

First phase results – September 2005

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This project has evolved somewhat as have our goals and methods. This report will outline the work that has been undertaken, the methods we use and the problems we encounter and precautions to any other groups undertaking similar projects.

First Weeks

Our first efforts were applied for the first few weeks in the shallow sandy areas just off the beach. This first area is/was heavily littered and immediately obvious was the amount of debris that was partially or completely buried by sand. The closer to the beach the more items were buried. In some cases we have found items such as bicycles, cement mixers, cabinets, and washing machines buried 1.5 meters beneath the sand with only a portion exposed. To cope with this we constructed a D.I.Y. sand dredger from 2" PVC piping and connected it to the low pressure supply of a scuba tank. Although the 'airlift' was able to lift the sand, we found that the air supply was far from enough for the amount of work it was needed for. Therefore we decided to leave heavily buried items to a later date when we would be better prepared.

We constructed a makeshift pontoon out of kayaks and proceeded to collect debris with divers underneath and snorkelers on the surface.

In the first couple of weeks we removed approximately 10 tons of debris and averaged 25 people per day.

Change of plan

Although from an aesthetic point of view and also because of the potential hazards to bathers the shallow beach areas are important to be cleared, we decided it would be better to focus our attention on reef areas that would more immediately benefit from the clean up. Although there was a huge amount of debris on the sandy substrate, it was obvious that these areas could wait, whereas areas that had debris covering corals seemed more important in order to prevent further damage to the corals.

Therefore with the use of a boat hired from Phi Phi Scuba, divers and snorkelers proceeded to work along the shallow reef fringing the west side of Tonsai Bay. Surface support crews were assigned jobs according to individual skills and experience. Jobs included in-water assistants, kayak duties, pontoon managers, boat detail, and beach crews. The objective of the surface crews was to streamline efforts made by the divers and to collect the debris located by the divers. At this time we found that due to the amount of debris a ratio of 3 snorkelers per diver was appropriate. On days where we found we



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had lesser numbers in the surface teams the divers found themselves wasting time waiting for equipment and support.

Note

It is important to carefully monitor the actions of people whenever working around coral areas. Enthusiasm and the desire to help quite often leads to people attempting to do things beyond the scope of what is possible and can cause more damage than good. We found ourselves needing to repeat time and again the importance of only attempting to do what was really possible.

At this point we were also given permission by the local 'Or Bor Tor' to dismantle the floating pier and use it as a work station.

The divers were split into buddy teams and were provided lines with plastic bags attached to them. (These lines were long enough to reach the surface). They would attach these lines to items too big to place into bags, but items still light enough to be pulled up by hand to the surface. Buddy teams were instructed that only one person would tie off items whilst the other buddy would carry all the lines and a couple of spare net bags.

Target items included sheets of corrugated metal, pieces of timber, plastics etc. Once the divers had surfaced enough marker bags the snorkelers would reposition the floating pontoon to the area and then pull up the items and place them onto the pontoon. Coloured bags were used to help the snorkelers identify which items could be pulled up. Green bags for liftable items, red bags for items that would need a lifting device to bring up the item. After using all the lines available the divers would use the net bags to collect smaller items like plastics, clothing etc.

Note

We found pontoons very useful as work stations rather than having boats moving around the area, which does make the divers very uncomfortable when they hear the engines above them.

We also found using the method of long lines better than the method used by other teams that have come to clear up, where they would just tie a plastic bag to the item and then hope that the item would float up to the surface. On many occasions we have found these items have floated off and sunk back onto the reef in another area.

During this time emphasis was on removing as much metal as possible and timbers that could damage the coral through collision or by covering the corals. At this time it was prudent to allow only divers with a minimum of 100 dives experience.

Important



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Much of the debris in this area was covered by large quantities of sand which has probably been the hardest obstacle to tackle during this project. Apart from making it harder to remove the item there is an even more important issue which is to avoid stirring up sand in areas close to corals in case of covering the coral polyps. Therefore divers are instructed to carefully remove sand from items (especially sheets of metal) as low to the bottom as possible, so that when lifted to the surface there is very little disturbance and the sand settles quicker.

We strongly recommend to any other clean up projects to minimize disturbing the sand as little as possible.

Whilst most of the divers worked in one area lining off items a second team worked in another area lifting larger objects using 40 ltr water tanks. This job was only assigned to certain divers with appropriate experience and all other divers were cautioned to stay away from the heavy lifting team. Although quite primitive we found using these tanks extremely effective and cheap for lifting even the largest roofs. Since our working depth was from 2 to 9 meters it was not difficult to raise items safely once a good system was found. Once raised the item would be dragged onto the beach by the surface crews.

