Published as pages 14-21 in *The New Zealand Diver's Handbook*, edited by Wade Doak, 165 pp. Reed Books, Auckland. 1993.

MARINE RESERVES AND COASTAL CONSERVATION

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The whole point of any sport or recreation is to enjoy yourself, and this is just as true of diving as any other. It sounds obvious, but in fact it is easy to be distracted from the real aim by ideas that contribute nothing to your fun. Many divers feel they must bring something home to justify themselves. Why? you don't bring anything home from a game of rugby or a tramp in the forest. Others feel that since you could spend all your time chasing fish, and this would require effort and skill, anything else is wimpish. Why? are cavers and mountaineers wimpish because they are not miners or quarrymen. Then there are those who always want to go deeper, faster or farther to impress others. Why? are you impressed by the tourist who "does" New Zealand in three days and moves on to Sydney or Bali.

Why do many divers let other people's perceptions spoil their fun? If you are hungry, you can try the supermarket or fish shop. Let the "macho" types do their own thing. Let the record-lovers spend their own money going to Truk Lagoon, or waste a whole day getting ten minutes at a great depth. You can and should concentrate on enjoying your dives. The best, easiest and cheapest way to do this is learn about the sea itself, this new world on your doorstep. It is still largely unexplored, and we know so little about it, we are still learning how to appreciate it and to take care of it.

Divers are the real pioneers in the marine world. Others can zoom about on the sea surface, but only divers can get in there and see for themselves. As a group, divers show both the virtues and faults of pioneers. Some have led the movement towards a better understanding of the sea and its life; others have been in the forefront of the grab and pillage brigade. Often the same people have been both. Cousteau himself, now famous for his marine conservation appeals, was an ardent hunter of fish in his youth. He didn't lose his taste for fish, but gained a greater interest in exploration.

The same thing happened to many New Zealand pioneer divers. Wade Doak, Kelly Tarlton, and Roger Grace were all once in the forefront of spearfishing, weight records, and competitive tournaments. Later on Wade wrote books on exploring marine habitats and the behaviour of fish and dolphins; Kelly organised wreck museums and public aquaria; and Roger became a professional marine biologist and consultant for marine conservation.

The whole game is new, and the rules are not at all clear. Wade Doak's book on fish, written while he was still teaching French at Wellsford High School, was the first in the world that talked about fish as animals you could watch, appreciate and try to understand. There were plenty of books on fish already, but either they were about fish as dead objects in museums, or about how to catch and cook them.

The progression from just using diving as a means to show off your skill or grab a free feed, to taking an interest in the underwater world for its own sake is not confined to the famous few, nor is it just an historical point. Many, perhaps most, divers go through the same stages, if they stay with diving for more than a year or two. It is a sad fact that most divers who rush out full of enthusiasm with their new gear for a season or two, then just fade out of the scene.

At first divers are fully occupied coping with the technicalities, and sustained by pride in their ability to master these. Later, many enjoy the thrill of the chase and the justification of a free feed. But once they have proved they can dive, and get something to eat, these points usually fail to provide a motive strong enough to justify the coninuing effort and expense required.

Other divers are fortunate and learn see it all quite differently. For them the sea is a new world; they are explorers. They realise how recent it all is. Thirty years ago virtually no one had seen any piece of the sea bed or most of its life. The first underwater maps are only 15 years old and still cover only tiny pieces, most marine life is undescribed and every habitat is new and different. What is more, all this is natural, unlike man-made paddocks and city streets. The underwater world is as natural and diverse as the Amazon forest, although right on our doorstep.

These divers learn to look at this new world and see what the hunters miss. Every dive becomes exciting. A "boring" expanse of sand, with no scallops in sight, is full of shell fragments, worm casts, feeding holes, wave ripples, grain sizes and colours. As they learn to read the signs, they find buried living shells, "snapper biscuits", tube worms, pale slender "yabbies" in deep burrows, camouflaged crabs and flatfish.

