

GLOBAL FLORA & FAUNA

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GLOBAL'S ZASQUA FLORA & FAUNA

TABLE OF CONTENTS

Table of content	02
Introduction	03
History of Zasqua	04
ARTICLES	05-23
• Ducks and the climate	06-07
• Dendroica Fusca in Zasqua	08-11
• Humans and hummingbirds	12-15
• Ants with the enviroment	16-18
• Bees vs climate change	19-23
	
https://www.nogales.edu.co/noticias/celebramos-10-anos-de-sostenibilidad/	
DESCRIPTIVE	34-39
An experience on a rainforest	35
Amazons	36
Characters related to the ecosystem	37
The ecosystem in the explorer	38
Strange places:Amazon tropical rainforest	39
SUSTAINABILITY IN ANCIENT CIVILIZATIONS	40
INFOGRAPHIC	41
Credits	42



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POEMS	24-33
Back in the past	25
The gift of nature	26
The lost tree	27
We need a miracle for the world	28
A connection that changes the world	29
Work together	30
Turtles	31
Whispers of nature	32
Egypt with nature	33



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INTRODUCTION

BY: MATIAS PIZANO

In this magazine, we will inform you about nature. However, it's not any kind of nature, but nature in ancient civilizations, nature in Zasca (a preserved ecosystem in Colegio Los Nogales), and nature in The Explorer (a book by Katherine Rundell). We made this magazine collectively as half of our classroom. It includes heartfelt poems, vivid descriptive paragraphs, and intriguing scientific articles and reports. All of this inspired by the stunning beauty and peculiarities within nature.

The poems are based on different, unique aspects of nature. We tried to make each of the poems with some specific characteristics that would improve the impact of the poems. These were similes, metaphors, hyperboles, personifications, onomatopoeias, alliterations, among others.

The descriptive paragraphs were about a book by Katherine Rundell called The Explorer. These ones are totally different from the poems. This had a goal to represent The Explorer's nature and environment, which took place in the Amazon forest. Some of them were focused on the plants and trees while others focused on the fauna. We tried to divide the ones we added between the flora and fauna. We did this to have the whole information of both. With this, we conclude what we would like you to take from the magazine, what we wanted to communicate on this magazine. And we hope you like it and learn about it.

By: Carlota Vergara

HISTORY OF ZASQUA

Camilo Camargo, the principal of Colegio Los Nogales, and Pedro Linares, who used to work at the school and care for Zasqua, were interviewed about Zasqua, and each shared different things.

Zasqua has been at Los Nogales for many years. While Camilo said that Zasqua is 15 years old, Pedro said that Zasqua is 11 years old. What is for sure is that it was built in 2009 because the school wanted a space for nature and to help students learn more about the different things that nature has. Zasqua is a Chibcha name from the Muisca, who were the most advanced Chibcha speaking people that lived from Bogotá to Tunja. Zasqua means a place that welcomes and that is born.

What is the most important thing about Zasqua? There isn't just one thing. There are many important things about Zasqua. One of the reasons is to restore water. Another reason is to help people understand how a forest looked like before humans arrived. A third reason is to save Zasqua so flora and fauna can live together. For example, we have birds, rabbits, bugs, ducks, and other animals.

People from the community investigated what a forest looked like. They planted some trees and some grew by themselves. The idea was to restore and recover the forest that historically existed at the time. At the moment that it was constructed, people started to choose the different species that existed, took them to Zasqua, and planted them. The vegetation has been growing for 15 years and has been regenerating to have all the vegetation and the part of the vegetable garden. This project helps nurture and recover the forest.

We can do many things in Zasqua. One of these is that we can have LED classes, Spanish, Art, or P.E. In other years, we had science classes. We can walk in the recess or lunch to relax and breathe nature. We can also see animals like birds, rabbits, or ducks. As you can see, we can do many things in Zasqua. We invite you to visit it.



ARTICLES

Articles are a huge and extensive way in which different concepts get expressed. One thing that we can express throughout articles are plants and animals. In these articles we would learn many important lessons about different animals and plants.

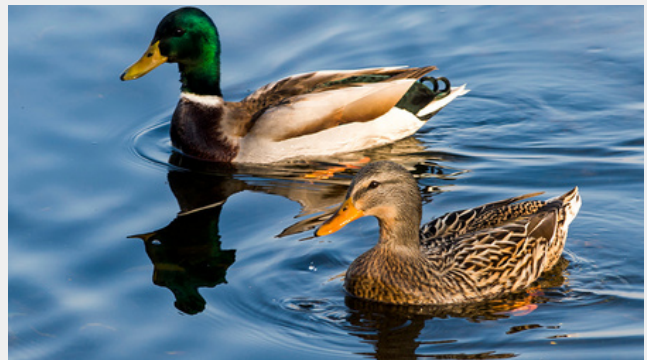
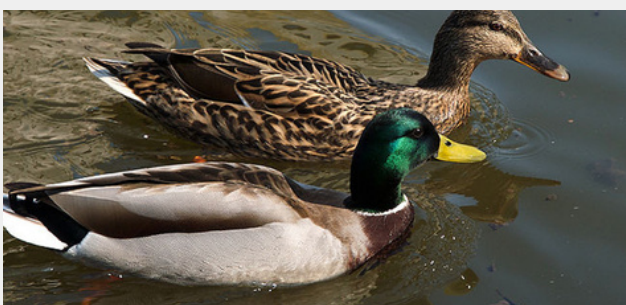
This poems had a huge process bejind all of it. First we made a research question each one based on our different organisms. After that we started searching for realizable sources to find information about our organisms. After that we took notes in a gathering grid answering some key questions to gain more information. After that we did a mini sentence outline in which we organizes the ideas that we wanted to adress in the articules.

By: Juliana Sierra

DUCKS AND THE CLIMATE

How much do you know about ducks? You've probably seen one or two before in your life, maybe on a trip or in your homeland, but do you honestly know ducks? There are estimated to be 34 million ducks all around the world. Each of them is very important to the environment. They help introduce new species to ecosystems and stabilize the insect population. They're also very excellent at pest control by managing things like duckweed and unwanted vegetation.

Ducks lovable creatures but right now they're in big trouble. Climate change all around the world has been threatening their habitat and diet. To solve this, first we need to raise awareness about how climate change and rain scarcity impact the food pyramid of a common duck endangering them. It is important to take action right now. We are in the only duration of time in which there's still time to change things, and make a big difference that can help keep our biodiversity safe. This article will talk about how a ducks diets works, the climate in Bogota, and finally how the climate affects a ducks diet, answering the question of "how climate change affects a duck's food pyramid?".



The common duck has a very interesting diet full of protein and vitamins. Ducks are omnivores which means they eat plants and animals making a varied diet for their everyday life. A duck eats many different plants and wheat grains. Specifically, some of the plants ducks eat are stems and roots of many different plants including sedges, grasses and smartweeds. They also like to eat acorns, wheat, barley, rice, and corn. Because ducks have beaks that restrict them from eating soft foods they mostly eat invertebrates (beetles, flies, dragonflies, caddisflies, and lepidopterans) and worms.

These plants are chosen by the ducks since they have hefty bodies, rounded heads, and wide, flat bills. So "when they need to eat they submerge their head and neck in the water by dabbling, rarely by diving and scouting for grubbing roots" (**Audubon,n.d**). Since for them this is the only way to get underwater food. A duck's diet is made specifically for them as you see, it allows them to survive in their environment and coexist with the other animals in their wetland.

For the past years, the climate in Bogotá has been changing from what it used to be. It's getting hotter, threatening much of Colombia's biodiversity. This is strange since Bogota has a consistent temperature throughout the year due to being in the equatorial region of the globe(**Climate-data,n.d**).

Since the climate is getting hotter, some scientists have made some predictions and calculations to see how much the temperature will change in the future if they don't stop the warming. The climate is projected to change even further in the next few years. Monthly temperatures are supposed to rise by $+1.88^{\circ}\text{C}$ by 2050 and by the end of this century will be higher by $+3.88^{\circ}\text{C}$. The temperature has already increased by 1°C and maximum temperatures too(**Unepgrid,n.d**).

The scientist's predictions are already noticeable in the way people adapt to the weather by changing their way of dressing. People have started to wear fewer sweaters and more T-shirts to avoid the heat. You can also see many people are comfortable in shorts and skirts, different from before when this was difficult because of the cold. Many more changes like this happen around the city and Colombia. This shows that the weather in Bogota and Colombia has already started to change possibly endangering many animals including ducks.