Note

Many of the roof sections removed were already beginning to deteriorate. One worry was that the roof sections could fall apart on ascent. It is important to attach reinforcement ropes to sections of roof prior to raising.

During March the DMCR arrived in Loh Da Lum Bay to complete the removal of debris started by them previously. Our teams joined Mr Phaitun to assist for the day and the general consensus was that there was hardly any debris left to remove in this bay.

By the middle of March we had collected approx 35 tons of debris and we were averaging 40 volunteers per day (10 to 15 divers) including 10 Thai staff. The funding for the project was now covering the wages for the Thai staff and accommodation and food for all long term volunteers, boat and tank rental, equipment for cleaning and other necessary items. The debris that we had collected was removed and placed onto barges by the private company commissioned by the government to collect the debris on the land. In total they filled 10 truck loads from the items that were recovered.

2nd Month

Prior to starting the Phi Phi tsunami Dive Camp the Thai Marine Department had been also working in the area and had left behind a very large pontoon that was piled full with debris. After noticing that some of this debris was starting to blow back into the sea, we chose to commandeer the pontoon, remove the debris, and use the pontoon for our project. This helped us



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immensely and we proceeded to use this pontoon adjacent to our 2 other smaller pontoons for the next few weeks.

For the following month we stayed in exactly the same area due to the amount of debris. We were systematically moving along as each section was cleared, or to a point where we would have to return later with the sand dredger.

R.A.I.D. team

At the beginning of April we were joined by a French Police team called R.A.I.D. consisting of 18 professional French police divers. They were funded jointly by the French Red Cross and the French Embassy. Arranging the group to come was difficult as some of the authorities had stated that all the work had already been completed and there was no longer any use for them. They assisted in raising some of the larger items including a 7 ton roof that washed into the sea intact. This proved to very difficult and eventually we dragged it out to deeper water, stripped it down as much as possible and have now left it to create an artificial reef. In total the French team worked for 2 weeks and assisted in removing 20 – 30 tons of debris.

Also assisting the French team was the Marine Department, using a zodiac and the large Marine Dept. boat. On departure the Marine Department took back the pontoon that we had been using to great success. The pontoon was then towed to Krabi where it was dissassembled and left on the mainland.

Body Recovered

On the 13th April we recovered the first and so far, the only, corpse of a woman that was mostly submerged in sand and covered by other debris.

She was carefully removed and brought to the surface by Andrew Hewett, Eko Lapp and Wan (Thai Rescue Police Diver).

The body was sent to Krabi by the local Thai Tourist Rescue Police and is yet to be identified. Although we get daily findings of bones, they usually result in the discovery of animal bones.

All bones found are collected and handed to the nurse at the Hi Phi Phi Clinic.

Note

Considering the state of the area that we found the body and the amount of buried debris there, it would be prudent to assume that there could be more bodies to be found in this area. We have just completed building a new 'airlift' sand dredger that is attached to an old second hand compressor. To reduce the amount of disturbance of the sand, we have also built a filtering tank that helps us to deposit the sand again in another area. Creating a 'coral friendly' sand dredger has been a difficult but important task. We plan to start using the dredger this week. Unfortunately the compressor for the dredger is not



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powerful enough to give enough lift in the very shallow areas where it is most needed. (Please see our list of requirements).

The recovery of human remains should only be undertaken under the supervision of the local authorities and only by selected persons. All other divers are required to move away from the area during the follow up searches and recovery. To assist the authorities in this matter, 3 of our staff have been certified as Thai Rescue Tourist Police Volunteers.

In the middle of April our teams moved to the tip of Tonsai bay and we proceeded to work back into the bay cleaning both the reef and the beaches. This whole coastline (Tonsai Bay west side) has now been cleaned to about 95%. Most of the work involved here was for snorkelers in the very shallow areas and so our teams were split up to cover 2 areas, with the snorkelers in one and the dive team and their support in another. Our floating pontoons were moved out to the area and we commissioned more longtail boats to ferry the debris from the beaches back to our main dumping zone.

By the end of the 2nd month, we were averaging 80 people per day including 30 paid Thai staff and had removed 80 tons of debris. The most common item to remove has been the corrugated sheet metal. Unfortunately, the most awkward material to remove has also been the sheet metal as it is usually covered in sand.

