

## Excuses and red herrings

Some of the "reasons" given for not establishing marine reserves, for delaying action, or for charging off in different directions are so common they are worth listing. Just knowing these ideas in advance helps to prepare replies. In addition, realising that these hoary old excuses will be trotted out "as sure as the sun will rise" provides mental protection against any suggestion they have real force or sense, however loudly they are shouted, or however many people are initially taken in.

1. Who says I'm doing any harm, what's the problem anyway.....  
(and I don't believe in insurance, either.)
2. There are too many restrictions, already.  
(Don't ask if they achieve something worthwhile- just count them!)
3. I've always fished off this rock - it's my right!  
(like my right to hunt moa!)
4. Why here? Not in my back yard. Somewhere else is better.  
(indeed, anywhere else.)
5. It's not my department. Don't bother me - I'm busy! They will deal with it.  
(Who?.....and is that a blank cheque?)
6. We need more research to find the right places, sizes, boundaries etc.  
(when we've counted and mapped all copepods, whales, sponges, kelps and kina round the entire coast, we will know just what to do.)
7. We need more consultation. We mustn't upset the....  
(and if anyone says boo! we will run away)
8. Yes, but one at a time! We should proceed cautiously.  
(like 3 reserves in 25 years)
9. How could you police it?  
(more easily than getting people to pay taxes - which is clearly impossible.)
10. Can I still catch fish?  
(translate as: "I am not just selfish, but short-sighted and in need of protection.")
11. Only after we've sorted out the quota system, a Maori fishing policy, drift nets, coastal resource management, the economy, plastic debris, etc.  
(which, of course, will only take a few days.)
12. We must first produce the general policy, state the precise aims, organise appropriate guidelines, arrange management policies, etc.  
(and bury the whole question in bureaucratic bulldust.)
13. Just get rid of the trawlers, the set-netters, the drift nets, the large boats, the outsiders and everything will be fine.  
(for me and my mates, and blow you, Jack)

14. Our waters are so cold (or murky or rough) there's no point in a marine reserve here.  
(if I can't look at it and say: "How pretty!" - there's no point at all.)

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## How about in your backyard?

Lots of people say, "Yes, I'm in favour of marine reserves in principle, but we don't want one here. Put it somewhere else". When local enthusiasts for a marine reserve first come up against this, they often get very worried. If, wherever the suggested site, there is opposition based not on principle but on a strong dislike of personal inconvenience what are the proponents to do ?

First, they could recognise that this problem is so common it even has a title - NIMBY - standing for Not In My Backyard. Second, we have already learnt how to deal with it. Third, the method for tackling it is rather slow, very hard work and there are no short cuts. Fourth, happily a lot of this work has already been done. Finally this is not just a problem in "other" people, we all do it frequently, and, although there is a element of selfishness and illogicality in it, it is both human and forgivable.

I expect you believe, in principle, that we need schools, hospitals, rubbish tips, motorways, ports and so on. So do I. However, I doubt if you are going to be very pleased if any of these is proposed for right next to your home. Even if you have children of primary school age, it is unlikely that you really want a school playground full of noisy children next door. Even if you commute a long distance to work, you probably don't want a busy motorway off-ramp next to your garden. Don't feel too guilty. This is true of nearly everyone.

Despite the fact that there will always be some strong opposition to any site, we still get schools and roads and other facilities that the community feels are important. This proves the second point. We already have social and political systems for preventing individuals from vetoing public projects. In a democracy, these systems depend not on convincing the locals that a particular site is the very best, but on convincing nearly everyone that the principle needs to be serviced.

If the community at large is convinced that children must be educated then sites for schools will be found. The sites chosen will reflect the level of belief in the principle. If a society feels education is very important, then the school sites will be level, spacious and central, but if schools are generally considered a method of keeping kids out of the way until they can do some useful work, then any little hole-in-a-corner will do for the school. The same principle will apply to marine reserves.

We need to convince large numbers of people that marine reserves are a good idea, and we have already. Even the opposition tends to say "It's a good idea in principle, but...". The next step is to raise the level of belief. If marine reserves are generally perceived as a minor luxury then there will be a few reserves in odd corners. If on the other hand they are important to our successful management of marine resources, a protection of our heritage, necessary for science, education and recreation, etc. then we will get a full and effective network.

But don't be fooled. The NIMBY principle will still apply. It always does. But if enough people believe strongly enough in the principle, NIMBY won't matter. In the meantime we can throw the challenge back at those who say "I believe in the principle, but..." The proper reply is: "Spell that out. Tell us what is this principle you believe in, and why everyone except yourself should contribute to it."

This probably won't convert the objector, but it will indicate to all the other citizens present the nature of the objection. This is not just a tactic. One of the strongest opponents to the first reserve at Leigh based his objection on the likely reduction of the value of his land if you couldn't fish off the adjacent shore. Some years after the establishment of the reserve, this land was put up for sale. Prominent in the advertisement was the proud claim "adjacent to the marine reserve"! Perceived values are changing.

