IMPACT REPORT 2021

coral GUARDIAN

Coral Guardian at a glance

To protect coral ecosystems through the involvement of local communities that depend on them for their livelihood.

We are currently active in Indonesia, France and Spain, and are looking to expand into other regions in the near future.

2021 figures

More than
7,500 corals
transplanted in Indonesia

More than
400 corals
restored in the Mediterranean

364 kilos of waste recovered from the Mediterranean seabed

57 local divers
involved in the Mediterranean

2 coral nurseries
installed in the Mediterranean

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Editorial

by Marina Palacios Miñambres –
Director of our project in Spain

Very few people can say that they have been lucky enough to fulfill one of their greatest dreams. I am immensely grateful and proud to be able to say that this is my case. And this, in the best possible way, hand in hand with great people and professionals such as the Coral Guardian and Coral Soul teams. When we started the coral ecosystems' recovery project in Punta de la Mona in 2020, we hoped to achieve great things. After a year and a half of actions, we still cannot believe the results we are obtaining, and we would never have guessed what was to come, not even in our best dreams.

The beginning was not easy: first, due to the serious state of the damaged coral ecosystem in Punta de la Mona, our area of interest, as well as the great technical difficulty involved in working at the required depths (between 30 and 50 meters deep). Likewise, when setting the objective of recovering one of the most unknown coral species in the Mediterranean (*Dendrophyllia ramea*, chandelier coral), many people thought that what we wanted to achieve was impossible. Ignoring these doubtful responses, and believing wholeheartedly in what we wanted to do, I presented the recovery project of Punta de la Mona to Coral Guardian's Blue Center call for projects. From the first moment Coral Guardian believed in our great challenge and supported it with its experience and resources. Are corals in danger in our seas, in the Mediterranean? We have to save them! After a detailed preparation and selection process, Coral Guardian gave us the opportunity to materialize our idea into actions.

Unfortunately, shortly after starting the collaboration with Coral Guardian, the COVID-19 pandemic crisis shut down the whole world... However, firmly believing in the project and ready to fight for my dreams, I didn't give up to adversity. So during lockdown I kept thinking, improving, and creating the techniques and protocols to recover the area. As soon as we got the go-ahead from the regional government, the project began, and we started working on the recovery of the Punta de la Mona coral seabed. Sadly, the number of volunteers that we had expected ended up being reduced due to COVID restrictions, which meant a decrease in our ability to work and additional difficulty in the actions we were ready to lead.

When the situation improved, we were able to open the project to everyone and quickly trained the team thanks to the help of divers, scientists and sea lovers who believed in our cause. Regional universities were interested and turned to support the project, since both the scientific knowledge of the area and the species prioritized in the project were very limited. This project represented an opportunity for scientific research on cold-water corals. All the scientific research that we develop will create a scientific basis in order to increase knowledge for the conservation of the chandelier coral, as well as justify the need to reinforce the protection of the area.

Today, the capacity of our ecosystems to become resilient has been seriously compromised, which is why the development of programs such as the one we have initiated in Punta de la Mona is so important. Our technique is based on the recovery of a local ecosystem, but our project aims to create a conscious change on a global level. With such positive and promising results, this pioneering project hopes to open people's eyes by highlighting the need to protect the oceans and the benefits of restoration projects on marine ecosystems, thus marking a before and after in the history of recovery of cold-water coral ecosystems.

When you protect and facilitate the rehabilitation of a marine area, the changes are amazing!

By working constantly and daily on the recovery of this ecosystem, I have been able to evidence its changes, to identify phenomena what could have gone unnoticed with the naked eye, thanks to random observations: the growth of a cold-water coral, the cooperation of fish in coral nurseries helping us save corals, the influence of currents on corals' well-being... We've only been working on the project for a year and a half and the change is impressive. Local divers who have been touring the area for years approach us to tell us that it doesn't look the same. Waste is no longer found in the rehabilitated areas, the corals that were damaged on the ground now show off their open and healthy polyps again on the seabed, the fish that already know us play with us and help us when we are cleaning the corals. The recovery of these corals' health has caused an explosion of life in Punta de la Mona. I can't help but get emotional when I see how the sea is grateful that we dedicate our lives to saving it, because if there is something worth fighting for, it is for life.

There are not enough words to thank each and every one of the people who make this project possible, but especially Coral Guardian, for giving me what has been the opportunity of a lifetime and for supporting us day by day with their dedication and experience. To the members of Coral Soul and the Deep Core project's team, since, we have created this great "coral saving family" together. And of course Buceonatura, Different Scuba School, Buceo Aqualia, Tavolara diving, Black Pearl, PSS, GUE and the Universities of Cádiz and Seville.

Thank you and a thousand times thank you. I want you to know that I am very proud of the affection, dedication and effort everyone has had towards this project. You make it possible, and the engine of these great results is the passion we feel for what we do.

Together, we will save corals!

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Teams

In France (employees ○ and volunteers ○)

MARTIN COLOGNOLI
CO-FOUNDER AND DIRECTOR

FLORINA JACOB
FIELD AND SCIENTIFIC PROJECT MANAGER

COCO TAMLYN
COMMUNICATIONS MANAGER

AUDREY MAILLARD
PARTNERSHIPS MANAGER

DR. OLIVIER DETOURNAY
PRESIDENT

CAROLINE BOURGEOIS
GENERAL SECRETARY

RUXANDRA TODERASC
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ANNE-SOPHIE MOURAUD
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DR. LEÏLA EZZAT
POSTDOCTORAL FELLOW AT THE UNIVERSITY OF CALIFORNIA

LOMANO TAKASI
AMBASSADOR

LAURIE-ANNE DELANNOY
TRANSLATOR

YANN FARINES
IT EXPERT

JULIEN BROCHARD
DEVELOPER

In Indonesia (employees)

JONASH CASTILO MURDINI
LOCAL DIRECTOR

VALENTINA LIMEK TUKAN
TOURISM MANAGER

ABDULLAH WEO
RESPONSIBLE FOR MEDIATION WITH FISHERMEN

SUHARDIN RONI
CAPTAIN

MURDIANTO
CORAL TRANSPLANTOR

MUSLIMIN
CORAL TRANSPLANTOR

SAHRIL
CORAL TRANSPLANTOR

IMMACULADA HANA
ENGLISH TEACHER

In Spain (employees ○ and volunteers ○)

MARINA PALACIOS MIÑAMBRES
PROJECT DIRECTOR

FERNANDO GARCÍA ALARCÓN
PRESIDENT OF THE NONPROFIT EQUILIBRIO MARINO

RAFAEL CAMACHO
TECHNICAL DIVER, VOLUNTEER PHOTOGRAPHER AND VIDEOGRAPHER, DIRECTOR OF A PARTNER DIVING CENTRE

SALVADOR BLANCO
VOLUNTEER TECHNICAL DIVER, CORAL TRANSPLANTER

NACHO MARTÍN
TECHNICAL DIVER AND VOLUNTEER REBREATHER, CORAL TRANSPLANTER

JAVIER SANCHEZ
VOLUNTEER UNDERWATER PHOTOGRAPHER, DIRECTOR OF A PARTNER DIVING CENTRE

> “Through Coral Guardian, since 2012, we want to bring forth a message of global hope where living things, of which we are an integral part, would have their rightful place. We have chosen to put ourselves at the service of coral ecosystems to make them known as widely as possible and thus protect them as best we can.

