

THE ORCHID PROTECTOR



Biologist, Luciano Zandoná in the Orchidarium at Legado das Águas

Orchidarium

Luciano Zandoná has been a partner with Legado das Águas since 2015. He is one of those researchers who transform their work into a passion. Always dedicated, his eyes sparkle when he talks about conserving the biodiversity of the Atlantic Forest, especially orchids. The biologist tells us, "If the Atlantic Forest is threatened, orchids are, too." It is a fact that, in Brazil, only around 7% of the original biome still exists, and, therefore, orchids are also disappearing from their natural habitat. Unfortunately, this is a reality that extends throughout most of the country.

In the 31,000 hectares that comprise Legado das Águas, fortunately the scenario is different – and far better. There, they are safe and very

well protected, thanks to Zandoná's work. He has been a partner-researcher with Legado since 2015. In just over two years with Legado, he has already catalogued 208 species growing in Reserva: 12 have been registered as endangered. "One of them was actually considered extinct in the state of São Paulo fifty years ago," he tells us.

The species in question is the delicate and beautiful orchid which goes by the name of *octomeria estrellensis*. "We managed to find a specimen of this plant and send it to a laboratory. Now, because of this particular orchid, our aim is to set up a genetic bank for the species. Because it is fragile, we need to handle it with special care," Zandoná explains.

NO EFFORT IS SPARED WHEN THE INTREPID BIOLOGIST LUCIANO ZANDONÁ IS OUT TO RESCUE SAMPLES OF ONE OF THE MOST FRAGILE AND ENDANGERED PLANTS IN THE ATLANTIC FOREST. HIS DEDICATION IS ALSO RESPONSIBLE FOR FINDING A SPECIES THOUGHT TO BE EXTINCT IN SÃO PAULO FOR MORE THAN FIFTY YEARS

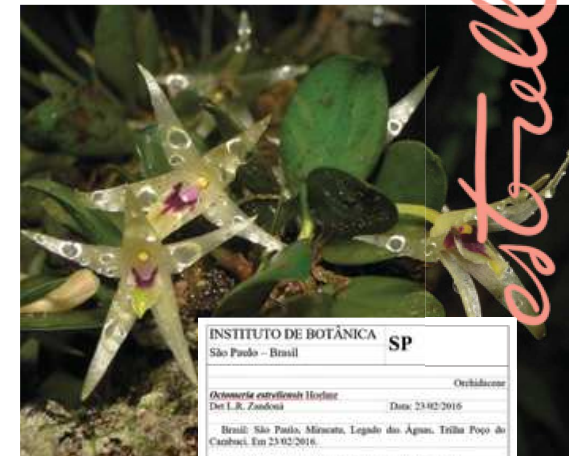
In 2017, Zandoná was responsible for:

- 100 days of field activities in Legado
- 208 listed species
- 12 endangered
- 1 considered extinct in São Paulo for more than 50 years



A species of orchid which was rescued and relocated to another tree

Octomeria estrellensis in its natural habitat. Also, the Botanical Institute of São Paulo's index card showing the species present in Legado das Águas



INSTITUTO DE BOTÂNICA SP	
São Paulo - Brasil	
Orchidaceae	
<i>Octomeria estrellensis</i> Hoffm.	Data: 23.02.2016
Det L.R. Zandoná	
Brasil: São Paulo, Município, Legado das Águas, Trilha Poço do Caracol, Em 23.02.2016.	
Obs.: Epífita, encontrada em árvore caída. Flores brancas manchadas, labelo com manchas vermelhas no centro.	
Cól. Luciano Ramos Zandoná e Angelica Guidoni Maragni Zandoná	
Epitipo:	

600 RESCUES IN THE FOREST

While walking along Legado's tracks, Zandoná keeps his eyes on the trees which have fallen naturally, mainly due to the heavy rains that are common in the area. The rain soaks the soil and makes the canopy extremely heavy. When he sees fallen trunks and branches, Zandoná and Angelica Guidoni, his workmate, swing into action. It is almost certain that they will find orchid species that would surely die if they were not collected from these fallen trees.

Taking every precaution, he then isolates the plant from the tree and takes it back to the orchidarium, located next to the nursery. There, the orchids receive the appropriate care to fight any fungus and bacteria. They are fed and watered daily. Once they are back to being healthy, they are relocated into other trees deep within the forest. Over time, they will bloom and perhaps even be pollinated, meaning that their descendants will thrive in other parts of Legado. Over the past two years, around 600 plants have been rescued, which, had it not been for Zandoná, would have died in the middle of the forest. ■

THE STRONG RELATIONSHIP BETWEEN RIVERS AND OCEANS

by Luciano Candisani*

Science has issued the following warning: it is impossible to consider conservation of the oceans separate from the strong influence they are under from the drainage basins that are spread across the planet. In the time it has taken to write these few lines, the Amazon River has deposited something close to 2 million liters of water into the Atlantic Ocean, which has also received around 170,000 liters from the Mississippi River in North America.

