 9.1 kg respectively) and a total length between 95 and 120 cm; large specimens – landing weight between 20 and 50 lb (9.1 and 22.7 kg, respectively) and a total length between 120 and 163 cm; and extra-large specimens – landing weight greater than 50 lb (22.7 kg) and a total length of more than 163 cm (Figure No. 5).

This allowed us to estimate the size of specimens of commercial interest; results showed that specimens with a dorsal fin 8 inches long or more had a minimum weight of 35 lb (15.9 kg) and a total length of 145 cm. This suggests that a significant percentage of fins (i.e., small ones) are not traded in the legal market regulated by CITES.

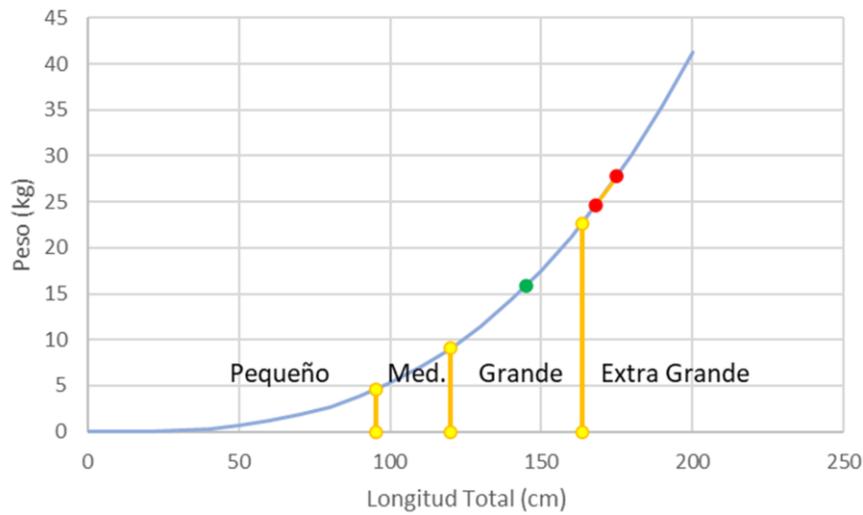


Figure No. 5. Commercial classification of dusky sharks according to their size (yellow lines), size at first maturity (red dots) and length of sharks with an 8” dorsal fin (green dot).

Translation of the text of the figure

Spanish	English
Peso	Weight
Pequeño	Small
Med.	Medium-sized
Grande	Large
Extra Grande	Extra-large

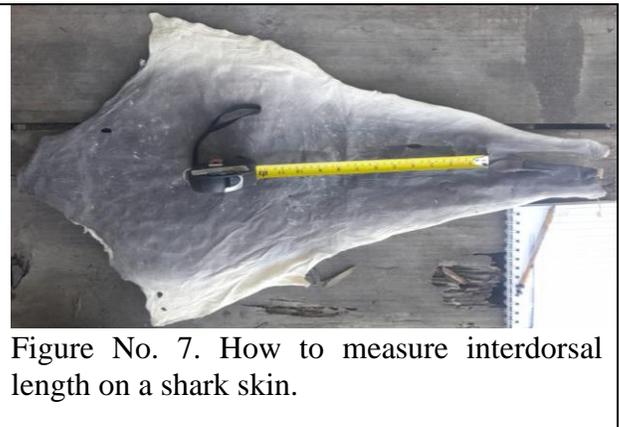
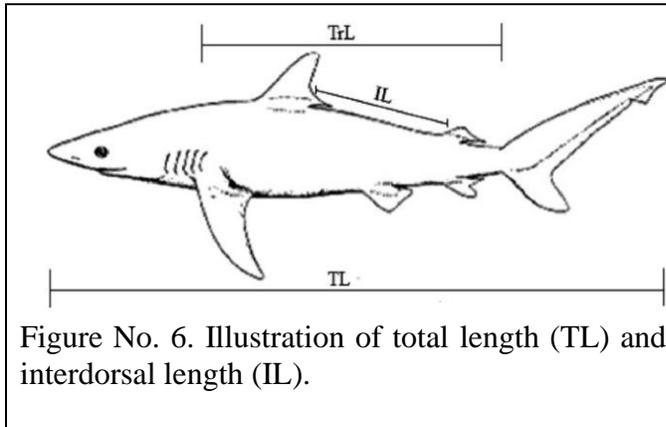
Another product of commercial importance is shark skin. We explored this aspect by determining the weight of the skin of dusky sharks to reconstruct the weights and sizes of whole and eviscerated carcasses and the skin yield. To do so, we collected information on the total length (TL), interdorsal length (IL)<sup>2</sup> and weight of the dry skin (Figures No. 6 and 7). During the fieldwork, measuring procedures were corrected as suggested by Polo-Silva *et al.* (2017) to use the reconstruction