- Martin Colognoli,
co-founder of Coral Guardian

In the field

Reminder of our marine conservation model

Our nonprofit organisation works in three main areas: protecting and restoring coral ecosystems by involving local communities, raising awareness of the importance of coral ecosystems around the world, and using science to contribute to scientific knowledge about coral ecosystems and their restoration, all according to the interests and needs of local communities. Our model of marine conservation is participatory, both locally and internationally.

Following the success of our pilot project in Indonesia, which is ongoing, our Blue Center coaching and training programme has enabled us to support new coral restoration projects throughout this year.

The Blue Center

The Blue Center is a training and support programme that was created to address the crisis of coral ecosystem degradation around the world, through sharing our participatory marine conservation model. The aim is to pass on our knowledge and experience gained since the beginning of our actions in 2012, through the accompaniment of local actors who wish to develop their own coral restoration project, involving local communities.

This support can be long or short term, depending on the needs of the project in question.

Long-term support: projects receive regular technical, scientific, communication and financial support and follow-up.

Short-term support: projects receive one-off support on a specific technical, scientific, communication or administrative issue.

Beyond our support and collaboration with these projects, the idea is to allow them to become autonomous regional training centres. They will thus be able to offer other actors in the region their advice and support in developing other projects for the protection and restoration of coral ecosystems.

In 2021, we continued the long-term support of projects around Hatamin Island in Indonesia, which started in 2015, and in Punta de la Mona in Spain, which started in 2020.

In addition, a new short-term project joined the Blue Center, this time in Martinique. We supported two nonprofit organisations, founded by young Martiniqueans, working to protect the coral reefs near the town of Sainte-Anne.

Pilot project in Indonesia, in the Flores Sea

REMINDER OF THE PROJECT

Our pilot project around Hatamin Island continues to evolve ever since it began in 2015. As a reminder, this reef had been destroyed by dynamite fishing, with a substrate made unstable and dusty, providing a hostile environment for marine biodiversity and affecting the livelihoods of the surrounding populations. Since 2015, our team has been working closely with the inhabitants and government of the fishing village of Seraya Besar, located opposite our restoration area, to restore and protect this reef through several actions:

- transplanting corals to the area by collecting fragments from the oldest and healthiest restored colonies, which are then attached to metal tables that serve as a stable substrate for their growth and the return of biodiversity;
- biological monitoring of the growth and health of restored corals and associated biodiversity;
- the ongoing protection of this Marine Protected Area, that was officialised in 2019, which allows for the accelerated recovery of the reef;
- outreach activities on coral reefs for tourists, boat captains and in local schools.

The aim is to continue to increase coral cover to recover the ecosystem and support the livelihoods of local communities that depend on fishing and tourism.

THE YEAR 2021 IN BRIEF

Despite the limitations of the pandemic, our local team is in good health and has been able to continue its work to restore and protect the coral reefs. We are very proud of this stable and dedicated team, whose members have not changed since the start of 2019.

Due to the pandemic, there was no international tourism, and our eco-volunteering activities on the restoration area are still on hold. However, there was some local tourism and our team was present on the island on a rotating basis to educate local tourists and boat captains during their visits to our restoration area.

In terms of restoration actions, our team continues to focus on our technique of asexual propagation of corals through fragmentation and transplantation onto new structures. A total of 7,575 corals have been transplanted onto our marine protected area thanks to our Adopt a Coral programme, and the support of our partners.

Our local team continues to attend English classes with our English teacher Imaculada Hane, so that we can continue to raise awareness among international tourists upon their return to our marine protected area following the pandemic.

LAUNCH OF THE SECOND COEUR DE CORAIL

In 2016, a project called Coeur de Corail (“Heart of Coral”), had allowed our team to restore 10,000 corals onto 67 structures arranged in the shape of a large heart on the Marine Protected Area. This project was developed over 3 years, thanks to the support of the Daniel Jouvance Foundation, but the positive impact of this project on marine biodiversity and on the lives of local communities continues to this day. It is even largely thanks to this action that our local team was able to train in restoration and biological monitoring techniques specific to the area.

In 2019, three years after the start of this operation, 15 times more fish have been counted in this area, while the control area has even suffered a decrease in terms of biodiversity, which proves its usefulness in terms of the recovery of the ecosystem.

> “In 2021, and following the success of this first operation, a second Coeur de Corail project was launched [...]”

In 2021, and following the success of this first operation, a second Coeur de Corail project was launched, again thanks to the support of the Daniel Jouvance Foundation and the planning actions of the local team. The objective is to restore 10,000 corals over three years, to develop the knowledge and skills of the local team regarding the restoration and management of marine resources, and to raise awareness among local communities on the importance of reefs and of the actions that are being implemented.

Several actions have already been carried out this year, and this project is well underway.

Firstly, an initial brief biological description of the site chosen for the installation of this Coeur de Corail was carried out by members of our local team, in order to ensure its relevance to the development of the project in both environmental and logistical terms. This also allows the local team to understand the initial conditions, and will therefore help to describe the impact on the biological community throughout the project.

Secondly, considering the size and duration of the operation, a plan for the construction and installation of the coral structures was programmed over three years, in collaboration between the Indonesian team and the French team. This allowed the local team to be involved in the planning and implementation of this new Coeur de Corail from the beginning.

Following this stage, the transplantation actions could begin. The selection of the mother colonies for the coral fragments was based on indicators of health (bleaching and mortality rates of the coral) and growth of our oldest corals, derived from monthly monitoring that is conducted by the local team. Corals in the best condition were selected for the cutting of fragments which were then installed on the first 22 structures of this second Coeur de Corail, between 2 and 8 metres deep within the Marine Protected Area, between June and December 2021. Each table contains 150 coral fragments from our oldest structures: a total of 3,300 corals have been restored this year.

The monitoring methodologies defined and implemented by the local team, measure not only the growth of the transplanted corals, but also the impact of the actions on the ecosystem in terms of the change in substrate. Some positive results are already visible! For example, the height of the reef (indicative of the habitat supply for marine biodiversity) has increased from 2 cm to 31 cm on average, suggesting greater shelter for local fauna. Indicator species for the health of the reef such as brown groupers (*Epinephelus quoyanus*), carnivorous fish, have also been reported in the restored area.

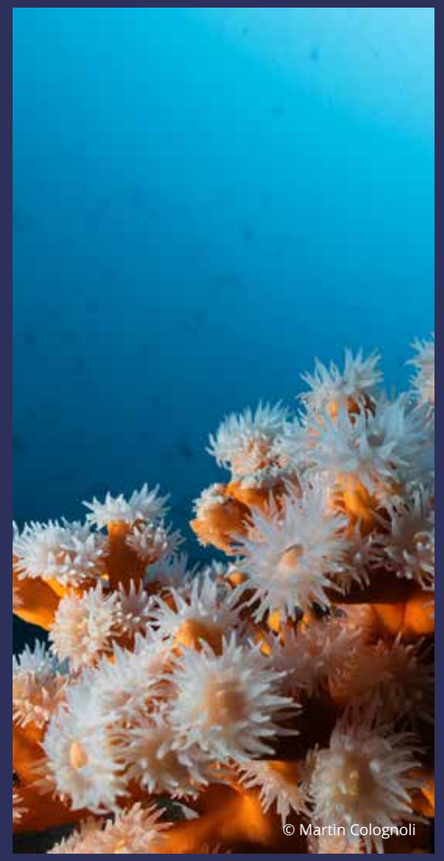
Project in Spain, in the Mediterranean Sea

REMINDER OF PROJECT

In 2021, our NGO continued its collaboration with the team of the local nonprofit Equilibrio Marino, in the area of Punta de la Mona in the south of Spain in the Mediterranean.

