

National Report – Dominican Republic

*Fishing for American eel, *Anguilla rostrata**

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Summary

This document was developed within the framework of the 40 C/5 and the project: GLO0122569 - GEF-PPG “Strengthening the stewardship of an economically and biologically significant high seas area – the Sargasso Sea”, Specifically this report provides available technical information on the local conditions relating to the fishing, management and export of glass and mature eels . It provides some data about the national eel fishery, the scale of imports and exports of live eels or eel products, and the economic importance of the fishery. In addition, the level of sustainability of the fishery, stakeholder analysis, management and governance of the fishery, and other issues in the Dominican Republic are discussed.

1. Introduction

Eels (Anguillidae) are an ecologically and economically important group of fish that face growing pressure from fishing effort and habitat degradation in the Dominican Republic (D.R.). Understanding eel life history, the level of exploitation and the scale of the export trade are critical to the effective management and conservation of this species.

The Dominican Republic is located on the eastern side of Hispaniola island with the nation of Haiti situated on the western side of the island. This is the second largest island of the Greater Antilles; the total area, including adjacent islands, is 48,670 km². The coastline extends around 1,668 km. and has an economic exclusive zone covering 238,000 km². The littoral zone is defined as a public asset and includes a strip of 60 meters from the high tide line. In the D.R. there is a close relationship between socio-economic aspects and the coastal marine area.

According to the scientific literature, the American eel, *Anguilla rostrata*, is a unique and versatile fish, which is highly migratory, with multiple habitat requirements, and a complicated reproductive cycle. It is a species with a catadromous life cycle - they reproduce in the sea but spend most of their life in brackish or freshwater, mainly upstream in rivers. Eels mature slowly, requiring seven to 30 years to mature sexually.

Adult eels spawn in the southwestern sector of the Sargasso Sea and larvae of both species of eels are known to occur in the vicinity of the seasonal subtropical convergence (Miller and others, 2015). The eggs transform into larvae, first as pre-leptocephalus (up to 7 mm long) and then leptocephalus (up to 10 mm long). These larvae are driven by currents towards the different continental and insular coastal shelves. They subsequently metamorphose into transparent eels, pigmented eels, and finally silver or adult eels.

Historical Data Distribution in the Dominican Republic

The species has been found to have a wide distribution in all coastal freshwater systems including: The rivers of the Atlantic Coast from Dajabón to Samaná, the province of La Altagracia (the channels of the sugarcane fields in the east), and in the south the Canal Marcos A. Cabral, Lateral Nizao, Baní and Najayo, in the province of San Cristóbal, Barahona, San Juan Yaqué del Sur River, and possibly as far as the Pedernales province.

2. Background and Context

In the Dominican Republic, the literature on studies of this species is scarce. The first attempts to cultivate eels in the country, were made during the Trujillo dictatorship period, between 1954 and 1959, an activity carried out by emigrants from the Japanese community, settled in Dajabón (personal communication). At the local level, there is limited consumption of eel and the trade in medium-sized adults are primarily in Asian communities. In the 1980s, a Korean citizen introduced eel fishing techniques to develop an export market to Asia. Later, a Canadian company with experience in this activity arrived, and thus others were integrated. *Anguilla* meat is imported smoked and other ways and is used in sushi restaurants.

Exploitation of elvers began in early 1980, but up until 2015, there were only six companies authorized by the Dominican Council of Fisheries and Aquaculture (CODOPESCA) to hold Fishing and Export Licenses. There were three registered fishermen's organizations in the country but this number has skyrocketed. Currently CODOPESCA issues an average of 20 permits per year to capture eel larvae from October-March. They are exported to fish farms for breeding or fattening in China, Hong Kong, Canada, USA, United Kingdom, etc. The captured larvae are exported by air. By feeding and strengthening the elvers, as is customary in Canada and Europe, the mortality rate during air transport is reduced. Consultations with fishermen indicate that their catch has been declining over the past years primarily because of contamination, fragmentation of eel habitat, and other factors

A workshop held in the Dominican Republic in 2018 brought together American eel range states with a specific focus on enhancing coordination and information sharing regarding fisheries, and capacity building with respect to data collection on harvests and exports. One of the key recommendations outlined in the vision statement of the Dominican Republic workshop called for collaboration among American eel range States. Further, at the CITES CoP18 a new series of Decisions were adopted, a few of which encouraged collaboration and establishment of joint programmes of work to benefit eel species. Decision 17,187 of CITES addresses the range States and Parties involved in trade of *Anguilla* species to promote international and regional cooperation on a species-by-species basis, including the organization of regional meetings to discuss how to fill

gaps of information and ensure sustainability, in the long term, in the face of the growing demand for international trade”.

