Tetiaroa Society FP 2022 IMPACT Report

Calophyllum inophyllum

Gehyra oceanica

We are very pleased to share Tetiaroa Society's 2022 Impact Report

This year was an exhilarating ride for Tetiaroa Society. Fresh out of the constraints of the past two years we hit the ground running in 2022 and made up for lost time. We pushed our limits on all fronts as The Brando occupancy came back strong – meaning lots of tours and activities for our Guides – and the Research, Conservation, and Education programs all came back on track. This was easily the busiest year ever for Tetiaroa Society and our staff responded enthusiastically to the increased activity.

The Tetiaroa Atoll Restoration Program (TARP) finally got over the hump of rat eradication and began ant eradication. The island, with all of its flora and fauna, is therefore on to a new era, free of invasive species, and our research teams are closely documenting its responses. Schools came back as well along with the collective joy of seeing young people learning natural history and culture in such an inspiring place.

Tetiaroa Society also met a new challenge this year by hosting the Blue Climate Summit in Tahiti which was a huge success. In cooperation with the government of French Polynesia, the summit welcomed over 250 participants for one week to find solutions to the climate crisis. It focused local and international attention on the most important subject of our time and one that threatens islands and cultures across the Pacific, and indeed the world.

As always we would like to thank our partners, The Brando for its generous support, SA Frangipani for its trust in us as island stewards, the local community for its solid support for our local and global programs, and of course the many donors who have stepped up to join us in our mission to save Tetiaroa and save the world.

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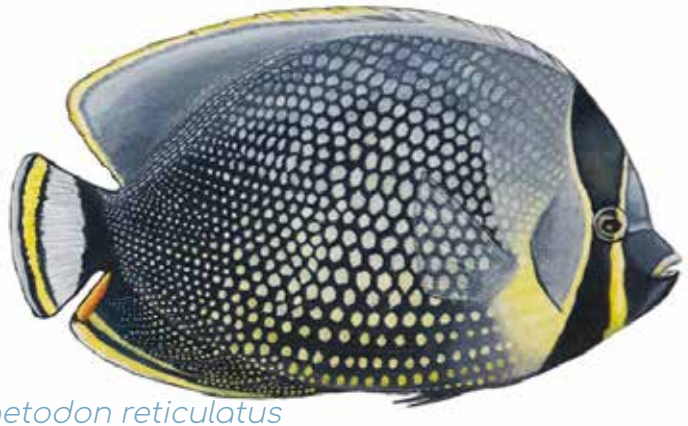
Forcipiger longirostris



Chaetodon reticulatus

Chaetodon ephippium

RESEARCH & CONSERVATION

Tetiaroa Society's Research and Conservation Programs were in full swing this year. Most of the work was focused on the rat eradication which occurred mid-year, and all of the monitoring taking place before and after that as part of our Tetiaroa Atoll Restoration Program (TARP). With participation from around 30 researchers from 14 different institutions, the TARP has developed into the most comprehensive study on atoll restoration anywhere. On top of this our ongoing research and conservation programs continued with mosquito control, green sea turtle monitoring, and mapping for our Geographic Information System. The long-term studies re-started this year, and we began our first deep ocean research project. In all this was a very productive year for studying and preserving Tetiaroa.

Tetiaroa Atoll Restoration Program

The Tetiaroa Atoll Restoration Program (TARP) aims to restore seabird populations and to establish Tetiaroa as a sanctuary for seabirds, green sea turtles, coconut crabs, and translocated endangered endemic birds.

2022 was a momentous year for TARP. The long-awaited rat eradication program was finally executed, and the long-term monitoring programs shifted from "before" to "after". Even as the intensity of the work and necessity for large numbers of volunteers strained the island's housing capacity it also brought together a remarkable group of dedicated scientists and conservation enthusiasts to work together to restore Tetiaroa to its natural state.

The following six projects were key components of the our 2022 TARP program.

Coral Reef & Lagoon

Principal Investigators: Rebecca Vega Thurber, Deron Burkepile
Affiliations: Oregon State University,
University of California Santa Barbara
Project Dates: January 2021 – long term

The objective of this research is to assess the impacts of rat eradication and the subsequent return of natural seabird populations on the health of the adjacent reefs on Tetiaroa.

To find causal links across the land-sea interface, this team is tracking how benthic (e.g., sediment, coral and algae) and pelagic (e.g., fish) assemblages and their ecology, biogeochemical cycling and microbial communities change throughout the rat eradication that is currently in progress on Tetiaroa under the guidance of Island Conservation and Tetiaroa Society. This holistic sampling approach allows us to characterise the environment in which reef organisms are living and assess both shifts in and impacts of nutrient cycling as a result of rat eradication.

Baseline fish collection and surveillance was undertaken after the receipt of our fishing permit. We sampled representative fish species from different trophic levels and functional roles (e.g., herbivore, predator) and visually surveyed fish and benthic communities along 51 transects (30 meters each) spread across 13 lagoonal sites while simultaneously conducting video and photo surveys of the benthos. This allows them to serve as permanent transects to monitor changes in fish and benthic community structure as rats are eradicated.

With our ongoing research, we aim to increase our understanding of what drives coral health, allowing us to better assess the current and future resilience of Tetiaroa, and other coral reef island ecosystems across the tropics.

Algae

Marine flora diversity of Tetiaroa atoll

Principal Investigator: Mayalen Zubia
Affiliation: Université de la Polynésie Française
Project Dates: January 2021 – long term

In 2022 the objectives were to continue to survey the algal community next to three motus: Aie, Reiono and Rimatuu – in essentially the same place as the fish and coral surveys are being done.

Data collected on the transects recorded algal diversity and the coverage of the invasive algae Turbinaria ornata.

Plants

Principal Investigator: Jean-Yves Meyer
Affiliation: Université de la Polynésie Française
Project Dates: January 2021 – long term

Monitoring conducted along 10 transects located on Motu Reiono to study forest dynamics (seedling recruitment of native woody plant species) after rat eradication in 2018 revealed an increase of the native tree Pisonia grandis, but also Pandanus tectorius and Guettarda speciosa. However, the total number of Pisonia seedlings has dramatically decreased in the past three years, and found below its original level of 2018.

In 2021 we set up 10 new transects on Motu Auroa, and added to our seedling recruitment protocol a visual assessment of herbaceous plant cover in order to monitor the potential changes in abundance of the creeping herb Boerhavia tetrandra, the succulent Portulaca cf. oleracea, and the terrestrial fern Microsorum grossum which might be also eaten by rats.

These 20 transects were monitored in 2022 before rat eradication and will be followed in years to come. Five new transects were also installed on Motu 'A'ie to study potential vegetation changes after the control of the Yellow Crazy Ant Anoplolepis gracilipes planned in 2023.

Pandanus tectorius

Bird Survey

Principal Investigators: Simon Ducatez, Jayna DeVore
Affiliations: Institut de Recherche pour le Développement,
Tetiaroa Society
Project Dates: September 2021 – long term

Since tropical seabird species tend to breed most of the months of the year, it is necessary to monitor them multiple times in a year. We have therefore implemented a long-term, atoll-wide, spatially explicit monitoring program. In July 2021, we established 100m long transects along the entire outer perimeter of every motu which we then monitored every month to determine relative bird abundance. We will continue to monitor these transects on a monthly basis until July 2022, at which point we will use the data to construct detailed breeding schedules for each of the seabird species breeding on Tetiaroa. After this point monitoring will occur every 3 months. Ultimately, this monitoring program will provide essential pre-eradication information on seabird abundances and phenology that can serve as baseline data for long-term monitoring programs or research projects that aim to establish how changes in seabird-derived nutrients affect atoll functions or communities.

