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CIT-CC17-2020-Doc.4A

Guatemala Progress Report 2016-2019 on the Implementation of the Resolution on Exceptions CIT-COP6-2013-R1

The Government of Guatemala CONAP presented the following document: Guatemala 2016-2019 progress report on the Implementation of the Resolution CIT-COP6-2013-R1: Exceptions for Subsistence Harvesting of *L. olivacea* Eggs in Guatemala and Panama. to the IAC Scientific Committee.

The Scientific Committee was requested to review the document presented by Guatemala and provide recommendations based on the results presented herein. Guatemala has not yet received the recommendations.

Request to the Consultative Committee: Consider the information in this report to provide recommendations as appropriate.

Progress Report on the Implementation of the Resolution on Exceptions in Guatemala
CIT-COP6-2013-R1
Report 2016-2019

Guatemala´s Progress report on the implementation of the Resolution CIT-COP6-2013-r1 on exceptions under Article IV (3a and b) for Subsistence Harvesting of *Lepidochelys olivacea* Eggs in Guatemala and Panama. It is suggested that to fill out this report use the one presented by CONAP in 2016 as a reference (pdf attached)

Date the report was submitted to IAC Secretariat *PT*: August 2020
Prepared by: Protected Areas National Council (CONAP) Guatemala

According to Resolution CIT-COP6-2013-R1 adopted by the Inter-American Convention for the Protection and Conservation of Sea Turtles Sixth Conference of Parties (COP6), the following measures are recommended to Guatemala and Panama to meet the requirements of Article IV (3) regarding Exceptions:

1) The COP recommends that Panama and Guatemala apply the precautionary approach by implementing the Protection Measures below, following the national laws governing the exceptions, and to continue to consult with the IAC Committees while the countries gather the suggested technical information and implement actions in the recommendations below so that the exceptions meet the requirements of Article IV (3) of the Convention.

2) The level of sea turtle eggs being harvested under an exception must be proven to be sustainable and therefore, monitoring protocols must be in place to assess the stability of the population in the long-term. These protocols must include nesting trends to support the sustainability of the harvesting proposed. The IAC Scientific and Consultative Committees can provide proper guidance on how to prepare or review a monitoring protocol if requested by the Party.

3) Each country must continue to report on its exception in its annual reports as well as on the implementation of the measures described below. The Scientific and Consultative Committees will continue to review the progress of the implementation of this resolution and report to the Conference of Parties the progress of the implementation.

4) In addition to the recommendations below, specific to Guatemala and Panama, the CCE concurs with the guidance provided by the Scientific Committee to both countries contained in Annex I.

1) Immediate Actions (1-2 Years) currently ongoing

a. The Government of Guatemala promotes appropriate legislation to ensure that the harvesting of olive ridley sea turtle eggs (L. olivacea) is sustainable in the long term and conforms to the text of the Convention.

To this date, various legal instruments have been adopted to manage conservation, management, and sustainable use of sea turtles, the documents are listed as follows:

CONAP Resolution 01-21-2012, establishing that all "parlameros" must provide 20% of *Lepidochelys olivacea* total harvest of eggs as a Conservation Quota to an authorized Conservation Unit known as "*Tortugario*" or hatchery.

CONAP Resolution 01-21-2017, establishing the extension of *Lepidochelys olivacea* eggs harvest until October 15th, 2020.

CONAP Resolution 05-20-2014, the National Strategy for Guatemala´s Sea Turtles Management and Conservation enter into force.

CONAP Resolution 03-17-2017, establishing the Regulations for Sea Turtles Management and Conservation. This document Articles 20, 23, 26, and 48 consider proper management for sustainable harvest of *Lepidochelys olivacea* eggs.

b. In the interim, increasing the percentage of eggs that must be deposited in hatcheries to at least 30%, preferably 40%, until more detailed data on population size is available.

Although the percentage has not officially increased to 30%, the current 20% conservation quota is appropriate as it has not negatively impacted the number of females nesting in Guatemala´s Pacific Coast. However, for this measure to continue, it is critical to support and strengthen the hatcheries as conservation units.

c. The Government of Guatemala must ensure that the harvesting of olive ridley (L. olivacea) eggs proposed in the exception does not impact other species, thus adopting appropriate legal measures and policies to avoid this.

Management Resolutions as well as the Sea Turtle National Strategy and the Regulations are legal instruments for protection of all sea turtle species.

The following chart is a summary of the above, included in items 1a, 1b, and 1c.

Indicate Yes/ No/ P= in progress (Mark with X)

Immediate Actions	Year 1	Yes/No/P	Year 2	Yes/ No/P
Government promotes appropriate legislation for sustainable (see 1a)	•Action 1 CONAP Resolution 01-21-2012, established for 5 years.	Yes	•Action 1 CONAP Resolution 01-21-2017, established for 2 years, to be updated in 2020.	Yes
Increase the percentage of eggs to be delivered at the hatchery (see 1b)		No		P
Government adopts legal measure to protect other sea turtle species apart from the olive ridley (see 1c)	•Action 1 CONAP Resolution 05-20-2014 Action 2 CONAP Resolution 03-17-2017	Yes	•Action 1 CONAP Resolution 05-20-2014 Action 2 CONAP Resolution 03-17-2017	Yes

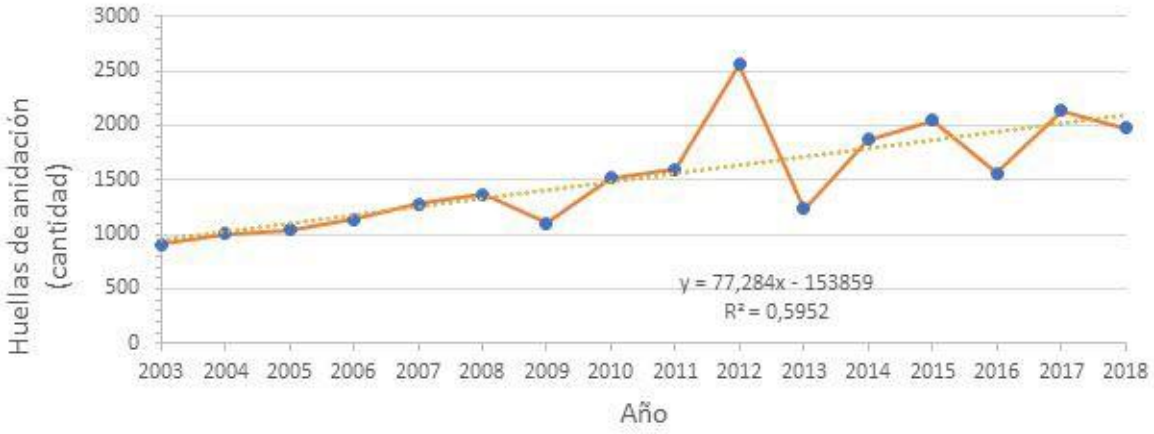
2) Midterm Activities (1-5 Years): the government of Guatemala develops a management plan that contains, among other items, the following:

a. Using the best available information, identify the level of sustainable harvesting that does not negatively impact the exploited population, and that must be achieved in the medium term through a gradual reduction of the current level of harvesting.