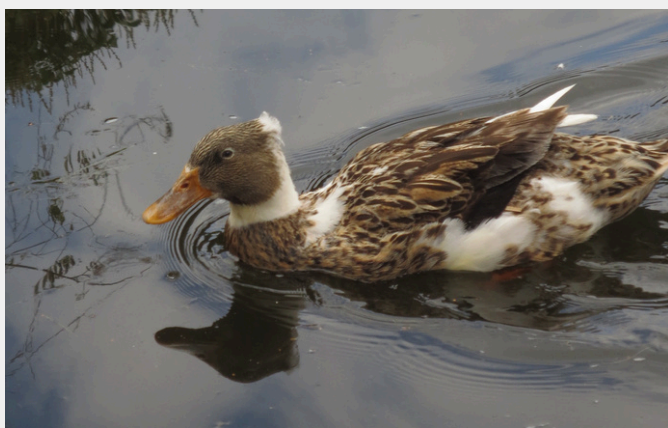


Image by: Salome Durate

The climate getting hotter is a really big problem for ducks since it is affecting their food pyramid and ecosystems. Hotter temperatures can also cause trouble with an ecosystem's food chain. "Rising temperatures could reduce the efficiency of energy transfer and threaten the survival of larger animals"(**University of Exeter,2021**).

Some universities experimented across many lakes and wetlands where they found that in warmer waters our food web and food chains are becoming smaller and less complex(**University of Sheffield,2024**). Some scientists have measured the difference between the transfer of energy from algae to small animals that eat them. They found that 4°C of warming reduced the transfer of energy by 56%(**University of Exeter,2021**). The higher the temperature is the more the metabolic rate accelerates faster reducing the energy that predators higher in the food chain get. This endangers a duck's whole food chain and especially the duck itself since the secondary consumer will get less energy. This could cause a crisis around the world and the duck could become an endangered species.



Image by: Salome Durate

Ducks are a wonderful species and a big part of the ecosystem. They have a unique diet and feeding behavior. Many of them live here in Bogotá's wetlands and they experience the same weather as us. This means their habitats are suffering the same effects of global warming as we are. Soon their food chain could collapse and define them as an endangered species. They are in danger because of something we are responsible for. We are the only ones who can help them and now that we know what the problem is, we need to act to change it. This can happen through small actions like using less electricity, eating less meat, recycling more, driving less, and minimizing food waste. Learning about this topic can help us improve from now on even when what you're doing isn't directly related to ducks, it can help you make connections and actions. Once we all act together to stop small things like climate change and rainfall patterns from affecting the food pyramid of a duck, it can help us prevent further problems in the future from happening.

By: Julia Romero

DENDROICA FUSCA IN ZASQUA

Dendroica fusca, and important species for the Zasqua ecosystem. Upon hearing that name, not many people recognise it, nor the habitat that was previously mentioned. Here goes a brief overview; *Dendroica fusca*, most commonly known as Reinita Gorginaranja or Blackburnian warbler, is a small migratory bird species that occasionally comes to Colombia, more explicitly during the winter. This research will prove if Zasqua, a preserved ecosystem in Colegio Los Nogales, provides what the species needs. Therefore, this report is written with the purpose of informing the reader about a certain migratory bird species, the Blackburnian warbler, and if the Zasqua environment provides enough for the species during its stay. This topic is relevant because through this and the investigation that was carried out before, the world will get to know one of the many migratory species that arrive in Colombia, and most importantly, how it manages to survive in Zasqua and why that environment is well prepared for welcoming the Blackburnian warbler. This will be achieved by explaining different aspects of each topic, like the bird's natural history, what the Zasqua environment provides, among other factors. With this, the research question is defined; Does Zasqua provide enough for the *Dendroica fusca*?



Female

<https://www.historicalrarebirds.info/u20/blackburnian-warbler>

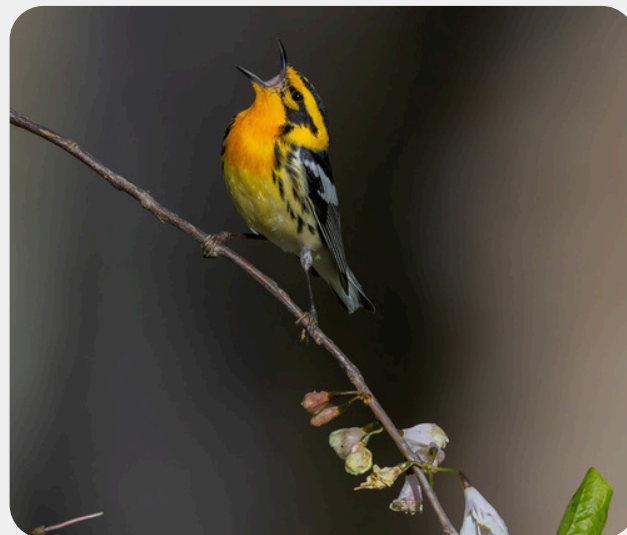


Male

https://www.allaboutbirds.org/guide/Blackburnian_Warbler/id

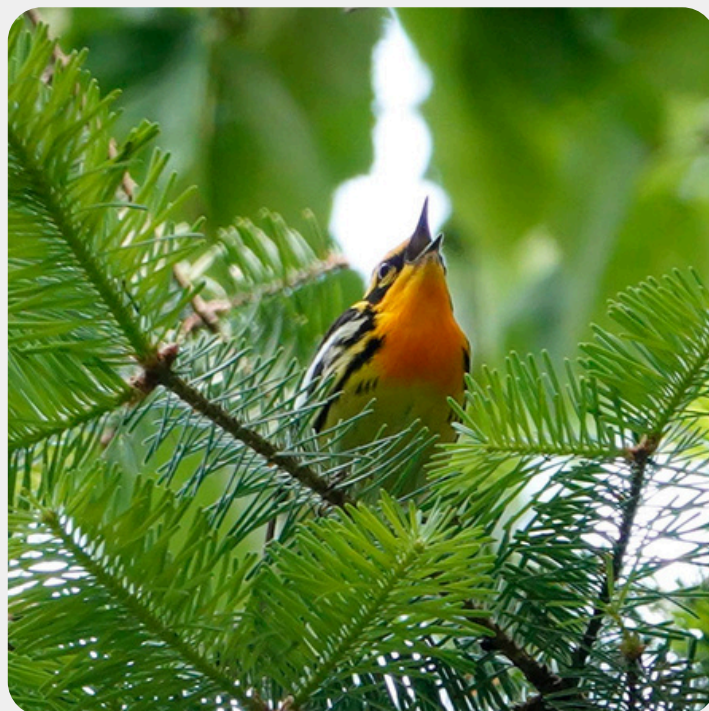
The *Dendroica fusca* is a unique species, which contributes to its distinctive role in the Zasqua ecosystem. It shows its qualities through its amazing visuals and intriguing behaviour. Males are identified by their orange throat, chest, and forehead, black crown and cheeks, and white stripes on their black backs, wings, and tail. They have black streaks over their white sides and flanks, with slightly orange lower chest and stomach fading to white towards the tail. Females have pale orange to yellow face and chest, with brown crowns, cheeks, and wings, as well as two streaks of white on their wings and completely white stomachs and undertail coverts. Lastly, they have gray streaks on their sides and flanks. The Blackburnian warbler is on average thirteen centimetres long and has a wingspan of twenty one centimetres. Their beaks are small and flattened, their legs black with three toes in front and one in the back. The *Dendroica fusca* is found in southeast Canada, Alberta, Newfoundland, and Georgia during the summer. During migration, flocks from one to seven individuals can be seen in the eastern coast of North America, as far as Oklahoma, as they migrate over the Gulf of Mexico, and some over the eastern coast of Texas.

During winter, they inhabit wet forests and wetlands from Panama to far into South America. Singing is used for breeding; they attract their mates by singing, doing so at dusk and dawn, with a frequency of four KHz to twelve KHz. When a female bird comes close, the male flicks its tail and pecks on a branch to catch her attention. Males protect their mates occasionally by fighting. They aren't social with each other or other species, in fact, they avoid competition. They reproduce between May and July, laying four to five eggs, which take two weeks to hatch. They nest by attaching spruce wood with spider silk on the outside and grass with pine needles on the inside, and it takes three to six days to build (*Animal diversity web, n.d.*). Their reproduction process doesn't happen during winter, which means they don't reproduce while in Zasqua. Reproduction occurs when the male is one year old, but is more successful when they're two (*Animal diversity web, n.d.*). The rest of its natural history also shows why the *Dendroica fusca* has a unique role. Its scientific name is *Dendroica fusca*, as said many times before, and fortunately, this species, classified as a bird, isn't endangered. Their diet is based on insects like caterpillars, mayflies, mosquitoes, gnats, spiders, etc., and they forage during the day and usually find them on leaves (*Animal diversity web, n.d.*). Therefore, this species doesn't hunt. Their most common predator are hawks (even though it's mainly larger birds and some mammals), as they eat their eggs, hatchlings, and sometimes adults when they're defending the nests (*Animal diversity web, n.d.*). This means they're the third consumer in a food web/chain. Mites and lice are often found living on them (*Animal diversity web, n.d.*), which is known as mutualism, since the species don't benefit nor harm each other. In addition, they are controllers of spruce budworms (one of their main prey) when they have outbreaks, which increases the birds' survival rate (*Animal diversity web, n.d.*) and benefits the balance of the ecosystem. This implies that the *Dendroica fusca*'s role in the ecosystem includes sheltering other animals, controlling outbreaks of other species, feeding their predators, etc. During its stay, this species ensures that the Zasqua ecosystem works in harmony. They inhabit deciduous and coniferous forests during the summer, though they prefer dense, coniferous forests, since they are most active in them, in a 0.4 to 1.1 hectare area.