Each dive becomes a comparison. This not just a rock wall, this one has less kelp, more branching sponges, bigger sea anemones and some funny-looking whelks that you never saw before. You become a surveyor as well as an explorer. You do not have to draw maps, except in your head, but you start to compare and contrast, to remember whole patterns, and learn to predict. You may not know any Latin names (neither did Captain Cook's naturalists, their stuff was new too!), you can't eat or sell the things you see, and half your friends don't understand what you are talking about, but who cares; you are having the time of your life.

As you learn to appreciate the full range, beauty, complexity and sheer interest of this new world, nothing is boring. Wharf piles and mangroves are full of life and activity

(but how many divers have ever looked at them). Your exploring diver can have fun while retrieving someone's lost mooring! The "same old place" you have dived many times is actually changing with the seasons, after storms and from year to year. Have you noticed? Your "surveying" divers, can give examples,and are even learning to measure some of the changes. They can have fun even in the murky water after a winter storm as they check what has changed. One boulder can have a hundred species round it, all with shapes and activities as wierd as a Martian monster, but only your "comparative" diver bothers to look close enough to notice anything at all. But if you do get into these things, and become more aware, you begin to feel privileged, proud and protective. You start to care about it all. Not in any stuffy way, but passionately.

Divers invented and still lead the cause of marine conservation, Before 1970, they were proposing marine reserves at Leigh and the Poor Knights, and imposing restrictions on their own fishing there. In the mid 1970's volunteer divers began to make the first underwater maps, inventing the habitat definitions as they went along and working out ways to record the abundance of fish and other life. Eventually Leigh (1977) and the Poor Knights (1981) were established as the first legal marine reserves. Today dive clubs and enthusiastic individual divers are the prime movers of most new proposals. It is a long hard battle, because most people see the ocean as just a dull grey bumpy surface, from which "goodies" can be pulled, and where "rubbish" can be dumped.

There are two tasks facing us if we wish to care for the sea. The most obvious is to deal with "the problems" - wall-of-death nets, oil spills, sludge dumping, overfishing, sewage pollution, reclamations and so on. These problems are often urgent, dramatic and highly publicised. Divers can be very helpful on these issues, not just with their opinions and as a lobby group, but also with information, with photographs, surveys, education, public talks and newspaper articles. They can raise the whole level of debate with their knowledge, which may come from previous experience or be specially gathered for the purpose. This is not only a public service of which they can be proud, it is also often exciting, interesting and orginal. Anyone can help, you need energy and initiative (and every diver has these), but you don't need any theory or particular expertise. Usually no one has any good theory, that's why these things are real "problems".

You can join in with existing environmental groups, like Greenpeace, Friends of the Earth, and the Royal Forest and Bird Protection Society, that deal with these issues on a wide scale or you can get into local action groups on specific problems, There are even organisations, like Max Hetherington's "Aqua", which concentrate on marine pollution and are connected to the N.Z. Underwater Association.

The "problems" are many and urgent, but we should not spend all or even most of our effort on these. Prevention is better than cure. We should try to stop the problems arising. We need to get back to basics. We are very ignorant about the sea and how it works. Compared to levels of knowledge which we take for granted on land, we know very little about marine life, marine processes and how to sustain them in the face of all our activities.

We need insurance and natural baselines. We need proper (no-take) marine reserves, pieces of the sea without any extraction, maintained with the minimum human disturbance we can arrange. The existing examples at Leigh and the Poor Knights have proved successful and popular in many ways.

Marine reserves are very successful in providing better information. Observations are much easier when the fish go about their ordinary buisness, instead of fleeing from you on sight. If the populations have more natural densities, then the patterns of abundance tell us about their lives and habits, not just where fishermen have been most active. If protection is absolute we can study very subtle points like territory defence, feeding behaviours and sex changes. Where protection is permanent, we can look at changes with weather, season and years, knowing these changes are natural. When we can measure the natural changes we can be more certain about the changes exploitation or other human interference causes outside the reserve. (Without this, anyone can argue a change was just a "bad year" or otherwise not their fault.)