The following data were considered for the analysis to identify the harvest sustainable level and are presented as a series of graphs:

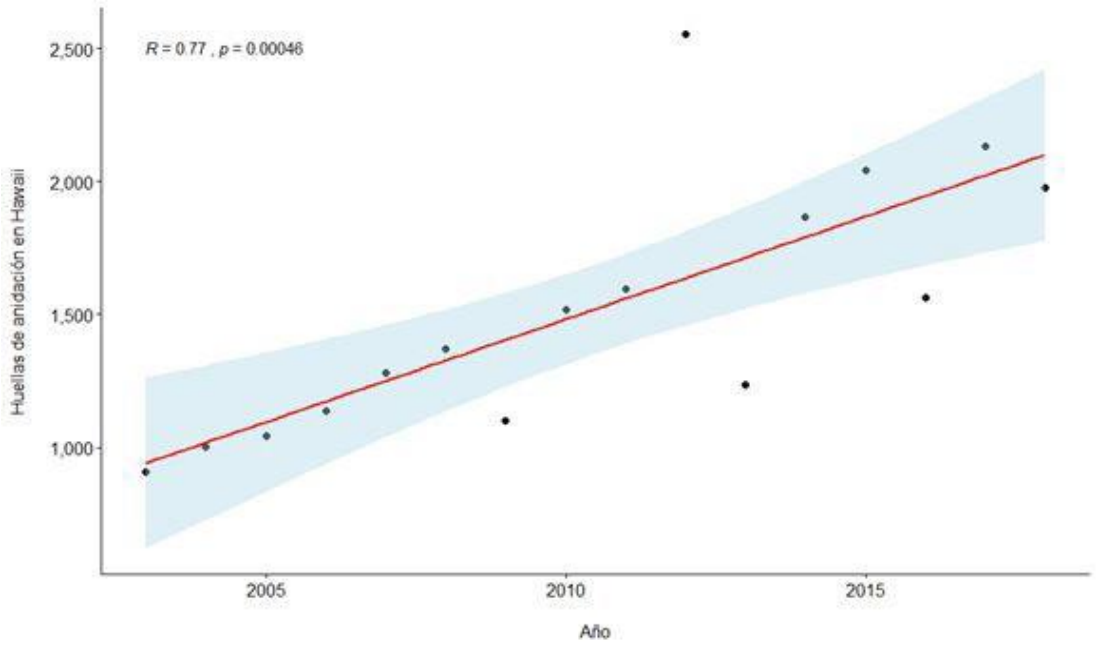
a.1. Assessment of the sustainable level of harvest of olive ridley L. olivacea eggs.

- ➔ Available historical data from 1999-2019 of eggs in hatcheries as an approximation to the number of eggs laid in beaches that are not eradicated from the population.
- ➔ Available historical data from 2003-2018 of sea turtles nesting tracks in the Hawaii area (which are the most robust and numerous)
- ➔ Available historical data from 2013-2018 of nesting tracks on the Pacific Coast.



(Y-axis) Amount of nesting tracks of *Lepidochelys olivacea* in Hawaii area, Chiquimulilla, Santa Rosa, for the period (X-axis) 2003-2018. Source: Ariano, D. 2020 using Muccio 2003-2018 database.

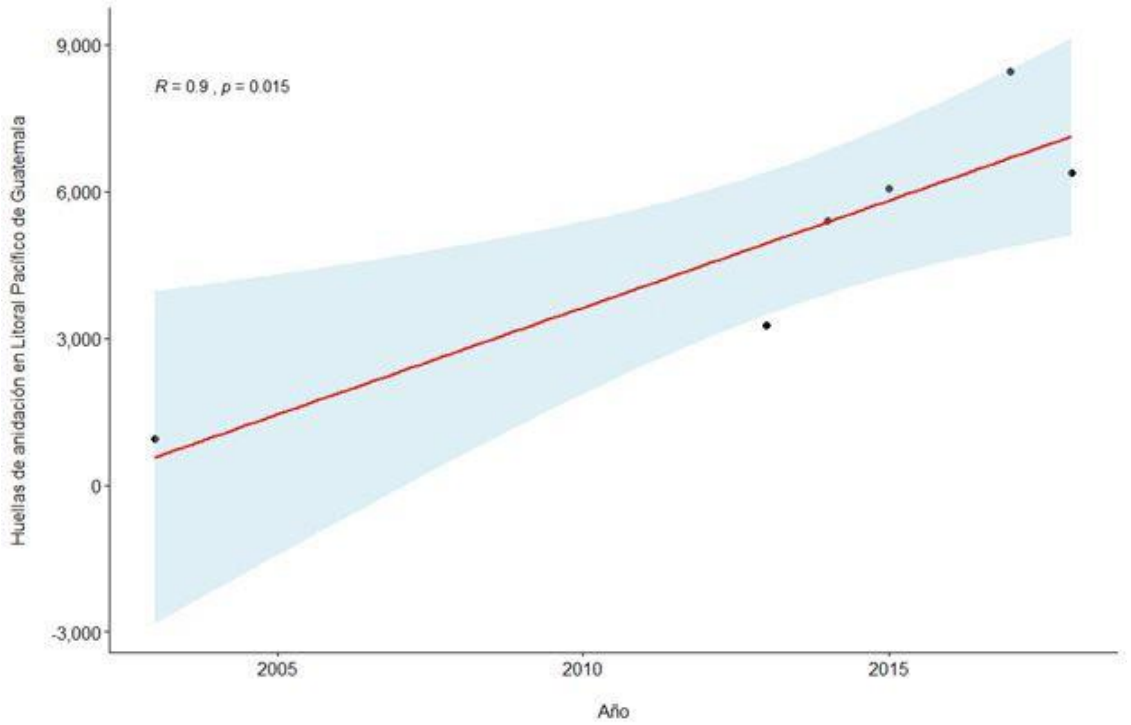
This graph shows that the number of tracks has increased steadily year by year for the period 2003-2018. A general linear model was used to assess confidence intervals and the significance of this correlation considering the nature of the relationship between the year and the number of nesting tracks in Hawaii.