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## **What's the problem? Please remember I'm busy.**

There are always people trying to bother you with some matter that seems terribly important to them, but turns out to be trivial, or just another crank theory for saving the world. Why should you even think about marine reserves?

Well, our whole world is mainly sea (about two-thirds of the planet's surface), but because we have been so busy with our affairs on land, we haven't given the sea much real thought yet. We have just done whatever seemed useful, and let anyone else do the same. As a result, we have already made quite a mess of the sea, and it's getting worse.

There are so many things wrong that those concerned could easily spend all their energy rushing from problem to problem, solving crises and generally fire-fighting. We do. If it isn't wall-of-death nets, oil spills or saving the whales, it's marinas, rubbish dumping or quotas for orange roughy. We need an opportunity to think about basics. What do we really want from the sea? Is this sustainable? Somehow we have to stop behaving like kids raiding a lolly shop. We must stop assuming that the only problems are about sharing out the goodies and not getting in each other's way. We have to think about the sea itself.

This is very difficult. The sea is big, mobile, wild and intractable. It doesn't fit our land-based ideas. Finding out anything about the sea is very hard. But we make it worse. We spread our activities anywhere we can get some profit, fun or an easier life. Each year there is more activity in more places. What is the baseline, where is natural, how does it all really work?

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 imagining it. If we had some clear 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 as a system, we could plan sustainable harvests and sensible manipulations, instead of having booms and busts. We could even show our children what the marine world was like (education), enjoy looking at it ourselves (recreation) and invite others to do so (tourism).

In New Zealand, we still have the option. It is quite practical to have a network of non-extractive marine reserves. We have the idea, some examples that work, plenty more areas for others, the legislation and administrative systems to create a real network, and the democratic system to make the decision. All we need to do is to think about it and decide. The only serious danger is that we won't bother to do that, we could easily say we were too busy.

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## **The thistledown effect: Planktonic dispersal**

One of the reasons why it is so difficult to manage marine life properly is the way it reproduces and disperses. Most of our experience is on land, and nearly all life on land has reproduction within the same population. With land plants and animals, the parents and the offspring occur closely together, and the young are born into the same population as their parents. Dispersion also occurs, but this spreading out is either slow or happens mainly to adults.

None of this is generally true in the sea. Most marine species have very large numbers of very small eggs and these are dispersed by drifting away from the parents in the currents. Most marine animals also have drifting (planktonic) larval stages as well. So, when settlement and/or metamorphosis occurs the young are a long way from their parents.

These are general rules (and there are exceptions). Everyone is familiar with thistles and thistledown drifting in the wind. This is one of the examples of plant seed dispersal on land. The reproduction and dispersal of thistles can be used as a model of what happens generally in the sea. Thistles have many small seeds with a fine hairy down which are dispersed by the wind. Even if we control thistles rigorously over most of the country, the dispersal of windborne seeds from scattered patches of thriving thistles will keep producing new thistles everywhere. The thistledown effect is similar to what happens with the planktonic dispersal of marine species.

This is both bad news and good news for marine reserves. The first bit of bad news is that no single marine reserve can be self-sufficient, unless it is gigantic. In any reserve of practical size some of its species will be totally dependent on recruitment of juveniles from outside. For many other species in the reserve much of the recruitment will be by larvae, eggs or spores which drift in from somewhere else. So if marine reserves are to be sustainable there has to be a network of them.

The second piece of bad news is that we cannot calculate the result of this planktonic dispersal in precise terms. Or, more accurately, even if we could learn how to calculate it, the result would be different for each species (different lengths of time in the plankton), it would be different in each year (current speeds and directions vary a lot), and it would be very different for each arrangement of reserves (varying with their spacing, size and precise position). In short we cannot calculate in precise terms where we should have the marine reserves.

The first piece of good news is that we don't need precision calculations. We know the principles and the trend of their effects. A farmer does not need to calculate which way or how far thistledown will travel, to know what to do. If he can't or won't do it the Noxious Weeds Board will. Thistles are pests, so we have to reverse the conclusions for marine reserves. It is clear that the precise position of marine reserves is not the crucial question. What we need is a network of maximally reproducing areas scattered around the country thickly enough to have a mass effect on recruitment of juveniles everywhere. Maximal reproduction from an area is generated by full protection i.e. marine reserves. The process can be started anywhere, and local and secondary principles can be used for precise positioning of the first reserves in each region.

The second bit of good news is that we already know how to handle situations like this. We do it all the time to create networks of hospitals, schools, fire brigades, and other systems which the community has decided are important. Precise locations have to be decided, but they are not the point that governs action.. Maximal delivery of the required effect is what we arrange. If we believe the effect is important we already know how to arrange it in political and social terms.

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## What's the point of food you can't eat?

At a meeting on an East Coast marae, to discuss marine reserves, there was a slide show. Some of the photographs were of holiday-makers looking at the abundant marine life in the Marine Reserve at Leigh. Afterwards one of the elders said, quite gently but firmly, that he didn't see any point in kai (food) you couldn't eat.