University of Washington Bird Study

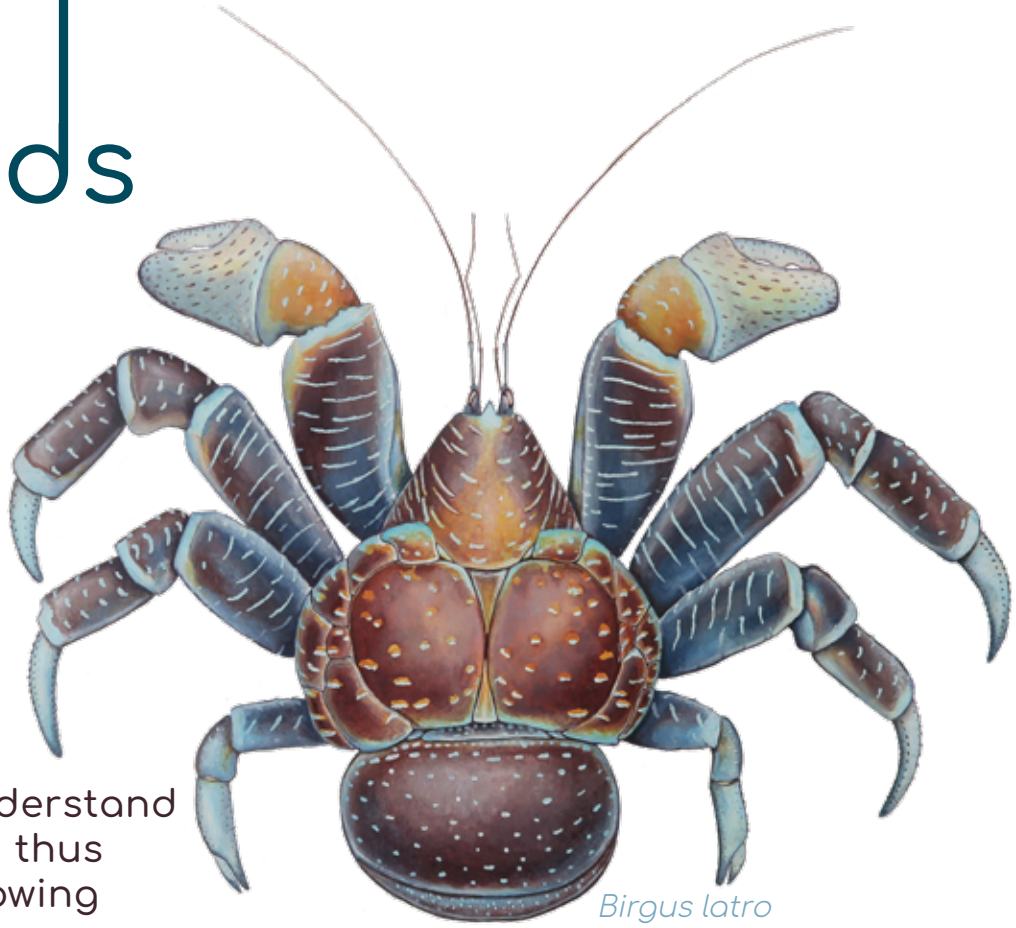
Principal Investigators: Beth Gardner, Sarah Converse
Affiliation: University of Washington
Project Dates: January 2021 – long term

In 2022, we had a full-time technician and a part-time technician in Tetiaroa collecting seabird data, predominantly focused on nest monitoring, point counts, and acoustic monitoring. We collected nest monitoring data using remotely triggered cameras and visual observations on 452 Brown Booby nests, 408 Brown Noddy nests, 282 Red-footed Booby nests to determine the rate and, when possible, cause of nest failure. We predominantly monitored nest on Tahuna Iti, Tiaraunu, Horaterra, and Hiraanae to compare nest success on a motu that is nominally rat-free (Iti) to motus with rats (Tiaraunu, Oraterra, Hiraanae) before and after rat eradication. Swells and rats were the leading causes of nest failures prior to rat eradication for Brown Boobies. We measured ant activity on Aie in conjunction with Brown Noddy nest and point counts. We also measured 380 Brown Booby eggs to better understand differences between first and second laid eggs and their susceptibility to predation by rats and crabs. To determine the relative activity of seabird species, we deployed 41 acoustic recorders that record sounds for 10 minutes each hour across the atoll. We also conducted repeated point counts at 70 locations across Honuea, Iti, Rahi, Aie, and Reiono. To determine the potential effects of rats on nesting success of seabirds, we established 3 Brown Booby nest monitoring transects, one each on Tahuna Iti, Tiaraunu, and Hiraanae and recorded the density of nests at each transect. With 2 team members frequently in the field, we resighted a number of seabirds banded on previous trips which provides valuable information on survival of seabirds of Tetiaroa and which locations individual birds are using. In 2023, we will continue a few months of nest monitoring, point counts, and acoustic monitoring and then will focus again on banding to better understand survival and movement of birds.

TARP | Arthropods

Principal Investigator: Sebastian Steibl
Affiliations: University of California Berkeley, University of Auckland
Project Dates: January 2021 – long term

Invertebrates (insects, spiders, crabs, etc.) fulfil many ecological functions that are crucial for the stability of ecosystems, e.g., pollination, nutrient recycling, or removal of dead material.



Birgus latro

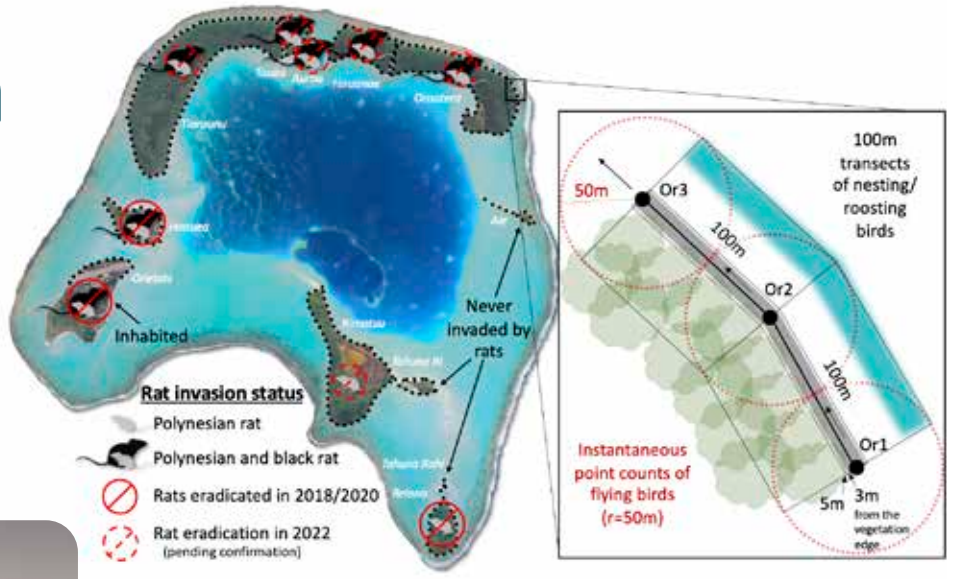
The goal of this research is to understand how terrestrial invertebrates, and thus ecological functions, change following invasive species management.