Marine reserves not only protect marine life, they also help restore it to more natural levels. The crayfish (rock lobster) in the reserve at Leigh are now about 20 times more abundant than in similar habitats which are still fished. The stocks have not built up because of extra larval settlement (this is just the same in the reserve as outside). The build up is simply due to the protection of those of fishable size.

Marine reserves have become very popular. The Poor Knights were always popular because of their special and spectacular marine life and scenery. The reserve protection simply maintains this (like protecting the Crown Jewels). The coast at Leigh, however, is a quite typical and ordinary piece of north-east open coast. The reserve there has created an attraction. The protection of the reserve means people can see more fish and other life, more easily, more abundantly and more naturally. They like this and come in droves. This is surprising if you remember that nearly everyone goes to the sea *talking* about fishing - spear-fishing, angling, set-netting, cray hunting, scallop gathering, and so on. None of this is allowed at Leigh, but all of the people who come must pass places where they could fish to their heart's content on the way to the reserve. Marine reserves are popular with schools, universities, adult education groups, naturalist societies, diver training classes, and tourists. It does seem odd that we still have so few.

The greatest potential value of marine reserves is still a controversial question in management circles. Would they form marine stud farms of value to fisheries and other marine resources? The few pilot tests suggest that the answer is yes. With 20 times the crayfish density found elsewhere, the 5 kilometre of reserve at Leigh produces as many free-drifting crayfish larvae as the next 100 kilometres of coast. No, more than that, because the crayfish in the reserve are larger and heavier than those outside (which don't last long once they reach legal size). The larvae from Leigh do not (after 10 months drifting) settle back where they started, but somewhere down current. Marine reserves certainly could act as free stud farms. Would they do so for enough species and to a sufficient extent to make a netweork worthwhile? Nobody knows for sure. The way to

find out, of course, would be to try it. Since the idea was put forward 12 year ago, more and more people are agreeing, especially divers and fishermen whose experience suggests that it would work.

The means to create more marine reserves already exist, we have the necessary legislation to act and a government department with the the necessary mandate. What we don't yet have, although it is building fast, is enough enthusiastic public support to satisfy the politicians. We need marine reserves in all regions of N.Z.(not just on the north-east coast), we need them to cover all habitats (not just special prime dive spots), we need them to form a significant network (not just a few "goldfish bowls"), and we need them urgently (not after a decade or two of scientific survey and bureaucratic argument).

We need divers to lead the way. With their knowledge, their pictures and their enthusiasm, the public at large will get the message. It is already happening but needs much more effort. The sea is public domain, you cannot buy a marine reserve, like a piece of forest; you cannot just get the ear of the minister and get a quick signature. Marine reserves require widespread public support. To build this up takes real time and effort; and has be done on broad principles, not just for each local proposal.

It can be all be fun, there is no real enemy, just ignorance and narrow-mindedness. Anyone can help. Active groups already exist in many parts of the country. They are proud of their efforts and rightly so. Nelson, Bay of Islands, Waiheke, Marlborough Sounds, East Cape and Banks Peninsula are just some of these. If there isn't some activity in your area, home base or active diving region, why not start an action group. Don't confine membership to divers, reach out to everyone, but divers can be the leaders and probably need to be the mainspring.

The campaign for more marine reserves is not just a matter of selecting and proposing a site, in fact this is only a small part of the game. The major effort is in getting the wider public interested and concerned. This needs lots of slide shows to schools and groups, letters to politicians, articles in the papers and so on. To do this properly you need slides, videos, specimens, stories and surveys of your coast. To get these you have to go out and explore it all, looking carefully, thinking about it, and having a lot of fun. What are you waiting for?

Perhaps you are modest and you are not sure how to begin. Maybe you want the experts to tell you what to do. The bad news is that in real terms there are no experts. The nearest thing to an expert in this game are those who have surveyed a few bits and realise that these were all so different, advice on "how to do it" is not possible. Methods suitable for describing marine habitats in Fiordland, Marlborough Sounds, Kaipara, the Poor Knights and the Wairapa are almost certainly so different from each other that a manual of what you "should" do would be very little real help.