As a reminder, this area is considered a Zona Especial de Conservación (“Special Area of Conservation”) by the Spanish government, as it has a great abundance of marine biodiversity. Unfortunately, despite these measures to protect the area, it is very much affected by pollution from fishing, coastal development and irresponsible tourism which all threaten the ecosystem. Corals often become entangled in abandoned fishing nets which eventually break and detach the corals from the substrate, or injure their tissue, threatening the entire ecosystem and local communities.

The main objective of the project is to restore and protect this area through seabed clean-ups, coral restoration and raising awareness among the local community. This will increase the resilience of the ecosystem and enhance the value of the ecosystem for local communities. Our mission focuses on two coral species threatened with extinction in the region: the chandelier coral (*Dendrophyllia ramea*) and the orange coral (*Astroides calycularis*).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ACTIONS TO RESTORE THE CORALLIGENOUS BEDS


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Cleaning the seabed is the first step before coral restoration can be carried out. This action is very important because it allows the collection of waste that impacts the ecosystems and biodiversity on site, thus preparing the ground for the next steps of restoration. The cleaning actions are implemented through very clear and strict protocols developed by the team, in order to ensure the safety of the divers and to optimise the positive impact on the ecosystem.

In 2021, twelve clean-up actions were carried out by the local team with a total of 399 kg of debris collected from the seabed between 20 and 50 metres depth. In particular, the actions were concentrated up to 32 metres deep, through which the team of divers was able to remove the pollution present on the seabed, which was entangled in the coral present in the area.

Following these cleaning actions, colonies of broken or damaged corals were collected and treated according to their state of health. The most damaged chandelier corals are transferred to one of our two nurseries in order to be cared for and cleaned by the team for several months and to recover their tissues before their final transplantation onto the natural substrate. In 2021, 84 chandelier corals were treated in our nurseries, 24 of which have already recovered their health and been transplanted into their natural environment using a non-toxic resin called bio epoxy.

The chandelier and orange corals that had not been too badly damaged by pollution were transplanted directly into their natural environment without a stage at one of our nurseries. In 2021, 328 corals were transplanted back to their natural environment.

In terms of coral species, a total of 139 colonies of chandelier corals have been restored on the seabed, and 273 colonies of orange corals, for a total of 412 coral colonies restored on the Punta de la Mona seabed in 2021!

THE SOCIAL ASPECT OF THE PROJECT

The project was very well received by local and regional stakeholders.

To begin with, thanks to the consistent work of the local team, the regional and local government granted us the required authorisations for our interventions on the seabed at Punta de la Mona. With this support, all the restoration actions could take place, benefiting the marine environment in this area that is so special and unique in terms of biodiversity.

Several diving centres, technical and recreational divers, boat captains, and the port of the village of La Herradura, among other actors, were very interested in the project and wanted to contribute in different ways: they were involved in the project and took part in various actions, such as cleaning the seabed, sorting waste in the port, recovering broken or damaged corals, or raising awareness of these actions and the importance of these coral ecosystems among local inhabitants.

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The team also visited schools in the region to explain our actions to the younger generation, and to allow them to better understand the importance of corals for local marine biodiversity but also for humans who depend on corals for their livelihoods as both an economic and food resource.

The project has also developed partnerships with two local universities (the University of Seville and the University of Cadiz) to collaborate on the study of coral ecosystems and the species that are prioritised within the project. These species are little known due to the difficulties in accessing them.

A total of 433 people were involved in the project or made aware of the importance of coral ecosystems locally in 2021.

In 2022, the project will aim to restore and clean up even deeper and more inaccessible areas, diversify its sources of funding, and develop new awareness-raising tools to ensure the long-term sustainability of the project.

CORAL GUARDIAN FRANCE TEAM'S VISIT TO THE PROJECT

In August 2021, the Coral Guardian France team went to Punta de la Mona to meet the local nonprofit's team for the first time, as part of their collaboration for coral restoration in Punta de la Mona, and to discover marine biodiversity in the area and the progress made on site.

This short week was filled with unforgettable encounters, as well as seabed cleaning actions, and restoration of chandelier and orange corals in the Punta de la Mona area.

These precious moments were filled with fruitful meetings, magical dives surrounded by splendid rocky surfaces of orange coral, unique chandelier coral gardens, strong currents, very heartwarming meals, and exceptional encounters with large groupers, octopuses, girelles,... A week that did us a lot of good, and greatly motivated us in developing our actions in the Mediterranean even further!

Find all the members of the team in Spain on page 11.

LOCAL STRUCTURE TRANSITION

In view of the positive results and the rapid evolution of the S.O.S. Corales project, in December 2021, part of the Equilibrio Marino team has decided to strengthen its efforts for the conservation of coral ecosystems specifically, by creating the Spanish nonprofit Coral Soul. From the start of 2022, our efforts for the conservation of coral ecosystems in the area will be carried out in collaboration with this new nonprofit organisation. Coral Soul will now be responsible for the implementation of the Deep CORE (Deep Coral Restoration) project, which aims to continue all actions including coral restoration, seabed cleaning and local awareness using the same methodologies carried out by most of the members that have been part of the project since the beginning.

WWW.CORALSOUL.ORG

CORAL SOUL

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Project in Martinique, technical short-term support

In 2021, our team began to support two nonprofits led by a group of young people from Martinique within the framework of our Blue Center. These two nonprofits, Guardians of the Earth and Roots of the Sea, are composed of young Martiniqueans that aim to protect the environment on the island of Martinique, in the Caribbean.

Guardians of Earth

Their actions include raising awareness of the degradation of marine and coastal ecosystems, promoting the sustainable use of natural resources and cleaning up endangered ecosystems, while respecting local cultures and ways of life.

These nonprofits contacted us through the Blue Center for the first time in 2019 to request technical support for the design of their coral restoration project in the south of Martinique: *Matinik Coral* project.

After months of discussions, at the beginning of 2021, we launched our collaboration to accompany them in the design phase of their restoration project, and more concretely, in the definition of the project's objective, as well as in the identification of priority sites for coral restoration. This first phase allowed us to move forward with the creation of a document to officially present the Matinik Coral project and request authorisations from local authorities.

THE CONTEXT

The island of Martinique, located in the heart of the French West Indies in the Caribbean, has 435 km2 of coral reefs, home to 49 species of coral, 16 of which are protected within the Martinique Regional Nature Park. Local communities depend on these ecosystems to support their livelihoods, particularly for tourism, fishing and coastal protection of villages.

Despite the importance of these ecosystems, they are degraded due to various factors such as pollution from human activities, coral diseases, temperature increase due to climate change and unsustainable development of tourism activities (boat anchoring, mass tourism).