<sup>2</sup> Polo-Silva, C., Acevedo, G., Siu, S., Carvajal, J.M., Ixquiac, M., Bessudo, S., Suarez, A.M. & Puentes, V. (2017). Morphometric relationships for some species of elasmobranch from tropical eastern Pacific. Wiley. Journal Applied Ichthyology.

parameters of the total length-interdorsal length ratio. This made it possible to reconstruct total lengths and generate similar parameters to those obtained by Santana *et al.* (2014) for Mexico<sup>3</sup> (Table No. 1).

Table No. 1. Total length-interdorsal length ratio for *Carcharhinus falciformis* on the Pacific coast of Colombia, Mexico, and Guatemala.

			Total length (cm)		Interdorsal length (cm)			
Species	Sex	n	Min.	Max.	Min.	Max.	Equation	r <sup>2</sup>
<i>Carcharhinus falciformis</i> Colombia	Combined sexes	1,208	30	232	21	68	$TL=26.0+(3.05*IL)$	.69
	Male	151	86	209	19	53	$TL=15.2+(3.79*IL)$	.95
	Female	243	77	218	19	49	$TL=12.1+(3.91*IL)$	.88
<i>Carcharhinus falciformis</i> Mexico	Combined sexes	1,196					$TL=8.277+(3.974*IL)$	.99
<i>Carcharhinus falciformis</i> Guatemala	Combined sexes	324	65	223	13	61	$TL=14.458+(3.548*IL)$	.91



Interdorsal length (IL) is an alternative measurement that is easy to obtain to estimate the size of carcasses landed with the head and fins removed. It is recommended to use the equations presented above for *C. falciformis* from the Central Eastern Pacific in order to standardize the measuring methods and be able to make reliable comparisons of populations based on the size of sharks.

We measured interdorsal length in cm and dry skin weight of 232 specimens and reconstructed total lengths between 100 and 210 cm for dusky sharks. We found a skin yield ranging between 0.96 and

<sup>3</sup> Santana-Hernández, Heriberto, Tovar-Avila, Javier, & Valdéz-Flores, Juan Javier. (2014). Estimation of the total, fork and precaudal lengths for the silky shark, *Carcharhinus falciformis* (Carcharhiniformes: Carcharhinidae), from the interdorsal length. *Hidrobiológica*, 24(2), 159-162.

4.48% of whole carcass weight. The highest yields – between 3.0 and 3.5% – were observed in small specimens with a total length of less than 110 cm, while the yield of specimens with a total length greater than 200 cm was only 1.5%. The average yield in the analyzed sample was 2.3%, with a standard deviation of 0.6% and a coefficient of variation of 27.1%. This coefficient could be considered very high to assign it to the population of sharks traded according to the landings of the small, medium-sized and large fleets. However, it is consistent with the average value of 2.3% found for specimens with a total length of 130 cm (Figures No. 8 and 9).

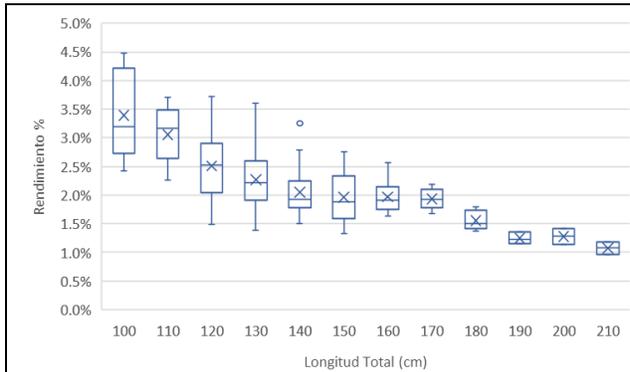


Figure No. 8. Skin yield (% of weight) of dusky sharks according to specimen size (TL in cm), using the parameters of the total length-interdorsal length ratio for Mexico.

