

Sustainable Management Plan for the Hicotea Turtle¹ (*Trachemys callirostris*)

Plan de Manejo Sustentable de la Hicotea (*Trachemys Callirostris*)

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Abstract-- The threat of extinction of the Hicotea turtle species has motivated the community of San Sebastián to work on raising awareness on the importance of preserving the ecological balance of the species. The purpose of this study is to design and implement a sustainable management plan, focusing on the practices to be used to preserve the Hicotea by the students, parents and teachers of Las Mercedes Departmental School. The study takes a qualitative approach, of a descriptive type, based on interviews of the students at the Externado de San Sebastián School. The main conclusion is that students are motivated to preserve species such as the Hicotea turtle, but further education on environmental impacts is required.

Keywords-- Conservation; environment; preservation; animal species

Resumen-- La amenaza de la extinción de la especie de la Hicotea se ha convertido para la comunidad de san Sebastián; un motivo para trabajar en la concientización e importancia que tiene la conservación de las especies en el equilibrio ecológico. Por esta razón el objetivo de la presente investigación es diseñar e implementar un plan de manejo sustentable, entorno a las prácticas empleadas, para la conservación de la hicotea por parte de los estudiantes, padres de familia y profesores de la Institución Educativa Departamental Las Mercedes. El estudio se llevó a cabo desde una mirada Cuantitativa, de corte descriptivo, empleando la entrevista como instrumento y que fue aplicada a aplicada a los estudiantes de la IED Externado de San Sebastián. Como conclusión se resalta los estudiantes se motivan a la conservación de especies como la hicotea, sin embargo, se debe seguir brindando formación en temas de educación e impacto ambiental.

Palabras clave-- Conservación; medio ambiente; preservación; especie animal.

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I. Introduction

As is true in any town, all cultures of our civilization have and will have a history, and the Las Mercedes Departmental School is no exception. In the 1960s a group of people concerned about the fact that there was no primary school in our town planted the idea of creating a grade school so their children could receive primary education. Years later this same community took the initiative of going beyond primary school. Some of those who took the initiative were the leaders of the Council of section 038, Henry Patiño Paba and Abel Rocha. In 1999 this initiative became a reality when the Departmental Education Office issued resolution No. 1188 of November 29, 1999, which approved the Basic Secondary School, based on a proposal submitted by the Area Supervisor, Gabriel Cera, to be named the Basic Rural Education Center of Las Mercedes.

A key date in the history of trade in threatened wild animal and plant species (CCITES) was August 31, 1981, when strict regulations were imposed on trading in endangered species, aimed at eradicating trading practices that are incompatible with their survival.

At the national level, Colombia has subscribed several international conventions and agreements aimed at the protection, preservation and sustainable use of biodiversity, specifically including turtles and their habitat.

TABLE 1. INTERNATIONAL CONVENTIONS AND AGREEMENTS FOR THE CONSERVATION AND USE OF BIODIVERSITY

Convention for the protection of flora, fauna and scenic beauties in America, signed in Washington in October, 1940.
Convention on nature protection and wild life conservation in the western hemisphere, which became effective in 1942.
Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), ratified by means of law 17/1981.

Source: Authors.

Historically, countries such as Colombia, which is rich in natural resources, do not have highly efficient institutions for the protection of animals, which has worsened the main environmental problems, such as those suffered by land and fresh water turtles in the country, including their recurrent over-exploitation and the degradation of habitats, which have been gradually destroyed to the point that in some areas wildlife has all but disappeared [1].

One of the main causes of the extinction of turtle species is their exploitation and commercialization, in many cases for human consumption, as is the case of the hicotea turtle (*Trachemys scripta callirostris*).

Most hunting of turtle species occurs in the trans-Andean region, particular in the basins on the lower Magdalena, Sinú and San Jorge rivers, and river turtles and hicotea are among the most affected.

Around the Holy Week season, i.e. in the second and third months of the year, there is high demand for consumption of this species, particular in the departments of the Colombian Atlantic Coast, and particularly in Córdoba and Sucre: "It is so high that in the region of Mojana (Sucre) alone, one million (1,000,000) turtles were captured in the 1996-1997 season" [2].

One of the most alarming factors has to do with the strategies used to hunt hicotea turtles, for example by burning dry beaches, which kills eggs and both small and adult specimens, and destroys their habitat, given that this species tends to look for shelter in difficult to reach areas, predominantly at night [3].

"Their habitat is varied, covering lakes, swamps, man-made pools and flooding areas of rivers and beaches. They prefer calm waters covered with aquatic vegetation, and it is a common species in gallery forests and mangrove areas. Under favorable environmental conditions, they can be found at altitudes of up to 1,500 meters. During the dry season, the *T. s. callirostris* aestivates, i.e. it buries itself and survives on its reserves until the rainy season arrives. In terms of food, they are omnivores"[3].

At the Las Margaritas rural district, with its wetland and marsh ecosystems, the situation is very similar to that experienced elsewhere in the Colombian Atlantic Coast, where consumption increases around the Holy Week season, purely for cultural reasons.