Cardisoma guanhumi

For this, we use a standardized monitoring on all twelve motus that allows us to study invertebrate biodiversity before and after ecosystem restoration measures. Compared to vertebrates, we know only little about the invertebrate diversity on Tetiaroa, so part of the work was to inventory the invertebrate community. We have catalogued more than 250 invertebrate species already, a lot being documented for the first time in whole French Polynesia, and at least three species are entirely undescribed and new to science! In addition, we established a monitoring system for the lizard populations, as they are a relevant link in the food web between insects and invasive rats.

Rat Eradication

Principal Investigators: Baudouin des Monstiers, Richard Griffiths, Frank Murphy
Affiliation: Island Conservation, Tetiaroa Society
Project Dates: 2018 - 2023



In March a team of 20 people began cutting transects across each motu. These were simple cleared paths, 20 meters apart, that would allow access to every square meter of the island. By the time they finished they had cut over 240 km of transects. Then in June and July the team grew to 40 people in order to do the baiting across the island. Two week-long baiting sessions separated by three weeks were completed and eradication was done. Or so we thought. Follow up surveys found that small numbers of rats had survived on three of the motu. Immediate response measures were put in place and these carried on for the remainder of the year. Careful observations have shown that rat population numbers have not increased and the detection and response work continues.

Mosquito Abatement

Innovative Mosquito Surveillance and Control

Principal Investigator: Herve Bossin
Affiliations: L'Institut Louis Malardé, The Brando, Tetiaroa Society
Project Dates: Ongoing

In 2022, preventative mosquito control was resumed by ILM after 2 years of COVID-induced interruption. Male mosquitoes carrying Wolbachia produced at INNOVENTOMO, ILM's new mosquito research facility are being released weekly to eradicate mosquitoes on Motu Onetahi where The Brando is located as well as all other Tetiarao inhabitants. Scaling up mosquito elimination atoll wide will represent a major goal in the coming years. This exciting challenge undertaken in partnership with the Tetiaroa Society will stimulate the further development, evaluation and integration of innovative vector control technologies including mosquito mass trapping and aerial release of sterile male mosquitoes using drones. Such research will support conservation efforts on Tetiaroa and accelerate the large scale implementation of novel vector control strategies in other Pacific islands and beyond.

Shark Research Program

Principal Investigators: Aaron Wirsig
Affiliation: University of Washington
Project Dates: October 2021 – long term

Negaprion acutidens

Carcharhinus melanopterus

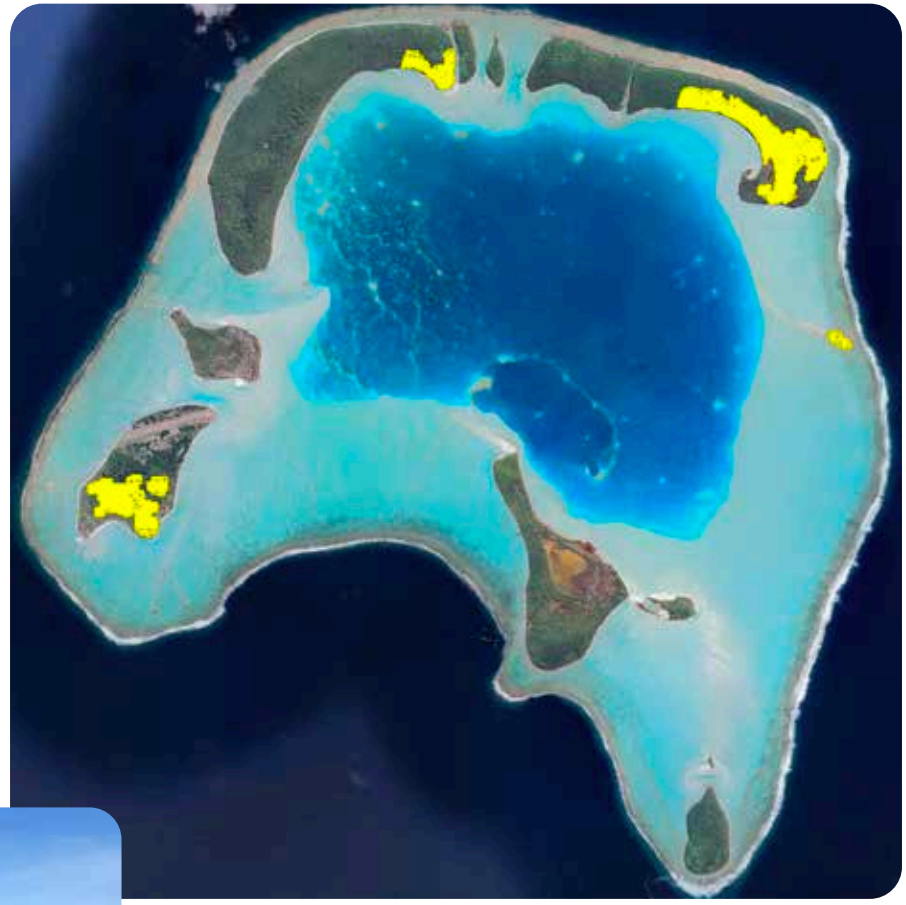
From October-November 2022, and in partnership with the Tetiaroa Society, scientists from the University of Washington, Florida International University, and the Centre de Recherches Insulaires et Observatoire de l'Environnement (CRIOBE) continued the first long-term study on the spatial of ecology of sicklefin lemon (Negaprion acutidens) and blacktip reef sharks (Carcharhinus melanopterus) inside Tetiaroa's lagoon.

During the trip, we equipped 15 more sharks with internal tracking transmitters, bringing us to a total of 32 blacktips and 13 lemons! We also serviced and downloaded all of the positional data from the 9 acoustic receivers in the lagoon, giving us tens of thousands of new shark locations dating back to the inception of the project (October 2021) and thus unparalleled capacity to examine movements of and interactions between blacktip and lemon sharks, and among adult and juveniles of each species, in lagoon environments.

Finally, this 2022 trip served as the launching point for a new project aimed at using baited remote underwater video systems, or BRUVs, to better understand daily activity patterns of sharks in the lagoon and the effects of shark activity on other species in the ecosystem. Some of these BRUVs have been deployed in shallow water (< 1 m in depth) to target small, juvenile shark behavior for the very first time, while others have been deployed on the forereef, allowing us to record the presence and behavior of sharks and other species outside the lagoon. This BRUVs project is being led by Fulbright Fellow Aarthi Kannan, who will be in Tetiaroa as part of the shark team through June 2023.

Yellow Crazy Ant Eradication

Principal Investigators: Simon Ducatez, Jayna DeVore
Affiliation: Tetiaroa Society,
Institut de Recherche pour le Développement,
Université de la Polynésie Française
Project Dates: August 2022 – May 2024



Yellow Crazy Ants are well known as invasive pests on tropical islands. They were introduced to Tetiaroa and have spread to four of the motu where they kill or displace crabs and disable or kill nesting birds.