Generalized linear regression of Lepidochelys olivacea nesting tracks in Hawaii area (Y-axis), Chiquimulilla, Santa Rosa considering time for the period 2003-2018. Source: Ariano, D. 2020 with Muccio 2003-2018 database. In red: linear regression; In blue: 95 % inferior and superior confidence intervals.

This figure shows a significant ($p < 0.001$) increasing trend in nesting tracks in Hawaii regarding time, which could evidence a rise in the adult reproductive population of olive ridley in the Hawaii area. This increase could be a product of the conservation actions taken mainly in the hatcheries of the region.

To assess the trends throughout the Pacific coast we used Montes (2004) monitoring nesting tracks gathered in 2002 fieldwork, as well as ARCAS monitoring of tracks data from the Pacific Coast available for the period 2013-2018. To make these results comparable only nesting tracks corresponding to the sites sampled by Montes (2004) and from ARCAS monitoring. These sites are *El Chico (Retalhuleu), Churririn (Suchitepéquez), El Paredón (Escuintla), Conacaste (Escuintla), Candelaria (Santa Rosa), Monterrico (Santa Rosa), Hawaii (Santa Rosa),* and *La Barrona (Jutiapa).*



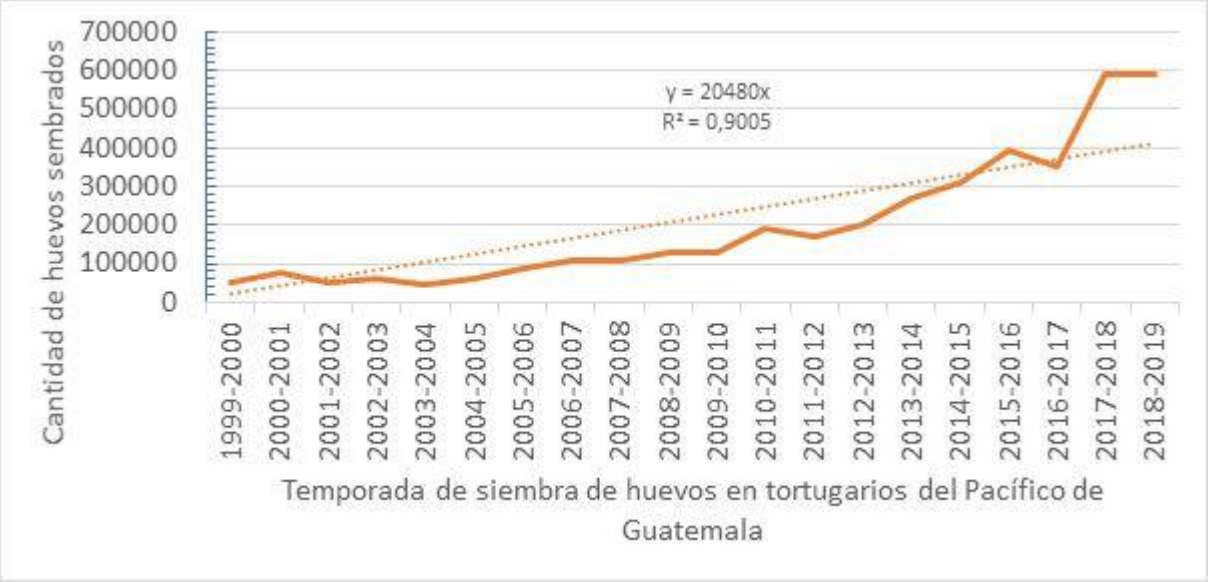
Generalized lineal regression of Lepidochelys olivacea nesting tracks for the period 2003-2018 in eight sites of Guatemala´s Pacific Coast: El Chico (Retalhuleu), Churririn (Suchitepequez), El Paredón (Escuintla), Conacaste (Escuintla), Candelaria (Santa Rosa), Monterrico (Santa Rosa), Hawaii (Santa Rosa) and La Barrona (Jutiapa). Source: Ariano, D. 2020 with Montes (2004) database and Muccio 2003-2018 databases. Red: lineal regression; blue: inferior and superior confidence intervals

This graph shows that the trend found in Hawaii is consistent with the increasing trend in nesting tracks found in Guatemala´s Pacific Coast for the period 2003-2018. This increase in nesting tracks is significant ($p < 0.05$) and the positive correlation is high ($r = 0.9$).

Based on the former, it can be concluded that the number of nesting tracks has increased significantly in a constant relationship between 2003 and 2018 in Guatemala´s Pacific Coast. This could be a sign of a steady increase in the number of *L. olivacea* females nesting in Guatemala´s Pacific Coast. This could mean that the rate of eggs harvested does not have a significant impact on the number of females nesting in Guatemala´s Pacific Coast, therefore the 20% conservation quota seems appropriate.