3. Justification

There is a lack of data about the American eel, *A. rostrata*, in the Dominican Republic and the available information is limited. The population status is unknown as is the relative abundance of elver eels in the country’s water courses. With the growing interest in the capture and export of this species, these major data gaps need to be filled. An overall plan must to be developed for the management and conservation of this species.

4. Objective

The objective of this report is to gather all the available information about the American Eel, *A. rostrata*, and to evaluate the current situation with respect to the level of exploitation, management effort, legislation, governance and conservation measures.

5. Methodology

Consultation of bibliography, studies, internal reports of the Ministry of Environment, Dominican Council of Fishery and Aquaculture (CODOPESCA), review National Customs Directorate Database, National Newspaper articles and interviews with officials of the Dominican Council of Fisheries and Aquaculture, fishermen, experts, etc.

6. Pressures and impacts

Spawning of mature eels in captivity is not yet possible, therefore, the aquaculture industry depends on, and is supported by, the capture of wild eels (Moriarty and Dekker, 1997).

7. Current situation

Only one national study has been conducted to date. The degree of negative impact caused by the extraction of elver eels, and other pressures on the ecosystem is unknown. As a result, the Ministry of Environment and Natural Resources contracted the company Inversiones MAREMME S.R.L. in 2012 to investigate under a project entitled “Preliminary Monitoring Research, Development, Culture and Exploitation Project of the American Eel, *Anguilla rostrata*.” The project encompassed 14 rivers that drain towards the Atlantic Coast. A total of 150 fishermen were engaged in the project in an artisanal way from the banks of the estuaries of the rivers.

The average length of the eels was **6.8 mm and the average weight 0.0025 g.**



Glass eels and pigment eels

8. Ongoing Studies.

“Biodiversity of the American Eel, *Anguilla rostrata* in the Dominican Republic.” Research subject area: Conservation Genetics, Fisheries Science, Natural Resource Management. proposing institution Rufford University, Virginia. Researchers: Mellissa DeBiase, PhD; Tara Pelletier, PhD; Lucy Howey, Msc., MBA.; and others.

Another study focused on the social and economic impact is being carried out according to officials from CODOPESCA (Pers. Comm. - Ángel Luis Franco).

9. Eel trade analysis.

Although the exploitation of eels began in 1970 in the USA and in 1980 in the D.R., the commercial boom started in 2012, which coincided with the moratorium of the European eel, *Anguilla anguilla*, in the USA. In parallel with the legal trade, an illegal market also developed. To counter this illegal trade, the authorities launched an operation entitled ‘Broken Glass’, which culminated in 2017, with the dismantling of illegal traffic to Asian markets (article “Millionaire traffic in *Anguilla Americana* on the East Coast of the United States in National Geographic, 2017).

The exploitation and export of eels requires special licenses that are granted by CODOPESCA. Fishermen must reside in the areas from which the fish are extracted, be “duly registered” and have an identification card of the companies to which they sell their products. In turn, these companies must have licenses of commercialization and export as indicated in Resolution 02-19 of CODOPESCA in force since November 2019 (Diario Libre, 2020).

Before 2017, prices per gram for eel were low. When fishermen discovered the true value of eels outside the D.R., there was a boom in the industry and the artisanal business changed forever. The price is now about \$ 2,000.00 US per kg.

Occasionally some fishermen sell their eels to the black-market dealers at better prices than those paid by the companies with licences. The price per gram varies by season or by fishing zone. The price in the 2019-2020 season ranged from RD \$ 200.00 - \$ 230.00 pesos (US \$4.00 - \$ 4.60.) per gram, the equivalent of seven or eight elvers.

Since the eel price increase in 2017, the number of Eel Fisherman Associations registered at the National Office of Intellectual Property (ONAPI), has skyrocketed. Before 2015, there were only three organizations registered, now there are 14 associations throughout the country.

