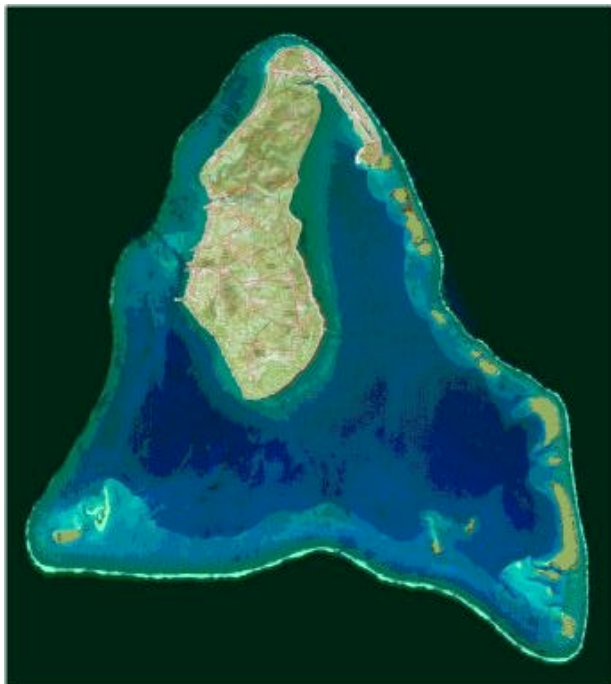


Protecting Aitutaki's Marine Resources

Aitutaki lagoon, with its warm shallow waters, is not only a visitor attraction, but a source of livelihood for the people of the island. There is not much commercial fishing at Aitutaki except for the occasional trochus shell harvest and fishing for local sale, and fish resources are overall in good shape and sustainable. However, the



traditional community measures that regulated the fishery in centuries past are inevitably being eroded by the modern way of life. The Aitutaki Island Council has introduced measures to help control what might become problem areas in the future.

In this leaflet we describe these measures, for the benefit of visitors. Some of these measures are informal guidelines, and some are coded into legally-enforceable regulations. Whilst the Aitutaki Island Council is responsible, in partnership with the Aitutaki community, for managing the reef and lagoon fishery, they are assisted by the Ministry of Marine Resources who perform surveys, provide advice, and operate the Research Station and giant clam hatchery just north of the airstrip (where visitors are welcome).

This leaflet was prepared on behalf of the Aitutaki Island Council by the Ministry of Marine Resources in collaboration with the Secretariat of the Pacific Community (SPC) – a regional intergovernmental organisation which runs an assistance service for the Pacific Islands, based in New Caledonia. Production was sponsored by the British Government Department for International Development.



General Information

If you have observed marine life in other parts of the world you may notice that there are fewer species of fish, coral, or other marine life here. This is because natural biodiversity is lower in the central Pacific than areas closer to continental coasts. For example, there are no mangroves at Aitutaki, and only one major lobster (crayfish) species, as opposed to the 4 species found in Melanesia.

The lagoon at Aitutaki is shallow (11 metres maximum depth, but usually less than 4 metres), and almost completely enclosed by a substantial barrier reef. There is only one major passage to the open ocean, on the western side, and even this is too shallow to be navigated by larger boats. This means that the lagoon environment is fairly isolated, and may differ slightly in temperature and salinity from the open ocean, depending on the state of the tide and rainfall.

As with all enclosed lagoon systems, live hard coral growth is much better on the outside of the reef than on the inside. So, whilst the Aitutaki lagoon is an ideal training ground for novice snorkellers and divers, with many swarms of colourful small fishes, the real sights are outside the reef where the coral and fish are most naturally abundant.

The prevailing wind is from the southeast, with occasional shifts to the north, and so

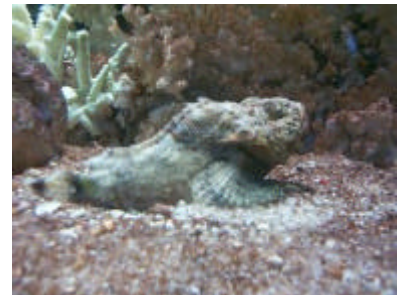
the western reef face is the most accessible to divers. However, the outer reef slope in the east is virtually undisturbed by human activity, and can be visited in calm weather.