In the south of Martinique, coral reefs near the village of Sainte-Anne are among the most degraded in the whole of Martinique. This trend has been identified not only by government agencies such as IFRECOR, but also by the inhabitants of the village, who testify to the degradation of the ecosystem on which they depend on for a living.

> "[...] the aim of this project is to encourage the involvement of local communities [...] in coral reef restoration [...]"


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THE PROJECT'S TEAM

MARCUS PIERRE-FANFAN
Project coordinator - Guardians of the Earth

MARINE REJON
Questionnaire Implementer - Roots of the Sea

FRÉDÉRIQUE FARDIN
President - Roots of the Sea

ALEX DOBAT
Collaborator and director of the Natiyabel diving centre - Guardians of Earth

THIS YEAR'S PROGRESS

The first step in the design of this project was to describe the perception communities of Sainte-Anne had towards coral reefs of the area, in order to include this information in the identification of potential sites for restoration. For this purpose, a questionnaire was carried out in collaboration with members of the two nonprofits. The objective was to understand locals' conception of the state of coral reefs in Sainte-Anne, the threats they face, and priority sites for action.

Despite mobility restrictions due to the COVID-19 pandemic, the local team was able to collect 32 responses from inhabitants, mostly fishermen and school children living within 5 km of the coast, and thus considered as direct beneficiaries of the reef. 72% of the participants identified a degradation in coral reefs in the last 5 years, on two sites in particular (Anse Caritan and Pointe Marin). 94% felt that it would be relevant to implement coral reef restoration actions.

These elements allowed for the creation of the preliminary ideas for the project, while giving a voice to local communities to better understand the context of the project.

THE NEXT STEPS FOR THE PROJECT ARE AS FOLLOWS

1 **Establish the biological diagnosis of the potential areas for restoration:** identification of the different biocenosis, description of the coral species present, identification of the state of health of the ecosystems and the pressures exerted on them. This step is essential to define the specific objectives of the project and of the restoration methods.

2 **Draw up the business plan.** This precise financial description will enable the search for financing and partnerships to ensure the sustainability of the project.

3 **Identify opportunities for collaboration** with government entities to obtain permits and develop the project.

The training manual

As part of our support to various projects around the world with our Blue Center, we have created a training manual. This manual contains key concepts and advice on the biological, social and financial aspects of developing a coral restoration project. The creation of this manual has been led by the entire Coral Guardian team for several years, and is the result of the collection of theoretical information and know-how of our team, which until now has been focused on tropical and shallow water coral reef restoration.

Following the phases of writing, organising the content, as well as collecting all the illustrations needed, we are currently in the layout and preparation phase for the launch. We hope to be able to share it with you soon!

A component with practical exercises, and concepts and advice for the restoration of cold-water coral ecosystems will be envisaged as next steps.

Raising awareness

EXHIBITION ‘CORAIL’

Our CORAIL exhibition, by our co-founder Martin Colognoli, highlights the harmony between humans and nature, and the existing solutions we can put in place to restore our natural environment.

During the entire duration of the exhibition at the Oceanographic Museum in Monaco, between 20th June 2020 and 12th January 2022, 605,167 visitors visited the exhibition and were therefore made aware of our actions. An astonishing and encouraging figure despite the difficulties linked to the pandemic.

THE BOOK ‘RÉCIF EN DANGER’

Our team took part in the elaboration of a small book on coral reefs, called Récif en Danger (‘Reef in Danger’), in collaboration with the publishing house Gulf Stream Editeurs.

Curious to know the story? Lucinda the manta ray, Paulo the crab, Rosine the seahorse, Méla the green turtle, Greg the fish-keeper and Toni the surgeon-fish, form the ESF (‘Extraordinary Shells and Fins’) club. These young adventurers will do anything to protect their reef! While spying on the adults, Paulo learns that the reef is being invaded by a colony of crown-of-thorns, the great coral devourers. They must act quickly! The ESF will have to cross the Plain of a Thousand Dangers, the kingdom of sharks and moray eels, to try to stop this catastrophe…

This book, available here, is a fun tool to raise awareness among children aged 6 to 9 about the threats corals face, and the solutions that exist to preserve them.

AWARENESS KIT

As a reminder, our awareness kit is a free tool that is open to all, and which includes a presentation with a quiz on corals, a video, a written-out speech, and an information sheet on the biology of corals and on our actions.

This year, the awareness kit has been updated by our team to include both tropical and cold water corals. It has also been translated into Spanish and German thanks to our valuable volunteers, and used by very different audiences (schools, companies, diving centres,…) and in equally diverse geographical areas (Iran, USA, France, Abu Dhabi).

ENVIRONMENTAL COLLECTIVES

Génération Mer

As you already know, in 2020 we joined the Génération Mer collective, a community of actors which acts for the preservation of the Ocean and the development of its resources and potential.

In 2021, and as part of this collective, our team took part in the World Conservation Congress in Marseille, organised by the IUCN. Our co-founder, Martin Colognoli, was able to present our marine conservation actions in the Indo-Pacific and the Mediterranean, and to exchange with various actors on marine conservation more globally.

Ocean & Climate Platform

With the aim of taking part in ocean conservation actions more scientifically and politically, we have continued our involvement in the Ocean & Climate platform.

In June, our nonprofit contributed to the report «An Ocean of Solutions for Climate and Biodiversity», which provides concrete information on the means to be implemented to move «from problems to solutions» regarding ocean protection. It was in this context that we presented our Blue Center programme, a solution that we have developed to support project leaders around the world in developing their own coral restoration programmes.

In December, our nonprofit also signed the «Ocean For Climate» declaration. Building on the work of the ocean community over the past ten years, this declaration called for COP26 to bring together strong political commitments on ocean-climate solutions including key actions that stakeholders should undertake to ensure healthy oceans, contributing to a resilient and positive future for nature with neutral emissions.

ocean-climate.org

Science

At Coral Guardian, we seek to contribute to generating and disseminating scientific knowledge on coral ecosystems, as well as the methods and impact of their restoration, both among our local teams and on an international level..

At the heart of the projects, this approach is carried out according to the interests and means of the local teams:

- firstly, through the development of scientific protocols for monitoring coral reef restoration and protection actions, in order to monitor the evolution of the actions and make adjustments to its management.
- secondly, through collaborations with universities and researchers that are set up according to the interests and possibilities of the local teams.

These actions also help to develop the curiosity of local team members around coral ecosystems.

On an international level, we aim to disseminate the results of recent scientific work on coral ecosystems through the publication of short articles that we send via our newsletter.

Indonesia

BIOLOGICAL MONITORING

This year, in collaboration with the MARRES Master's programme of the Université Côte d'Azur in France, we have made progress by reviewing the results of the monitoring carried out by the local team during the year 2020 to help describe the general state of the restored area, identify the strengths and limitations of the methodologies, as well as the options we have to optimise them.

The first result from the mapping (carried out by the local team and with the support of the Allen Coral Atlas platform tools) indicates that there are 3000 m2 of restored coral cover within the Marine Protected Area, i.e. a quarter of the entire marine area. Most of the restored reefs are located on the reef crest, at 8 metres deep, and just some on the reef flat at a depth of 2m.