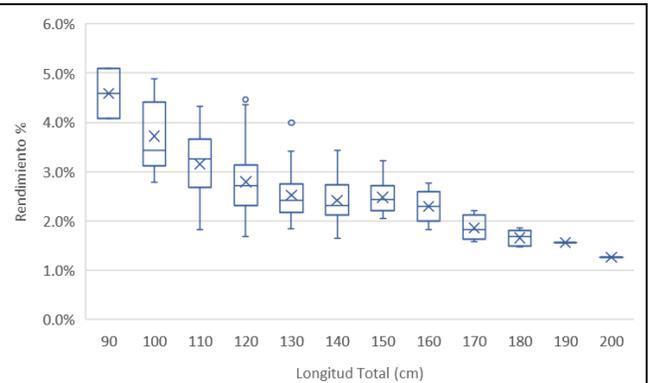


Figure No. 9. Skin yield (% of weight) of dusky sharks according to specimen size (TL in cm), using the parameters of the total length-interdorsal length ratio for Guatemala.

Translation of the text of the figure

Spanish	English
Rendimiento	Yield
Longitud Total	Total Length

Using the parameters of the total length-interdorsal length ratio, the yields obtained ranged between 1.26 and 5.09% of whole carcass weight. The highest yields – 4.5% – were observed in specimens with a total length of less than 90 cm; by contrast, in large specimens with a total length greater than 200 cm, the yield was only 1.3%. The average yield in the analyzed sample was 2.73%, with a standard deviation of 0.69% and a coefficient of variation of 25.3%. This coefficient is still considered very high to assign it to the population of sharks traded according to the landings of the small, medium-sized and large fleets (Figure No. 10). The conversion parameter from dry skin to whole carcass weight is 2.73%, which is 21.78% lower than that used in the non-detriment findings in 2021, which was 3.49%.

The information used to make NDFs based on conversion factors from commercial dry fins to eviscerated whole carcasses has varied during the implementation of CITES as well as the by-products regulated. This will need to be considered in the future for other shark-derived products. At first, when the dusky shark was listed in the CITES Appendices, the conversion criteria used were those estimated by the traders themselves. These parameters were used in the non-detriment findings in 2017 and 2019. By 2021, the parameters used were based on NDFs available in the literature. The present report has generated the first parameters on the ratios between dry fins, tails and skin and

landed carcasses on the Pacific coast of Guatemala. For dusky sharks, the ratios found between dry shark product weight and whole carcass weight were 2.73, 0.91 and 0.68 for skin, fins and tails, respectively.



Figure No. 10. Conversion factors for dusky shark products – fins, tails and skin – used in NDFs in 2017, 2019, 2021 and 2023 for dusky sharks (*Carcharhinus falciformis*) from the Guatemalan Pacific.

Translation of the text of the figure

Spanish	English
Factor de conversión	Conversion factor
Aletas	Fins
Rabo	Tails
Piel	Skin

**Thresher sharks (*Alopias pelagicus*, *Alopias superciliosus* and *Alopias vulpinus*)**

The information analyzed for the family Alopiidae is a challenge regarding the availability of data for each of the species. Landing data of the fishing fleet in the 21 years for which information is available suggest that the landings of this family represented 6.2% of shark landings. In turn, the records suggest that the landings were made up of 94.6% *Alopias pelagicus* and 5.4% of *Alopias superciliosus*. As regards *Alopias vulpinus*, reports of catches in these fishing grounds were very sporadic and were not considered in landing records. Hopefully, reports and records with basic information on this species will improve in the next few years.

Moreover, information compiled in the field is very diverse due to the different ways in which carcasses are landed (i.e., with or without the fins, tail and/or head attached) for processing the products. The artisanal fleet usually lands whole carcasses, which are processed locally. By contrast, the medium-sized and large-scale fleets land eviscerated carcasses without the head or the tail and with the fins separated from the body. These are known as ‘dressed’ carcasses.

Information was collected from 59 specimens. Of these, data on their length were available for only 39 and weight data were available for only 24 specimens. This information was used to generate the biometric parameters. In thresher sharks (i.e., genus *Alopias*), the tail, second dorsal fin and anal fin have no commercial value. These parts should not be considered to estimate the conversion parameters between commercial fins and landing weight, since they are not traded.