Elements that are fundamental to the biochemical balance of the marine environments travel in these and in many other huge masses of fresh water together with some of the most significant threats to the balance of life in our seas. The same water that carries nutrients to seaweed, algae, sea grass (flowering plants) and microorganisms, can also carry excess sediments and devastating, polluting chemicals.

Working as a photographer specializing in environmental subject matters, conservation and traditional populations, I have had the opportunity to get to know, up close, many different examples of the impact rivers can have on the marine environment in various parts of the world. One of the most emblematic experiences that I have ever had was the Costa dos Corais (Coral Reef), situated between the states of Alagoas and Pernambuco. I was traveling through the region to document the life of a critically endangered marine creature – the manatee or sea cow. The trip involved several weeks of trekking with a team of biologists from the Itamaracá Island Aquatic Mammal Center, in Pernambuco. While I was searching for this extremely rare animal (there are only around 500 of them left, according to

OCEANS RECEIVE ALL OF THE SEDIMENT AND POLLUTION CARRIED ALONG BY RIVERS. FOR THIS REASON, MARINE CONSERVATION DEPENDS ON THE PROTECTION OF SPRINGS, FORESTS AND WATERCOURSES

most estimates), I dived into various estuaries in the region – estuaries are the preferred habitat of this 4-meter-long marine mammal. My aim was to photograph the efforts being made to avoid the extinction of this species in Brazilian waters.

DESTRUCTION OF MANGROVE SWAMPS AND FORESTS

The main obstacle to conserving the tiny remaining manatee population is connected to the destruction of mangrove swamps and coastal forests. Without the protection of the mangroves, the female manatees are forced to give birth to their young in open, turbulent waters. Not having the strength to resist the currents of the water, the newborns are caught up in the waves and end up stranded or beached. In addition, the excess sediments carried by the rivers kill off the coastal marine



The meeting of the Tatuamunha River with the Atlantic Ocean, in the State of Alagoas; habitat of the threatened manatee

feeding grounds where the adult manatees eat. I see a similar situation here where I live – near the island of Ilhabela, just off the north coast of the state of São Paulo. A few decades ago, the water in our many rivers used to flow crystal clear into the sea, even during the heavy rains. We would swim in a translucent sea, even up to the channel that separates the island from the mainland. We rarely saw murky seawater. The situation today is quite the opposite. Because of the intense urbanization and the lack of soil infiltration, coupled with deforestation for illegal land occupation, an enormous quantity of sediments infiltrate the rivers with each heavy rainfall, meaning the channel's blue water takes on that unmistakable murky color of mud. Even worse, domestic wastewater coming from poorly built septic tanks is dumped together with the

sediments. The situation is even more ominous in neighboring towns. In the vast area of Ilhabela facing the open ocean, however, a state park has protected the forest since 1977. This prevents flooding and reduces the huge quantities of sediments flowing into the rivers.

Cases like these clearly show what science has already demonstrated through statistics and analyses: that marine conservation is dependent upon the protection of forests, mangroves and rivers. ■

* Luciano Candisani is a biologist and photographer for *National Geographic* magazine, among other publications. He is the winner of a number of international awards, such as *Wildlife Photographer of the Year*, 2012, and is a member of the International League of Conservation Photographers (ILCP).

A LABORATORY IN THE ATLANTIC FOREST

Have you ever thought about the possibility of studying and watching nature in a gigantic laboratory measuring 31.000 hectares? Well, many scholars have had precisely this stroke of luck and are reaching excellent results. Over the next few pages, you will get to see some of the main advances in the research carried out at Legado das Águas and what has been done in terms of environmental monitoring to make the area safe and sound from environmental threats.

BIOTECHNOLOGY

One of the most promising lines of research at Reserva is biotechnology, through genetically mapping plants in Legado das Águas and the compound transformations. In 2017, an important milestone in the development of products and services was based on Legado's biodiversity. Mauro Rebelo, teaching assistant at the Biophysics Institute at the Federal University of Rio de Janeiro (UFRJ) and head of the Environmental Molecular Biology Laboratory explains, "We have managed to produce two substances which have sparked the interest of the cosmetics industry. They are 1,2-Diol-Limoeno and alfa-terpineol, both derived from r-limoneno, a sub-product of the orange juice industry. We used modified microorganisms with genes taken from species found in the Atlantic Forest. Although it has only been a few microliters, this has been important proof of concept for us to gain new partners and financing to upscale this process."

JAGUARS & PUMAS

The year 2017 also held pleasant surprises for the team at the Conservation Institute for the Neotropical Carnivores (Pro-Carnivoros) which is coordinated by Ecology PhD Sandra Cavalcanti. By means of traps laid in the forest, it was possible to capture both a jaguar and a puma, both in areas surrounding Legado. "As there had already been several sightings of these animals, the local population alerted us. We were very soon able to understand why they were in the area, and we made attempts to capture them," Sandra explains. "In the end, everything went well. After a few attempts, we managed to capture them and put a radio collar on each one."