In 2022 Tetiaroa Society, Institut de Recherche pour le Développement, and the Universite Polynesie Francaise obtained funding from the L'Office Français de la Biodiversité (OFB) to eradicate this invasive species from Tetiaroa. Planning and impact studies began this year for implementation in 2023.

Effects of Yellow Crazy Ants on Brown Noddies and Crabs

Principal Investigators: Simon Ducatez, Jayna DeVore
Affiliation: Tetiaroa Society,
Institut de Recherche pour le Développement,
Université de la Polynésie Française
Project Dates: August 2022 – long term

This team established 53 5-m radius plots (30 in Aie, 10 in Tahuna Iti, 5 in Tahuna Rahi, 4 in Oroatera, 4 in Tiaraunu) in which the abundance of yellow crazy ants, breeding seabirds, and terrestrial crabs were regularly assessed. Ant abundances were assessed using ant-count cards (i.e., by counting the number of yellow crazy ants that cross a 10x10cm card in 30 seconds) and instantaneous ant counts within a 0.25m2 quadrat. Nest densities were assessed by counting every nest present within the 5m radius plot. Crab densities were assessed by searching the entire plot for crabs and crab burrows. Full assessments of each plot were conducted in August and October 2022 (prior to the ant eradication on Aie) and again 10-days post-eradication in October 2022.

The pre-eradication data suggests that both brown noddies and strawberry hermit crabs avoid areas where yellow crazy ants are abundant, but information on whether these species recolonize these areas post-eradication will allow us to better determine whether the ants drove this exclusion from these habitats.

Sprayed noddy chick

Healthy noddy chick

Nitrogen Flux from Motu to Reef

Principal Investigators: Mayalen Zubia, Anne Lorain
Affiliation: Université de la Polynésie Française
Project Dates: November 2022 - long term

As seabird colonies recover after rat eradication it is expected that there will be an increase in nitrogen levels in the groundwater of the motu and then also into the lagoon and onto the coral reef.

The team started a project this year to sample water in the fresh-water lens of the motu seawater just offshore, and then obtain nitrogen levels in nearshore coral by taking cores. Samples were taken in the same transects near on the three motus Aie, Reiono and Rimatuu Preliminary results from other sites suggest that the brackish water lens located under the islets acts as a powerful bioreactor, and is the key mechanism for nitrate enrichment of the reef. The first CS-d15N records over only a few years also revealed that guano derived nitrogen inputs to the reef flat were assimilated by coral throughout the year and its lifetime, demonstrating the potential of CS-d15N records to reconstruct nitrogen supply by seabirds over historical timescales, providing a valuable tool for reef management and future conservation studies.

Archaeology Program

Principal Investigators: Guillaume Molle, Vahine Ahuura Rurua
Affiliation: CIRAP
Project Dates: August 2017 - long term

The Archaeology team from CIRAP began phase 2 of the Archaeological Program in August 2022. This consisted of targeted excavations at key sites previously recorded. This year, they focused their efforts on two locations on motu Onetahi. First was the ahu of a marae, a ritual structure part of a larger ceremonial complex. ONE-05 is an 8-meter long enclosure limited by coral slabs put on edge, with an upright stone in the rear. In order to better document its function and chronology of use, the team excavated the entire structure and sieved the sediment through 1mm mesh to recover all fragments of charcoal, fish bones, shells and lithics. We identified several deposits within the ahu that attest to a series of offerings. Faunal analyses and radiocarbon dating are in progress. Second site is a cultivation pit, maite, in the center of the motu. We excavated a 6-meter long trench and took a series of monoliths samples. Geoarchaeological analyses are ongoing at the ANU and include soil-micromorphology, nutrients and particles size distribution analyses. This work will shed further light on the construction and use of the pit through time.

The 2022 team: Guillaume Molle, Vahine Ahuura Rurua, Aymeric Hermann, Gabrielle Traversat, Emilie Dotte-Sarout and Elisa Scorsini. Excavations were authorized by permit n°7986, dated to 25 July 2022, delivered by the Ministère de la Culture of French Polynesia. The 2022 project was funded by the Seeley Foundation, Molle's ARC DECRA grant (ARC DE190100187), SA Frangipani, The Brando, and CIRAP.

Green Sea Turtle Research

Chelonia mydas

Principal Investigators: Cecile Gaspar, Margaux Touron
Affiliation: Te Mana o te Moana
Project Dates: Ongoing

Tetiaroa Atoll represents a unique place for Green Sea Turtles in French Polynesia, as one of the last remaining nesting sites in the Society Islands.

Field work in 2022 included:

A. Research on nesting females: Identification of nesting females using photo identification, genetic samples and flipper tagging are carried out to better understand inter-annual nesting frequency and their genetic structure. Four females were recaptured including one that have already been identified 2 times before this season. Three of them were recaptured after 6 years and one after 5 years.

B. Research on eggs and hatchling survival rate: protection of hatchlings is the second key component of this program. It involves the nests' protection that are located on the motu where the hotel "The brando" is implemented: the team release the hatchlings around sunrise time to be sure they would reach the sea and would not be attracted by the hotel's lights. Nest excavation to gain insight on natural hatching success is also one of the team's roles. Injured hatchlings stuck in the nests or predated are sometimes transferred to the sea turtle rehabilitation center when deemed necessary. They receive care before they reach the age of 6 months and are released into the wild. Teams in the field record incubation temperature using thermo-loggers inside the nests to get an estimate of newborns sex ratio.

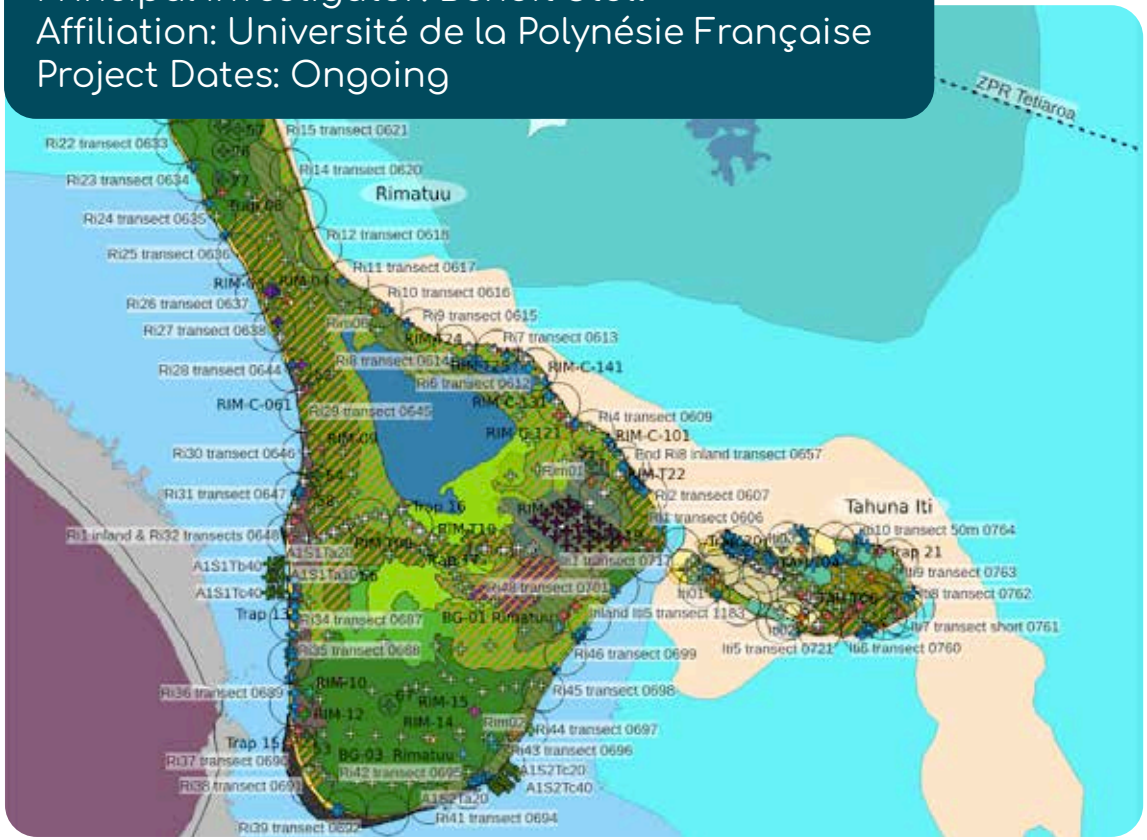
C. Research on embryo success: To lead this project, three different parameters that could influence the embryo success were studied. Incubation temperature, rainfall data and nest depths were analyzed among an internship of an undergraduate student.