Figure No. 11 shows a whole carcass of *Alopias pelagicus* landed by the artisanal fishing fleet; the carcass in the bottom picture is probably *Alopias superciliosus* (based on the color and the location of the attachment of the fins to the body). The different ways of cutting the head lead to changes of up to 6% in the average weight for each size. The evisceration method also leads to considerable changes when estimating the weight of the whole specimen. In dressed carcasses, to distinguish between *A. pelagicus* and *A. superciliosus* it is necessary to observe the location of the dorsal fin compared to the pelvic fins. In the latter, the base of the dorsal fin ends almost across from the origin of the pelvic fins, which differs greatly from *A. pelagicus*. Although *Alopias vulpinus* is rarely found in landings in Guatemala, its different color should lead to its adequate classification. During the study period, no specimens of *Alopias vulpinus* were observed in the sampling.



Figure No. 11. Whole thresher shark carcass landed by the artisanal fleet (above) and thresher shark carcass landed by the medium-sized fleet (below), Port of Iztapa, Guatemala.

The first estimates of the relative weight of the fins of *Alopias pelagicus* showed a high value for pectoral fins. Of 100% of the weight of the fins, 36.8% corresponded to small fins (i.e., second dorsal and anal fin) and the tail or upper lobe of the caudal fin, which have no commercial value;

63.7% corresponded to commercial fins, composed of the lower lobe of the caudal fin (7.7%), the dorsal fin (6.1%), the pelvic fins (9.2%) and the pectoral fins (42.7%) (Figure No. 12).

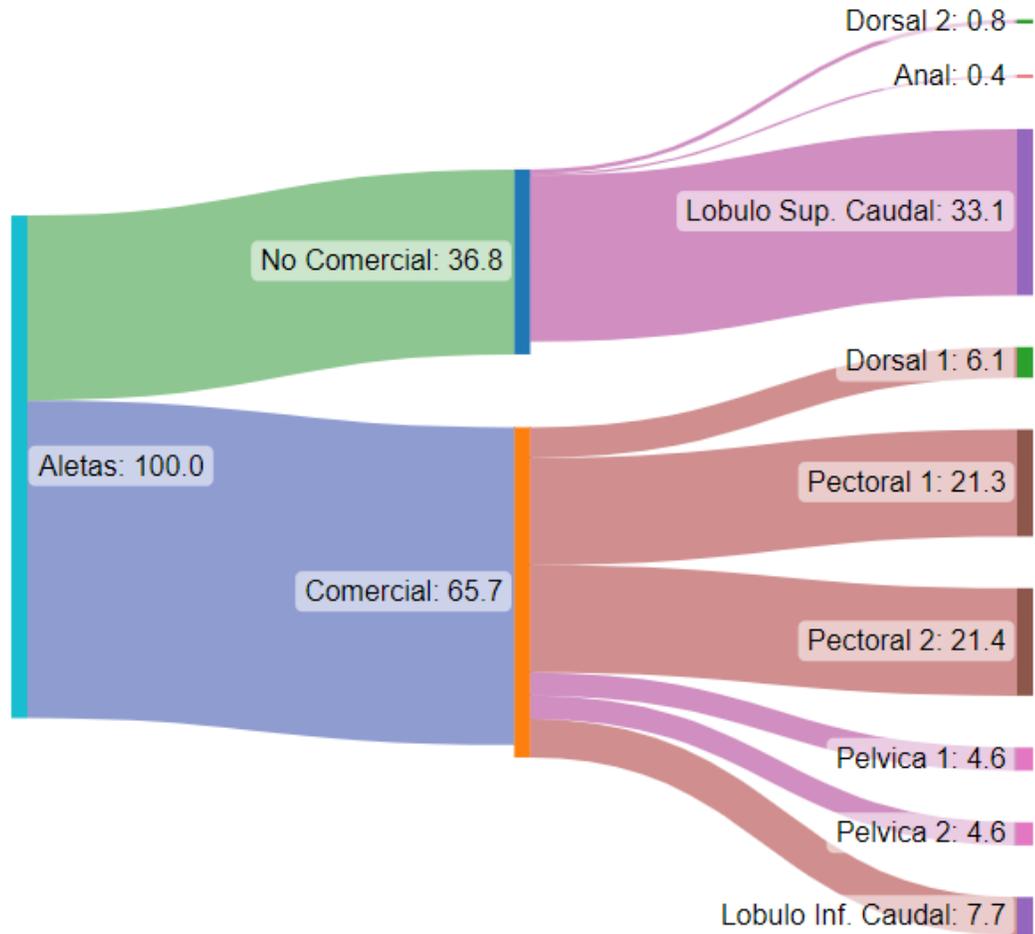


Figure No. 12. Breakdown of the percentage in weight of the fins of *Alopias pelagicus*.