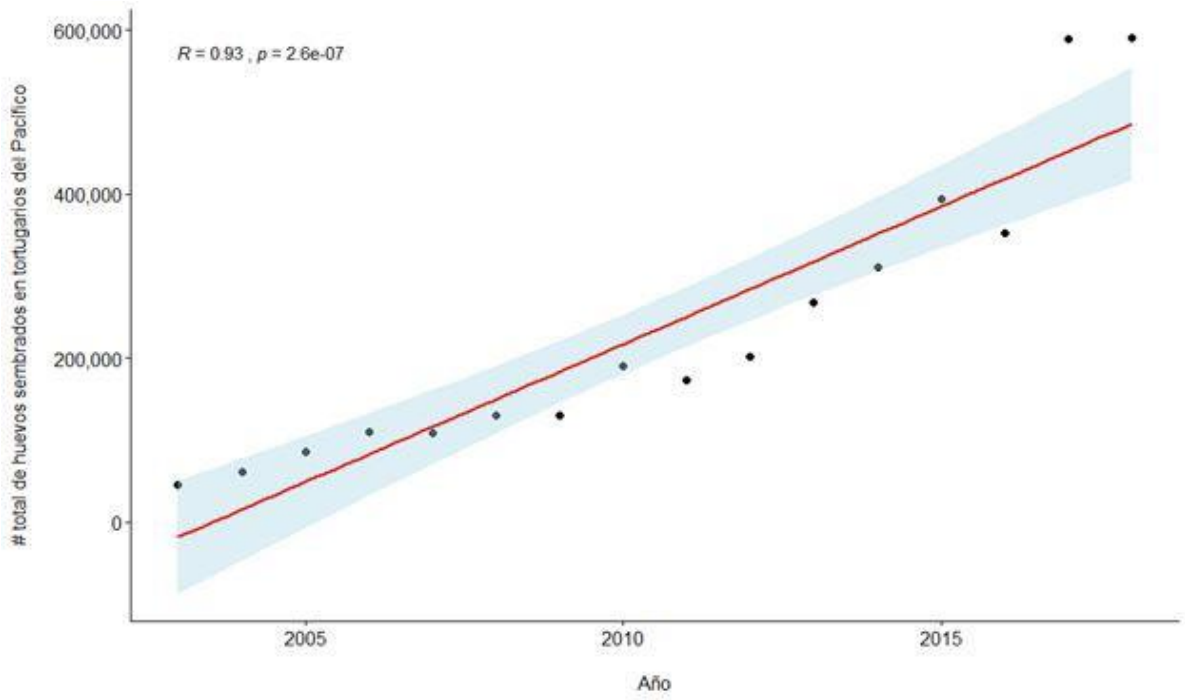
With the establishment of CONAPs first regulatory measures on the use of sea turtle eggs in Guatemala, a 20% of eggs conservation quota was established for the collectors (*parlameros*) which had to be delivered to the hatcheries (Resolution 03-17-2017). In Guatemala´s Pacific Coast, there are 34 active hatcheries. According to official records and the Sea Turtle Situational Analysis prepared by ARCAS (Muccio and Pérez 2016, Muccio 2017 y 2018), since 1999 until 2019 there is a steady increase in the number of eggs placed in hatcheries of Guatemala´s Pacific Coast, going from 52,879 eggs in season 1999-2000 to 590,405 eggs for season 2018-2019. A significant increase is observed for season 2017-

2018, which coincides with the systematic implementation of hatcheries purchase of eggs from collectors, to complement the conservation quota.



Number of eggs placed in hatcheries (Y-axis) of Guatemala´s Pacific Coast ZMC for the period 1999-2019 (X-axis). Sources: Ariano D. with Sánchez-Castañeda et al. 2005 database, CONAP Reports to the Inter-American Convention for the Protection and Conservation of Sea Turtle 2005-2015, CONAP Database 2011-2019, Guatemala's Sea Turtle Conservation Situational Analysis by Muccio 2016-2019.

Season 2017-2018 increase outside of the trend line, is the number of eggs that previously were used for trade and began to be purchased by hatcheries for conservation. A generalized linear model was used to assess confidence intervals and the correlation significance evaluating the nature of the relationship between the year and the number of eggs in hatcheries, recorded in Guatemala's Pacific Coast.

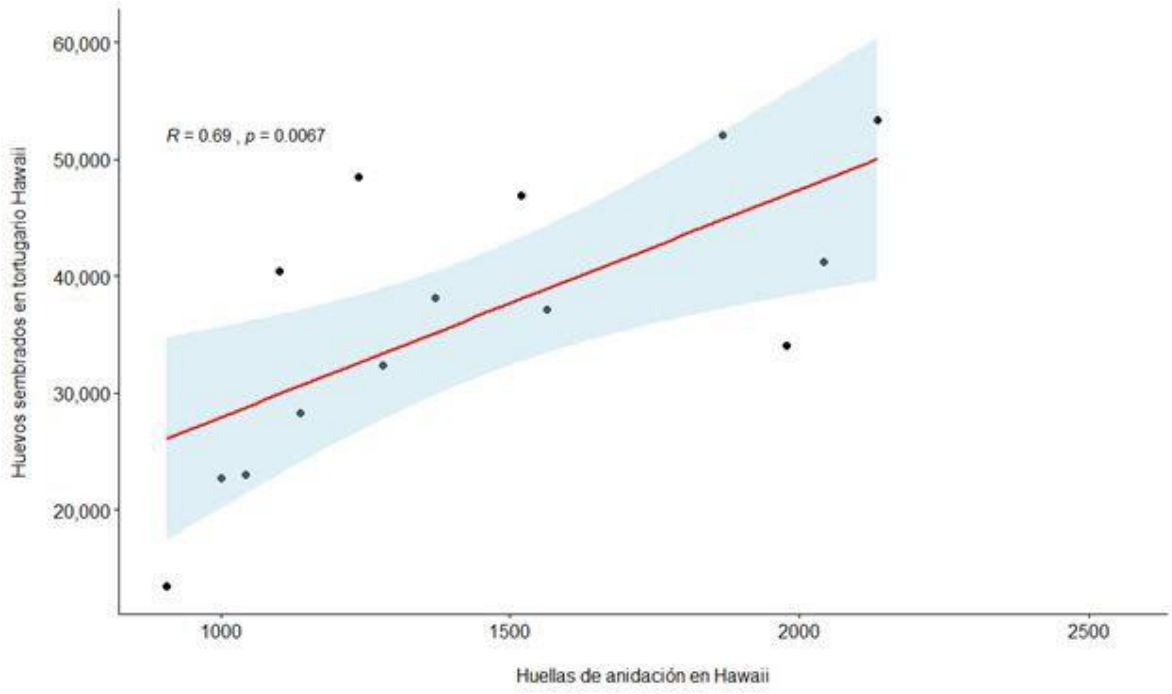


General linear regression of *Lepidochelys olivacea* eggs placed in hatcheries on the Pacific coast for the period 2003-2018. Sources: Ariano D. with Sánchez-Castañeda et al. 2005 database, CONAP Reports to the Inter-American Convention for the Protection and Conservation of Sea Turtle 2005-2015, CONAP Database 2011-2019, Guatemala's Sea Turtle Conservation Situational Analysis by Muccio 2016-2019. Red: lineal regression; blue: 95% inferior and superior confidence intervals

This graph shows the number of eggs in hatcheries on the Pacific Coast has increased significatively ($p < 0.001$) with a high positive correlation ($r = 0.93$). Based on this it could be concluded that the number of eggs in hatcheries has increased significantly in the Guatemalan Pacific, maybe as a result of an increased number of females nesting. However, it is necessary to assess if there is a correlation between the number of nesting tracks (nesting females' indicator) and the number of eggs placed in the Pacific hatcheries to conclude that