The good news is that you can just start. The first underwater survey in New Zealand was at Mimiwhangata (in 1974). Wade Doak and Roger Grace did not have a model of how to do it, they made one up as they went along, but they got on with the job

and the results are still very useful. The next survey at Leigh (1976-7), learnt from this trial. Instead of being very "scientific" and mapping in order of depth, substrate, topography and dominant life forms, Tony Ayling and his helpers mapped "habitats" which relied on the visible life for their definitions. This was much quicker, much easier *and* more informative. The main habitats found at Leigh (shown in the figure) were described by seaweeds (or lack of them). The third survey, at Mokohinau in 1978, was carried out by amateur divers who were not even science students. They were RNZAF personnel on expedition training. Despite their non-expert status they produced a very useful survey. Since then, various clubs, groups and organisations have "had a go", realising that common sense and enthusiasm are the main requirements. You can invent habitats too (probably different in your area), and map them. Have fun *and* get a place in history.

The third marine reserve was established in 1990, around the Kemadacec Islands; another at Kapiti in 1991 and three more in 1992 - at Hahei,on the Coromandel; Mayor Island in the Bay of Plenty; and at Long Island in the Marlborough Sounds. Many more are under active public discussion or various stages of formal proposal. But if all these are established they will form barely 1 percent of our sea area and many marine habitats will not be represented at all. On land we have about 25 percent of the area of the country in unexploited reserves - scenic reserves, National Parks, wildlife refuges and forest reserves - every habitat is represented and there are formal policies to ensure these are adequate for conservation.

At the 1990 election all the political parties said nice things about marine reserves and some came out in favour of 10 percent. It could happen, interest and support are increasing, but it has taken 25 years to get a small scatter of reserves. We need more push, we need a proper policy, we need a representative network of reserves in our seas, capable of acting as natural stud farms as well as conserving examples the whole marine environment.

Marine reserves will not solve all the problems, but they would certainly help us think clearly. If we decided to have some places in the sea as undisturbed and natural as possible we could learn what was natural instead of just trying to imagine it. If we had some natural baselines, we could measure the effects of our activities instead of just arguing about them. If we had better ideas about how the sea operates naturally as a system, we could plan sustainable harvests and sensible manipulations, instead of having booms, busts and pollution. We could even show our children what the marine scene is like (education), enjoy discovering it for ourselves (recreation) and show it to the world (tourism).

We have the option, but it won't happen unless many people decide they really care. We need those who can actually go into the sea and record what is happening, to speak up about what they learn, and to lead the rest of us.

For further information:

Ballantine, W. J. 1991 *Marine Reserves for New Zealand.* published by Leigh Marine Laboratory, University of Auckland. 196 pages.
A resource book of background information on marine conservation and marine reserves. Copies were sent to all New Zealand public and secondary school libraries in 1991.

CAPTION FOR FIGURE:

Some of the main habitats in the Cape Rodney to Okakari Point Marine Reserve, near Leigh. Drawn by Dr. John Walsby.

In descending order:

(a) **The intertidal rocks**: covered with barnacles and patches of small seaweeds.

(b) **A zone of large brown seaweeds**: often several species mixed together, but all "leafy and stringy" types. Mainly *Carpophyllum, Cystophora* and *Sargassum.*

(c) **A "bare" grazed zone**: kept clear of large seaweeds by sea urchins (= kina, sea eggs, or *Evechinus*), but with a continuous cover of pink encrusting or turfing coralline material (red seaweeds collectively called lithothamnia).

(d) **The kelp forest**: a zone of large brown kelps (just one species - Ecklonia), usually dense enough to form a continuous canopy. No sea urchins.

(e) **The deep reef**: no large brown seaweeds (light now too dim) and dominated by masses of sessile animals (i.e. those fixed to rock), like sponges, sea squirts, sea anemones, brachiopods(lamp shells), and bryozoa (encrusting or lace like forms).

(f) **Sand and shell gravel** beyond the reef: no large seaweeds or fixed animals (but plenty of crawling and burrowing animals).