Translation of the text of the figure

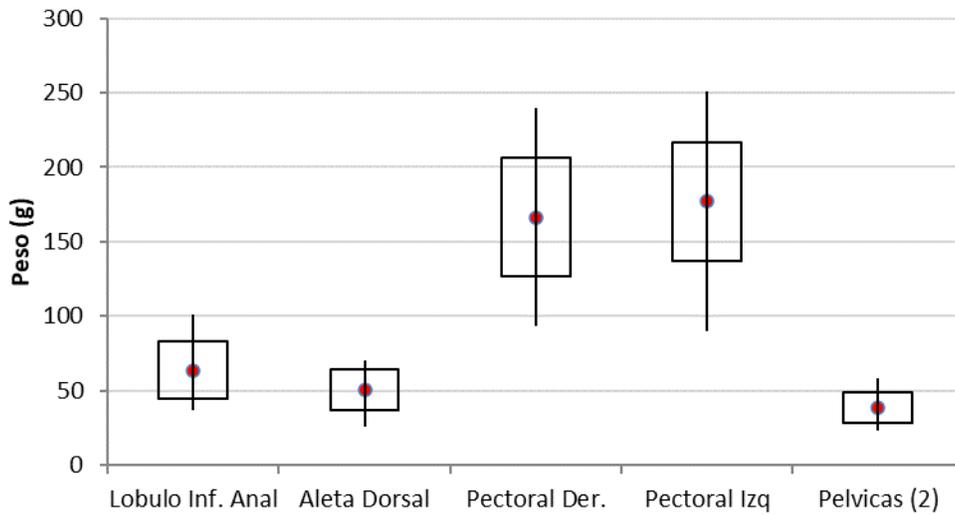
Spanish	English
Lobulo Sup. Caudal.	Upper lobe of caudal fin
Aletas	Fins
Pelvica	Pelvic fin
Lobulo Inf. Caudal	Lower lobe of caudal fin

This first finding allowed us to set two limits in the estimation of the conversion parameter from landing volume to dry fins: 1) small fins should not be included; and 2) the tail or upper lobe of the caudal fin should be included.

The texture of the fins of thresher sharks is very different from that of dusky sharks. Hence, it is relatively easy to distinguish the pectoral fins because of their morphometry but also other fins based on their texture.

The conversion parameters between dressed carcass weight ranges and fin weight were developed from aggregated landing data, given that the fins are landed separated from the carcass and tied together in bags. This was done by analyzing the average values of the most frequent dressed carcass ranges – 20 to 25 kg in this case. As observed in other shark species, small specimens exhibited higher conversion rates, which decreased with the size and weight of larger specimens.

The weight of the dry fins of thresher sharks differed depending on the fin observed. Pectoral fins had an average weight of 166.5 g (right fin) and 177.5 (left fin); the variation is probably due to the way the fin is cut. In addition, the pectoral fins had a weight range between 90.0 and 251.0 g. Another fin whose dry weight exhibited high variability was the lower lobe of the caudal fin, also known as the tail (range: 37-101 g, average: 63.5 g). The weight of this part of the fin is slightly higher than that of the dorsal fin. The dry dorsal fin exhibited a range between 26 and 70 g and an



average of 50.67 g. In addition, the pelvic fins, which have no commercial value in other species, exhibited weight ranges between 23 and 58 g. and an average of 38.39 g (Figure No. 13).

Figure No. 13. Weight range for thresher shark fins landed on the Pacific coast of Guatemala.