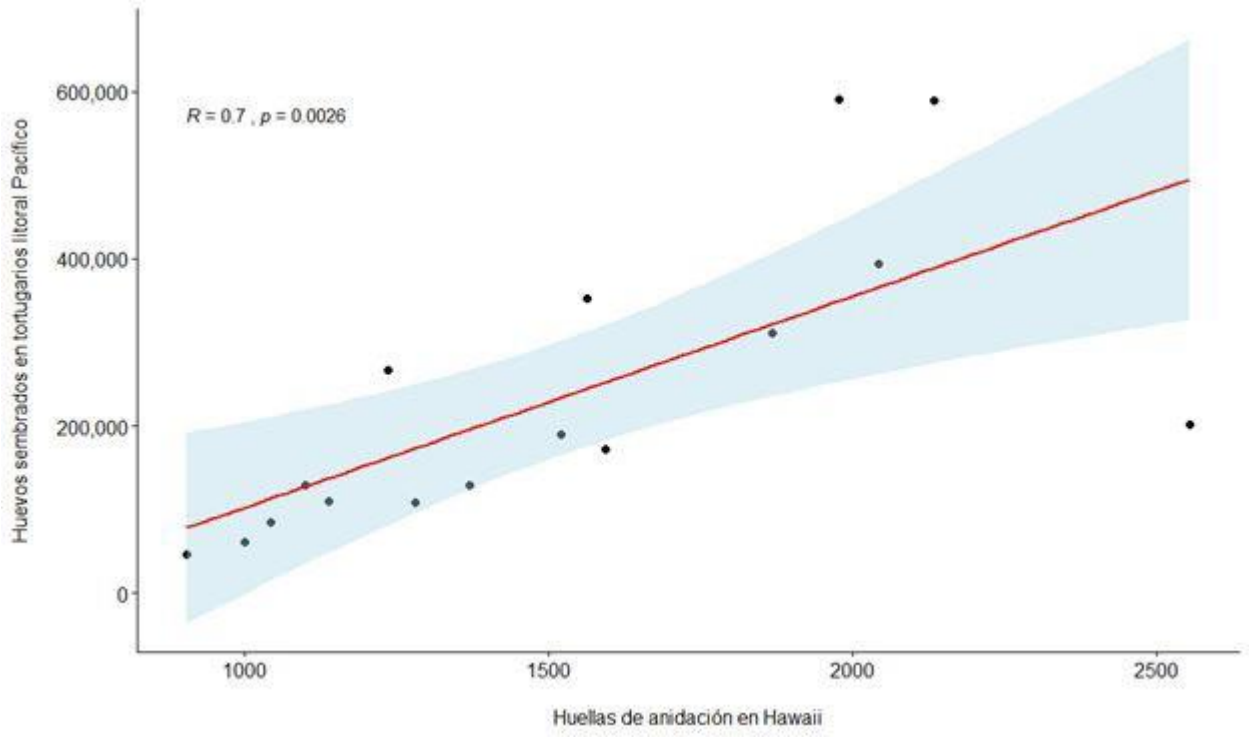
a.2. Relationship between nesting tracks and the number of eggs placed in hatcheries

To assess if the increased number of eggs in hatcheries is a result of a higher number of females nesting, a correlation between the number of nesting tracks (indicator of the number of females) and the number of eggs placed in hatcheries in the Pacific was assessed. Considering that Hawaii's is the longest monitoring of nesting tracks is, these data were used as a reference for the correlations.



General linear regression of *Lepidochelys olivacea* nesting tracks in Hawaii area, Chiquimulilla, Santa Rosa, regarding the number of eggs placed in Hawaii's hatchery for the period 2003-2018. Sources: Ariano D. with database from CONAP Reports to the Inter-American Convention for the Protection and Conservation of Sea Turtle 2005-2015, CONAP Database 2011-2019, Guatemala's Sea Turtle Conservation Situational Analysis by Muccio 2016-2019. Red: lineal regression; blue: 95% inferior and superior confidence intervals.

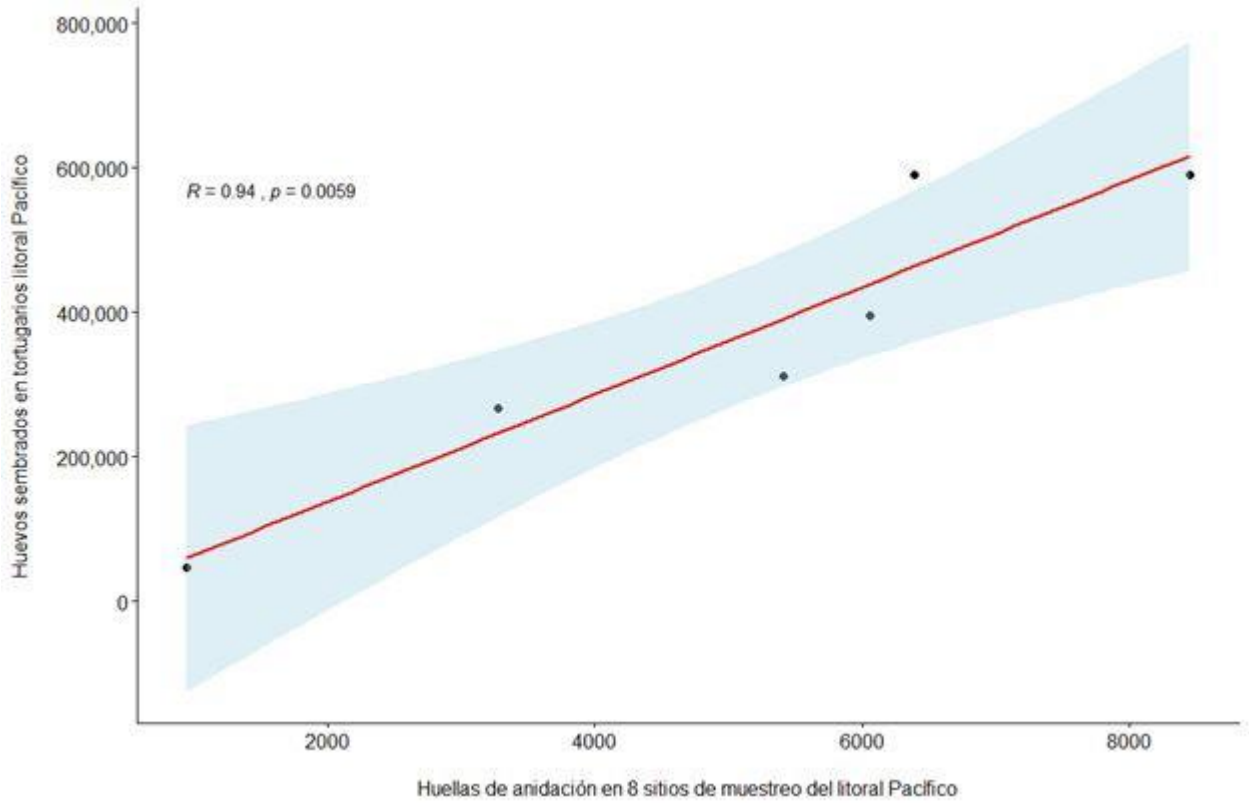
This graph shows a positive significant positive correlation ($r = 0.69$, $p < 0.01$,) between the number of nesting tracks in Hawaii and the number of nests placed in that hatchery. As the correlation found is lower than expected ($r > 0.7$), the correlation between Hawaii's nesting tracks and the total number of eggs placed in hatcheries of Guatemala's Pacific Coast was also assessed.