This has implications for the environmental conditions to which the corals are exposed, in particular to water temperature (Davis et al, 2011). Thermometers were placed in different areas of the restored area, allowing the team to monitor this parameter on a weekly basis. Statistical analysis of the data collected shows that the water temperature of the reef flat is significantly higher than that of the reef crest (median of the bed: 31°C, median of the crest: 30°C, Dunn test p-value<0.05), which can be explained by the difference in depth and solar radiation between the two study areas.

Although this temperature difference may seem small, if prolonged over time it can result in differential exposure to thermal stress depending on the depth of the corals, and thus variable rates of coral bleaching and mortality. In order to describe the health status of the transplanted corals, mostly of the genus Acropora spp., the local team follows a weekly monitoring protocol: they count the number of colonies considered bleached (which show a loss of colour, but are not colonised by macroalgae), and those considered dead (colonies covered by macroalgae) on a sample of restoration structures distributed throughout the area.

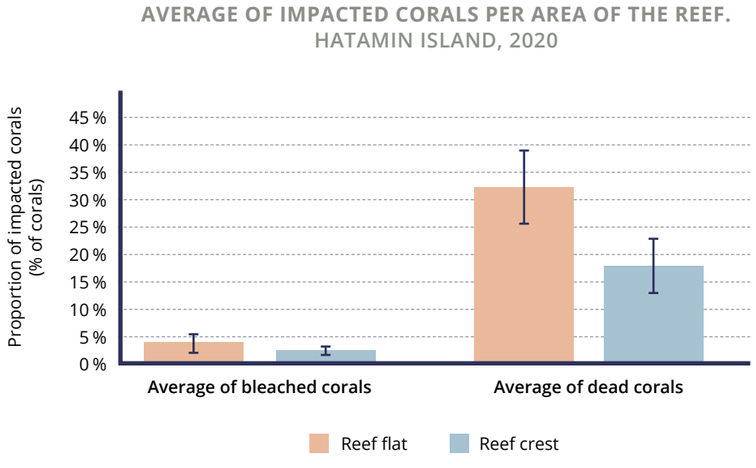


Figure 1.
Proportion of corals impacted according to their area of identification (reef flat or crest) (total number of corals on the reef flat= 2048 corals; total number of corals on the reef crest= 1942 corals). The bars show the average, and the standard deviation.

The 2020 results show that an average of 3% of the coral colonies transplanted on the reef crest were bleached, and 18% were covered by macroalgae, and were therefore considered dead (total n= 1942 coral colonies). Whereas on the reef flat, where the temperature is higher, 4% of the corals included in the monitoring had bleached (n= 2048 colonies), and 32% showed signs of mortality (macroalgae growth on the skeletons), suggesting that on this area, the corals are exposed to a higher temperature stress.

Despite the higher coral mortality on the reef flat, some scientific studies show that corals surviving a thermal stress regime are better acclimatised to later stress conditions (Guest et al, 2012; DeMerlis et al, 2022). This opens up interesting prospects for transplantation experiments with corals surviving from these areas.

Thanks to this analysis, we were able to confirm through the data what the team had observed in the field during the 2020 bleaching event, which reinforces their confidence in the methodologies and enhances their monitoring work. We were also able to identify room for improvement in the protocols, such as the value of taking water temperature samples at different times of the day to understand temperature variation. This aspect, among others, remains to be developed in the future.

BIBLIOGRAPHY

DeMerlis, A., Kirkland, A., Kaufman, M.L. et al. Pre-exposure to a variable temperature treatment improves the response of Acropora cervicornis to acute thermal stress. Coral Reefs (2022). https://doi.org/10.1007/s00338-022-02232-z

Guest JR, Baird AH, Maynard JA, Muttaqin E, Edwards AJ, Campbell SJ, et al. (2012) Contrasting Patterns of Coral Bleaching Susceptibility in 2010 Suggest an Adaptive Response to Thermal Stress. PLoS ONE 7(3): e33353. https://doi.org/10.1371/journal.pone.0033353

Spain

AREA DESCRIPTION STUDIES

A fundamental step in targeting coral recovery measures is to get to know the local species, as well as the conservation status and impacts in the area that is to be restored. Given the lack of scientific information on the Punta de la Mona area, in 2021, the local team focused on describing the area, in collaboration with researchers from partner universities in Spain.

The first studies on the spatial distribution and abundance of the chandelier coral's (*Dendrophyllia ramea*) population in Punta de la Mona were carried out, as well as the description of associated species and human impacts (debris on the sea bed). These analysis and data collection were conducted in collaboration with students of the master's degree in Oceanography and researchers from the University of Cadiz, as well as the Spanish Institute of Oceanography.
This research showed that in the deepest areas studied (48 metres deep) the number of species of epibionts (coral parasite organisms) was greater, as well as the associated fauna species. In particular, the presence of the invasive alga species Okamura's Dictyote (*Rugulopteryx okamurae*) (García-Gomez *et al*, 2019) was recorded for the first time in the area, attesting to a threat in addition to pollution related to abandoned fishing gear.

Additional information on litter cover, colony abundance, and coral colony size was collected at different depths. This information has been useful for tailoring restoration measures. The research team is currently working on processing the data in order to publish it in a scientific journal.

Additionally, samples of coral tissue, of the substrate, and of water, were taken by the team in collaboration with the University of Seville and of Cadix, in order to carry out genetic analyses of the coral population and of pollutants present in the area.

MONITORING OF INTERVENTIONS

In order to follow up on the evolution of the restoration actions, protocols for monitoring the corals and the biological community have been developed with the local team.

On the one hand, the growth and recovery of chandelier corals in the nursery was monitored thanks to a monthly photographic follow-up. The results showed a fairly rapid recovery of the coral colonies. After one month, healthy tissue recolonised the areas of necrotic tissue of the corals that were treated in our nurseries. Also, the budding of new polyps on the corals was recorded after one month of treatment on the nurseries. These observations demonstrate the positive results of the treatments implemented in the project, as well as a first step in establishing monitoring methodologies for chandelier corals, especially considering that this programme is one of the only programmes to have ever worked with this species.

For orange coral (*Astroides calycularis*), the objective of the monitoring was to describe changes in the number of species associated with the restoration area over time. For this purpose, quadrants were delineated in the area that was repopulated with orange coral colonies, and in the adjacent deteriorated areas established as a control area. There, the team of volunteer divers was able to follow the evolution thanks to photographic monitoring of the number of marine species present. Through the analysis of these photos, based on the presence and absence of species, an increase was recorded of 42% in the number of invertebrate species present in the restored area two months after the transplantation. This first monitoring exercise of the biological diversity in the orange coral recovery area allowed us to demonstrate the positive impact of our interventions on this ecosystem, as well as to raise awareness among a large number of divers.

BIBLIOGRAPHY

García-Gómez JC, Sempere-Valverde J, González AR, Martínez-Chacón M, Olaya-Ponzone L, Sánchez-Moyano E, Ostalé-Valriberas E, Megina C. (2019) From exotic to invasive in record time: The extreme impact of Rugulopteryx okamurae (Dictyotales, Ochrophyta) in the strait of Gibraltar. Sci Total Environ. 20;704:135408. doi: 10.1016/j.scitotenv.2019.135408.