Jaguars

With this equipment, it is possible to monitor them using GPS. That way, their habits and behavior can be better understood; the areas they inhabit, which paths they take and where they go. "We already know that they inhabit an area within a radius of about 80 kilometers. And as they are opportunistic animals, they prefer areas where they can find lone animals that are easier to hunt," Sandra adds. With this data, it is now easier to clarify other doubts regarding these animals.

Sandra Cavalcanti and her team are trying to better understand the behavior of jaguars that inhabit the Atlantic Forest

Biotechnology



Researcher Mauro Rebelo with a sample of the product developed from micro-organisms which have been modified using the genes of a species found in the Atlantic Forest



LIVING FOREST

TAPIRS

Between November 13th and 18th, 2017, the Tapirs at Legado das Águas made their presence felt during the 7th International Tapir Symposium held in Houston, US. It brought together more than 80 experts from 20 countries – specialists who have dedicated themselves to studying these animals. Among the Brazilian representatives was Mariana Landis, president of the Manacá Institute, another partner institution. She spoke about the management model at Reserva and the research carried out there. Among other points, Mariana showed the area occupied by Legado das Águas, the famous albino tapir, the areas inhabited by the tapir, and the challenges in conserving this species.

"Since August 2016, we have been constantly monitoring the existing fauna within Legado by means of photographic traps hidden in the forest," Mariana explains. Between January and December 2017, for example, 1,178 large mammals were photographed. The tapir was the

most common – 26% of all images. "This means that the area is highly populated with tapirs," Marina adds. The animals are relatively protected at Reserva, but outside these borders, there are enormous challenges mainly because of illegal hunting. Mariana finishes off by saying, "For this reason, it is still important that we continue to work hard in environmental education, to reduce this impact."

An interesting fact is that as these photographic traps capture movement made by any animal. The research also offers information on other animals such as the *tayra*, the bush dog, *tapeti*, as well as another seventeen species.

Monitoring the tapir in Legado das Águas is raising academic interest among the students at some respected universities, such as the Escola Superior de Agricultura Luiz de Queiroz at the University of São Paulo (USP).



Mariana Landis, President of the Manacá Institute at an event in Houston, US, in November, 2017



Biologist Leticia Munhões installing cameras in the middle of the forest to capture images of tapirs in Legado

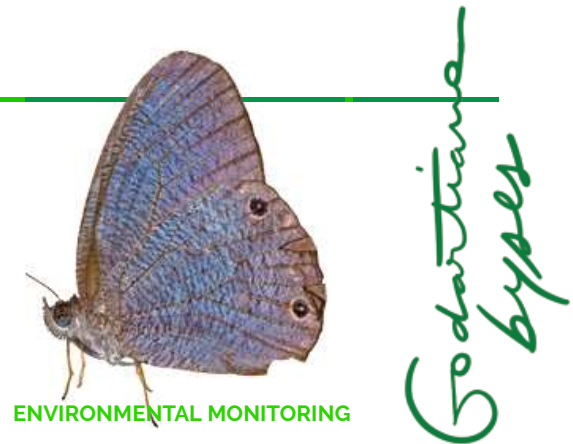
BUTTERFLIES

Studies involving butterflies also took great strides forward in 2017. "By the end of the year, we had registered 182 species. In 2016, we had 65," says Laura Braga, a biologist and PhD in ecology as well as a specialist in Lepidoptera. Together with her team, she has already conducted four collection operations inside Legado. The good news is that, among the species registered, there was one that had never before been registered in the state of São Paulo: *godartiana byses* (see photo). "It is a very rare species, endemic to the Atlantic Forest and an important indication of well conserved forests", Laura explains. This finding of important scientific interest generated the publication of an article in the *Journal of Lepidopterists' Society*, one of the most renowned scientific magazines in the field.

"The study on butterflies in Legado is important for us to discover which species frequent the area and if there are any rare or endangered species. With this information, we are able to develop a management and conservation plan. In addition to this, butterflies are strong indicators of the environmental quality, especially the state of conservation of the Atlantic Forest vegetation within Legado das Águas. In other words, the richer and wider the diversity of the species, the better the state of conservation the butterflies inhabit," Laura adds.

ENVIRONMENTAL MONITORING

Legado das Águas is situated in a region which has one of the lowest Human Development Indexes (HDI) in the state of São Paulo. This, together with the lack of "environmental awareness" on the part of many people means that the whole Vale do Ribeira region, in the southern part of São Paulo state, has a history of illegal hunting and palm tree felling. "We are aware that, for the time being, it is impossible to avoid this, but we are working towards reducing such aggression toward the environment as much as possible," says Rodrigo Inojosa de Oliveira, Manager of the Operations, Maintenance and Administrative Services at Legado das Águas. Environmental monitoring is responsible for the area's security. "Each month, the teams make the rounds along Legado's perimeter as well as monitoring the internal tracks, checking for signs of hunters or palm fellers. Any incidents are photographed and, when necessary, the environment police are informed," Inojosa comments.