Translation of the text of the figure

Spanish	English
Peso	Weight
Lobulo Inf. Anal	Lower lobe of caudal fin
Aleta Dorsal	Dorsal fin
Pectoral Der.	Right pectoral fin
Pectoral Izq	Left pectoral fin
Pelvicas	Pelvic fins

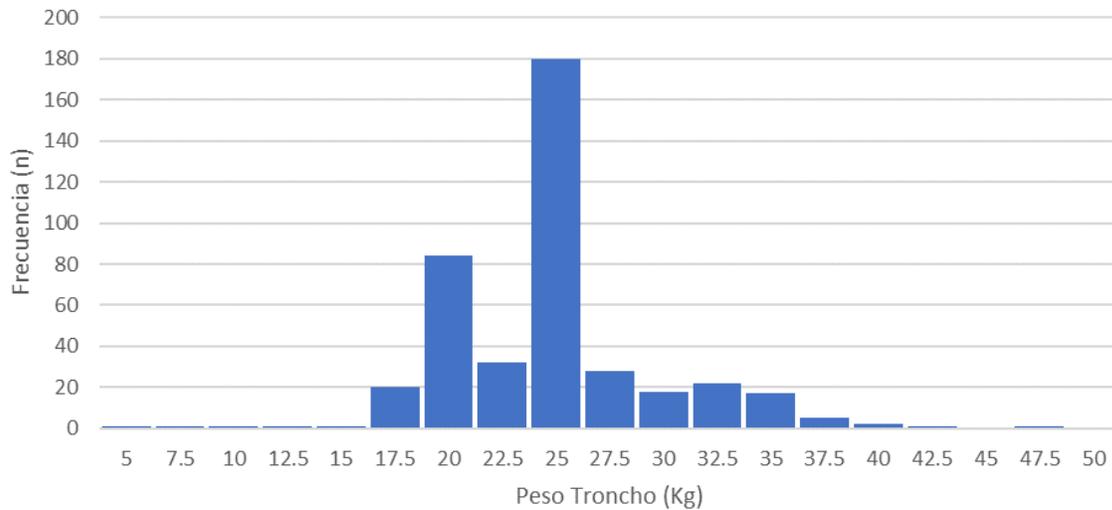


Figure No. 14. Frequency distribution of the average dressed carcass weight (kg) of thresher sharks based on landings in the years 2019 to 2021 on the Pacific coast of Guatemala.

Translation of the text of the figure

Spanish	English
Frecuencia	Frequency
Peso troncho	Dressed carcass weight

The distribution of the weight of dressed carcasses of thresher sharks landed ranged between 4.12 and 47.17 kg according to the landing records per fishing trip of DIPESCA in 2019 and 2021. Values between 20 and 27.49 kg represented 71.3% of landings. The conversion factor was estimated on the basis of the average dressed carcass weight of 23.31 kg. The average weight of dry fins was 484.82 g; this value was used to calculate the factor of 2.08 % to convert landed dressed carcass weight to dry fin weight (Figure No. 14).

The recommended conversion parameter from dry skin to whole carcass is 1.94%; this is 18.4% lower than the parameter used in the non-detriment findings made in 2021, which was 2.383%.

The information used to develop conversion factors from commercial dry fins and dry skin to eviscerated dressed carcass weight has varied during the period of implementation of CITES regulations. When thresher sharks were included in the CITES Appendices and regulations started to be implemented, the parameters used were based on the NDFs available in the literature for 2021. However, the present report generates the first contribution on parameters regarding the dry fin and dry skin to carcass ratio for thresher sharks on the Pacific coast of Guatemala (Figure No. 15). Based on this study, the recommended conversion factors for fins and skin are the following: 2.018 for fins and 1.96442 for skin.

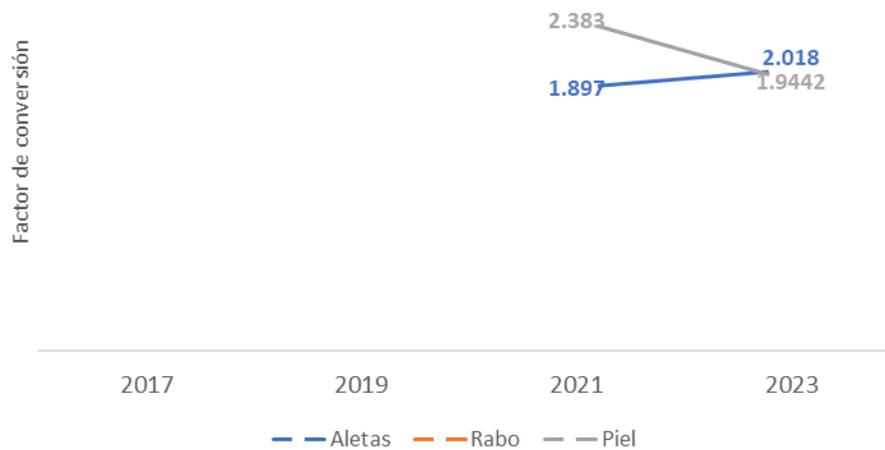


Figure No. 15. Historic conversion factors used to determine the quota for dry fins and tail of dusky sharks.