<https://wildadironacks.org/adironack-birds-blackburnian-warbler-setophaga-fusca.html>

Their preferred species of trees are pines (pinus), spruces (picea), and hemlocks (tsuga), and prefer the tallest canopies. This can all be found in Zasqua, which is why the bird visits. Its life cycle is also unique; the eggs hatch after two weeks, the young becomes independent after about seven months, it mates with a female bird, breeds and nests within the age of one and two, and lives for three to six years. Their primary cause of death is not surviving migration (*Animal diversity web, n.d.*).



<https://www.flickr.com/photos/genekdr/53657370570>

The *Dendroica fusca* isn't the only unique aspect of the research. Zasqua also has a big flex; an astonishing variety of natural factors and organisms within its environment. The diversity of organisms in Zasqua is almost never ending, for example, the insects. Insects contribute to the balance of the entire ecosystem. For that to happen, the three types of arthropods have to be there; biocontrollers, fertilizers, and pollinators. Biocontrollers are in charge of controlling other arthropods' populations to prevent unbalancing. Insects like spiders, centipedes, and earwigs are biocontrollers. Fertilizers, also known as decomposers, convert organic residue into nutrients for the soil. Insects like flies, ants, staphylinid beetles, and dung beetles are fertilizers. Last but not least, pollinators are in charge of the reproduction of some plants, by transporting pollen to the right place of a plant so it can germinate. Insects like flies, butterflies, and bees are pollinators (*Zasqua Journal #4, n.d.*). These characteristics all fill in for each other, keeping Zasqua at its best. Not only are insects an indispensable part of the organism in Zasqua, so are the plants. Plants in Zasqua include Eucalyptus, Palma de Cera del Quindío, Nogal, Jazmín del Cabo, Carbonero rojo, Yarumo blanco, Palma de Abanico, Mano de Oso, Magnolio, Amarrabollo, Feijoa, Sietecueros, Flor de sauco, Papiro, Chicalá, Cerezo, Aliso and Alcaparro , between others. Their unique qualities include their height, their flowers, their fruits, their captivating colors, interesting shape, among other aspects (*Zasqua Journal #4, n.d.*).



Photo by: Julia Romero

Zasqua



Photo by: Julia Romero

Zasqua

These play different roles in the ecosystem, like attracting pollinators with their flowers and fruits, birds with their height and coverage, etc. Zasqua is a wetland ecosystem, which means its climate is humid and not very warm. This benefits the plant species because those are the perfect conditions for their growth and longevity. Zasqua wouldn't be balanced if it wasn't for them, since many other species rely on their hospitality and resources to keep the environment accurate.

Taking into account all that information, the *Dendroica fusca*'s needs are very well satisfied by the Zasqua ecosystem, it's the perfect fit for this peculiar species. As mentioned before, one of the factors for the *Dendroica fusca* to survive is its diet. Zasqua's resources include the bird's preferences when it comes to eating, which are caterpillars, mayflies, mosquitoes, gnats, spiders, and many others (*Zasqua Journal #4, n.d.*). That being said, the *Dendroica fusca* helps balance Zasqua by controlling the outbreaks of some of these species (*Animal diversity web, n.d.*). That helps avoid overpopulation and prevent Zasqua from lacking resources. Those outbreaks also help the bird to thrive in this habitat, by giving the species more food, preventing fights, and increasing the population rate (*Animal diversity web, n.d.*). Another factor that ensures the *Dendroica fusca*'s survival is a proper habitat.

This means an appropriate environment with suitable conditions for the species to thrive. Without the presence of the specific conditions the bird needs, *Zasqua* wouldn't be inhabited by the *Dendroica fusca*. Factors such as habitat, climate, and resources are all criteria for the accurate environment for the species. The *Dendroica fusca* arrives in Colombia during the winter. As mentioned previously, the birds' preferred habitat for the winter are wet forests and wetlands (*Animal diversity web, n.d*), which means their preferred climate is humid and cold. Therefore, *Zasqua*'s environment is appropriate for the *Dendroica fusca*, since it's a wetland ecosystem. If *Zasqua* was located at a different level above the sea, the climate would change, which means some species wouldn't survive and the habitat wouldn't be balanced anymore. This would not be a good environment for the *Dendroica fusca* because the lack of one species can cause the ecosystem to collapse, resulting in different conditions that wouldn't fit the birds' preferences. Luckily, *Zasqua* satisfies the birds' needs, that's why, during winter, this species visits Colombia.

In conclusion, *Zasqua* is the perfect fit for the *Dendroica fusca*, as it provides all of its preferences and necessary things for its survival during its stay in the winter. This not only proves that every factor within an ecosystem is vital for the balance and development of the others, but proves how very slight changes to the habitat can make it thrive or collapse. These findings are likely to be helpful in the future, as they contain information about a certain species and how it interacts and survives in its winter habitat. This can help to maintain a record of the species and make comparisons between the species now and the species in the future. Even though this report wasn't based on the climatic effects that the species experiences, it is still an important matter. Due to climate change, weather conditions are changing drastically, which definitely affects the migration process of this species. Just by simply reducing your carbon footprint, using your car less, using less plastic, etc., you will contribute to opposing climate change. This can be done with even the tiniest amount of your effort. Also, by promoting these small changes to your friends and family, a new lifestyle can be achieved as well as the original weather conditions.

After learning so much about this species, doesn't it feel right to take better care of the environment? In addition, taking care of the environment means taking care of the *Dendroica fusca* and many more species. This report shows how important they are, so much so, that scientists use this species to study the effects of forest fragmentation (*Animal diversity web, n.d*). Safe to say, *Zasqua* provides more than enough for the survival of this amazing species.



<https://www.nogales.edu.co/noticias/celebramos-10-anos-de-sostenibilidad/>



<https://www.pinterest.com/pin/blackburnian-warbler-by-twilly-379920918539064399/>



<https://www.nogales.edu.co/noticias/celebramos-10-anos-de-sostenibilidad/>

HUMANS AND HUMMINGBIRDS

Hummingbirds, small birds from the *Trochilidae* family, are known for their vibrant, reflective feathers and extraordinary capabilities, such as flapping their wings up to 70 times per second in flight and 200 times per second when diving (*Smithsonian's National Zoo & Conservation Biology Institute, n.d.*). They play a vital role as pollinators, feeding on nectar from flowers in gardens, forests, parks, and urban areas while inadvertently transferring pollen, including for plants that only they can pollinate (*Smithsonian's National Zoo & Conservation Biology Institute, n.d.*). Hummingbirds have a sugar-centric diet, requiring minimal protein, which they obtain from arthropods (*Flavia P. Zanotto & J.E.P.W. Bicudo, n.d.*). Despite their visibility in natural and urban environments, much remains unknown about these fascinating creatures. This report shifts the focus from admiring their unique traits to addressing the critical question of how human activity impacts the flowers they visit and their feeding patterns. By analyzing their natural behaviors, feeding habits, and the findings of various studies across the Americas, this report aims to highlight the effects of human influence on these birds and emphasize the need for environmental awareness and conservation efforts. As essential pollinators, the loss of hummingbirds would significantly harm ecosystems. And that is something we can't afford to ignore. So we'll wonder; how does human activity affect the flowers hummingbirds prefer and the places they visit? Through reflection and action, we can mitigate the environmental threats they face and ensure their continued presence in the delicate balance of nature.

To understand if human activities are altering hummingbird habits, we first need to examine their feeding preferences and habitats. Hummingbirds rely on nectar for energy, requiring flowers with specific traits to sustain them (*Smithsonian's National Zoo & Conservation Biology Institute, n.d.*). Ideal flowers are rich in sugar, averaging around 26%, but not overly sticky, as this makes it difficult for the birds to drink (*Smithsonian's National Zoo & Conservation Biology Institute, n.d.*). These flowers are often red or orange, long and tubular, and hang downward for easy access (*Smithsonian's National Zoo & Conservation Biology Institute, n.d.*). Examples include bee balm, cardinal flower, and trumpet creeper (*Smithsonian's National Zoo & Conservation Biology Institute, n.d.*). Some hummingbirds have evolved



Image from: <https://www.kaytee.com/learn-care/wild-bird/hummingbird-facts>



Image from:
<https://www.britannica.com/animal/hummingbird>

specialized beaks that perfectly match specific flowers, forming a "lock-and-key" relationship, which reduces competition with insects (*University of Zurich, n.d.*). For instance, the Passiflora of Tacsonia and the Ensifera ensifera hummingbird demonstrate this co-evolution (*University of Zurich, n.d.*). Such relationships are also observed between Heliconia bihai and Eulampis jugularis in the Lesser Antilles (*University of Zurich, n.d.*). Hummingbirds prefer plants exclusively pollinated by birds, like epiphytes, vines, and shrubs (*University of Zurich, n.d.*). They are more specialized near the equator, where diversity and mutualistic traits are highest (*Sonne J et al., 2020*). Most species reside in the tropics, with a few nesting in the U.S., primarily near the Mexican border (*Smithsonian's National Zoo & Conservation Biology Institute, n.d.*). These feeding and habitat preferences offer insights into their natural behaviors and whether human actions are disrupting them.