France

INTERVENTION AT MARRES MASTER COURSE

As part of our collaboration with the MARRES Master's programme of the Université Côte d'Azur, and in order to share our experience in the academic environment, our French team had the opportunity to give a course to first and second year students of the programme in autumn 2021. This master's degree is an international and interdisciplinary programme recognised by the French government, which trains students in science, development and conservation related to marine resources.

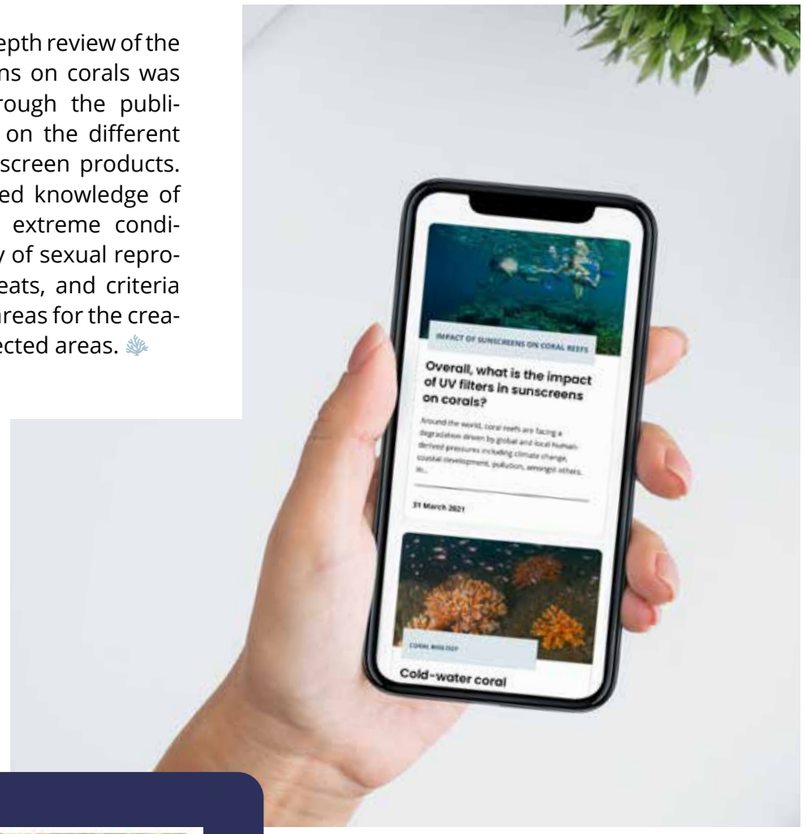
During the one-day course at Sophia Antipolis, our director and co-founder Martin Colognoli presented his background on the creation and management of Coral Guardian, and answered questions from students intrigued by the history of our nonprofit. Our field and scientific project manager, Florina Jacob, then presented the global context of coral restoration today, and introduced our two current field projects.

This day of stimulating exchanges was a first step towards this type of intervention for our Coral Guardian team, and leaves the door open for future collaborations. A huge thank you to the MARRES team for their welcome!

SCIENCE ARTICLES: REEF BLOG

Every month, our team has been publishing science articles on our REEF Blog. These articles aim to make results obtained by groups of researchers and published in scientific journals more accessible to the general public. Among the authors of the articles are students from the Biocampus nonprofit, from the Sup'Biotech school of bioengineering in Paris, Elise Viau, Coralie Barrier, Jeanne Kault, as well as the Coral Guardian team in France. Florina Jacob and Coco Tamlyn from the Coral Guardian team are responsible for editing the texts.

This year the topic of cold-water, or mesophotic, coral ecosystems was explored for the first time, in view of our Mediterranean coral restoration project. A more in-depth review of the impact of sunscreens on corals was also conducted through the publication of 3 articles on the different filters found in sunscreen products. Other topics included knowledge of corals living under extreme conditions, the synchrony of sexual reproduction and its threats, and criteria for the selection of areas for the creation of marine protected areas.



RÉCIFS CORALLIENS

Atypical corals: lessons from these organisms living under extreme conditions

Coral reefs are one of the most threatened ecosystems by human activities. Given the changing environment, corals face a significant challenge to adapt to suboptimal...

2 December 2021

CORAL REEF CONSERVATION

Marine Protected Areas: how to prioritise conservation objectives?

Why protect the oceans? Oceans support an enormous biodiversity, play a key role in climate regulation, and provide a wide range of benefits to...

29 July 2021

Events

22 MARCH

MONACO BLUE INITIATIVE

Our co-founder Martin Colognoli took part in the Monaco Blue Initiative as part of the Monaco Ocean Week.

14 APRIL

CALLS FOR CLIMATE #5 — PROTECTING & RESTORING MARINE ECOSYSTEMS BY CLIMATE CONNECT

Available **here**. Roundtable discussion on 'Protecting & Restoring Marine Ecosystems' organised by Climate Connect with our co-founder Martin Colognoli alongside Mangrove Action Project:
Dylan Skeffington / General Manager; The World Federation for Coral Reef Conservation: Vic Ferguson / Founder; DeepWave: Heye Groß / co-director.

17 MAY

LIVE WITH CORAL GUARDIAN & UMAÏ & EKUME BY BLUTOPIA

Available **here**. A lively chat between our co-founder Martin Colognoli and the French nonprofit Blutopia's team.

8 JUNE

CORAL REEFS, EU RESEARCH AND MEMBERSHIP TO ICRI: AN INITIATIVE TO CELEBRATE WORLD OCEANS DAY

Presentation by Florina Jacob and Coco Tamlyn on Coral Guardian's restoration actions with the European Commission, ICRI, Coralassist Lab.

1 JULY

MEETYOO'S DIGITAL DEEP DIVE

Our team took part in the Future of Digital Events as an environmental partner to raise awareness about the importance of coral ecosystems. Thanks to their «Meemo» game where participants could click on hidden fish throughout the event, Meetyoo raised €1375 for our cause.

21 JULY

LIVE WITH PATYKA

Available **here**. An exchange between our partner Patyka, and our field & scientific project manager, Florina Jacob on our coral restoration actions.

7 OCTOBER

LIVE WITH BOTANIC

Available **here**. Presentation by Coco Tamlyn, our communications & awareness manager, on Coral Guardian's and the importance of protecting corals.

17 NOVEMBER

SALON BOTANIC

Martin Colognoli was present at the Botanic show in Haute-Savoie to present our actions.

8 SEPTEMBER

IUCN - WORLD CONSERVATION CONGRESS IN MARSEILLE

Presentation by Martin Colognoli at the World Conservation Congress on our Blue Center programme, our projects in Indonesia and Spain, and our tropical and cold-water coral awareness kit.

27 SEPTEMBER

LIVE WITH FACEBOOK GROUP 'LE RÉCIF'

Available **here**. Presentation by Martin Colognoli of our actions in the Mediterranean Sea to a group of aquarium enthusiasts.

13 OCTOBER

POLLUTEC

During the Pollutec Mer et Littoral exhibition, Martin Colognoli was present to talk about our actions in the context of the show's theme: «Preservation of ecosystems».

26 OCTOBER

PREVIEW OF THE DOCUMENTARY CREATED BY UMAÏ

Available **here**. In this documentary, Florina Jacob, our field and scientific project manager, explains our work to restore and protect cold-water corals in the Mediterranean.