Translation of the text of the figure

Spanish	English
Factor de conversión	Conversion factor
Aletas	Fins
Rabo	Tail
Piel	Skin

**Conclusions and recommendations**

This report modifies the conversion factor used to date regarding the percentage of the weight of dry fins compared to the weight of eviscerated shark carcasses (i.e., dry fin to carcass ratio) landed by the medium-sized fleet.

We recommend that the fisheries authority establish a closed season for shark fisheries in the Pacific from 1 May to 31 July, which would coincide with the closed season established in the Republic of Mexico for the Pacific, considering that the main species landed in the area of Tehuantepec is the dusky shark.

We recommend extending the present study to larger specimens, considering that during the study period very few specimens were observed in the ‘large’ and ‘extra-large’ commercial categories.

In conclusion, the lack of information about conversion factors from the weight of dry commercial fins to that of eviscerated whole carcasses has been a weakness in the implementation of the CITES regulations for trade in sharks and their products. The present report generates the first contribution to develop conversion parameters between dry fins, tail and skin and carcasses landed on the Pacific

coast of Guatemala. It is an important step towards having updated and accurate information to be able to monitor and regulate trade in species subject to CITES controls.

It is key to continue researching and collecting information on conversion factors and other aspects related to the overexploitation of sharks so as to protect these species and the marine ecosystems in which they live.

### **bibliography.**

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Annexes /formats used

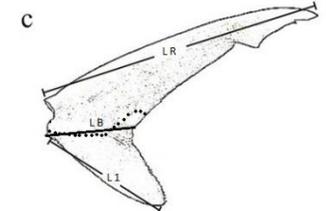
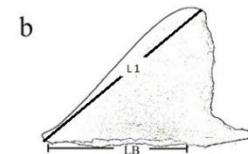
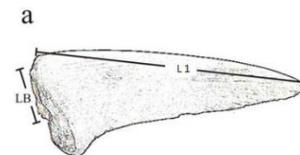
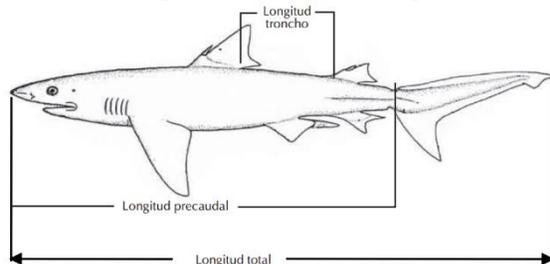
landing place		date		Responsible	
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Biological data registration form

#	species	Sexo	Presentación	L. total (cm)	L. Troncho (cm)	L. precaudal	P. Eviscerado	P. A. Dorsal 1	P. A. Dorsal 2	P.A.Pectoral D.	P.A.Pectoral I.	P.A.Pelvica.D	P.A.Pelvica I.	P.A.Anal	P.Lobulo Cola	P. Rabo	L. Dorsal	L. Dorsal L1	L. Pectoral D.	L. Pectoral D.	L. Pectoral I.	L. Pectoral I. L1	L. Lóbulo Cola	L. Lóbulo Cola	L. Rabo
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									

**Presentación:** **1.** Entero (Con viseras, cabeza y cola), **2.** Eviscerado (Sin viseras, con cabeza y cola), **3.** Troncho (Sin cabeza, sin viseras, sin cola) y **4.** Troncho cola (Sin cabeza, sin viseras)