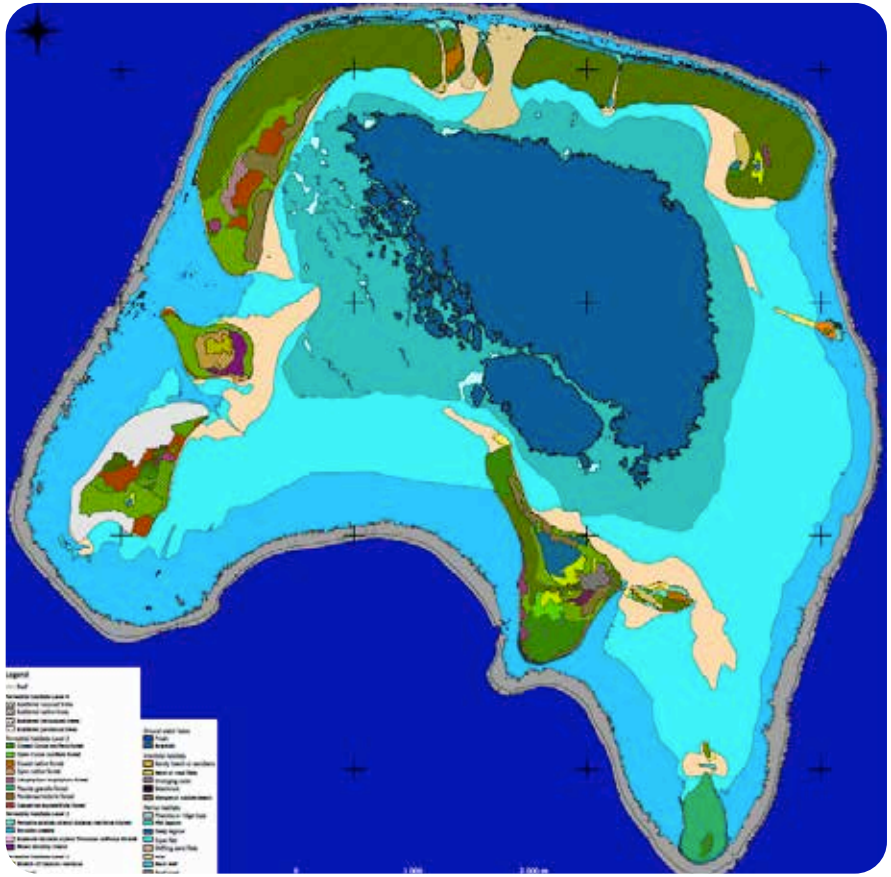
D. Research on predation impact: To better understand the impact of predation by crabs, motion-triggered cameras are set up on turtle nests and crab holes around the nests are reported. Drone surveys were also lead during hatching moment, in order to evaluate the lagoon predation.

Mapping Tetiaroa

Geographic Information System

Principal Investigator: Benoit Stoll
Affiliation: Université de la Polynésie Française
Project Dates: Ongoing





The Tetiaroa Geographic Information System project is involved in developing maps and analyzing GPS, Satellite, and LiDAR data on Tetiaroa. This has involved detailed mapping of Onetahi in collaboration with Institute Louis Malardé. the analysis and processing of historical aerial photos, mapping of turtle nesting sites for Te Mana o te Moana, mapping cultural sites in collaboration with Australian National University, and creating a vegetation map.

In 2022 this project continued to develop the Tetiaroa Habitat Map and add data from all projects on Tetiaroa to its amazing database. All of the 200+ kms of transects that were cut for the rat eradication project were added and all of the TARP sampling sites for birds, corals, insects, plants, etc. were added as those projects developed.

EDUCATION

The Tetiaroa Education Program got under way again this year after a couple of slow years. We had a total of 6 school groups, including two from the USA for a total of 157 students and 610 user days.

UC Berkeley Island Sustainability Program

The Tetiaroa Education program started this year with the first ever field course from University of California Berkeley. This "Island Sustainability Program" was developed to address, "making a just transition to environmental sustainability", by using islands as, "model systems for exploring issues affecting this transition around the world." The program spent almost three weeks on Tetiaroa being introduced to the atoll and Tetiaroa Society Conservation and Education Progams. Aside from their own work, the students helped collect data for the TARP, and aided the ILM mosquito abatement program, as well as helping to plant native vegetation around the Onetahi Marae Complex. It was a very successful start of what we hope will be a long term program.

Local School Groups

The local schools come to Tetiaroa to learn about the island and the sustainability features of The Brando. Their activities include visits to the archaeological sites, a "Green Tour" of resort facilities, visits to the motu to see sites that feature natural and cultural heritage.

• CJA Vaiare

This trade school from Moorea had an exceptional time learning about the island and helped us building our ceremonial platform (paepae) in the Onetahi Marae Complex. Bad weather cancelled their boat and they had to fly back which was the first time for many of the children being in an airplane.

• Lycee de Taravao and Lycee Raapoto

These are both high schools and the students prepare projects to discuss different aspects of the natural and cultural world of Tetiaroa.

• Universite Polynesie Francaise

These students from the Anthropology and Tahitian Language programs at UPF came to Tetiaroa with the members of our Cultural Committee to experience Matari'i Raro or the rising of Matari'i which is the Pleiades. On a particular date in November the Pleiades rises in the East right as the sun sets in the West. This marks the season of abundance (Summer) and was a time of great happiness and feasting. The evening was perfect for viewing this phenomenon and it was a memorable experience for all.

BLUE CLIMATE INITIATIVE

The Blue Climate Initiative was created by Tetiaroa Society to address critical climate change issues. Everything came together this year to hold a summit in Tahiti which promoted solutions to the climate crisis. Two projects, 'Voice of the Ocean' and a campaign against Deep Sea Mining were both born out of our commitment to finding and supporting sustainable solutions.