3rd Month

The pier

At the end of April we once again moved locations and started working in the heavily littered area next to the pier. At the same time we started to use a new method with the use of the lift bags and nets that were donated to us by the French R.A.I.D.

New Methods

Teams of 3 or 4 divers lay large nets on the bottom (each marked with a marker buoy) and proceed to fill the net with as much as it can hold. Smaller net bags are employed to collect smaller debris and once full are placed also in the large net. Once full the marker buoy is replaced by a safety sausage to indicate the net is ready for lifting.

A second team of 2 divers follows up the first team and ties the large net into a packet and then lifts it with two 100 kg lift bags. A long tail boat then ties off the net and then draws the net to the beach where the beach team empties the net onto our dumping site.

This method was extremely successful and we increased our volume of recovery immensely.



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Items recovered next to the pier included a lot of large masonry. Thousands of paving slabs, bricks and mortar have been removed. These have littered the beach area from 0m – 7m depth. Surface teams have been working for weeks walking in the shallows and picking up the masonry by hand. The bricks have been collected and are being used to repair roads around the island that were damaged.

Many coconut trees were also washed into the sea here. The trees are quite buoyant and new trees have appeared over the last few weeks so we included them in the list of things to remove. We believe at least 30 tons of coconut trees have been removed so far.

By the end of 3 months we had collected approximately 120 tons of debris. We averaged 80 people per day (15-20 divers) including 30 Thai staff.

4th Month

By the end of May and due to the high tides during this period most of the accessible work for the snorkelers was complete.

Snorkel teams and beach crews focused on removing debris on the east coast of Loh Da Lum Bay. Due to the rocky terrain it was quite a difficult job operating in the area. Although there was a lot of tsunami debris in the area, much of the debris was pre-tsunami. Large surf coming in from the west made it impossible for the boats to beach in order to transport the collected debris to our main dumping area and so the debris was being collected and bagged for removal at a later date. Meanwhile during the low tide periods the beach teams were walking through the shallow sand flats, removing rice sacks, masonry and plastics. One of the pontoons had been towed around to Loh Da Lum Bay.

As the monsoon season started, we saw a drop in numbers to 55 persons a day. Fortunately we were protected in Tonsai Bay from the heavy wave action, but the strong winds traveling across the peninsular made it cold and hard work for our surface support teams. However we only lost 3 or 4 days of work due to the weather.

Our new sand dredger consisted of a second hand low pressure compressor attached to two 2" flexible hoses that drew the sand up to a 1600 liter depositing tank. The tank had a 4" dumping hose that was extendable and deposited the sand away from the area and close to the bottom, thus reducing the amount of disturbed sand.

Unfortunately the sand dredger was very big and difficult to move around and in some cases it was just easier to use brute strength instead. In front of Arida Resort was where the bulk of the work for the dredger.



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By the end of 4 months we have collected 150 tons of debris. We average 60 people per day (15-20 divers) including 25 Thai staff.

5th and 6th months

The last 2 months were very much the same. We used this time to cover the remaining areas of the bay and to research the areas covered in previous months.

What we did discover was that there was very little debris left in the bay below 6 meters, but areas that we had already cleared in the shallows (1 – 4 meters depth) was starting to reveal debris such as bricks and pavings that were previously buried.

As a result our workload increased dramatically since the weight of the debris had increased.

Some of the more experienced members of the team worked on removing the sheets of metal that were protruding from the sand, by attaching liftbags to them and then inflating them slowly to tease the metal out of the sand. Mean while the other dive teams continued to fill net bags with bricks.

The dive camp completed the first phase of the project on the 14th August after 154 diving days and 250 tons of debris.

On hindsight

On hindsight it would have been better had more heavy machinery for lifting and pulling been rented. Money saved in not using these machines was money lost in time and energy.

Personal Items Recovered

Any items found on the reef are of extreme importance in verifying the presence of any of the 300 hundred people reportedly still missing. All items discovered are carefully logged and itemized. These include wallets, I.D. cards, credit cards, passports, boat licenses and personal telephone books. Any valuables found with these items are logged and kept with the items. All documents belonging to Thai nationals are returned to the persons if recognized, or presented to the Krabi Police department. All documents belonging to foreign nationals are presented to the specific embassies or DVI teams where available, or the German embassy who will help to give it to the correct embassy.

In the 6 months we discovered hundreds of these documents.



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