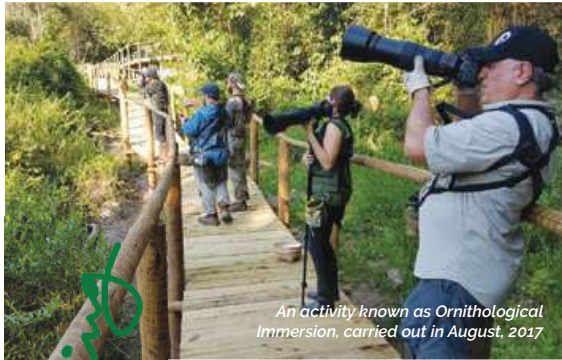


Biologist Laura Braga and her butterfly net



Members of the team responsible for Reserva's security

SCIENCE IN THE SKY, ON LAND AND IN THE WATER



An activity known as Ornithological Immersion, carried out in August, 2017

LEGADO DAS ÁGUAS HAS BECOME A VERY SPECIAL PLACE TO OBSERVE RARE BIRDS AS WELL AS STUDYING SNAKES AND AMPHIBIANS

BIRDS

A living forest in an advanced stage of conservation, full of trees of 30 meters or more and thick vegetation, where significant relationships between living creatures still exist, is one of the few places capable of sheltering the most diverse animal species, many of them endemic to the biome. Birds are among these species and have been a focus of study by a number of ornithologists, who, before sunrise, are already in the field, looking skyward searching for the rare species, seldom seen in other parts of the country.

"In 2016, there was a list of 287 observed species. In 2017, this had increased by four, reaching 291. The number of endemic species continues around the 40% mark," informs Wagner Oliveira, an ornithologist from Sustentar, the partner organization responsible for this work and for organizing public bird-watching activities. These activities, too, have increased over the past two months. "The year 2017 was one in which we were able to put our bird-watching operations to the test at Legado. We did this by promoting and running events. We tested different kinds of activities, combining bird-watching walks and workshops."



Bufador woodpecker (Piculus flavigula), one of the most beautiful birds at Legado das Águas

Wagner points out that there were five events throughout the year. The main event was the Ornithological Immersion, which was made up of a day of walks and workshops on ornithology and bird watching, lead by renowned specialists. "This was one of the events that we enjoyed most. We are sure that 2018 will attract the public even more," Wagner adds.

HERPETOLOGY

They are not the friendliest of creatures, not to the general public, at least. In fact, there are still lots of people who are scared of them, probably due to a lack of information or because they do not know how to react if they come across one. In spite of this, snakes are also part of the biodiversity. They have their role to play in the biome and deserve to be studied under the watchful eye of science.



“Snakes are not overly popular. Our activities serve to show that, even though some of them are dangerous, these animals deserve respect in all its forms. Mainly because they are living creatures.

Giuseppe Puerto, biologist, specialist in herpetology and Director of the Biology Museum at the Butantan Institute

"In 2017, we did the field work, listed the different species and released a lot of scientific information. In total, eight campaigns, in different areas of Reserva, in all four seasons," explains Giuseppe Puerto, biologist and Director of the Biology Museum at the Butantan Institute, says. Marcelo S. B. Lucas and Adriana Mezini are also members of the team at the Butantan Institute, which has been a partner of Legado since 2016. "We have discovered twelve species of snake; three of them venomous, the most common being the *jararacuçu* (*bothrops jararacussu*), and nine non-venomous, the *caninana* (*spilotes pullatus*) being the most common. We also recorded four species of lizard and one turtle (*cágado-da-serra*). We were also able to observe a further 34 species of amphibians divided into nine families. Although they were found in a number of areas within Legado, two particular areas were noted for the number and variety of species; the Barra Quarry (*Pedreira da Barra*) and the Cambuci Trail. The marked presence of amphibians represents an excellent bio indicator for the quality of the environment in the region," Giuseppe Puerto concluded. ■



bird watching

While walking along the pathways that run through Legado das Águas, people do not know whether to look up to the sky, down at the ground or straight ahead at the thick forest full of colors and enchantment. At the end of the day, it depends on what you are interested in, there is plenty to see in all directions. In fact, this has been one of the most peculiar research projects developed at Legado. Quite often, specialists get together on field trips, exchange ideas, share results and study methods. After all, they all have the same interest: to discover and better understand the Atlantic Forest's biodiversity.

“The year 2017 was one in which we were able to put our bird-watching operations to the test. We did this by promoting and running events. We tested different kinds of activities, combining bird-watching walks with workshops.