• Blue Climate Summit - May 2022

In May of 2022 the BCI hosted a summit in French Polynesia. This global convening brought together 250 ocean and climate advocates from around the globe to advance 20 projects targeting ocean protection and climate change. Participants included scientists, community and cultural leaders, government officials, youth representatives and environmental organizations.

The Summit Co-Conveners included Prince Albert II of Monaco, Richard Bailey, Marc Benioff, Dr. Sylvia Earle, Andrew Forrest, French Polynesia President Edouard Fritch, Laura Turner Seydel and Nainoa Thompson. Projects ranged from a new blue carbon exchange and an MPA watch to a wave energy incentive competition and a deep sea mining (DSM) moratorium project. Traditional knowledge and youth involvement were a major focus - providing valuable new perspectives and insights.

• Voice of the Ocean

As part of the Blue Climate Summit, Tetiaroa Society convened a discussion about a project titled 'Voice of the Ocean'. The decision was to make a pledge which follows on the Marae Taputapuatea.

"In the face of climate change and related environmental and cultural crises, a growing international movement has recognized the rights of natural entities such as rivers and mountains. We propose to do the same for the Pacific Ocean, long recognized as an ancestor by Polynesia people. This is in counterpoint to western concepts of exploitation, and the United Nations Law of the Sea, which represents the ocean as a resource to be managed. The goal is to develop the argument that, in order to protect the ocean (and the planet) what is needed is to take the lead from indigenous cultures who have always recognized the natural world as having the same rights as themselves.

Our Call for the Voice of the Ocean is a commitment to work in partnership to develop a plan to recognize the rights of the Pacific Ocean. This plan should be rooted in the traditional knowledge of Pacific's indigenous cultures, but also provide legal pathways for representation. The plan will be carried by the Hokulea and Hikanilia on their Moananuiākea Voyage around the Pacific Rim and be a focus for discussions with indigenous cultures along the way. In this way the plan will evolve and grow and become inclusive of all who respect and depend on the Pacific Ocean. The plan will also be presented and discussed at the IMPAC5 Congress in Vancouver in February 2023."

• Deep Sea Mining Moratorium

One of the major focuses of the Blue Climate Initiative in 2022 was working on achieving a moratorium on deep sea mining. Deep sea mining is widely recognized as one of the greatest global threats to the ocean, creating irreversible harm to ocean ecosystems. It is also one of the few environmental challenges we have a chance to get ahead of and stop – if we act urgently. For this reason, the Blue Climate Initiative has made the moratorium one of its top priority projects.

Good progress towards a deep sea mining moratorium was achieved in 2022, and we are thrilled that French Polynesia and France have joined the growing coalition of countries, scientists, environmentalists and forward-thinking companies calling for a moratorium.

The Blue Climate Initiative also helped facilitate a call for a deep sea mining ban from indigenous leaders across the Pacific. The petition from these indigenous leaders can be found on the Blue Climate Initiative website.

SCIENTIFIC COLLABORATIONS

• Fair Island Project

The FAIR Island Project is working with Tetiaroa Society to coordinate research on the island with an optimal data policy for open access, mandatory registration requirements, and data management plans containing controlled vocabularies and identifiers implementing global standards. All researchers working on Tetiaroa, resident or visiting, are required to create data management plans (DMPs) for their proposed projects to study the island and said DMPs are updated as data collection advances. The goal is to translate the broader FAIR principles into a set of specific requirements and implementable activities that demonstrate how good data management practices and policies accelerate research for the benefit of all stakeholders.

• Mission Blue Hope Spot

Tetiaroa Society continued its partnership with Mission Blue this year as one of their Hope Spots. MIssion Blue is developing support for a global network of marine reserves and Tetiaroa Society is proud to be a partner with them.

OPERATIONS

Personnel

The Tetiaroa Society team this year was somewhat in flux, with some leaving and new ones arriving. As always though we had great continuity and commitment to the island, the culture, and the mission of Tetiaroa Society.

Executive Director

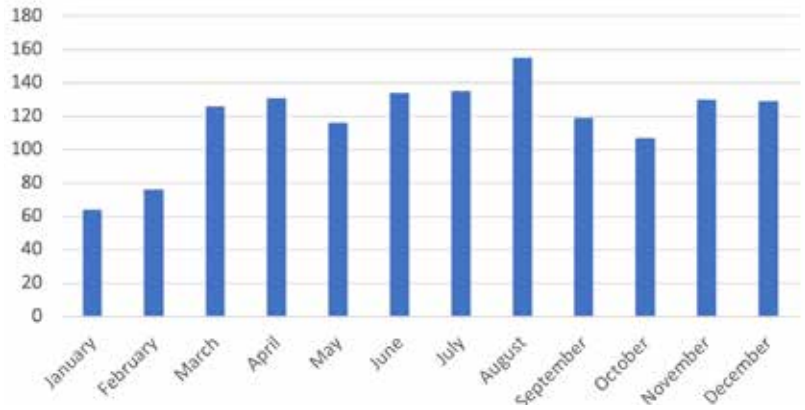
Frank Murphy continued to serve as Executive Director of Tetiaroa Society French Polynesia. His duties include: overseeing the Guide Program, the Ranger Program, all administrative issues, human resources, accounting, communications, and developing and managing CASUP programs. He also interfaces with guests of The Brando, does lectures, and occasionally guides tours. He works on the island and also out of a home office on Moorea. Frank splits his time working on Tetiaroa and out of his home office on Moorea and last year spent 63% of his time on Tetiaroa.

Guide Program

Actions and Tour Numbers

Tours per month

	Tours	Guests
January	64	243
February	76	311
March	126	613
April	131	664
May	116	494
June	134	623
July	135	633
August	155	813
September	119	505
October	107	471
November	130	619
December	129	594
TOTALS	1422	6583



This was a very busy year, both in the resort and at the Ecostation. Our staff responded with lots of hard work and overtime hours. In 2022 the Tetiaroa Society Guides did 1,188 regular tours and 234 private tours for a total of 1,422 tours. Even though the hotel was closed for 4 weeks in Jan/Feb this is still significantly higher than the last normal (pre-covid) year (2019 had 1,175 tours). The total number of guests was much higher than 2019 with a total of 6,583, up from 4,555.






Guide Program

Other Activities

The Guides were also busy in their time off from tours doing a whole variety of projects.

Regular conferences were done for hotel guests on a variety of topics including: whales, birds, coral reefs and history of Tetiaroa. Conferences were also organized to be done by visiting researchers about their particular areas of expertise.

A complete review of the Archaeology Tour was done with new information included from Hinano Murphy, Eliane Tevatua, and Guillaume Molle.

The Guides developed a new program for guests that was done on two occasions which involves legends and stories from Polynesian culture. These were done in collaboration with The Brando cultural animators.

A new Lagoon School Program on birds was developed to add to the programs on turtles, whales, coral reefs, and plants.

The Guides also took the lead this year for TS social media, creating regular posts for the Instagram and Facebook accounts.

Short videos were done for TB Marketing with interviews and discussions with researchers.