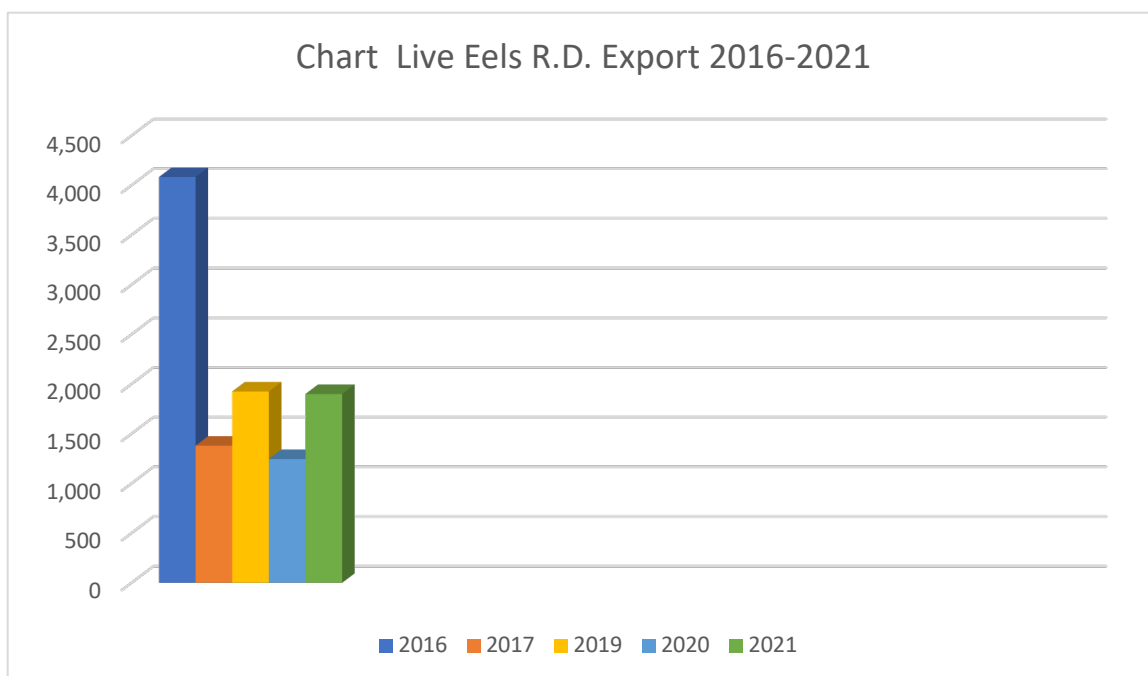
10. Permit Protocols and requirements

There is an Electronic Permit System: "Single Window for Foreign Trade". In the case of export / import of wild species, fauna and flora, parts and derivatives, including CITES aquatic species are issued by the Ministry of the Environment. In the case of those not regulated by CITES, the company or person must make a request through the "Single Window" - Environment Ministry - CODOPESCA - General Customs Directorate.

According to the Customs database from 2016- 2021, there were about 20 authorized Eel Export licenses per year.

Dominican Republic, Customs database the registered export of live eels from 2016 to part of 2021 are as follows:

Export data 2016-2021					
Tariff code no: 0301.92.10, live eels					
2016	2017	2018	2019	2020	2021
4,083kgs	1,380kgs	1,569kgs	1,925kgs	1,245kgs	1900 kgs



Graph shows the variation of exports 2016-2021

In the period 2016-2021, 12,102.2 kgs of live eels were exported according to customs database records analysis, with an average of 2,017.3 kgs per year. Between 2016-2020, the D.R. imported around 1,588.79 kilograms (eel BBQ, eel UNAGI, frozen **mature eel products**), mostly from USA, Spain, Vietnam, China and Hong Kong.

Table - Haiti Live Eel Exports through Miami Airport

2018	2019
3,341 kgs	845 kgs

90% exports to Canada, then Hong Kong, USA and United Kingdom

In 2017, fishermen discovered that a better price per kilogram of eel was being paid in Haiti. As a result, some local fisherman sold a portion of the harvested eels in DR to the black-market buyers instead of to authorized companies.

The table above indicates that Haiti live eel exports through the Miami airport were 3,341 kg. in 2018, while the D.R. export total was only 1569 kg. and of this total, 1141 kg. went through the same airport. It is important to note that the price per ton exported by Haiti was around \$ 3,6 million dollars per metric ton, while in the D.R. the product was exported to Canada at the price of around \$ 922,500.00 dollars per metric ton.

11. Threats

The glass eel fisheries are carried out in estuaries, which are habitats where large quantities of larvae and small hatchlings of invertebrates and fish are found. The Environment and Natural Resources Law 64/2000, in Article 136, Section 1, declares “native and endemic flora and fauna of high interest, promoting their reproduction and multiplication, as well as the preservation of the natural ecosystems that serve as habitats for those species of flora and fauna whose survival depends on them, which will be the object of rigorous in situ protection mechanisms, etc.” This Order seeks to protect estuaries as critical habitat.