Wagner Nogueira, ornithologist

serpents
amphibians

YELLOW FEVER AND PRIMATES

DURING 2017, THE NUMBER OF CASES OF THE DISEASE INCREASED IN BRAZIL, ESPECIALLY IN THE STATES OF SÃO PAULO AND MINAS GERAIS. BUT WHY DID THIS AND OTHER TROPICAL DISEASES REAPPEAR, SCARING THE POPULATION AND KILLING A NUMBER OF MONKEYS IN OUR FORESTS?

Those who followed the news headlines in 2017 will not be able to forget the reports of people being vaccinated for yellow fever in clinics all over Brazil, but especially in the Southeast region. The motive was clearly justifiable. Many of these people lived in high risk areas, near thick forests – the perfect environment in which to be bitten by the mosquito that transmits the disease. People’s worries were understandable. After all, the Ministry of Health had disclosed some data between July 2017 and the end of January 2018 which showed that there had been 213 cases of yellow fever, including 81 deaths related to the disease transmitted by the *haemagogus* and

sabethes mosquitoes. It is worth noting that urban yellow fever, transmitted by *aedes aegypti*, the same mosquito that transmits dengue fever, was eradicated from Brazil in 1942.

ANIMAL SENTINELS

But what could have happened to cause this disease to return to infect so many Brazilians, especially those who live near forest areas? “We are still trying to find more definitive answers that could explain the outbreak of yellow fever that has occurred in Brazil. This is linked to the natural transmission cycle which occurs endemically in the Amazon, but which has been expanding into other regions since 2014. Entire populations of howler monkeys, one of the most sensitive species to the virus, were wiped out in the State of Minas Gerais, in 2017. It is the single largest ecological tragedy to hit primates recorded in the history of the Atlantic Forest,” says Luis Paulo Ferraz, Executive Secretary of the Associação Mico-Leão-Dourado (AMLD, Golden Lion Tamarin Association), situated in Silva Jardim, in the state of Rio de Janeiro. It is true that “among the common howler monkeys and the brown howler monkeys, almost 90% of infected animals end up dying. This does not mean that they are good hosts for disease.

It means they are its victims. When these deaths occur, it is a warning sign for the human population to immediately seek vaccination, in order to provide prevention and protection in the face of spreading yellow fever. In other words, monkeys do not transmit the disease; in fact, they help us prevent it,” explains Fabiano R. de Melo, Professor at the Federal University of Goiás, Jataí region, and Visiting Professor at the Federal University of Viçosa in the State of Minas Gerais, member of the Deliberative Council of the Muriqui Instituto de Biodiversidade (MIB, Muriqui Institute of Biodiversity), as well as a partner at Legado das Águas. “Thankfully, the number of deaths among other primate species, such as the woolly spider monkey and marmoset, are considerably lower, between 10% and 30%,” Fabiano points out.

PROBABLE CAUSES FOR THE DISEASE

Although we do not know for sure the main reasons causing the increase in yellow fever, there are some important indications. “Not only in Brazil, but in South America and in other tropical areas, yellow fever and other diseases have been spreading because of the increase in deforestation and environmental degradation. The pressure that has been put on the natural habitat has led to the release of a number of diseases which, beforehand, were limited to wild areas. Besides this, there is the growth in the human population leading to more contact with wild species,” Professor Fabio adds. Luis Paulo, from AMLD, comments that, “It is highly likely that deforestation and the use and disorderly occupation of land has contributed to spreading the disease.”

Mauricio Talebi, Professor of Environmental Science at the Federal University of São Paulo and Coordinator of the Woolly Spider Monkey project (Projeto Muriqui) at Legado das Águas, believes that there could be other factors responsible for spreading these tropical diseases. “Among them is the elimination of the mosquitos’ natural predators. The death of the Doce River, for example, might well have devastated a large part of the food chain in the macro region, creating the conditions for a proliferation of mosquitos. Furthermore, there is much misinformation and a lack of awareness on the part of the general population,” Talebi adds.

According to Luis Paulo Ferraz, unlike the howler monkeys in Minas Gerais, there has been no confirmed case of any golden lion tamarin being infected with yellow fever, up until now. The Executive Secretary of AMLD, reports, “Some of the dead animals we found were taken for examination, but fortunately the disease was not found. What did occur were two isolated cases of animals being killed through human ignorance. The animals’ bodies were taken to the Health Surveillance Authority with severe fractures and evidence of violence.” Through communication means, on social media and other actions taken, Luis Paulo has tried to raise the local population’s awareness with regard to the mistake in killing these animals instead of recognizing that they are important ‘sentinels’ against the disease. At the end of the day, they are as much victims of yellow fever as we humans are. ■

primates



Yellow fever is a serious threat to the work we have been doing. If what happened to the howler monkeys in Minas Gerais happens to the golden lion tamarin, the entire population could be wiped out. If this were to occur, the pioneering efforts made from 1984 to 2000 of reintroducing animals from zoos to save the species would have to start from scratch.

