

Current Trends in cultivating Live Rock

By Walt Smith

In 1992 Walt Smith International in the Kingdom of Tonga (South Pacific) began the harvest and export of live rock which was in demand because of the quickly developing “mini reef” market for the aquarium industry worldwide. There were three types (or shapes) available at this time and the most popular was Tonga Red Branch followed by Reef Rock and Shelf.

In about 1994 a new player in the industry began shipping live rock out of Fiji and it quickly became the most popular in the industry because of its shape, heavy coverage of coralline algae and porosity making the rock very lightweight to ship. This was a very attractive feature since all rock was shipped by air freight and air freight is charged by the kilo.

In 1995 Walt Smith International was invited to Fiji by the Fisheries Department to participate in the emerging aquarium industry and help to set the standards based on my knowledge of the industry and my highly developed husbandry techniques utilized in Tonga.

Once we settled in Fiji we immediately started shipping live rock collected along the western side of the main island. We chose this site because of the high amount of nutrients in the water, due to agricultural runoff, and the amount loose porous rock covered in sufficient amounts of the required coralline algae. This attractive and lightweight rock soon became very popular among hobbyists worldwide

After several years of exporting large quantities of live rock week after week those who were uninformed of the actual and realistic sustainability issues started to voice their concerns. During that time a scientist was engaged to study the harvest and submit a report on the socio economic assessment and environmental impact. The studies that were carried out proved that the harvest was both valuable to the economy and was sustainable. However, it was my view that we must also develop an alternative means to supply the growing need of live rock to the aquarium industry. Even though it was not entirely necessary to do so, it became an important contribution to help ease the concerns and showed that our industry is listening and adaptable. Therefore WSI began experimenting with the idea of manufactured live rock.

In 1998 we began an experiment to grow coral by placing large racks in the sea and using fragments of larger colonies of coral to place on these racks mounting the fragments to manmade plugs. At the same time this was developing I had the idea to start making larger pieces of manmade rock utilizing the same technique we developed for making the plugs. There were many experiments carried out with the goal to achieve a realistic looking rock from cement and various other forms of substrate to give it a natural appearance. However, the biggest challenge was the weight. You see, cement did not

have the same porosity as the natural harvested rock so it made this rock much heavier to ship and thus, unattractive to the market.

We tried many different techniques and materials to minimize the weight that included mixing hollow pasta, polystyrene, popcorn and blowing air into the mix to name a few. However, none of the attempts provided us with the desired results. As I continued to search for a material that would be both light and porous I stumbled on the answer quite by accident. The solution was provided by an erupting volcano! One day while driving my boat to one of our collection sites I became startled by what sounded like a car driving on a loose gravel road. I finally realized that I was driving right across a patch of floating pumice pellets that have been ejected from a volcano under the sea. This is actually a quite common occurrence and I remembered seeing these pellets all over the beaches in both Tonga and Fiji. There was literally about one square acre of floating, porous stones! To make matters even more interesting the beaches were littered with this stuff all over the island. It didn't take me long to realize that I quite possibly have found the answer to my problem. Pumice was porous, volumetric and light weight ... in fact, it floated!

I soon arranged for one of our crew to visit a village on the coral coast where I had remembered seeing this stuff littering the beach. The Fiji custom dictates that you approach a village in a formal manner and ask permission (kare kare) from the Chief to take samples from their fishing grounds, in this case the beach. Once we determine that the samples are useful to us then it becomes necessary to do things in a more formal manner which requires a visit from me and gifts to the village. They hold a ceremony called Savu Savu and we present our proposal to the elders of the village for them to vote on our request. In short, we offered to hire the village members to harvest these little grey stones that lay all over the beach and that we would pay them for this harvest. At this point a price must be offered and the voting is done in a formal village meeting usually carried out a few days or a few weeks after the Savu Savu. Of course we got permission to pay for these stones that was a nuisance to them and useful to us. This is how you create a small community project that benefits both parties.