2021-2031

UN DECADE ON ECOSYSTEM RESTORATION

This year, the United Nations launched the Decade on Ecosystem Restoration, which will run from 2021 to 2031, to stimulate action by governments, businesses, nonprofits, scientists and all citizens to restore ecosystems worldwide. We took this opportunity to write an **article** on the definition and distribution of coral restoration around the world, as well as the inauguration of this decade.

Partners

As we have done every year for almost ten years, our marine conservation actions continue to exist and develop thanks to the support of our many partners and collaborators.

Every gesture, even the smallest, helps to make our actions possible. Nothing we have achieved so far would have been possible without their help.

Volunteers, foundations, oceanographic institutes, consultants, production and communication agencies, developers, scientific organisations, translators, editors, donation platforms, cosmetics, textile, equipment and services brands, media, PMO experts, sales and training companies, graphic designers, former ecovolunteers, biologists, illustrators, sports and leisure clubs, patronage networks, artists.

We would like to thank them all for their commitment, support, guidance and trust.

They supported us

FINANCIAL PARTNERS

SCIENTIFIC PARTNERS

OUR NETWORK

Press and media

LE PETIT JOURNAL JAKARTA

Coral Guardian : « notre objectif : redonner de la couleur aux océans »

BLOG GOBI

6 idées de cadeaux d'entreprise qui font VRAIMENT plaisir (à soi et à la planète)

VOGUE PARIS

La belle action : et si on adoptait un corail ?

CARENEWS

Lancement du premier projet de conservation marine participative en Méditerranée

MARIE FRANCE

10 idées de cadeaux à offrir pour la Saint Valentin

TABU

Și dacă am adopta un coral la distanță?

PHILENEWS

Αυτή η οργάνωση σας επιτρέπει να υιοθετήσετε ένα κοράλλι στην Ινδονησία

EUROPE 1

Une école pour apprendre à protéger les coraux

MR MONDIALISATION

Au large de l'Espagne, des associations œuvrent pour préserver les coraux méditerranéens

BRUT.

Pendant ce temps là, des plongeurs restaurent un récif corallien

FRANCE INFO

Ces plongeurs se battent pour sauver un récif corallien

VIVRE DEMAIN

Ces plongeurs veulent réparer les coraux espagnols

20 MINUTES

Espagne : Ces plongeurs restaurent le récif corallien

POSITIVR

Espagne : ces plongeurs partent au secours d'un récif corallien

RÉCIF EN DANGER

Livre Le club des NCE /1 – Récif en danger !

EUROPATROPICAL

Retirados de los fondos marinos de la Punta de la Mona unos 250 kilos de residuos en lo que va de año

COSTA DIGITAL

Almuñécar colabora con el proyecto SOS Corales

GRANADA DIGITAL

Almuñécar colabora en la conservación y protección de los fondos marinos sexitanos

GRANADA HOY

250 kilos de basura retirados en lo que va de año: El riesgo que acecha a los fondos marinos de Almuñécar, donde se proyecta la primera guardería de corales de España

FRANCE BLEU

La Grande Bleue France Bleu Azur 2022

Press and media

EUROWEEKLY NEWS

More than 250 kilos of harmful waste cleared from Almuñecar seabed

OCEAN NEWS & TECHNOLOGY

The Perfect and Eco-Friendly Gift that Gives Back on Mother's Day

AVENTURES POUR LE CHANGEMENT

Cinq idées cadeaux nature pour la fête des mères !

OCEAN & CLIMATE PLATFORM

Ocean of solutions to tackle climate change and biodiversity loss

LE PETIT JOURNAL JAKARTA

Souvenirs d'Indonésie à mettre dans vos valises

L'ADN BUSINESS

Extrême s'allie à Coral Guardian pour sensibiliser à la préservation des coraux d'eau froide

AQUARIUM ST MALO

Journée mondiale des océans, l'importance de Coral Guardian

OCEANOGRAPHIC MAGAZINE

CONSERVATION, Little by little

ZEI

Idées cadeaux écoresponsables pour la fête des pères

GALA

La vague bleue

VERGE MAGAZINE

What to wear now: SACCOSTYLE

CHILDSPACE

ECE is at the forefront of change and so is Ocean Protection

GALA

Crème solaire : Comment protéger sa peau du soleil sans polluer les océans ?

MADMOIZELLE

Des produits solaires certifiés bio qui ne laissent pas de traces blanches ? C'est possible !

EL PAÍS (ESPAGNOL)

Una guardería de corales en la costa de Granada

EL PAÍS (ANGLAIS)

Protecting coral off the coast of Granada

GRANADA HOY

Nueva vida para los corales del Mediterráneo gracias a la guardería de una ONG andaluza

CARENEWS

La première nurserie de coraux en Méditerranée voit le jour

DEEPER BLUE

Coral Nursery Installed On Spain's Mediterranean Coast

ONA

Ocean Talk

Press and media

L'ADN
OuiLive, Les Ateliers Durables et Coral Guardian organisent la 1ère compétition connectée pour engager les collaborateurs dans la protection des océans.

BUSINESS IMPACT


Martin Colognoli, Fondateur de Coral Guardian - «Allier la passion de la biologie marine et de la photographie pour sauver les coraux»

MOUVEMENT UP
Comment protéger les coraux ?

LES ECHOS
Développement durable : former ses salariés et faire de la raison d'être une raison d'agir

POSITIVR
"Corail" : plongez dans le monde fascinant des coraux et participez à leur protection

FIRST STEP AWAY
50 idées cadeaux voyage (2022)

CARENEWS
Vendredi prochain sera bleu !

ICRI
Mapping the global funding landscape for coral reef restoration

PLONGEZ MAGAZINE
Article dans le n°36 du magazine

CARENEWS
Conservation des océans : un cadeau écologique et original qui redonne des couleurs à l'océan !