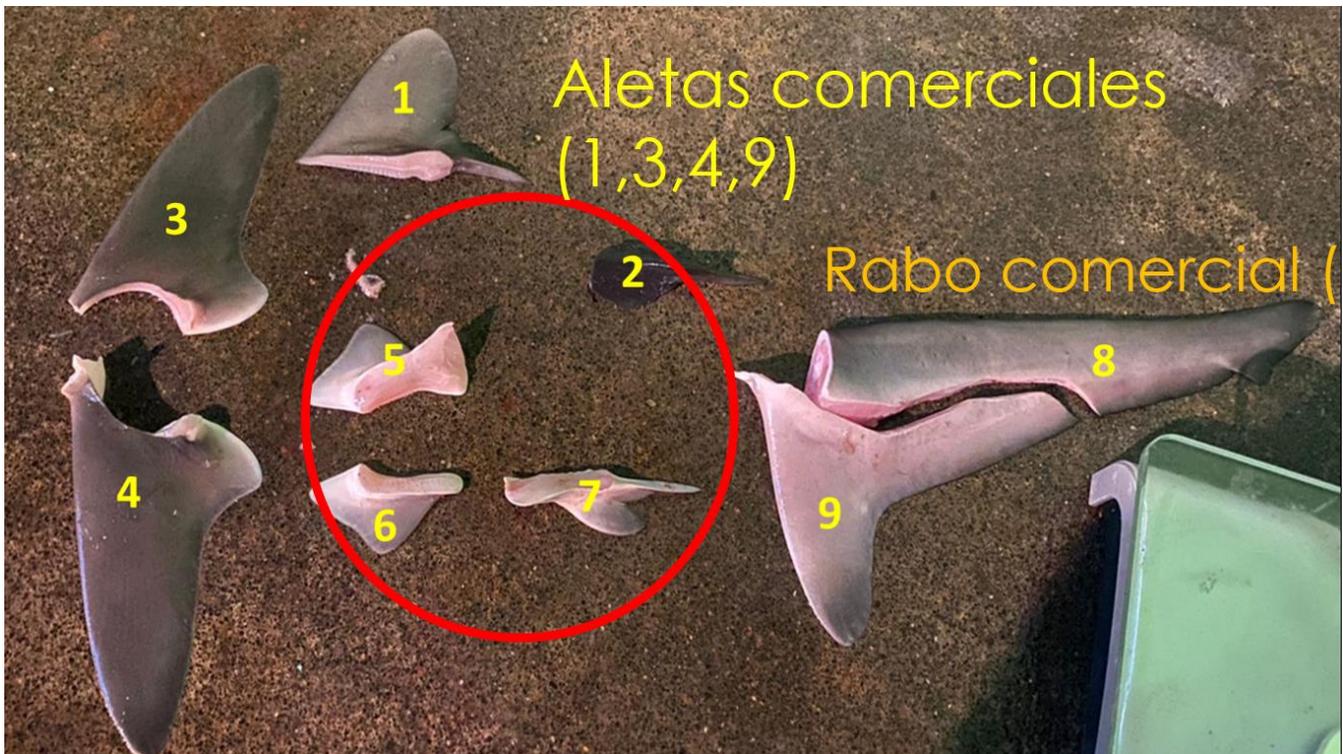
**L.** Longitud. **P.** Peso. **A.** Aleta. **D.** Derecha. **I.** Izquierda. **L1.** Longitud Comercial. **Aletas:** a. Pectoral b. Dorsal. c. Caudal (Lóbulo Cola y Rabo). **LB.** Longitud base. **L1.** Longitud Comercial. **LR.** Longitud Rabo.



**Photographs**



Process of weighing and recording of whole organisms and fins of gray sharks in the Pacific of Guatemala.



Gray shark fins, commercial fins: 1. Dorsal, 3, 4 Pectoral right and left, 9. Lobe of the caudal fin and 8. Tail. Non-commercial fins (red circle): 2. Second Dorsal, 5 and 6 pelvics and 7 Anal fin.



1	Dorsal 1	Primer dorsal	Comercial
2	Dorsal 2	Segunda dorsal	
3	Pectoral 1	Pectoral derecho	Comercial
4	Pectoral 2	Pectoral izquierdo	Comercial
5	Pélvica 1	Pélvica derecha	
6	Pélvica 2	Pélvica izquierda	
7	Anal	Anal	
8	Cola 1	Caudal superior (Rabo)	Comercial
9	Cola 2	Caudal lóbulo	Comrcial



Base of First Dorsal Fin (10.9 cm)



Dorsal Fin Commercial Length (13.2 cm)



Commercial length of dorsal fin or height (10.0 cm)



Right Pectoral fin base (9.0 cm)



Commercial length of the right Pectoral fin (20.8 cm)



Right Pectoral fin commercial length or height (17.3 cm)



Left Pectoral fin base (8.8 cm)



Commercial length of the Left Pectoral fin (21 cm)



Commercial left Pectoral fin length or height (17.5 cm)



Tail Length (33 cm)