Once we started receiving truckloads of pumice from several different villages the large scale of manmade live rock commenced. However, we soon found out that we had one more serious obstacle to overcome. Making wet cement mimic a piece of rough, porous irregular rock that was harvested from the sea is not as easy as it sounds. If the manmade rock did not look "natural" we would never receive the support from the market and this product would be rejected. So, into the mix went sand, loose coral rubble found at the high tide mark on the beach and pumice stones about the size of a peanut. We then trained some Fiji craftsman to take all these different materials and shape the mix into assorted shapes that gave the finished product the same appearance as natural live rock. Once dried in the sun for about 6 weeks the rock was fully cured and ready to be placed on the "farm" out on the reef for further curing and to allow natural overgrowth.

The rock takes about 18 months to take on a sufficient amount of coralline coverage and introduce the micro organisms that live within the rock that makes it a beneficial live rock for the aquarium. However, on our first attempt we noticed that we had another small problem after about 6 months. When you place a rock made from cement into the water it still looks like grey cement unless the coralline reaches 100% full coverage. Since this hardly ever happens, even on natural live rock, we found that we had grey and red rock that did not look natural enough for aquarist to accept. In the real world the rocks from the sea take on a darker tone because they are not made from cement but rather hundreds or thousands of years of fossilized coral substrate. When this happens the natural rock base blends more naturally with the coralline coverage. This presented a problem for us and made it necessary to go back to the drawing board to meet this new challenge. I soon researched different types of cement dyes that were non toxic. I finally came across a pink and red mixture of oxide that looked quite bright when freshly mixed but after months in the sea took on a more natural dark red color and worked perfectly for our application. We were now on the way to go into full production with a product the industry would accept and appreciate Or would they?

On our first attempts to find a suitable location to place the rocks in the ocean we decided that the western coral coast was the most logical choice since it was the same area the we harvested the natural live rock we have been selling for years. However, this location presented us with a challenge we had not anticipated. The area is mostly made up of large tidal flats that extended several hundred meters to the reef edge. These flats have huge swells rolling over them that would cause our rock to be moved all around by nature and by the time of harvest we would probably never be able to find it. We came up with a solution to mold the rocks with a hole in the center so that we could run a thick cable through each rock at tie them all together by securing them to stakes we had positioned at each end. It was sort of like a clothes line full of manmade rocks. We thought we had solved the problem of controlling the movements of our rocks but had no idea that once they were ready for market it would be hard to convince the trade to accept rocks that all took on the appearance of a donut. After a several years on the market these rocks only occupied a very small percentage of our overall rock sales. It wasn't until about five years on the market until we realized that the hole in the middle was the problem. At this point we have invested about eight years into the project (with three years product development and five years marketing) and it became obvious that there were still some changes that needed to be made if we were going to enjoy any success with this product at all. We did not want to give up.

In 2004 we began to experiment by putting our "donut" shapes on reef slopes in the same areas where we have our coral farms. Much to our delight we found that the rock stayed where we put it and developed an acceptable coverage of coralline algae. In 2005 I decided that we needed to change our whole approach and started to dabble with interesting shapes that did not include the whole. Once I saw the results I was sure that we finally had a product the industry would embrace. However, it would eventually take at least 18 months to bring this to market in order to allow the coralline enough time

to fully develop. About this same time a graduate student at the University of the South Pacific needed a research project to pursue his MA degree in marine studies. He chose to make a study comparing the natural live rock against the manmade live rock and the residual benefits to the aquarium. When the study was completed he was able to prove that the manmade live rock was just as beneficial and natural harvested live rock. This was amazing news for us.

Today we have approximately 800,000 kgs of manmade rock and 60,000 pieces of coral growing at various stages on several different farm sites around the reefs in Fiji. This rock has finally made a useful contribution to our sales. Comparing it to the early years when this product was about 2% of our overall rock sales today we have achieved over 20% and that number keeps rising. Walt Smith International will continue to encourage the aquarium industry to endorse this product and believes that it will help bridge the gap between those that have a negative perception of our harvest and those that understand that a sustainable, renewable resource can be greatly enhanced by creating awareness and making alternatives available to all who want to participate in this fascinating hobby.