

Tetiaroa's Lagoon Fish And Crustacean Replenishment Program

LE CENTER DE RECHERCHES INSULAIRES ET OBSERVATOIRE DE
L'ENVIRONNEMENT DE POLYNESIE FRANCAISE (CRIOBE)

The degradation of our planet's coral ecosystems pose an urgent threat not just to fish, but to humans as well. Coral reefs help sustain a large percentage of the ocean's plant and animal life and provide a range of important functions for humans from food production and coastal protection to biotechnology development and tourism. So it is of great concern that due to global climate change and anthropogenic pressure over the past three decades, the World Conservation Institute estimates that 20 percent of coral reefs are already definitively destroyed, another 25 percent are in great immediate threat and another 25 percent will be threatened by 2050. There is an urgent need for improved management based on increased knowledge of biology and ecology of coral reef ecosystems. Tetiaroa provides an excellent opportunity to learn how to protect coral reefs, replenish fish and other marine life, and eventually establish a sustainable fishing program.



PROJECT DESCRIPTION:

Researchers from CRIOBE, with the support of local organizations and Polynesian fishermen, aim to replenish fish and crustaceans in the protected Tetiaroa lagoon by deploying a method used successfully in aquariums and aquaculture. Sandwiched between a thorough socio-ecological study of Tetiaroa and a study to measure the impact of the restocking program, scientists plan to use the Post-larval Capture and Culture (PCC) method where fish and crustaceans are caught in the post-larval stage and reared safely in aquariums in Tetiaroa Society's Ecostation or in the lagoon over the course of three month periods. Once their chance of survival is greatly increased, they will be released back into the lagoon. The final stage in this four-year study is then to disseminate the results and the learnings with local fishermen, schools, and the international scientific community.

PROJECT STAGES:

1. Socio-ecological study of the fishing potential on Tetiaroa

Building on the previous CRIOBE/Tetiaroa Society-backed study from 2011, researchers will focus on the socio-economic and anthropological characters of the people connected to the lagoon and develop an integrated management model.



2. **Post-larval capture and culture**

The PCC is setup over three steps:

Step One: Establish three crest nets on the lagoon for six months and sort the post-larvae by species.

Step Two: Post-larvae are reared until they reach juvenile stage (between one and three months).

Step Three: Tag fish and release into the lagoon. The tagging allows scientists and local fishermen to study the amount of these fish and crustaceans now among the adult populations.

3. **Study of the socio-ecological restocking impact on fish and crustacean stock**

Fish with commercial interest: Experimental fishing with Polynesian fishermen performed every three months to estimate population.

Fish with no commercial interest: Underwater visual censuses taken every three months in the lagoon to estimate the population.

Crustaceans: Released into a controlled section of the lagoon and three month censuses will determine whether the tagged lobster or mantis shrimp are still in the habitat.

Polynesian Fishermen: Two months is dedicated to coordinating with local fishermen and authorities to discuss a management plan for the fisheries.

4. **Dissemination of results will be presented to:**

- Fishermen on Tetiaroa and Tahiti.
- Schools on Tahiti and Moorea, and international masters classes through CRIOBE.
- Tourists on Tetiaroa who can visit the aquaria in the Ecostation.
- International scientific community at the 14th International Coral Reef Symposium in 2016 (Hawaii) and the 13th Pacific Science Congress in 2017.

WHY IT'S IMPORTANT:

The post-larval stage is vital to fish and crustacean populations as 90% of marine organisms at this stage will disappear through predation within their first week on a reef. The PPC technique is proven in aquariums and agriculture but much less so in lagoon environments. This project will provide new understanding of the connectivity of fish and crustacean populations among habitats in coral reefs, which will assist conservationists and reef managers to maintain biodiversity on those reefs. It will be proven as an environmentally friendly and sustainable solution for restocking coral lagoons with the help of local fishermen and authorities, which could be replicated around the world to help restore diminishing coral reef ecosystems.

PRINCIPAL INVESTIGATOR:

Dr. Serge Planes, principal research scientist at CRILOBE, is a world leader in the study of population genetics of marine fish. Dr. Planes has been involved in the study of population genetics of marine fish since the beginning of his career that started with his PhD in 1989. Over the past 25 years, he has published about 65 papers in international journals dealing with the population genetics of coral reef fishes and an additional 50 papers dealing with ecology, ecology of marine protected areas and recruitment of marine fishes. ISI Essential Science Indicators (ESI) analyzed research into coral reef ecosystems in the past decade (1995-2005) and ranked his work at #19 in the world out of 5,060 authors

SUPPORT RESEARCH ON TETIAROA:

This research is sponsored in part by Tetiaroa Society, a non-profit organization established to help protect Tetiaroa, promote sustainable activities, and support scientific research targeted at understanding and protecting delicate island ecosystems.

We invite you to experience the life of a scientist in the field and better understand our work by joining investigators studying on the atoll. If you are interested, please contact one of our scientists on the atoll or the concierge at The Brando.

We also invite you to make a financial contribution to Tetiaroa Society to support the world-class science taking place on the atoll. Your donation will support us in our mission and the next phase of this project. If you want your funds to be used exclusively for this research project, please note this when you donate. Donations can be made online at www.tetiaroasociety.org. Thank you for your generosity, participation, and support.

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