Things to watch out for

Human beings are not designed to spend much time in the sea, and as in all marine environments there are things which can hurt you if you are not careful. Sharks are very rarely seen in the lagoon, with only a few small reef-sharks, and should not be worried about. You are safer from sharks whilst swimming in Aitutaki lagoon than in just about any other tropical area in the world. Most of the problems come from things that you might step on or touch.

If you are walking on in the shallows of the lagoon it is sensible to wear thick-soled shoes, both to avoid coral cuts (which rapidly become infected – lemon juice is a useful remedy) and stonefish stings.

Stonefish are present at Aitutaki, they are very difficult to see, even in clear water (there is usually one



on display in a tank at the Crusher Bar) and can give a very painful sting if stepped on. The best remedy if you suspect a

stonefish sting is to immerse the affected area in very hot water. The chemical structure of the poison is broken down with heat. Just be careful not to make the water so hot that it boils your leg!

Despite these dire warnings, please be assured that these are problems experienced in all coral reef environments. Aitutaki is actually safer than most.

Marine Resources Protection

Marine Reserves

The main weapon in the Island Council's drive to ensure the protection of Aitutaki's marine environment are marine reserves. These are to provide areas where fish can live and breed undisturbed. This has benefits both for visitors and for the surrounding fishable areas upon which most of the local population still depends for a large part of its protein.

There is still a large dependence on subsistence fishing and, on average, fish is eaten at 5 meals a week by Aitutaki families, and each person consumes around 100kg per year of locally-caught fish. For the benefit of visitors, fish rapidly become tame and approachable in no-fishing reserve areas, and edible invertebrates like giant clams (*paua*) can recover to natural densities.

Marine reserves are located at both of the southern corners of the triangular barrier

reef (see map), and enclose both the outer reef-slope, the reef-top, and a portion of the lagoon. No fishing or taking of marine life at all is allowed in these areas. There is another no-take reserve which covers the shallow enclosed area at O'otu, in the northeast lagoon. This almost-estuarine environment appears to be unique in the Cook Islands, and is an important habitat for juvenile bonefish, milkfish, and mud-crabs.

Gillnetting restrictions

Catching fish by driving them into coconut leaf-sweeps in reef channels is a traditional fishing method, and the use of gillnets is seen as a natural development and improvement on this method by many Pacific Islanders. However gillnetting was a little too carelessly used at Aitutaki in the past, with subsequent problems for certain highly-prized food-fish species. Nets can quickly wipe out aggregations of fish when they come together to spawn, and some nets were left for long periods, sometimes permanently, in the water. Unlike coconut leaf-sweeps, gillnets are not biodegradable.

The existing bylaws at Aitutaki prevent the possession of nets more than 100 metres by 4 metres in size, or with a mesh size of less than 60 millimetres. A net must not be set less than 100m from another net, and one person may not set more than one net. If setting a net between two *motu* (the small islands on the barrier reef), the net

may not extend over more than one third of the channel between the *motu*. In addition the person setting the net must remain “in the vicinity” for the whole time that the net is set.

Unfortunately it was difficult to enforce these partial restrictions and the Island Council is now in the process of implementing a total ban on gillnetting at Aitutaki, and searching for funds to implement a buy-back scheme for every gillnet on the island. Although gillnetting is one of the quickest and easiest of ways to put food on the family table, the prospects for other ways of catching fish, particularly handlining, rapidly improve if nobody is using gillnets.

Shellfish export restrictions

Unlike gillnetting, which is carried out all over the lagoon, it is easier to enforce restrictions at the airport or the wharf. Following problems with wholesale export in the past, the bylaws state that no-one may take more than 20 *paua* (giant clams), 20 *kai* (*Asaphis* spp shellfish) or 20 *ariri* (turban shells) out of Aitutaki. In any case, any shells of these species taken out of Aitutaki must be larger than a certain size:- 75mm for *paua*, 50mm for *kai* and 38mm for *ariri*. These named species are also banned from sale within Aitutaki except by special permit, and are normally only taken for home consumption or special occasions.

Ban on SCUBA fishing

The use of SCUBA gear or other underwater breathing apparatus for catching fish or shellfish is banned at Aitutaki. Unlike many more developed countries spearfishing is not banned entirely, and may still be carried out using a snorkel. Spearfishing is a traditional Pacific Island fishing method and a complete ban on spearfishing as well as the gillnetting restrictions would cause undue hardship to local people who still depend heavily on fish to keep their family fed. Many species of common fish, particularly the herbivorous fish lower in the food chain, cannot be caught with hook and line.