Fishing nets for eels

12. Governance

The following legal articles regulate the eel fishery: 136, 138 of Law 64/00 of the Ministry of Environment and Natural Resources and Article 42 of Law 307/04 of the Dominican Fisheries and Aquiculture Consortium (CODOPESCA). They outline the responsibilities of both institutions, in terms of conservation, location, delimitation and regulation of capture.

The issue of the eel fishery (*A. rostrata*) has been discussed for the past few years, between the Directorate of Biodiversity and CODOPESCA, with the aim of developing a small management program based on the following considerations:

- a) The fishery is being conducted for economic gain but without knowledge of the population status, genetic composition and levels of territorial fidelity, making effective management challenging..

- b) Most of the eel permits are issued along river courses and estuaries that are within the conservation units of the National System of Protected Areas (SINAP).

They therefore conflict with and contravene the General Law of Environment 64/00 and Sector Laws: 202/04 Protected Areas and 333 /15 of Biodiversity.

- c) The conduct of the eel fishery is contrary to the following goals of the United Nations Convention on Biological Diversity (of which the Dominican Republic is a contracting party) which links the country with the fulfillment of the following goals: (Goal 4 of Strategic Objective A) and (Goal 6 and 7 of Strategic Objective B). Particularly, Goal 6. Also, the Food and Agriculture Organization (FAO), in its recent report on food security and biodiversity, highlights indiscriminate fishing, as one of the threats to maintaining food security.

The way *Anguilla rostrata* is currently exploited, managed, traded and exported conflicts with Articles: 137, 138, of Law 64/00, and obviates the mandates of Article 142 of said law, which establishes that they are faculties of the Ministry of Environment and Natural Resources. In the same way, this procedure is contrary to Articles 148 and 149 and, Articles 16, 18, 19 and 20 of sections H, I of the Sectorial Biodiversity Law 333/15 are violated.

13. Legal aspects.

The incursions for the glass eel fishery within the limits of the Protected Areas System has recently led to clashes between armed people in the service of authorized fishing companies and staff of the Ministry of Environment. Some staff have been attacked, while trying to bring order and control to the fishing activities. There have also been clashes between fishermen over disputes to control fishing areas of rivers or estuaries. Some incidents resulted in people being injured or killed.

The current restrictions, regulating the eel fishery are as follows, issued through Resolution 02-18 CODOPESCA:

Article 1.- A fishing period for pre-juvenile *A. rostrata*, from November 1st to 1st April.

Article 2.- A general ban is established for fishing and trade of *A. rostrata*, in the period between (1st) April to (31) October of each year and will cover all stages of its life cycle. In addition, it establishes a quota of 150 kg per company, and 2,500 kg per season (October to April) in the Dominican Republic.

Current management measures are based on the best information available. Using as a guideline the average exported amount of 2017.4 kg per year between 2016 to 2021, it can be seen that this quantity does not reach the CODOPESCA resolution quota of 2,500 kg.

Considering that there is a greater number of fishermen dedicated to eel fishing and currently more fishing effort per hour, then this data could suggest the possibility, that the resource is being exploited to its maximum capacity.

The fishery sector, CODOPESCA and the Ministry of the Environment, should work together to develop a management program for the sustainable exploitation of eels which guarantees the conservation of the species in D.R.

14. Opportunities

Proposal of Regulation for the Management of Eel Fishing, contains a series of regulations to be implemented prior to granting possible future capture permits for commercial purposes, as well as evaluating the sites allowed for fishing and some conservation and restoration measures. of the habitats upstream, where the *A. rostrata*, remain adult until sexual maturity. These measures include promoting the placement of ladders in those dams that require it, to allow the upstream and downstream movement of adult eels, among other conservation actions.

15. Benefits of its Implementation

This plan would help to ensure the sustainability of eel capture over time and could provide a sufficient amount of recruitment, juveniles and adults.

Legend



Legend – Adult *A. rostrata* TL = 41cm

16. Socio-economic benefits

This fishery resource, even though seasonal (autumn-winter), can be economically important for a segment of local fishermen because of the high value of eels.

17. Conclusion

In the Dominican Republic, eels are an ecologically and economically important resource that face growing pressure from fishing effort and habitat degradation. A **Management Protocol** is needed at the national level to regulate eel fisheries and this must include long-term conservation measures like, reduction of pollution, ladders in dams and other barriers that prevent movement upstream in rivers, as well as other conservation actions.

18. Recommendations

Addressing this problem, will require economic resources,so it is important and necessary to obtain local and international financial support for the development and execution of a project of this nature.

It is also important to promote collaboration among American eel Range States - - enhancing coordination and information-sharing regarding fisheries, and capacity-building with respect to data collection on harvests and exports.

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