General linear regression of *Lepidochelys olivacea* nesting tracks in Hawaii area, Chiquimulilla, Santa Rosa, regarding the number of eggs placed in hatcheries throughout the Pacific coast for the period 2003-2018. Sources: Ariano D. with database from CONAP Reports to the Inter-American Convention for the Protection and Conservation of Sea Turtle 2005-2015, CONAP Database 2011-2019, Guatemala's Sea Turtle Conservation Situational Analysis by Muccio 2016-2019. Red: lineal regression; blue: 95% inferior and superior confidence intervals.

This graph shows a positive significant correlation between the number of nesting tracks in Hawaii and the number of eggs placed in hatcheries throughout Guatemala's Pacific Coast ($r = 0.7$, $p < 0.01$). An interesting aspect is that this correlation is stronger than that shown by the eggs placed in Hawaii's hatchery. This could be because not all eggs laid in the Hawaii area are necessarily placed in the hatchery and can be brought by the egg collectors to other hatcheries. However, at Guatemala's Pacific Coast, this local effect is reduced if there is a high correlation between both variables. Based on this it can be inferred that in fact, the number of eggs placed in the hatcheries consistently reflects the number of females nesting in Guatemala's Pacific coast.

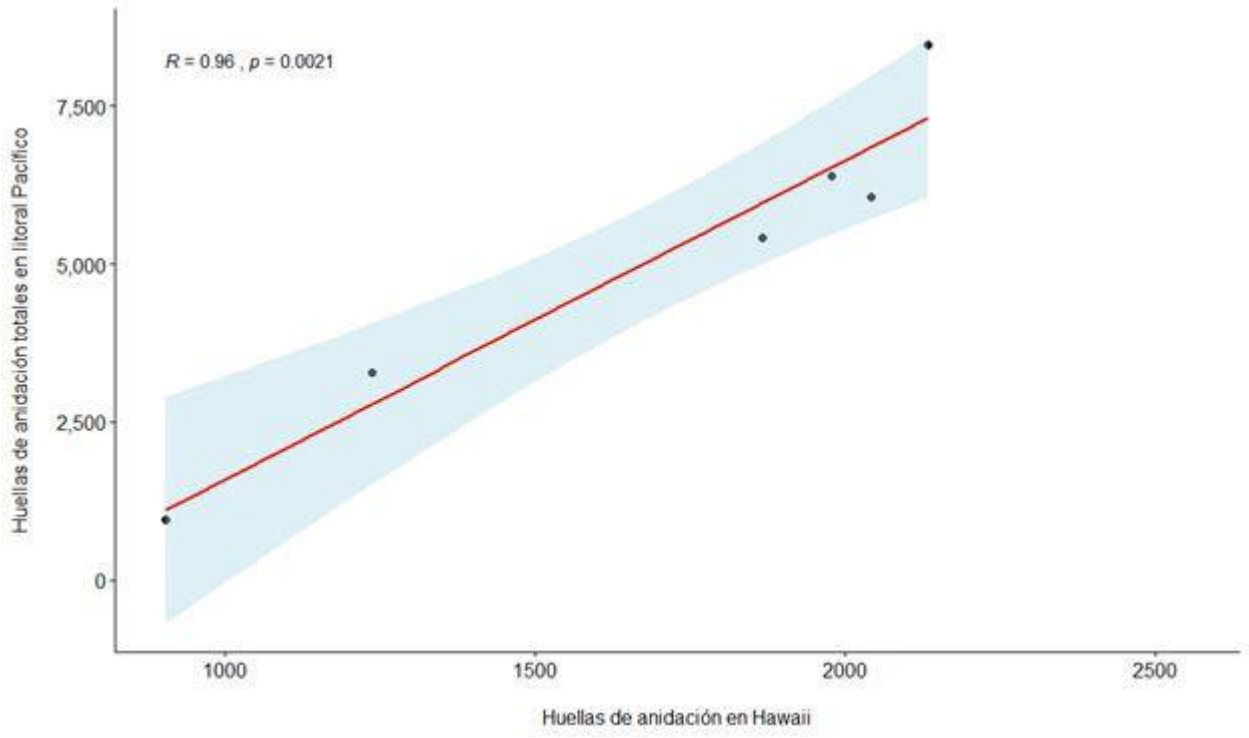
Subsequently, we analyzed the relationship between the number of nesting tracks at the eight sites of our systematic sampling, to assess if the pattern found in Hawaii was also present in the rest of the Pacific Coast, using a general linear model using the software R.



General linear regression of *Lepidochelys olivacea* nesting tracks in eight sites of Guatemala's Pacific Coast: El Chico (Retalhuleu), Churririn (Suchitepequez), El Paredón (Escuintla), Conacaste (Escuintla), Candelaria (Santa Rosa), Monterrico (Santa Rosa), Hawaii (Santa Rosa) and La Barrona (Jutiapa), regarding the number of eggs placed in hatcheries throughout the Pacific coast for the period 2003-2018. Sources: Ariano D. with Montes database (2004), Muccio 2003-2018 databases, CONAP Reports to the Inter-American Convention for the Protection and Conservation of Sea Turtle 2005-2019, CONAP Database 2011-2019, Guatemala's Sea Turtle Conservation Situational Analysis by Muccio 2016-2019. Red: lineal regression; blue: 95% inferior and superior confidence intervals.

This graph shows a strong positive correlation between the total number of nesting tracks recorded for eight sampling sites in the Pacific coast and the number of eggs placed in hatcheries ($r = 0.94$, $p < 0.01$). This indicates that the number of eggs placed in Guatemala's Pacific Coast, is, in fact, a product of the number of females nesting in the country.