SCUBA gear is also banned for the purpose of hand-collecting any species, or for setting a gillnet.

Destructive fishing methods

Although explosives are not used to catch fish at Aitutaki, there is a law that makes it an offence to do so, or to use poisons. It is also against the law to use any methods at Aitutaki which damage coral, such as crowbars for extracting *paua* embedded in the reef.

Reef reseedling

The Ministry of Marine Resources research station at Aitutaki breeds several species of marine life both for conservation

purposes and to assist in the potential development of future marine farming enterprises. The hatchery was set up with assistance from the Government of Australia and has concentrated mainly on breeding *paua* (giant clams). *Paua* stocks are now regenerating, but over-collection (mainly to provide gifts to visitors from other islands, and to supply Rarotonga)



was a serious concern past decades. The hatchery breeds several species of giant clam, and also experiments with trochus and blacklip pearl shell (which has always been extremely rare at Aitutaki), and is open

to the public at certain times (call 31406 to check that the staff are not out on the lagoon). The ocean nursery where the clams are grown out to “escape size” in underwater cages (to protect them from triggerfish and other predators) is close to the reserve boundary at Maina and can also be visited by snorkellers.

Given the financial squeeze on the Cook Islands civil service the marine research station is run “on a shoestring” and must look for additional sources of revenue wherever possible. There is bunk space and research equipment available to visiting researchers and overseas students who are prepared to pay a small fee

towards the maintenance of facilities, and the set-up is a dream for any biologist or researcher interested in the marine resources of a real Pacific Island.

Trochus fishery management

The Aitutaki trochus resource supports the one major commercial fishery on the island and the benefits are spread across the whole population. This is model fishery and widely publicised by SPC to other Pacific Islands as a good example of wise fishery management.



The trochus shell was introduced to Aitutaki from Fiji in 1957, close to the site of the old seaplane alighting

area in the southeastern lagoon, and has since spread round the entire barrier reef. Trochus shells are the main source for the mother-of-pearl buttons found on high-quality shirts and command a good export price in Asia and Europe. These conical shells graze on algae and can be found in and around the surf zone on the barrier reef.

The trochus shell harvest at Aitutaki is tightly controlled by the Island Council, both in the conduct of the fishery and the distribution of financial benefits. The harvesting period is short – usually for one week every two years. A “total allowable catch” (TAC) for the whole island is

calculated after a resource survey by the Ministry of Marine Resources, and set at a level intended to maintain the stock at a sustainable level of long-term maximum production. This TAC is then divided by the number of households on the island by the Council and each family is given a quota (usually 10-20kg of shell). This quota can either be caught by that family during the harvest period, or in the case of those who are unable to do their own fishing, transferred to another family. The Island Council supervises the collection, shipping and sale of shells and distributes the resulting cash according to the allocated quota. This “community transferable quota” system is currently unique in the world.

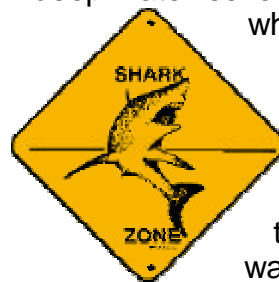
In addition to the restrictions on harvesting time and volume, there are also size limits in place (the legally fishable size-range is 80-110 mm shell diameter) and a trochus reserve close to the original introduction site where no trochus fishing is allowed at any time.

Fish aggregation devices

Another way of promoting lagoon resource conservation whilst continuing to provide food and income is to encourage fishing activity on the more resilient resources of

the open ocean. This takes a larger boat and is mainly for the more commercially-minded, but produces fish that are usually more to the taste of visitors than reef-fish. You can eat as much tuna, mahi-mahi and wahoo as you like and feel content that you are doing your best not only for the local economy but for the environment. As well as being very resilient in a fishery sense (and coming from a much larger “pool” than the reef-fish), oceanic fish are locally produced, unlike imported meat.

Fish aggregation devices (FADs) are floating rafts anchored by rope and chain in deep water several kilometres offshore,



which attract fish to their shelter and make oceanic fishing more cost effective. They are good for tag and release game-fishing too, and if you really

want to see sharks this is a good place to make a SCUBA dive. Not for the faint-hearted.

Unfortunately FADs do not last forever, particularly in the cyclone season, and cost several thousand dollars to replace. Please do not tie your boat onto the FAD and risk straining the shackles or dragging the anchor.