Ranger Program

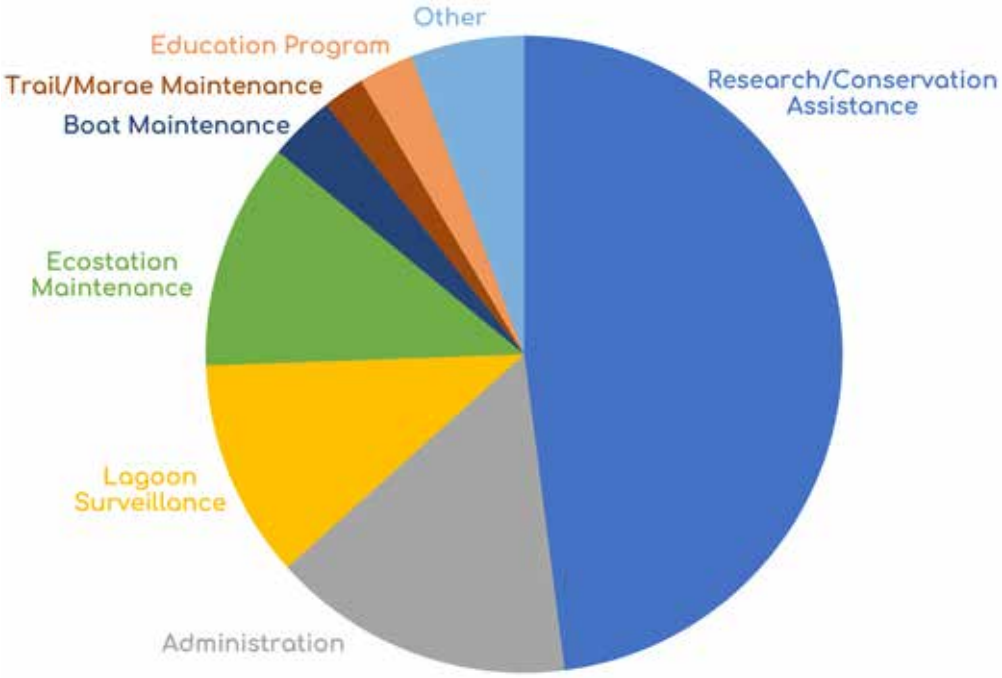
The team and the work

There were three Rangers working all year and they continued to manage the Ecostation and assist scientists in the field as well as patrol the lagoon and visit the motu to watch for trespassers and illegal fishing.




The Ranger activity was recorded this year using a new Google doc that the Rangers filled in at the end of every day recording their hours and activities. Due to the need for assistance for the Rat Eradication Program, TARP, and the resurgence of research activity this year, the Rangers recorded the majority of their time attending to conservation and research needs.

Ranger Work	Hours	Av
Lagoon Surveillance	604	11
Research/User Assistance	2614	48
Administrative	838	15
Ecostation Maintenance	628	12
Boat Maintenance	184	3
Trail/Marae Maintenance	115	2
Education Program	153	3
Other	314	6
TOTALS	5449	



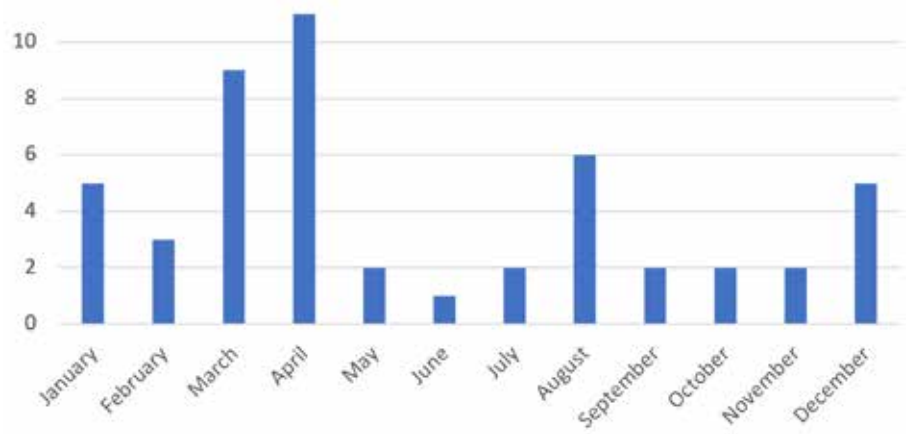
Ranger Program

Lagoon Surveillance

Charterboat numbers were comparable with the previous year, with higher numbers during months with the best weather. The very low numbers in June and July were a combination of there being fewer good weather days for accessing the island (season of south wind and swell) and that the Rangers did not have time to count boats and passengers since they were wholly occupied with the rat eradication.

Month	Boats	Pax
January	11	104
February	3	23
March	26	319
April	30	318
May	10	130
June	0	0
July	3	47
August	46	586
September	27	297
October	12	180
November	7	103
December	10	119
TOTALS	185	2226

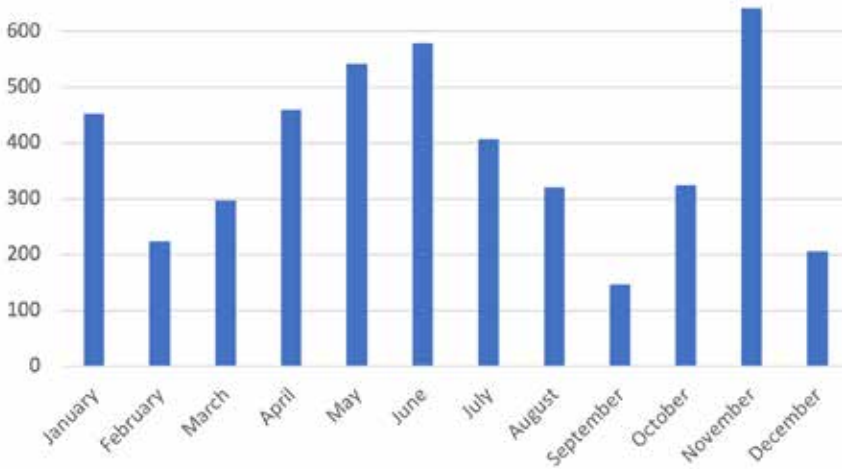
Fishing pressure was lower this year overall than in previous "covid" years. But Rangers still interacted with fishermen when they were in the lagoon and in particular when they were breaking laws by fishing in the "no take" zone (ZPR). In those cases reports were prepared and sent to the Mayor of Arue, the Gendarmes, and the DRMM (Fisheries Department).



Ecostation Use

This was the busiest year ever for the Ecostation with 4,602 user days including Research, Conservation, and Education programs. The 3,688 Research/Conservation user days is a huge jump over the last normal year, 2019, which had 2,538. This was of course due to the Rat Eradication program, the TARP research focused on eradication, and the resurgence of research after the long delays from the Covid epidemic.

User Groups	User Days
TS/Island Conservation	1379
TS Education Program	914
Universite Polynesie Francaise	647
Tetiaroa Society	383
University of Washington	349
Institut Louis Malarde	269
Oxford University	154
University of Auckland	132
Cal State University Long Beach	100
Australian National University	77
Oregon State University	60
CRIOBE	55
University of Victoria	54
Kivikuakua	15
University of Georgia	14
TOTAL	4602



Month	User Days
January	452
February	224
March	297
April	459
May	542
June	579
July	408
August	321
September	147
October	325
November	642
December	206

RAISING AWARENESS Communications

Tetiaroa Society Communications rolled along this year. The website was migrated to Drupal 9, and performance & styling upgrades were started (and are ongoing in 2023). Four well-received newsletters were sent out to our readers, and social media posts increased in frequency when the guides took on the role of social media posters. Internal communications improved with the use of Workspace shared drives and Microsoft office apps being made available to TS staff.