Additionally, the species faces other threats associated with its natural environment, such as: Nest pillaging by natural predators and men, depredation of newborns after hatching, and burning and destruction of wetlands, which are the natural habitat of the species.

The Las Mercedes Departmental School is located in a wetlands area, and the population's livelihoods are derived from the resources offered by the marshes. During the dry season food becomes scarce (fish), which makes Hicotea turtles the main source of food for the population, and because of religious custom they are hunted indiscriminately, ignoring the important role they play in the ecological balance, all because of the lack of awareness and sense of belonging regarding our endangered animal species.

The threat of extinction of the hicotea species has become for the Las Mercedes School a cause to strongly advocate in the community and to raise awareness on the importance of preserving the species for ecological balance. This is why we have taken on the task of campaigning to multiply, free and preserve the hicotea. In the classroom we can learn through research of all the biological and ecological aspects for the multiplication of the hicotea, with the aim of changing the children's way of thinking towards preserving their environment, so they in turn can raise awareness in their entire community.

In this process we have found students who make purposeful, pointed and concise questions that may lead us towards a solution. We also found students who wrote very basic questions that lead to very basic answers. What they both have in common with the adults is that they are aimed at resolving a troubling situation, in this case, how to preserve the hicotea species.

It was also inferred that many students are motivated to study about this matter they have not explored before, as they are not very common, some have never seen them because they are near extinction, and consequently it is interesting for students to explore topics they do not know about.

Currently, the educational community at Las Mercedes has a common concern: the preservation of the hicotea. We have discussed different possible solutions, which facilitates the formulation of research questions, while at the same time posing the problem to justify the preparation and performance of the project to multiply and set free the hicotea turtles.

What process of inquiry was useful for modifying, extending or reformulating the initial questions?

What enabled arriving at the proposed research question was an interview with a biologist, who provided us orientation on feeding newborns. He told us that they cannot be fed concentrate and they should not be held for a long time in captivity, because if they are set free they will better adapt to their environment and learn to defend themselves from predators. Carlos Dita, biologist from Universidad del Atlántico.

When we inquired with a marine biologist with experience in turtles, she talked about handling of the eggs and the environmental conditions for hatching, in order to have a greater percentage of reproduction, in addition to the care to be given to set them free.

It seems that our student's minds are focused on the existing threat to some endangered species; all they need is natural resources management programs with a scientific, technical and social approach for innovation and the sustainable development of natural resources. This proposal enables us to explore together a promising field of productive sociology in the region.

A. National and International Legislation on Protection

Colombia is important in terms of biological resource management, because it has in place a legal framework with specific regulations on everything related to the preservation of turtle species.

Law 2811/1974 emphasizes that all animals are the property of the state, and also opens the door to study changes regarding guidelines for the protection of animals and support for new channels for the prevention of destruction of wildlife [4].

In 1998 the then Ministry of the Environment, the Alexander von Humboldt Biological Resources Research Institute and the National Planning De-

partment published a "Technical Proposal for a National Action Plan on Biodiversity", which was not adopted, but it established guidelines for biodiversity management at the national level [5].

Currently, the updated policies and actions on animal protection include significant contributions, such as Resolution 383 of 2010, which "addresses the matter of endangered species in Colombia and the National Plan for the Conservation of Continental Turtles in Colombia".

In terms of international framework:

With the aim of contributing to the reduction of consumption of endangered species, Colombia has subscribed various international conventions and agreements that "promote the protection, conservation and sustainable use of biodiversity and ecosystems in the country, which indirectly involve turtles or their habitats" [6].

There are priorities regarding environmental sustainability, and particularly in caring for wildlife, but the country's political situation in recent years has led to the enactment of precise legislation on everything regarding native wildlife. As a result, in 1974 all Colombian species were declared to be the property of the State [8], which implies that no individual has the right to capture or hunt such species. The only exception made is for animals raised in farms. The hicotea has become an animal that requires care and protection, and all control bodies must guarantee their care and wellbeing. [7].

The objective is to work primarily on the care of species such as the hicotea turtles in the protected areas, and to enforce laws that regulate their care [9]. It is important to mention that the scientific entities in Colombia infer that the size of the populations must be reconsidered in order to justify the exploitation of animals. This aspect must be taken into consideration in order to approach the state's intentions regarding the sustainable management of the species [10].

II. Methodology

This study will use a Qualitative approach [10], with a descriptive scope. This type of research enables understanding and interpreting the reality of the phenomena that are studied. Forty (40) students from the Externado de San Sebastián school in the municipality of San Sebastián, in the Department of Magdalena, participated in the study. Based on the characteristics of the research, it was decided to use structured interviews as the tool for data collection, to be recorded in a log book. The study also used participative observation. Both instruments enable data classification, analysis and interpretation [11].