We also analyzed the relationship between the number of nesting tracks found in Hawaii, regarding the total number of nesting tracks recorded in the monitoring sites of Guatemala's Pacific Coast. This was done using a general linear model analyzing the number of nesting tracks in Hawaii regarding the total number of tracks recorded on the Pacific coast, each monitoring year.



General linear regression of *Lepidochelys olivacea* nesting tracks in Hawaii, Chiquimulilla, Santa Rosa, regarding the number of nesting tracks counted on the Pacific coast for the period 2003-2018. Sources: Ariano D. with Montes database (2004), Guatemala's Sea Turtle Conservation Situational Analysis by Muccio 2016-2019. Red: lineal regression; blue: 95% inferior and superior confidence intervals.

As shown by this graph, there is a high positive correlation between the number of nesting tracks recorded in Hawaii and the total number of nesting tracks in the Pacific coast ($r = 0.96$, $p < 0.01$). This allows us to conclude that the number of nesting tracks in Hawaii efficiently reflects the total amount of nesting tracks on the Pacific coast, therefore they can be used for future references. Based on this, there is evidence that the 20% Conservation Quota is appropriate, and its use for subsistence by *parlameros* (collectors) is not having a negative impact in the nesting female's population of Guatemala's Pacific coast.

a.3 Estimate of eggs laid in the beach and estimate of eggs with a commercial destination

Considering that the number of nesting tracks shows a significant positive linear correlation regarding the number of eggs placed in hatcheries, it can be inferred that is feasible using this variable as an estimator of the number of nest and eggs laid on the beach. To do this, the following correction factors were applied to the total number of nesting tracks recorded by date according to Montes (2004) and Muccio (2019) data.

Estimated # of nets laid on the beach:

The following correction factor was applied to the total number of nesting tracks recorded by date according to Montes (2004) and Muccio (2019) data:

# of nests laid on the beach = # of nesting tracks - (# of nesting tracks x 0.0967)

Estimated # of eggs laid on the beach:

The following correction factor was applied to the total number of nests laid on the beach during the season and recorded by date, according to the average number of eggs per nest from Muccio (2019) data:

# of eggs laid on the beach = # of nests laid on the beach x 92.66

Estimated # of eggs with commercial destination:

The number of eggs placed in registered hatcheries was subtracted from the estimated number of eggs laid on the beach to calculate the percentage of estimated eggs with commercial destination:

# of estimated eggs with commercial destination = # of estimated eggs laid on the beach - # of eggs laid in hatcheries

Based on these calculations, the following chart summarizes the number of nesting tracks, the number of nests placed in hatcheries, the estimated number of eggs, and the estimated number of eggs with commercial destinations.

b. With technical guidance from the IAC, establish a program for long term monitoring of the population that includes goals and indicators

Guatemala expects that this document is reviewed and analyzed by the IAC Scientific Committee to obtain the feedback required to improve the activities for the conservation and sustainable use of *Lepidochelys olivacea* eggs.

c. Considering that egg harvesting responds to an economic subsistence need of the coastal traditional communities, economic alternatives must be sought that address these subsistence needs to reduce the harvest to sustainable levels.

Product 2 is presented as Annex 1. *Proposal on economic alternatives to meet subsistence needs to reduce the harvest of olive ridley's eggs to a sustainable level.*

According to the data, it was identified that in the last 3 years there is an important change in the fate of the clutches obtained by egg collectors during the peak nesting season (July-December). Currently, some hatcheries have the purchasing power to buy the rest of the eggs from each clutch after the collector gives them 20% as a Conservation Quota.

Most collectors prefer selling their eggs to the hatcheries rather than to traders where the destination is consumption. In general, today the average purchase price of hatcheries is Q. 15.00 per dozen.

According to the latest reports, 590,405 eggs were placed in hatcheries during the 2018-2019 season, subtracting the 20% of the Conservation Quota, we obtain Q. 590,405.00 distributed among collectors by hatcheries that bought their eggs during the 2018-2019 season.

Nearly 100% of olive ridley eggs laid on the Pacific coast of Guatemala from January to June are destined for human consumption (trade), without complying with the minimum 20% conservation quota. Based on reports from hatchery managers, on the number of turtles arriving on the beach during this period, a minimum of 6,000 and a maximum of 12,000 eggs was estimated to go directly to trade in the region without meeting the conservation quota. This coincides with the period of greatest demand for egg consumption, at Easter time in Guatemala.

d. Gather additional technical information

i. Data should be included on monthly nest activity, nest predation, and natural nest mortality and survivorship on the nesting beach.

ii. Information on the organizations participating in and the resources allocated to the management of the exception.

Listed below are the organizations that have participated in the development of sea turtle conservation, management, and awareness activities, among others. However, data on the funding that each organization has allocated for sea turtles are not presented in the current

document.

- Centro de Estudios Conservacionistas de la Universidad de San Carlos de Guatemala
  –CECON-
- Escuela de Biología, Universidad de San Carlos de Guatemala
- Centro de Estudios del Mar y Acuicultura –CEMA-, Universidad de San Carlos de Guatemala
- Facultad de Veterinaria, Universidad de San Carlos de Guatemala
- Centro de Estudios Ambientales y Biodiversidad, Universidad del Valle de Guatemala
- Dirección de Normatividad de la Pesca y Acuicultura -DIPESCA- del Ministerio de Agricultura Ganadería y Alimentación
- Asociación para el Rescate y la Conservación de Vida Silvestre, ARCAS
- World Wildlife Fund -WWF-
- Colegio Austriaco Guatemalteco
- Fundaselva
- Centro de Conservación Marina -AGHN-, Zoologico La Aurora
- Base Naval del Pacífico
- Policía Nacional Civil a través del Servicio de Protección a la Naturaleza, DIPRONA

iii. Information should be provided on all hatcheries, with full descriptions of egg handling, nest density, and other hatchery procedures.

To comply with this item, we presented the document: Guidance for proper management of *olive ridley eggs.* Annex II of this report.

iv. Additional information on the economic aspects of turtle egg harvesting in Guatemala is requested with a socio-economic study of the beneficiaries of the egg harvest and justification for traditional use.

The social and economic aspects were assessed and presented in the document *PRODUCT 3: Proposal of economic alternatives to meet subsistence means needs to reduce the harvest of olive ridley's eggs to a sustainable level.* Annex III of this report.

v. The effects of increased nearshore predation caused by hatchling release from hatcheries and ways to reduce this effect should be identified

Currently, there is no scientifically supported research on predation during hatchlings release.

vi. An evaluation of the impact of illegal trade on the exception presented is recommended.