Luis Paulo Ferraz, Executive Secretary of the Associação Mico-Leão-Dourado (AMLD)

Almost 90% of the infected common howler monkeys and brown howler monkeys end up dying. They are victims of the disease. When these deaths occur, it is a warning sign for the human population to immediately seek vaccination.

Fabiano R. de Melo, Professor at the Federal University of Goiás, Jataí region, and Visiting Professor at the Federal University of Viçosa



Among the probable factors responsible for spreading tropical diseases is the disappearance of the mosquitoes’ natural predators. The death of the Doce River, for example, might have devastated a large part of the food chain of the macro region, creating the conditions for a proliferation of mosquitos. Furthermore, there is much misinformation and a lack of awareness on the part of the general population.

Mauricio Talebi, Professor of Environmental Science at the Federal University of São Paulo and Coordinator of the Woolly Spider Monkey Project (Projeto Muriqui) in Legado das Águas



SOCIAL EFFORTS

Legado das Águas is not an island. It is situated in a region where the lowest HDI in the state creates a number of serious challenges for society. One of Reserva's missions is to serve as a catalyst for social and economic initiatives that contribute to the development of the local area, considering that regional development is a prerequisite for the activities performed by Reserva.

into the wants and needs of the local towns and raise some of their main demands, as well as developing a social agenda in partnership with the Instituto Votorantim. Through these actions, we want to take action to help the local area to find their vocations and create the conditions to improve the Human Development Index in the area," says Simone Conte, Legado das Águas' Social Responsibility Consultant.

IT IS NOT ENOUGH FOR LEGADO DAS ÁGUAS TO SIMPLY FOCUS ON WHAT IS HAPPENING WITHIN ITS BOUNDARIES. IT NEEDS TO LOOK BEYOND AND OFFER SUPPORT, KNOWLEDGE AND TOOLS TO THE LOCAL TOWNS, SO THAT THEY TOO CAN GROW AND DEVELOP

In 2017, social projects accounted for 77% of all investments made in Legado das Águas.

For this reason, Reserva has created a number of activities which contribute to improving public administration, encouraging enterprise and promoting tourism with the support of partner companies and the Instituto Votorantim (Votorantim Institute).

"In 2017, we celebrated five years since the implementation of our social effort strategy in Legado das Águas. This great relationship has allowed us to carry out a wide-ranging study



Our aim in implementing these programs is to promote environmental conservation and to create shared value.

Simone Conte, Social Responsibility Consultant, Legado das Águas

AGP - APOIO À GESTÃO PÚBLICA (PUBLIC ADMINISTRATION SUPPORT PROGRAM)

One of the main efforts within the program was to finalize the Plano de Turismo Integrado Regional (Plan for Regional Integrated Tourism), including the townships of Juquiá, Miracatu and Tapirai, formulated with the partner company Diagonal. "The plan introduces a complete inventory of all activities related to tourism in the three towns. Among other information relevant to the sector, maps have been created and a complete study of the supply and demand for tourism in the area was undertaken. Besides this, training workshops were held for public administrators and representatives in the hospitality and restaurant industries with the aim of providing more integration within the tourism sector. "The region has enormous potential for tourism. Now, we just need to know how to tap into it," Simone Conte comments. The Plan will also be useful when the towns apply for the Town of Touristic Interest program.

EMPREENDE TAPIRAÍ (TAPIRAÍ UNDERTAKING)

This program was set up by Legado das Águas to encourage entrepreneurship in the region of Tapirai, paying particular attention to the characteristics and features of the local economy. The first training sessions involved around thirty people and were held in 2016. After that, in 2017, the best projects were selected to receive important training in managing a business, leadership and technical assistance from the Instituto Meio (Meio Institute), the partner responsible for the program. At the end of the process, the following entrepreneurs received initial assistance to set up or boost their businesses:

- Associação Cabocla do Bairro Ribeirão da Anta (local association);
- Confeitaria Pão Divino (bakery);
- Gengibre & Cia. (beauty and personal care);
- Vale Vivo, which produces organic banana flour.



Sonia dos Santos, Leader of the Gengibre & Cia. project

ReDes - REDES PARA O DESENVOLVIMENTO SUSTENTÁVEL (SUSTAINABLE DEVELOPMENT NETWORKS)

ReDes was formed in partnership with the Instituto Votorantim and is expected to last five years. It started in Juquiá and Tapirai in 2016, with a focus on helping structure businesses through the articulation of production chains and investment in projects. One of its main propositions is to strengthen the associations between its members by means of strategic



We found out about the program during a workshop held by the Instituto Meio. We did all the training. It was all very useful in learning how to get the business off the ground. We are a family business, and we use the projects' resources to outsource the processing of raw materials and to acquire packaging and labels. Now, we sell our product in the Organic Market at Água Branca Park in São Paulo city.