Hummingbirds exhibit unique adaptations and behaviors that help them survive and may influence their interactions with humans. Adaptations are traits or behaviors that allow organisms to survive in changing environments, and understanding hummingbird behavior sheds light on how they perceive humans. Like other birds, hummingbirds may chase each other, engage in courtship disputes, or fly away if they feel threatened by people (*Regad, 2023*). They also communicate through a range of sounds, used for predator warnings or mating (*Stone, n.d.*). However, their remarkable memory sets them apart;

hummingbirds can recognize individual humans and associate them with food sources, suggesting they've adapted to human presence (*Regad, 2023*). Additionally, hummingbirds enter a state called torpor instead of sleeping, where their metabolism slows and body temperature drops to conserve energy, likely as a response to the constant threat of predation (*Regad, 2023*). They consume vast amounts of nectar—up to half their body weight daily—supplemented with insects for protein and fats (*Regad, 2023*). This high energy demand ties them closely to their floral environment, making the availability of flowers crucial to their survival. These behaviors highlight their dependency on stable ecosystems and suggest that human activities affecting flowers could significantly impact them.

Studies reveal both positive and negative effects of human activity on hummingbirds, particularly regarding urbanization and deforestation. Research shows hummingbird biodiversity is significantly higher in forests than in coffee plantations, with twice as many birds recorded in forests (*Morrison & Mendenhall, 2020*). In a Brazilian urban park, a year-long experiment demonstrated that while urban areas lack plant biodiversity, hummingbirds remain abundant when sufficient resources are available, emphasizing the importance of green spaces (*Lima-Passos, Araujo, & Machado, 2024*). Observations suggest that hummingbirds are highly adaptable to urban environments, becoming comfortable around humans over time (*Regad, 2023*). Although some species thrive in deforested areas, such as *A. tzacatl*, which can colonize coffee plantations, the overall loss of biodiversity due to deforestation remains concerning (*Morrison & Mendenhall, 2020*). Positive human interactions, like ethical care and

conservation, can foster trust in animals, whereas negative actions, like habitat destruction, can cause fear and mistrust (*Helmold, n.d.*). Despite these challenges, urban hummingbirds appear curious rather than fearful, often seen fearlessly exploring gardens and approaching humans, especially in areas with abundant flowers, such as Bogotá, Colombia. These findings highlight the resilience of hummingbirds but underscore the need for conservation efforts to maintain their habitats in both natural and urban landscapes.

Hummingbirds are remarkable birds with specialized behaviors and unique flower preferences that contribute to ecosystem health. However, the research results show up that human activity significantly impacts the flowers they visit and the places they frequent. Urbanization, for instance, has affected hummingbirds negatively, as they are less abundant in coffee plantations after deforestation compared to forests (*Morrison & Mendenhall, 2020*). Urban parks are essential for sustaining hummingbird populations, offering a habitat and food sources they require to survive (*Lima-Passos et al., 2024*). Without these green spaces, hummingbirds may struggle to adapt to



Image from:
<https://www.perkypet.com/articles/species-spotlight-rufous-hummingbird>



Image from:
<https://www.jsonline.com/story/news/local/2024/04/18/hummingbird-migration-map-2024-how-to-track-sightings-in-wisconsin/73345660007/>

increasing urbanization. Additionally, animals, including hummingbirds, form perceptions of humans based on their interactions. Positive experiences, like being fed or cared for, can foster trust, while habitat destruction or harm instills fear (*Helmold, n.d.*). Interestingly, some hummingbirds have adapted well to humans, even recognizing faces and feeders, indicating a degree of familiarity (*Regad, 2023*). Yet, this adaptation comes with risks: reliance on artificial feeders, which lack the nutritional value of real flowers, can harm their health. Deforestation and habitat loss also force hummingbirds to adjust their feeding behaviors. Some species, like *A. tzacatl*, thrive in deforested areas, feeding on coffee flowers, but overall biodiversity decreases in these transformed landscapes (*Morrison & Mendenhall, 2020*). Hummingbirds dependent on specific flowers may struggle to find food if their habitats are destroyed, leading to competition and potential decline. In urban areas, curiosity about humans may bring hummingbirds closer, but this is not their natural environment, and their numbers are significantly lower than in forests. Bird feeders may provide temporary sustenance, but they replace the flowers essential to hummingbirds' diet, posing long-term risks to their health. Furthermore, hummingbirds fearful of humans might avoid urban areas and critical ecosystems, leaving crops and plants unpollinated, which could destabilize ecosystems and threaten food security.

To protect hummingbirds and the ecosystems they support, humans must take action. Replace bird feeders with real flowers that meet hummingbirds' dietary needs, such as tubular, brightly colored blossoms. Advocate for conservation campaigns to halt deforestation and preserve natural habitats. Plant hummingbird-friendly vegetation in parks and gardens to provide sustainable food sources. These small actions, when combined, can mitigate human impacts and ensure a balanced future for hummingbirds and the environment.



Written by: Maria Antonia Cohenar

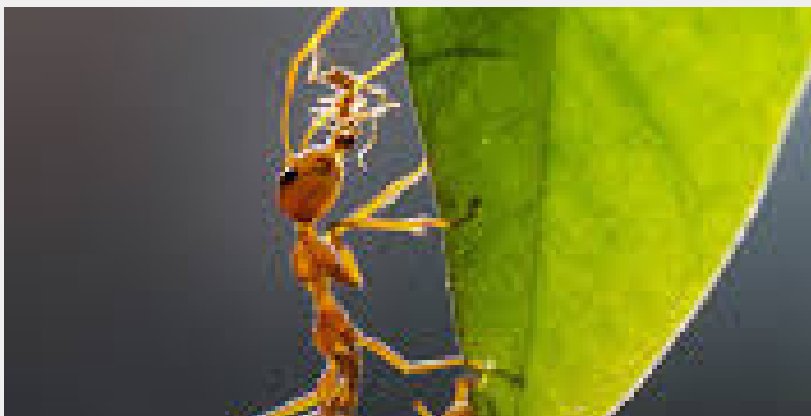
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https://docs.google.com/document/d/16DSEe13uRE__QBce08zgPw_w3KdbBFVmdHXq7nCsFpk/edit



ANTS WITH THE ENVIRONMENT

Many animals have interactions with the environment, but ants are special. They have a special interaction and it is crucial for the environment. That is a question that not many people ask themselves. But ants are very important organisms for every ecosystems they interact with. These interactions that ants have with the environment are key for the ecosystem's success. In Nogales we have a small ecosystem that is called Zasqua. This was a "built by humans ecosystem" in which there are different animals and plants and in this essay I will talk in detail about ants. This is an important topic because lastly ecosystems have been damaged by many natural factors but ants are kind of saviors for ecosystems because with their key labors they help the ecosystems. Ants are small insects that work in groups to survive. Ants' diet and habitat is key for their survival because depending on the types of ants they live in different places and they eat different things. The habitat is key not only for ants but also for ecosystems because ants work all the time and this makes their habitat key for them to get food, water and many resources. In Zasqua there are many types of ants and their survival here in the school is key. This research's purpose is to answer the question: How do ants interact with the environment is Zasqua



<https://biodiversity.com.pt/biohistories/ants-and-eucalyptus-an-alliance-with-both-advantages-and-challenges/>

Ants are very small and important insects with very particular qualities. Ants use these important and particular qualities to survive in different environments. These insects use their physical qualities to get food and resources to survive. One example of these characteristics is their incredible jaw strength. Ants use this strength to break leaves and different types of food for them to be easier to carry back to their home. Another important example about their incredible physical characteristics is their antennae. Antennae are the principal communication method that ants have. They use their antennae to communicate thanks to the smell that the other ants leave. This also helps and to find their way home also thanks to the smells that other ants leave (Zasqua Journal, 2018). Ants have a life cycle in which they start as eggs and evolve with the time to convert to the ants that we all know. Ants may be small but they have an extensive diet of things that they eat in the different places where they live. This animal normally eats a mixture between animals and plants that they found around their houses, this is also a huge demonstration of an interaction between ants and the environment (Hormigas, Familia Formicidae, n.d.). Some examples of this are spiders and different insects. When ants find food in trees or in the ground they work together to bring it back to their anthills where they save it and then eat it when they need it. A key aspect in ants' diet is that they love sugar and sweet things; this is why they may normally be found in houses or farms. These insects show a huge demonstration of teamwork in many aspects of their living. Like when they find food and they need to get it back to their homes they work all together to accomplish this (Zasqua Journal, 2018).