The National Strategy Against Wildlife Traffic in Guatemala and Action Plan 2020-2029 were approved in the first semester of the year. This will support actions that

provide information on sea turtle eggs illegal traffic.

Year five report - 2019 (Mark with an X below)

Guatemala's Exception Management Plan: Following the midterm activities in the Resolution, an Exception Management Plan must be presented in the 5th year of the Exception. Attach the document and fill in the table below.

Mark with an X what has been implemented

Guatemala's Midterm Activities Management Plan Activities Update according to the following:	**YES**	**NO**	**In Progress**
Exception Management Plan (see #2) Draft proposal, socialization pending. See document PRODUCT 5: Assessment of items in Resolution CIT-COP6-2013R1. Annex IV in this report.	X		
Identification of the sustainable harvest level (see #2a) See document PRODUCT 5: Assessment of items in Resolution CIT-COP6-2013R1. Annex IV in this report.	X		
Establish long-term monitoring of the population (see #2b) See document PRODUCT 2: *Lepidochelys olivacea* monitoring program in Guatemala's Pacific Coast. Annex I of this report. In process of socialization.			X
Identification of economic alternatives that meet the subsistence need of coastal communities (see # 2c) It is expected that the acquisition of *L. olivacea* eggs are considered as "conservation sales" and are purchased by hatcheries (it should be considered that not all hatcheries can buy eggs and they will only accept the Conservation Quota and donations).			X
Collect technical information on the following aspects (see # 2d) • Nesting activity, including predation and survival • Participating organizations and assigned resources • Information on all nurseries • Socio-economic diagnosis of the egg harvest and a justification of the traditional use • Identification of the effects of increased predation due to the release of hatchlings from the hatchery and forms of mitigation • Evaluation of the impact of illegal traffic in the exception presented			X

Annex I

Additional Guidance Suggested for Guatemala

Mark with an X what has been implemented until now 2016-2019

X Use published biological data on sea turtles to interpret abundance trends, thereby reducing the possibility that the changes in numbers observed nesting is being wrongly attributed to hatcheries.

Consider the possibility that there might be a mixing of animals with those from other nesting colonies in the Eastern Pacific and that increases in numbers of nesting turtles may result from conservation measures being implemented at other locations.

X Maintain the management of nests as close as possible to natural conditions.

X Handling of eggs must be avoided to the greatest extent possible. Time outside of the sand should be minimized since prolonged exposure to elements outside of their natural incubation environment significantly reduces the embryos' chance of survival. Therefore, eggs must be buried within the shortest time possible and with the least amount of handling. Eggs received as donations or confiscated eggs that might be contaminated must be reported and managed outside of any hatcheries.

X Use existing technical manuals to manage the exception to implement the suggestions mentioned. A technical institution of the country requesting the exception should endorse these manuals. It is up to the Party country presenting the exception if they wish that the IAC SC review their manual.

X Establish the control, registration, and management of hatcheries, which must include a full survey and identification of all the nests collected.

X Develop and apply strict inspection, surveillance, and control measures to ensure that all egg collectors comply with the required mandatory submission of eggs and try to get them to submit complete nests instead of only a fraction of them.

Establish spatial or seasonal closures on exploited beaches to protect the rest of the turtle species from exploitation.

X Establish partnerships with other organizations, institutions, and NGOs to guarantee sea turtle conservation and research.

X Implement training and education campaigns to better manage and reduce egg consumption

X Propose alternative economic activities, including those that use sea turtles in a non-consumptive manner. Countries with exceptions should strive to present at least one model community where this is being done successfully and is technically appropriate.

X Designate or allocate sufficient human resources and funds to succeed in correctly managing the exception

At the end of this analysis we conclude:

With the best evidence, it is possible inferring that the 20% conservation quota is appropriate, as the current harvest levels don't show evidence of a decrease in the number of females nesting in Guatemala's Pacific coast, on the contrary, there is an increase in females nesting over the years.

The conservation strategy using eggs placement in hatcheries of Guatemala's Pacific coast is effective for increasing the olive ridley population nesting numbers in the country.

It is essential to maintain the strategy of buying eggs from or granting in-kind incentives to collectors, to provide an alternative income to commercial sales. The data show that this strategy has a highly significant impact on the number of eggs placed in hatcheries in the Guatemalan Pacific.

Recommendations

Consult Guatemala's Sea Turtle Advisory Group on alternatives to prepare the analysis of the sustainable harvest with the available data and make comparisons with the current results.

Promote, if possible, the hatcheries, and to the extent of their possibilities purchase the entire clutch (in a differentiated way to the hand in of the 20% Conservation Quota) from collectors, to establish the "purchase for conservation", avoiding consumer trade.

Evaluate the relationship between the movements of Central America Thermal Dome concerning the greater nesting observed gradient eastern Pacific coast of Guatemala.

CONAP must ensure that the 20% minimum conservation quota is met throughout the year and not only during what is known as the nesting season (July to December). To do this, it is essential that hatcheries receive eggs throughout the year, at least in hatcheries managed directly by CONAP, as well as El Banco and Hawaii hatcheries.

CONAP must watch over final sales points of olive ridley eggs (restaurants, cevicherias, and juice stands) that traders have their final delivery voucher proving the eggs in a legal way.

References

Consejo Nacional de Áreas Protegidas -CONAP- y Programa de las Naciones Unidas para el Desarrollo –PNUD- (2018). "CONSEJOS PARA EL MANEJO ADECUADO DE HUEVOS DE TORTUGA PARLAMA". Proyecto "Conservación y Uso Sostenible de la Biodiversidad en Áreas Protegidas Marino Costeras (APMs)". (MARN-CONAP/PNUD-GEF). Fondo Mundial para la Naturaleza -WWF-, Guatemala. Documento educativo 02-2018.

Note: The following are documents prepared with the support of USAID, specifically for the presentation of the exception report to IAC through a consultancy titled: Management Plan on the exception for the subsistence harvest of *Lepidochelys olivacea* eggs, Resolution CIT-COP6-2013R1. At the time of officially submitting this report, it is requested that the Annexes are not disclosed. They are attached to accompany the Guatemala national report and only for internal use of IAC Committees, the consultant will inform when the documents can be shared for use outside IAC.

PRODUCT 2: Monitoring Program for the olive ridley (*Lepidochelys olivacea*) in Guatemala's Pacific coast.

PRODUCT 3: Proposal on economic alternatives to meet the subsistence needs to reduce the harvest of olive ridley eggs to a sustainable level.

PRODUCT 5: Assessment of items proposed in resolution CIT-COP6-2013R1