Jonatas Malta da Costa, one of those responsible for the company that produces organic banana flour



APIVALE meeting

planning workshops that map out the businesses' needs and help build goals and action plans.

Throughout 2017, the APIVALE - Associação dos Apicultores do Vale do Ribeira (Beekeepers' Association of the Vale do Ribeira) in Juquiá and the ARCPHPN - Associação Rural Comunitária de Promoção Humana e Proteção à Natureza (Rural Community Association for Human Improvement and Protection of Nature) in Tapirai, have benefitted from ReDes. "The businesses that received support via ReDes showed great improvement in their production management, which generates access to new markets and an increase in income generation," Paula Ebeling, consultant at the Instituto Votorantim, points out.

Main actions taken together with APIVALE and ARCPHPN

- Establishing, monitoring and implementing action plans;
- APIVALE's refurbishment of the Casa do Mel headquarters;
- Start of collective roadside sales with ARCPHPN;
- Group structuring for new investments;
- Start of institutional strengthening.

Development

VALUING OF CULTURE AND INCLUSIVE EDUCATION

One of the most touching moments of 2017 for Legado das Águas was the launch of the book *Ribeirão da Anta – Resgate histórico de uma comunidade tradicional cabocla de Tapirai – SP (Ribeirão da Anta – the Historical Rescue of a Traditional Cabocla Community in Tapirai – SP)*. This happened during a session at the Tapirai City Council, held in the presence of several community inhabitants and some descendants of the pioneers who lived in the region in the 1930s.

The book, which brings together dozens of reports, interviews and numerous photos by Maurilo Casemiro from the Resolve consulting firm, recounts, in rich detail, the saga of four families who left their original cities and journeyed deep into the forest for days on end until they established the area known today as Ribeirão da Anta, starting a true *Cabocla* community in the interior of the State of São Paulo.

PUBLISHING A BOOK RESPONSIBLE FOR REVIVING THE STORY OF THE RIBERÃO DA ANTA COMMUNITY AND THE ACTIVITIES SHARED IN PARTNERSHIP WITH THE INSTITUTO VOTORANTIM ALSO MARKED THE YEAR OF 2017

"For us it was really important to understand how the current community representatives in Ribeirão da Anta were portrayed in the book. Many of them, until that moment, did not know their forefathers' past. Now, through the book, we were able to share with them the difficulties and challenges they underwent," explains Simone Conte, consultant for Social Responsibility at Legado das Águas. Through this important effort to give value to the history and culture of a traditional population, the Municipal Chambers of Tapirai granted Legado das Águas the Recognition Award.



I was incredibly happy when the book was published as it is both preserving and publicizing our history. Even in Tapirai, there are very few people who know Ribeirão da Anta's past.

Cilene Faria de Moraes, great granddaughter of Gumerindo and Marian, the first inhabitants of the community and president of the Associação Cabocla do Bairro Ribeirão da Anta (Cabocla Association of the Ribeirão da Anta)

Besides the launch of the book, here are further activities that took place in the Ribeirão da Anta community:

- Inauguration of Cozinha Cabocla e do Centro de Tradições Caboclas do Ribeirão da Anta (typical culinary and Ribeirão da Anta Center for Cabocla Traditions);
- Associação Cabocla do Bairro Ribeirão da Anta's cultural exhibition in Piedade;
- Institutional Strengthening Workshop – Mapping Work Fronts and Association Vocations;
- Workshops on Solid Waste and Snakes



Associação Cabocla do Bairro Ribeirão da Anta's cultural exhibition

PVE, PARCERIA VOTORANTIM PELA EDUCAÇÃO (VOTORANTIM PARTNERSHIP FOR EDUCATION)

The quality of public education in Brazil still presents an enormous challenge to overcome and is one of the main factors responsible for the low levels of development in the country. Some indicators point to the fact that poor management of public investment in the sector has meant that Brazil loses R\$ 56 billion each year. In an attempt to reverse this scenario, the PVE - Parceria Votorantim pela Educação was created in 2008 to contribute to improving public education in the 57 regions and 16 states where the company has activities by socially mobilizing local communities and promoting good management practices.

The program was developed by Legado das Águas in Vale do Ribeirão and adhered to Instituto Votorantim's guidelines, offering two models. The individual PVE provides specific services specific to the region with localized, focused activities and efforts. The PVE Hubs provide services geared towards two or three regions within the territory. In this case, some of the activities and efforts are individualized while others are collaborative. "In 2017, the town of Juquiá worked as a hub together with Miracatu and Jujuitiba, allowing more significant interaction and an exchange of experiences between the Secretariats for Education," said Elaine Izabel de Moura, education analyst at Legado das Águas.