Monthly Newsletters "News from the Atoll"

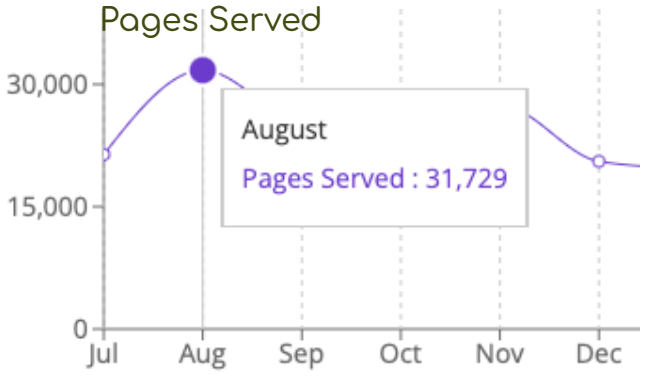
Issue	Open Rate
February	56%
May	52%
August	57%
December	58%

Tetiaroa Society's newsletter, "News from the Atoll" has 4301 subscribers. Our open rate is consistently well above average for a non-profit.

Our subscribers are scattered all over the world, with the majority (46%) from the USA, 6% from the UK, and 6% from France.

52% of our readers open the newsletter on desktop, and 48% on a mobile device.

Communications via Website & Social Media

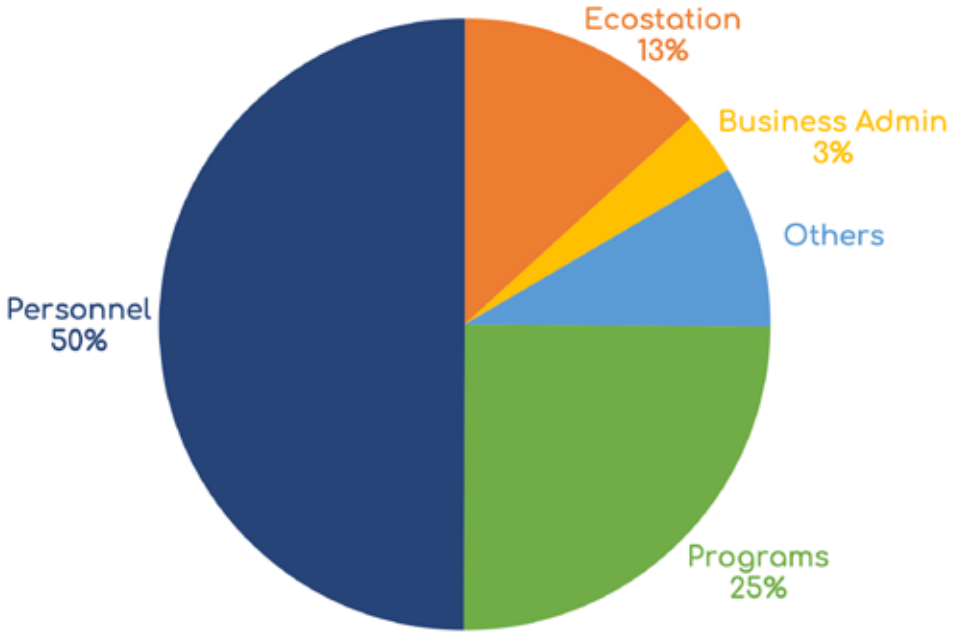


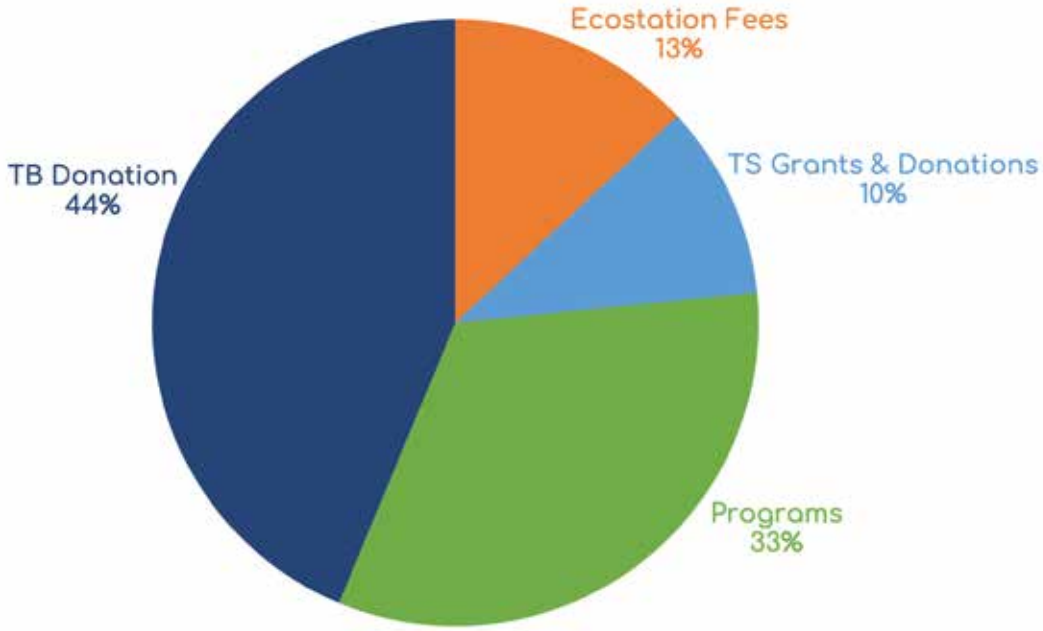
Tetiaroa Society has 5.6k followers and a 5.0 rating on facebook. With posts in English and French, our message is reaching a diverse audience.

Expenses & Income

Expense category	Amount XPF	Amount USD
Personnel	51 140 185	$464,911
Ecostation	13,565,387	$123,322
Business Admin	3 379 359	$30,721
Programs	25 555 298	$232,321
Other	8 766 704	$79,697
TOTAL	106 066 787	$930,972

Income source	Amount XPF	Amount USD
TB Donation	46 384 999	$421,682
TS Grants & Donations	10 981 710	$99,834
Ecostation Fees	13 868 131	$126,074
Programs	38 831 947	$316,654
TOTAL	106 066 787	$964,244





Donations

Donations are vital to the programs and mission of Tetiaroa Society. Without donations we could not do the important work we are engaged in.

We are fortunate that donations from The Brando pay for our core operations, but we need additional funds to achieve our objectives.

We deeply appreciate the support we received in 2022.

Gehrya mutilata

Donate on our website
Thank you for your support!

Donations to Tetiaroa Society and the Blue Climate Initiative can be made through the Tetiaroa Society website. Anyone with any questions about donations can reach out to our Executive Director Frank Murphy at fmurphy@tetiarosociety.org.

The illustrations & the artist

Scaevola taccada

Tetiaroa Society's team was joined by an intern in 2022. She captured some of the atoll's inhabitants in beautiful detail.

Anna Pedersen is a science illustrator and marine naturalist from California. She has a masters certificate in Science Illustration and a B.S in Conservation and Resource Studies. Salty Earth Studios is her company to create awareness around the ocean through art and illustration.