As ants live in anthills and work in colonies each ant has a key role for the colony to succeed. The queen of the colonies are the huge ants and they guide the others. The main role of these huge ants is laying eggs and taking care of the smallest ants. Each ant in an anthill has a role starting from the ones that organize the food all the way to the ones that work bringing leaves and food all the time (*Tipos de hormigas, qué comen y dónde viven*, n.d.). Ants normally work in relationship to their age and experience. This doesn't mean that any job is more important than the others, just that normally the bigger ants are stronger and they can handle harder jobs. This means that there is not a role that is more important than the other all are key. This is a huge example of teamwork demonstrated by the ants. Teamwork is also a key aspect in ants' lives. The anthills where ants live are always built by themselves and it takes a long time for them. When a huge group of ants is searching for a place to live they normally live in anthills that are holes in the ground with many internal tunnels which they use to communicate. The leaders guide this construction, but they normally don't work on almost anything. To get to be a colony leader they normally have to pass through all the roles and then get to be leader. Normally the leaders are female ants and the males are the ones that work. Lastly we may think that ants' job is sometimes not worthy of their colonies but all this teamwork and interactions are a huge demonstration of the key species that ants are for the environment (The Editors of Encyclopedia Britannica, 2025).



<https://www.britannica.com/animal/ant>

Ants are found in almost every ecosystem in the world which contributes to maintaining biodiversity. Ants contribute to these ecosystems by interacting with plants and animals. This means that ants are key parts in different food webs. In one anthill they may fit 100.000 ants and with their different jobs they share everything they have. The bigger part of this group of ants work together going for leaves and food. This interaction also helps the environment in many ways (*Tipos de hormigas, qué comen y dónde viven*, n.d.). One of the main ways that this helps the environment is by decomposing and taking out the old leaves. This way the trees may grow new ones. This also shows the key role of nature for ants and how they relate to it to survive. When ants are in need of food and they get out of their anthills they find many amounts of food but sometimes this food is very big so ants need to decompose

it (Ecologiaverde.com, Retrieved, n.d.). In Zasqua there are many trees and ants take advantage of this to have food and live there. Here in Zasqua ants also grab food from the river. Water is also a key survival resource for ants. Though water is a key resource for ants in many of the places where they live they don't find it. This shows a clear pattern showing that without ants there would be an environmental crisis and people still don't get in account.

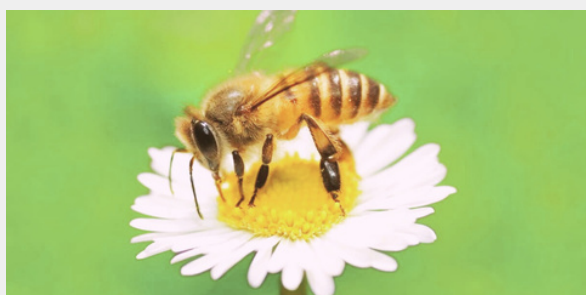
Seeing all this information should make us take actions to save our world and ants. One of them is that not always the bigger parts of things are the most important. In this case ants that are very small animals are some of the most important living creatures found in the ecosystems. Ants are key animals for the different ecosystems in which they interact with and with their complex living style they work really hard to reach their goals. Knowing this all the school has different types of roles to keep a safe environment. Another key point is that, believe it or not, ants are an endangered species. Here in Nogales there is a big conscience in all our species. Taking into account that ants are so important for the environment we need to keep taking care of ants. Always take consideration of the good that they do for the environment. In conclusión in Nogales we need to continue taking care of the beautiful environment that Zasqua is and being empathic with every living creature there.



By: María Brigard

BEEES VS CLIMATE CHANGE

Apis mellifera is a crucial species for the planet but they are being affected by climate change. If people don't do something to stop climate change now, in the future it's going to be a big challenge for *Apis mellifera* to survive, knowing that people are already seeing some effects of climate change. In some years it's going to be way worse. Because of climate change, *Apis mellifera* can be in a lot of danger with a reduction in their population that can make them have to adapt to lots of new conditions, new life styles, and a lack in their usual resources. The purpose of this report is to persuade people, especially from Colombia but to everyone around the world that might read this, to take action against climate change for a long-term benefit for *Apis mellifera*, the planet and its population. Protecting *Apis mellifera* from disappearing is crucial because they are essential for the planet and they pollinate plants and help flower reproduction.



<https://carolinahoneybees.com/identify-honey-bees/>



<https://dteklivebeeremoval.com/what-makes-a-beehive/>



<https://maeshoney.com/en/hive-honeycomb/>

This topic is very important because climate change is a reality that all people will have to face, and it's visible some of the effects of it, like when it stops raining for a long time. If people don't take action, it's going to be a little worse every year. It's a huge threat not just to humans but to *Apis mellifera* too. This article is about three main topics: 1. Everything about *Apis mellifera* and the process of making honey 2. Climate change in Bogota and Colombia, and its effects, 3. The effect of climate change in *Apis mellifera* and its production of honey. These three topics will help the readers understand and answer the research question. How does climate change affect *Apis mellifera* and their production of honey? The purpose of answering this question is to make people aware of how their habits and actions have an impact on the environment and the animals. *Apis mellifera* are one of the most affected species due to this situation, and it's all people's fault so everyone should put their part to stop this problem.

The first thing that is needed to address to find the answer to the question is everything about *Apis mellifera*, like their behavior and their characteristics but also how they produce honey. *Apis mellifera* are very important to the planet and people should learn from them, about their capacities and abilities being so tiny but powerful. *Apis mellifera* are animals with a great adaptation capacity and this can be seen since they are all around the world in every ecosystem despite the temperature. They can adapt to the environment, its conditions and the resources around them that are different from other parts of the world. *Apis mellifera* pollinate 80% of all flowering plants when they go out of their hive from flower to flower collecting nectar and pollen. Female *Apis mellifera* are called worker bees because they are the ones who go out of the hive to collect pollen and the nectar they use to make honey, which is also their food resource made by themselves and the principal thing on their diet. *Apis mellifera* are invertebrate animals with six legs and two pairs of wings. They are one of the few species that have social divisions having a queen bee, worker bees, and the drones. The queen bee is the only female *Apis mellifera* that can lay eggs and that's her only job, the worker bees are the other female *Apis mellifera* that can't lay eggs but take care of the babies and go out to collect nectar and pollen, and the drones that are the male *Apis mellifera*. Another thing we should know about *Apis mellifera* is how they make honey and how the process of making honey is done.



<https://www.hcn.org/articles/opinion-killer-bees-are-calming-down/>

The process of making honey is amazing and really impressive how it's done from the flower to the hive. *Apis mellifera* collect nectar and pollen from the flowering plants around its hive and its ecosystem. They take the nectar to their hive and save it in the honeycombs where the sugars are separated. In the honeycombs there's also a space where some water is stored so when they evaporate they help the sugars melt, turning into sweet liquid honey. The process starts at a flower when the *Apis mellifera* collects the nectar but it's really all done in the hive. The flavor and the color of the honey can change and vary depending on the flowering plant the nectar came from. *Apis mellifera* are special and unique animals with an amazing capacity of making their own food from many different flowers in every ecosystem that can change its flavor. It's amazing how they can do everything like making their own food, building their hive and protecting it.



<https://maeshoney.com/en/hive-honeycomb/>



<https://blog.3bee.com/es/miel-de-sulla-es/>

Before getting into answering the question, it is also needed to know more about climate change in Colombia, that is the cause of the problem. To understand climate change it's necessary to know what's happening in Colombia and what are people doing to stop this problem. Climate change is a reality and a big problem. This is causing lots of damage to the country and its people and it will continue if no one takes action. Climate change is one of the biggest challenges humanity faces. Climate change is the impact on the planet caused by climate change and contamination produced by human activity. Daily activities that are really common in Bogota like spending a lot of time in the car due to traffic can produce a significant amount of contamination. This is because the car is constantly burning fossil fuels and it's one of the main things people do to worsen climate change unconsciously. Climate effects on Colombia are predicted to be primarily an elevation in the temperatures and a lack of water supply. Also rainfall will be affected and it will badly affect the population of animals and wildlife, also affecting people. As a city and a country it's needed to address this problem with ways to contribute before it is too late to help.

Everyone needs to put from their side to contribute to slowing down climate change or maybe even solve it. Bogota's government is creating plans to reduce their carbon footprint and the emissions produced by all the city. Also they are thinking of how to reduce contamination to improve climate change. One thing that they are doing is creating and putting into service electric and emission free vehicles for public transportation. People are spending too much time in their cars and that is really polluting so they are looking forward to this new transportation to make people spend less in cars. At the same time this would reduce traffic for people that will still use their cars and helps to spend less time on cars. Along with this the government is also creating plans and campaigns to encourage people to walk or bike to their destinations like their home or place of work. This is what's going on now and what will happen with climate change. Knowing that, it's already possible to answer the question.



<https://www.istockphoto.com/photos/climate-change>

After learning about *Apis mellifera* and Climate change it will be easy to answer the research question. Before answering the question let's remember it: How does climate change affect *Apis mellifera* and their production of honey?