Throughout the year, a number of activities were held aimed at strengthening educational management and developing projects with students within these regions. All this was achieved through training and mobilization involving the school community. The activities included:

- Training with technical staff for the local Secretaries for Education in Juquiá, Miracatu and Juquiá;
- Training with public school principals and coordinators in Juquiá;
- Developing the Criativos da Escola (School Creatives) Workshop with students from the regional and state public school system in Juquiá aimed at encouraging creativity based on interaction, experimentation and collaboration among youths;
- Defining the project's theme: A escola é para todos! (School is for Everyone!) #PorUmaEducaçãoInclusiva;
- Participating in the II Conferência Escolar para o meio ambiente (School Conference for the environment) in Jujuitiba;
- Workshop on the importance of biodiversity in the Atlantic Forest in the Vila São José school, in Miracatu;
- Planting seedlings with students from APAE and the regional public schools in Juquiá. ■

In 2017, the PVE was present in

53 Brazilian municipalities and 16 Brazilian states;

795 schools benefitted;

More than **700,000** students were impacted.

Memories



NATURE REVEALED

There is no better scenario for one of Brazil's most renowned nature photographers than Legado das Águas, a rare area of land with around 75% of its territory in an advanced stage of conservation. In the last six years, while walking for hours along the trails, climbing and descending hills, climbing trees of more than 10 meters or wading the many water courses that cut through Legado, Luciano Candisani has managed to capture the most surprising images that reveal the exuberance of the Atlantic Forest's biodiversity and share it with the public.

Some of his images even travelled the world and become iconic references within the region, such as the albino tapir, photographed in 2015. Nevertheless, more than just capturing a photo of

an isolated animal, Candisani sought to develop visual narratives that awaken the eyes of those who see it. For this reason, he created the Legado da Mata project. "My aim is to produce images that transmit the concept of a forest that is alive and healthy, precisely what Legado das Águas is," he explains. With this, he has been putting together a unique collection with images used for several purposes (see box).

From 2017 onward, after having photographed hundreds of species of plants and animals (many of them rare or endemic to the Atlantic Forest) and representatives of the communities which live in the region of Legado, Candisani has chosen to focus his work on accompanying researchers working in Reserva.



"My idea is to create a record of people doing fieldwork, recording their activities and creating a link between the work being done by the scientists and the conservation of the forest. After all, this is the only way everyone can understand the need to protect an area as rich as this," he tells us.

The photo to the left, for example, captures exactly this. Biologist Mauro Rebelo needed to collect some DNA from a specific plant located at the top of a tree. To do so, Candisani, Rebelo and Luciano Zandoná, another partner, needed to choose a tree and, using ropes and pulleys, get to the top. After a few hours' work, Mauro finally found the tree he was looking for. It was by no accident that this photo was on the front page of the *Folha de São Paulo*, in April 2017. ■

IMAGES OF LEGADO IN THE MEDIA

The photos taken by Luciano Candisani, who took most of the images used in this publication, are also used in several different forms of communication with the public. The following are some examples from 2017.



Copy of the front page of the newspaper *Folha de São Paulo* from April 17, 2017, showing biologist Mauro Rebelo in action at the top of a tree in Legado das Águas



Anambezinho

Buff-throated purple tuft



A RARE BIRD

Those who walk along the trails at Legado das Águas are able to appreciate dozens of species of bird. But few are as emblematic of the Atlantic Forest as the *anambezinho* (*Todopleura pipra*). "It is a species that depends on well preserved environments to survive and that is generally associated with the forests and lowlands in the east of Brazil," explains Wagner Nogueira, ornithologist.

The *anambezinho* lives in the tree canopy (the higher part of the tree) and feeds mainly on fruits. Its small size (it only measures about 9 cm), discreet song and preference for the canopy, means that, apart from naturally being rare, it is really difficult to locate. It is one more endangered species. Wagner Nogueira adds, "the *anambezinho* is one of the most sought after attractions by bird watchers who visit Legado and it is always one the most celebrated birds if ever it graces the observers with its rare appearance." ■

If 2017 has brought many advances and victories, the year 2018 promises to be even better, with a number of projects continuing, the implementation of new initiatives, and the structuring of new and important partnerships. Take a look:

- Broadening the legal reserve compensation contracts;
- Reforestation in public parks, third party APPs and other priority areas in the state of São Paulo;
- Increasing the production of seedlings and plants focusing on native ornamental species;
- Increasing activities in ecotourism and environmental studies;
- Improving visiting facilities for those wishing to take part in adventure tourism, especially mountain climbing, biking and kayaking;
- Improving visiting facilities for those interested in bird watching activities;
- Training local environmental monitors (guides);
- Inaugurating the Reservation Central;
- Intensifying rescue efforts and orchid studies;
- Seeking further partnerships to continue biotechnological research;
- Restructuring research into and monitoring of butterflies and various species of mammal, such as the tapir, the jaguar and miqui monkey;
- Broadening studies into herpetofauna;
- Improving security in the area of Reserva and environmental monitoring. ■

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