POSITIVR
Coral Guardian : pour Noël, adoptez un corail

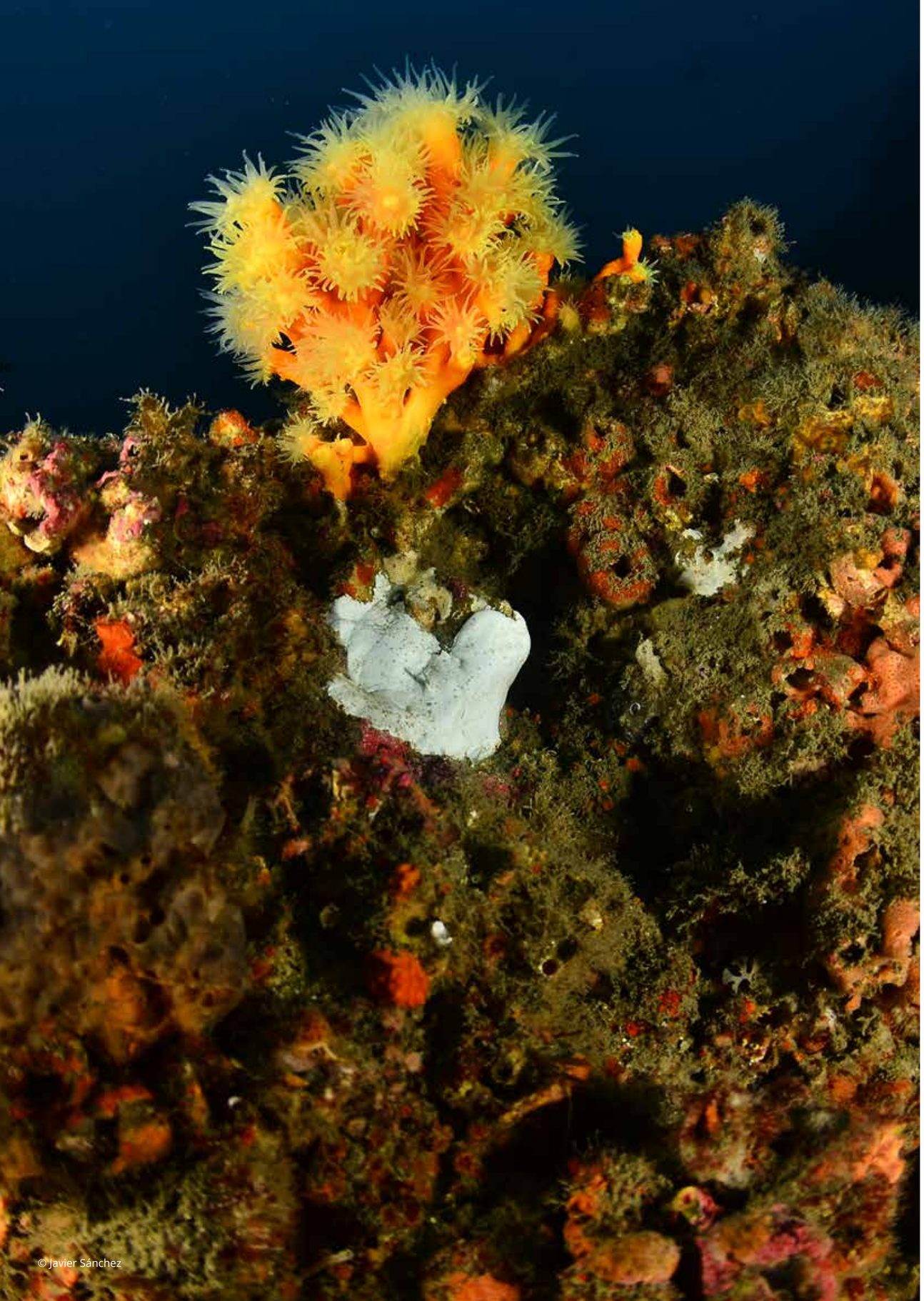
LES LIGNES BOUGENT
Conservation des récifs coralliens : chacun peut agir de son côté pour redonner des couleurs à l'océan !

IRD
The Ocean for climate declaration

FUN RADIO - LE VACHER TIME
Podcast du 17 décembre

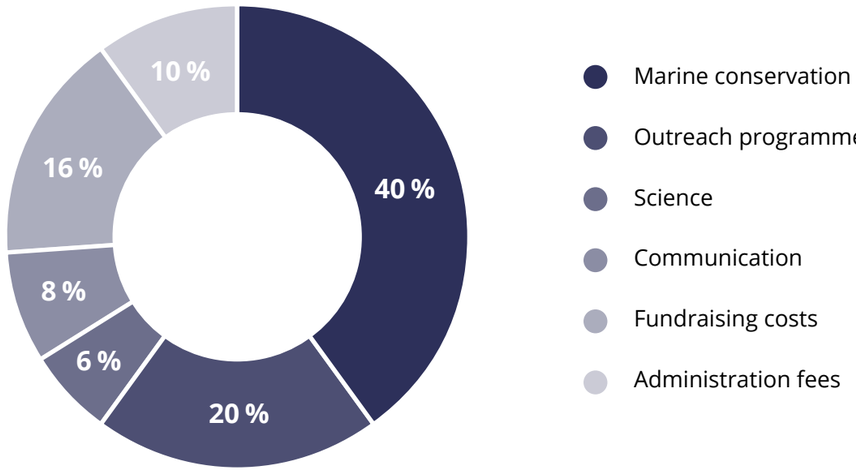
POSITIVR
10 idées de cadeaux de dernière minute pour un Noël écoresponsable

FEMME ACTUELLE
Noël 2021 : Notre sélection de cadeaux écoresponsables pour des fêtes plus respectueuse de la planète

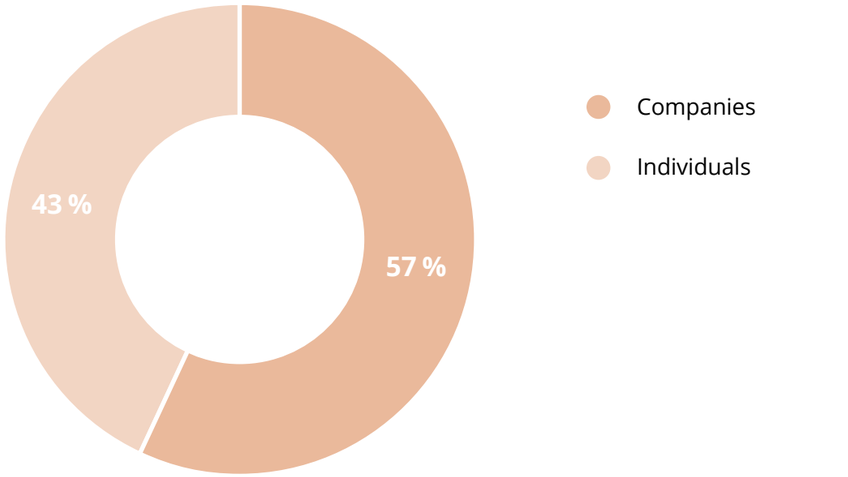


Financial statement

DISTRIBUTION OF COSTS BY PROGRAMME



ORIGIN OF DONATIONS



FINANCIAL PRODUCTS

	2021	2020
Other interest and similar income	-	1,00
TOTAL FINANCIAL INCOME (A)	**-**	**1,00**

FINANCIAL EXPENSES

	2021	2020
Negative exchange rate differences	815,00	718,00
TOTAL FINANCIAL EXPENSES (B)	**815,00**	**718,00**
FINANCIAL RESULT (A) - (B)	**-815,00**	**-717,00**

OPERATING INCOME

	2021	2020
Production sold (goods and services)	900,00	9 500,00
Operating subsidies	-	-
Other income (excluding membership fees)	328 308,00	259 095,00
TOTAL OPERATING INCOME (C)	**329 208,00**	**268 595,00**

OPERATING EXPENSES

	2021	2020
Other purchases and external charges	151 370,00	125 847,00
Taxes and similar payments	486,00	146,00
Wages, salaries and social charges	171 791,00	169 919,00
Depreciation on fixed assets - depreciation charges	2 782,00	4 124,00
Other expenses	-	1,00
TOTAL OPERATING EXPENSES (D)	**326 429,00**	**300 035,88**
OPERATING RESULT (C) - (D)	**2 779,00**	**-31 441,00**

1,222,521 people reached
worldwide

2 long-term coral restoration projects
supported and monitored

47,062 corals
transplanted since the beginning in Indonesia

Let’s continue
to act together!

FACEBOOK
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