Now let's talk about the effects climate change would have on *Apis mellifera* and their future. The main effect of climate change that can be seen is the variation in the amount of population and reproduction of *Apis mellifera*. Another thing really affected by climate change is a diminution in their production of honey that can lead to a decrease of the population. Due to climate change temperatures rise a lot and the species is exposed to all that heat. The heat exposure *Apis mellifera* have to deal with can shorten or even end their life. All the members of the colony are affected by the heat exposure from the queen bee to the worker bees and the drones. With highly extreme temperatures there's going to be a lot of dryness and aridity killing all the plants around. *Apis mellifera* will have nowhere to find flowers where the nectar and pollen are found so the production of honey will be little to none. With no honey *Apis mellifera* will start to die because that's their food resource. The temperature outside the hive is really high and eventually even higher so worker bees won't be able to do their job.

The workers will stay inside and won't go to find nectar if there even is some. *Apis mellifera* are going to try to adapt to the new conditions they'll have all around the world but it might be hard to deal with the temperatures and lack of resources. It's already known that *Apis mellifera* can adapt and survive to conditions like the ones at the Sahara and Arizona desert. Thinking about them living in those places might now say that they will survive in places that are now cold. *Apis mellifera* has their own behaviors and protective methods to save their hive from melting in the heat. From the inside of the hive *Apis mellifera* have a tiny supply of water and ventilation inside the hive to cool it off. It wouldn't be impossible for *Apis mellifera* to survive climate change but it would be a big challenge.



<https://es.vecteezy.com/foto/6240026-panal-de-colmena-de-abejas-relleno-de-miel-dorada>

Apis mellifera are really important and unique animals that are key to the planet. If everyone doesn't take action to protect them they're going to disappear. Doing something to stop climate change is crucial because it might save *Apis mellifera* from it and if it doesn't stop it *Apis mellifera* might become extinct and the planet will have a lot of consequences and difficulties. They could adapt for a while to the new conditions but if it gets worse it will eventually be impossible to survive. The high temperatures will end with natural resources *Apis mellifera* need to survive like all types of flowering plants to produce honey.

If people don't take climate change seriously it can end with *Apis mellifera* production of honey and even the species. Our planet would be compromised without *Apis mellifera* and everything they do for the planet. *Apis mellifera*, their habitat and the planet will be in danger. This tiny but powerful species might be one of the most crucial for the planet. Let's start doing everything possible to improve this situation and protect *Apis mellifera*.



<https://www.ecoguardpestmanagement.com/pest-resource/do-bees-fly-at-night>



Photo by: Julia Romero

POEMS

Poems are a way to communicate but not only with words. Poems are rhymes that make stanzas. This can communicate a point in a more harmonious way. Poems also gives messages throughout their rhymes and stanzas. We used our knowledge on ancient civilizations to write thoughtful poems that reflect sustainability and nature during those periods. We drafted, then revised, and wrote the final version when we were satisfied. In this section of poems you would learn many important lessons about nature civilization.

BACK IN THE PAST

By: Victoria Garzón Márquez

Looking at nature,
Feels like a failure,
Cause it isn't the way,
It was before

Back in the past,
A river passed,
The source of life,
Of the Ancient Egyptians

Now in the present,
Water's unpleasant,
The trash in the river,
Just dancing around

In the book "The explorer",
The author describes,
A beautiful ecosystem
That now can't be found

Diluting the sweetest,
Of our sugary planet,
That gives us resources, to live
and survive

What we're doing to Earth,
Will it be declassified?
In fifty years,
When we all just die
Man will be death
And death will be man





THE GIFT OF NATURE

By: Gabriela Duque

Diffrent shades of green
You can find in the trees
As the sound of the river
Brings a gentle breeze

With every breath we start to feel
The careful sound that helps us
heal
The whispering wind only our
hearts can feel
That feels just unreal

The world is full of wonders, we just
cant see
Waiting to reveal the world is
paciente
As free as the ocean
Birds fly in a blue sky

Nature is a gift
Not even time can steal
If we learn to protect it
We can help it be.

THE LOST TREND

By: Sofia Gaviria

We humans are bright,
Like the moon in the night,
Nature, as well,
But in ways we can't tell.

Mysteries lie deep,
In ocean forest and creek,
But humans just few,
Share the care of earth's hue.

Cutting down trees,
Melting earths freeze,
ONLY worried about money,
Never have we dropped so much honey,

Of Course over time
Our relationship lost its rhyme
Earth is a dead trend
And that is not ok-EY!

In case you want to learn more about earths
problem here is a link

<https://www.youtube.com/watch?v=5TTU5DJ4xeo>





WE NEED A MIRACLE FOR THE WORLD

By: Juliana Sierra

Our world is ending
and we are pretending
We are all addicted
but we are still conflicted

It seems as if before we were smarter
we had brains ten times larger
Before, the Chinese used wheels
now all we care about are heels

Trees are soldiers standing tall
and we are killing them as if we're at war
Maybe all we need is a little inspiration
but all discussing gives us is frustration

I'm in my room and I hear a bang!
one tree, two trees, three trees down
Renewable and non renewable, which one is which
people just care it makes them rich

Something's seem safer never spotted
I may sound paranoid but all things we find end up destroyed
Nature is beautiful, that's indisputable
If we want to keep it alive, all we have to do is act.

<https://youtu.be/B-nEYsyRIYo?si=HKP4LALAwK7TSicL>



A CONNECTION THAT CHANGES THE WORLD

By: Tomás Restrepo

The man, the nature
For both of them, god is the creator
An explorer in a jungle
All the day, trying to struggle

Many people in ancient civilisations
Being sustainable
An having degradation
Are still our inspiration

To coexist with the plants
Man has to be an ant
And for him to be the animal
A balance with nature has to be rational

With thousands of resources to use,
We can't be the ones that abuse
Let's treat nature as our friend,
because eventually, it will have an end

The tiger, the time
Millions of plants, I don't know why
The time very large
But not many, for this piece of art

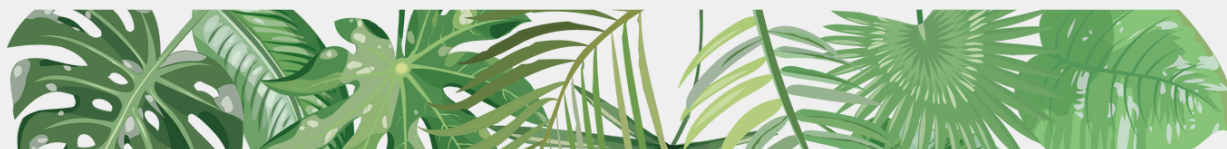
More nature and man connections in:

<https://youtu.be/4AgsttQq-Mw?si=JD9m5ZFEqqxugjqX>



WORK TOGETHER

By: Federico Jimenez

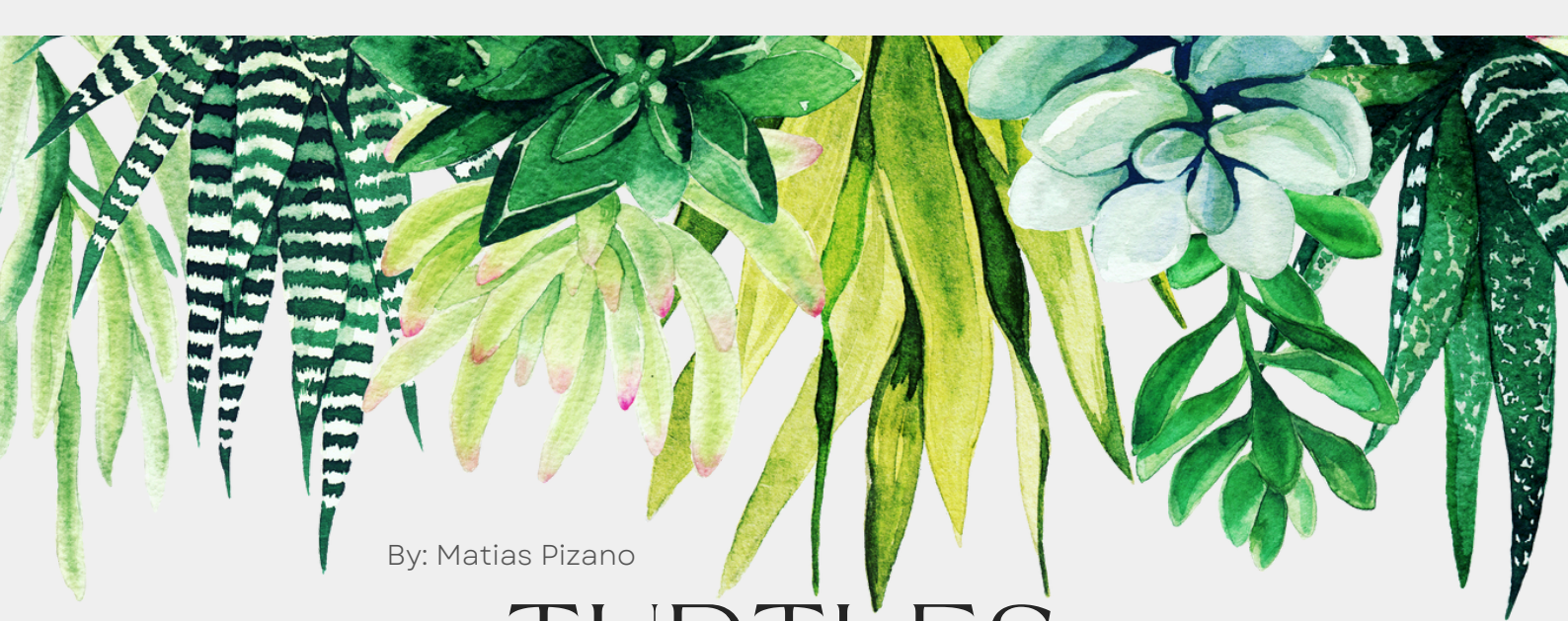


A man is part of nature
Where there are creatures
There are also plants
The human have these plants and animals in there houses
And this constant

In the plants there are tree
So that's the earth can be free
Humans work
And for survival
Animals also work

Coexist together we most
And our balance must be just
The important thing we share
And to show nature that we care

Now that this poem is about to end
There is a message I need to send
Our world is crippling away
Only you and me can save the day



By: Matias Pizano

TURTLES

One Turtle, two Turtles, three Turtles, all
Turtles.