The following is the procedure that was carried out:

- Stage (1): Selection of the instruments to be used
- Stage (2): Specification of the categories of the study

Stage (3): Selection of the information gathering instruments

Stage (4): Based on the categories of the study: sustainable management, Hicotea species and environmental education, the interview was performed with the participants, aimed at describing the studied phenomenon based on the type of research (non-experimental), in which the phenomenon is observed and studied in the manner in which it actually occurs.

Stage (5): Once the results of the structured interview and the observations are completed, they are interpreted and studied in light of research theory.

Stage (6): The results and findings are displayed.

III. Results

The following are the findings resulting from the instruments that were used, based on the leading question: How can hicoteas be conserved through the implementation of a hatchery designed by the students of the Las Mercedes School?

The records in the guide had the following questions, based on the guiding purpose: Implement a sustainable management plan for the conservation of the Hicotea turtle (*trachemys scripta callirostris*), using local community practices, in the rural district of Las Margaritas and its area of influence.

The following were the observations and records taken from the log that address the above purpose:

Research purposes	Participant views	Theoretical articulation and systematization
Design and implement a sustainable management plan, based on ancestral practices, to preserve the species <i>trachemys scripta callirostris</i> , by the students, parents and teachers of the Las Mercedes Departmental School.	The threat of extinction of the hicotea species has become for the Las Mercedes School a cause to strongly advocate in the community and to raise awareness on the importance of preserving the species for ecological balance. This is why we have taken on the task of campaigning to multiply, free and preserve the hicotea. In the classroom we can learn through research of all the biological and ecological aspects for the multiplication of the hicotea, with the aim of changing the children's way of thinking towards preserving their environment, so they in turn can raise awareness in their entire community.	Taking into consideration what was said in 1998; Alexander von Humboldt Biological Resources Research Institute and the National Planning Department published a "Technical Proposal for a National Action Plan on Biodiversity", which was not adopted, but it established guidelines for biodiversity management at the national level [2] Based on the above, we can infer that it is the first guideline for managing biodiversity at the national level, so guidelines are already in place on how to create one for the school according to current legislation, and that it can also be carried out by the students.
Build and operate a hatchery at the facilities of the Las Mercedes School, to incubate, hatch, and care for newborns and subsequently repopulate the marshes and wetlands in the surrounding areas.	The Las Mercedes School is located in a wetlands area, and for this reason the population's livelihoods are based on the resources offered by the marshes. During the dry season food (fish) becomes scarce, which makes the hicotea the main source of food for the population. Due to religious custom they are hunted indiscriminately, ignoring their importance for the ecological balance. All this is because of the lack of awareness and sense of belonging about our endangered wildlife.	Based on the above, it is important to build the hatchery in this area, and it is a very good option because it would not only repopulate the area with these creatures, but also the religious tradition in the region would not have to be changed, because for many in the area this would be catastrophic because it has roots that go back hundreds of years.
Raise awareness in the student community and other participants in the process of developing the management plan on the importance of preserving the species.	It should be mentioned that the educational community at Las Mercedes currently has a common concern: the preservation of the hicotea turtles, which enables us to think about different alternatives for a solution, which facilitates the formulation of research questions and at the same time while at the same time posing the problem to justify the preparation and performance of the project to multiply and set free the hicotea turtles.	The above allows us to conclude that awareness-raising can be carried out quickly and effectively, because the community is concerned about the preservation of the species. Consequently, if they are explained how to do it, they would probably be willing to support the notion.
Implement five eco-tourism modules at strategic locations in the municipality of San Sebastián, Magdalena.	It seems that our student's minds are focused on the existing threat to some endangered species; all they need is natural resources management programs with a scientific, technical and social approach for innovation and the sustainable development of natural resources. This proposal enables us to explore together a promising field of productive sociology in the region. In this process we have found students who make purposeful, pointed and concise questions that may lead us towards a solution. We also found students who wrote very basic questions that lead to very basic answers. What they both have in common with the adults is that they are aimed at resolving a troubling situation, in this case, how to preserve the hicotea species.	This makes it possible to receive assistance from the students themselves when making the module, because they are the ones who have more pointed and concise questions that will lead during implementation of the modules to the information required to find the fastest solution.

Source: Authors.

IV. Conclusions

Even though in Colombia substantial efforts have been made towards eradicating hunting and consumption of turtle species such as the Hicotea, the rules still need stricter enforcement, because even in purely rural areas there is a huge market for the distribution and sale of species of this type. The population is not aware of the damage that the disappearance of part of the wildlife causes to the ecosystem, and that future generations will never get to know this species if we continue exploiting them inappropriately.

The above helps us understand that the conservation of the species is not only a matter of people's concern, but that it has already been established by law, so what we must seek is to comply with current legislation because, more than anything else, it is a law in favor of preserving the planet's biodiversity.

Regarding the education of the students at the Externado de San Sebastián school, the main focus to be strengthened is to work on improving management of the resources and the species, because these are initiatives for conservation and a responsible attitude towards the ecology, and consequently the educational community is the one that has set in motion a plan for the preservation of species in the municipality. However, additional joint efforts must be made to achieve the proposed objective.

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