Caring for Turtles, giving them plants
and taking them to our gardens.

Giving them sardines.

Because sardines are happiness for
them.

Turtles can be pets.

And there is no need to take them to the
vets.

Turtles are not dogs.

There is no need to spend too much
money

They adapt to every ecosystem;

This is because of their body system,
And you don't even need to assist them.

Because to every problem they
overcome

They give nutrients to trees.

But they also bring their seeds.

Even though they need ages.

And the trees cry out of happiness
when turtles cross their path



WHISPERS OF NATURE

By: Salome Duarte

Between every whisper of wind
They are different types of plants
The leaves softly balance in the air
With their calm moment that they share

Between every whisper of air
A population of bees is floating there
If you hear the magic sound of the breeze
It whispers secrets through the trees

A melody that is soft
That guides you as you walk
The enchanting evening blue sky
Makes you wanna catch the stars

Close your eyes and you may see
The beautiful plants and trees
The whispers of the trees are soft and
clear
That they make you feel so near

Humans can freely breath
Because the enchanting trees
There is a sweet peace
Where the stars up there sleep
When you close your eyes
Let nature call
A whispered truth that impact us all



EGYPT WITH NATURE

By: María Brigard

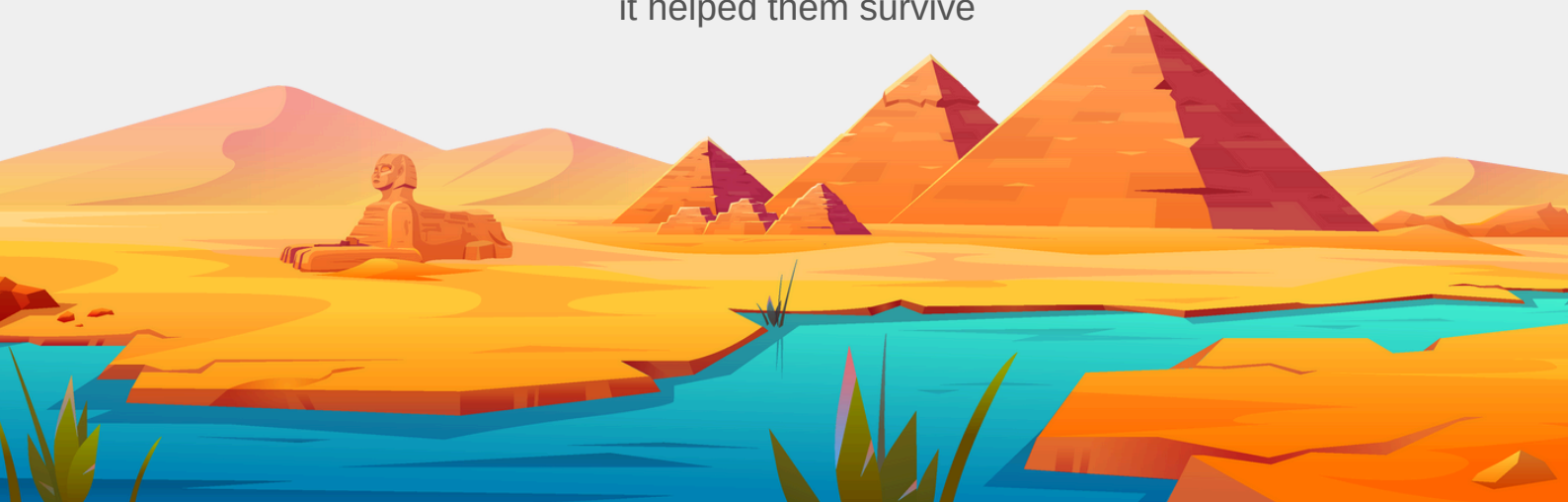
Nature in Egypt
the rules were rigid
nature bright and vivid
to take care of it they were committed

The river passed running
it made the place stunning
it gave them water to drink
the river would flood
and watered their crops

Nature is art
thus their choices where smart
to build gigantic pyramids they put their heart
they built them as solid as stone
their treasures would own

Nature their food, nature their home
nature was everything they owned
it had it all
animals, plants, temples, that was all

Nature is all
everything they own
it kept the alive
it helped them survive





DESCRIPTIVE TEXTS

Descriptive texts are a very good way of describing different things. One of this things is the environment, We can describe many types of environments throughout descriptive texts. The Explorer was a great example of a huge and complex environment that we could describe throughout a descriptive text. After thoroughly reading the book, we took our time to write down every important detail we took from it. In this section we will give many examples of descriptive texts that describe everything in the environment in “The Explorer”.

A EXPERIENCE ON THE RAIN FOREST



<https://www.treehugger.com/lush-temperate-rain-forests-around-world-4869718>

A wide forest, full of life. Each tree maintains familia of an expand amount of species. Every step is just forward for each time a new area, full of adversities although it's thrilling and breathtaking. The trees, create a mesmerizing and dazzling shades of green, being hard not to fall in love with. Each hectare has their own history. Although in not a quiet place, is full of sounds that make it unique. In the morning just a simple chirp of birds, and on the night croaks and squeaks. Wind blows each tree, each time seeing more leaves falling everywhere. In the other hand, the river is just different teach time. Either crystal clear or blurred, every time is a gorgeous to see and feel. Sometimes is soft and tranquil, being easy to navigate. Meanwhile, other parts are hard and strong, making it easy to get lost. At first, at the distance it just seems as a normal part of the forest. But as diving in you get hypnotize by the arquitecture and nature. Vines and lianas are everywhere, having a really interesting experience. The building has a perfect structure, made with lots of precision. Statues captivate the center of attention, being really tall and unrecognizable figures. The canopy is made of rocks, just giving a feeling for a secure shelter and protection. Enough resources are found everywhere to ingeniarte for survival. Although being there has their own risks, it's just a fascinating place. When traveling thought it, you can feel the strong and warm humidity entering your pores. The sweat drops falling through your skin. Although the best feeling of the cold breeze at dawn. Being at this place, lots of adventures be found with in their own risks, having unique experiences to live.

AMAZONS



<https://colombia.travel/es/amazonas>

The amazing Amazon is full of biodiversity. The Explorer is a great book that provides information and description about Amazon. Enormous trees full of birds nesting. It's a rainforest full of plants that make the ecosystem flow and work together to fight extinction. The shadow from the trees and the humidity of the wind make a warm place. A perfect ecosystem that has a big river with a brown color and many animals inside there. Animals are so marvelous and help the food web and food chain to be always stable. Wind is warm during the day and chilly at night.

<https://colombia.travel/es/amazonas>

CHARACTERS RELATED TO THE ECOSYSTEM



Eieihttps://www.raisg.org/es/radar/las-razones-que-explican-la-importancia-de-la-selva-amazonica/

As we get through to the book of the explorer we can see them. The green takes a big amount of what the characters observe. But they locate with references the first reference is where the airplane falls and with the time they find things like the river. They start adapting rapidly to the jungle and they start using their resources to survive for more time. Another thing they had to deal with is the species because this one's transform is a problem. They prove their rapid adaptation to the environment when they use the river to transport. After they get to a tree and find a map that makes the jungle more clear. As the book advances we can see the way the characters are interacting with the setting is changing. Also the characters are adapting more to the unknown. At the end of the book the characters had the clearest picture of the jungle in the airplane where they could visualize all the green of the Amazonas. In the sky they could see how extensive the rainforest was. This image finalize when the airplane landed in the farmland.

For more information in: The Editors of Encyclopedia Britannica. (2025). Amazon Rainforest. En Encyclopedia Britannica.

(N.d)Caldafra.com.
Recuperado el 27 de enero de 2025, de
<https://lift.caldafra.com/wp-content/uploads/2020/10/The-Explorer.pdf>

THE ECOSYSTEM IN THE EXPLORER



<https://www.andbeyond.com/advice/south-america/ecuador/amazon/why-visit-the-amazon/>

The Explorer is being told on the Amazon forest. It is an incredible ecosystem but it is described as a dangerous place. It is home to lots of fantastic animals and species. Animals like monkeys, ants, dolphins and much more. We can't forget to mention the enormous variety of different types of olive, emerald, maroon, scarlet, amber, gold and more color plants and flowers. In the book, the author names tall trees, vibrant flowers and lots of more plants the characters run to while exploring the rainforest. Also, rivers are also an important characteristic the Amazon has. Like the Amazon river, where the characters traveled and used for survival. This source of water is very amazing. It has windy paths that look like forks and there are moments when the water jumps, skips, runs, falls and it becomes very curvy. Of course there are a lot of more characteristics of this amazing ecosystem, but in my opinion this are the highlights that the book describes.

STRANGE PLACES: AMAZON TROPICAL FOREST

By: Tomás Restrepo



<https://ecosistemas.ovacen.com/biodiversidad-amazonica/>

The Amazon tropical forest has a very wild biodiversity. It includes exotic animals and plants like birds, that have many colours on their feathers and many types of beaks. The river has a very strong current, making it impossible for someone to swim on it, also giving habitat to many fish. This tropical forest has a very humid and balmy climate, with a very dense air, and it feels like fire but without the flames. Also, it is difficult to walk in its lands because they have many strange things like big and colourful insects or spines on the floor. The branches and creepers in this place disturb a lot. The insects in the place can be very dangerous with their bites, and disturbing with their buzzing aside the ear. Every year, explorers that go to this tropical forest risk their lives, because there is a chance for them to pass by. It could be because of the animals, plants , or many other factors.



<https://www.freepik.es/fotos-vectores-gratis/region-amazonas>



<https://depositphotos.com/es/photos/amazon-rainforest-animals.html>

SUSTAINABILITY IN CIVILIZATIONS

BY: MARTIN GIRALDO AND JULIA ROMERO

Ancient civilizations were often sustainable without even realising. For example, the Phoenician empire. They used advanced skills to take care of their natural resources, which led to them being sustainable towards the environment. Most of what they used was natural and based on materials they already had, which caused less of an impact. The Phoenicians used irrigation channels and terracing methods, which are both simple and sustainable ways of caring for their resources while making the working process more efficient. Since that was a long time ago, the Phoenicians probably didn't have a concept of what sustainability could be, it's a modern concept. Therefore, even if they were impacting the environment negatively, they wouldn't know for the most part. In the ancient Egypt civilization, their main source of sustainability was the Nile river. They used the Nile river in many ways; it was their water, agriculture and main transportation source. This shows how by only one river they had almost everything they needed and without even noticing they were sustainable. Another example is ancient China. They used canals and water wheels to collect water from rivers, which they used to create energy. The Phoenicians and the Chinese had this in common; both were aware of the importance of nature and worshipped its value. Because of this, they were conscious of how they were using their resources and made sure to be careful with how they treated them. They took only what they really needed, they didn't exploit nature for materials. In addition, everything they took from were renewable sources. That is what we call sustainability. Another example is found in the Sinu civilization. This civilization used rivers as a sacred place and as an agricultural source. Others, like Romans, used aqueducts to manage their water supply throughout the empire. These ancient civilizations show how a basic natural resource can be a huge advantage for the community while being sustainable, and most importantly, the way it's used. Most of these methods revolve around the presence of water, which is another reason why they were sustainable. They rarely struggled with water scarcity. What we do nowadays is just an easier way of doing almost the same tasks, however, the 'easy' leaves an insane footprint.



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SUSTAINABILITY IN ANCIENT CIVILIZATIONS

SUSTAINABILITY

Sustainability is a modern concept because ancient cultures were sustainable without being aware of it. To achieve it, the three basic pillars must be addressed: economic, social, and environmental. In the environmental pillar, conservation focuses on protecting natural resources for future human use, while preservation aims to protect the environment for its intrinsic value, not as a resource for humans.

- ONE OF THE GREATEST EMPIRES IN THE WORLD
- CREATORS OF THE QANAT SYSTEM TO MOVE WATER IN UNDERGROUND TUNNELS.
- THEY PRACTICE THE ZOROASTRIANISM RELIGION IN WHICH THEY BELIEVE IN THE GOD AHORA MAZDA AND THE DEVIL ANGRU MAINYU
- HAD A VERY IMPORTANT RELATIONSHIP WITH NATURE BECAUSE THEY THOUGHT IT WAS A MANIFESTATION OF AHORA MAZDA.
- FOR THEM A KING THAT HAD A SOSTENIBLE ENVIRONMENT WAS A GOOD KING. BECAUSE FOR THEM NATURE WAS EVERYTHING
- THE EMPIRE HAD A GOOD SOCIAL SUSTAINABILITY BECAUSE OF THE GOOD INVENTIONS THAT HELP THE COMMUNITY



THE PHOENICIAN EMPIRE HAD A VERY STRONG RELATIONSHIP WITH NATURE. IT WAS RESPECTFUL AND CONSIDERATE, WHICH LED TO ITS CONSERVATION. THEY WORSHIPPED NATURE TO THE POINT IN WHICH THEIR GODS AND CELESTIAL FIGURES WERE BASED ON NATURAL FORCES LIKE THE SEA, RAIN AND FERTILITY. THEIR RELIGIOUS PLACES AND SHRINES WERE LOCATED IN NATURAL AREAS, AND THEY WERE BUILT WITHIN NATURE TO EMPHASISE ITS IMPORTANCE. THEIR EMPIRE WAS LOCATED IN WHAT TODAY IS LEBANON, SYRIA, AND ISRAEL. SINCE THEY WERE LOCATED ALONG THE COASTS, THEIR CONNECTION WITH THE MEDITERRANEAN AS PART OF NATURE WAS STRONGER. THE AREAS IN WHICH THEY LIVED HAD PLENTY OF NATURAL RESOURCES, WHICH THEY USED FOR THEIR OWN WELL-BEING AND FOR SOCIALISING WITH OTHER CIVILIZATIONS THROUGH TRADE. HAVING A SOCIAL NETWORK, THEY GAINED MORE RESOURCES, IMPROVED THEIR SKILLS, AND MADE TECHNOLOGICAL ADVANCEMENTS, WHICH CONTRIBUTED TO THE EXPANSION OF THEIR EMPIRE AND NEW COLONIES.

This civilization is sustainable in different ways. One example is when the Chinese saw agricultural advances because of the unique usage of things around them. One example of this is when the Chinese created many water mills, other examples of this is when they made a construction of large scale canal systems or when they used all the materials around them to make iron pillars.

THE ANCIENT EGYPTIAN CIVILIZATION WAS VERY SUSTAINABLE. FOR EXAMPLE, THEY WERE VERY CLOSE TO NATURE AND BELIEVED IT WAS GOVERNED BY DIVINE FORCES. THEY WERE CLOSER TO NATURE IN THE OLD KINGDOM, (THE EARLY PHASES OF THE CIVILIZATION) THEY WERE ALSO CLOSE IN THE LATE PERIOD (TOWARDS THE END OF THE CIVILIZATION). THANKS TO THIS, THE EGYPTIANS TOOK A VERY GOOD CARE OF IT. THEY PROTECTED A LOT THE NILE RIVER, AND WAS THEIR PRIMARY SOURCE OF WATER, AGRICULTURE AND TRANSPORTATION. ALSO THE EGYPTIAN ART AND ARCHITECTURE REFLECTED A DEEP RESPECT FOR NATURE BY USING SUSTAINABLE MATERIALS, WHICH PERSUADED MORE PEOPLE TO BE SUSTAINABLE.



THE SINU CIVILIZATION LIVED FROM 200 BCE TO 1600 CE ALONG THE BANKS OF THE SINU RIVER. A MAYOR WATER WAY FOR TRADE. THE SINUS BELIEVED THE RIVER, THE FOREST AND THE WILD LIFE WAS SACRED AND WERE ASSOCIATED WITH GODS AND DIETIES. THE SINUS WERE GREAT ENGINEERS AND THEY BUILD CANALS AND IRRIGATION SYSTEMS FOR THEIR WATER. THEY ALSO BALANCED THEIR GIVE AND TAKE IN NATURE. BY DOING SO, THEY RESTORED WHAT THEY TOOK, ACHIEVING SUSTAINABILITY.

THE AZTECS HAD A SONSTIOTATED AND HIGHLY ORGANIZED AGRICULTURE SYSTEM THAT DEEPLY RELAY ON NATURE, AND AN EXAMPLE OF THIS IS ARE THE FLOATING GARDENS THAT ARE AN AGRICULTURAL PRACTICE, THIS ALLOWED THE AZTECS TO CULTIVATE CROPS MORE EFFECTIVELY. THAT HOW THEY ACHIEVED SUSTAINABILITY, BY TAKING CARE OF OPTIMIZING THEIR RESOURCES, LIKE THEIR WATER.



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