I've forgotten what I replied, but whatever it was, it lacked force, because I agreed with him - up to a point. He was reminding me that, while it was very nice, near Auckland, to provide entertainment for leisured and affluent city folk, in his area people had more serious things to worry about - like getting enough food to eat, or money to purchase essentials.

At the time I was mainly concerned with my insensitivity, and how to atone for it. Later I had a chance to think more deeply about what he'd said, and what I should have replied (after an apology for including matters of little local concern). I should have led the discussion back to really important points, using his remark as a focus. For, of course, in another context, he already knew the sense of food you could not eat. It happens all the time when we keep some of this year's crop as seed for next year.

When growing kumara or beans, if we want a crop next year, we need to keep some seed. This seed is not those bits we didn't need to eat. It is put aside first, and kept at all costs. Next year's seed is not some low-grade left-over, it is selected as the best. When it has been safely put aside, it may be looked at, but not eaten.

Is there a useful comparison here? Yes and no. Obviously some fish and shellfish need to be kept to breed, if stocks are to be maintained. However, in the sea, the relationship between what we leave now and what we can expect to have in the future is usually very obscure. Which of these points is more important: the known general principle or our ignorance of exactly how it should be applied?

Put in this way the answer is obvious, and simply an extension of our gardening practice. Even for kumara and beans, the gardener doesn't know exactly what the return will be next year. The weather and other circumstances cause considerable variation in yield. So the prudent gardener keeps more seed to cover the uncertainty, and stores them in more than one place, to reduce the risks of loss.

In the sea, we are very ignorant of the way stocks relate to reproduction, even in the best-studied fisheries. The little we do know indicates large differences in juvenile recruitment from year to year even when stocks are constant. It would clearly be prudent to keep back from harvest a significant amount of each stock. It would be sensible to make sure these breeding reserves were some of the best. It would be wise to have these untouched stocks spread about in different places.

These reserves would then be like the food or seed you couldn't eat. Having got them for essential purposes, it would be all right to let people look at them, so long as no damage was done. Whether this looking was as entertainment for tourists, education for children, training for students, or research for scientists, it would all be "cream on top". Furthermore, these reserves would let us know, for the first time, just what natural healthy marine stocks

should look like. Some of us think we can tell now, but we don't know this for a fact, it's just a thought, and it could be wishful thinking.

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## 10% ?

Since 1980, I have been recommending that 10% of all New Zealand seas be made into non-extractive marine reserves. One tenth of all marine habitats in all regions of the country. Why the figure of 10%? is this just a nice round number? No, it has a reasonable basis in experience and principle.

One tenth has a long traditional use as a figure that signals importance without serious hurt. In religious tithes, insurance premiums, business contingencies and other fields, one tenth is commonly used to indicate that the point to be covered is of great importance and must be provided for, but that precise measurements of necessity are not possible.

The 10% contrasts with the 90% for exploitation, for fishing, aquaculture, and other extractive or intensive uses, and clearly recognises the importance of these uses. We are not trying to change direction, we are trying to support, insure, and protect the system that allows " business as usual".

There is virtually no direct marine experience for a reservation amount, but on land in New Zealand, much more than 10% reservation from extractive and intensive use has been found worthwhile. Land reserves comprise between 20-30% of the total area of New Zealand. 10% is therefore a conservative figure for our seas.

Natural variation in marine resources (such as fishable stocks) is known to exceed one tenth. The year to year variation, due to natural changes in weather and other uncontrollable factors, is generally much more than 10%. The implications of this are many and subtle, but it means that any arrangements made for using these resources must have at least a 10% safety factor built into them, if they are to be sustainable. Because of economic and political pressures, it is very difficult to build a safety factor into actual extraction quotas, indeed they are often set with a risk factor of damage or collapse. This may be acceptable to the particular industry and the immediate economic conditions. We need a separate and additional system to provide for the overall public interest in long-term sustainability.

It can be questioned why we need a figure at all for marine reservation. Would it not be possible to operate step-by-step, without setting any general aim point? Well this is what we have been doing until now. The results have been 3 marine reserves after 25 years of step-by-step discussion, while the resource base is increasingly pressured and shows clear signs of general degradation and particular losses.

There are two reasons for setting a clear aim for marine reservation. One is to reassure those who might be worried about "where will it all end?". It is an amazing fact that even when the first tiny marine reserve was proposed some people leapt up and started crying, "We must make a stand before they lock it all up!" Even if this is merely a slogan produced by those who have no better argument, it is important to have a figure representing the aim for the foreseeable future, which would not be exceeded unless there was a clear demonstration that more was necessary..

Much more importantly, however, we need to propose an amount which would be enough to provide worthwhile and widespread benefits. The idea of 10% is not just to

produce an easily-remembered, conservative and traditional figure, it is also designed as an aimpoint for those who really wish to protect our marine heritage and ensure the sustainability of our marine resources. A network of marine reserves comprising 10% of every type of marine habitat and spread round the country has every chance of achieving these aims, and is a worthy cause for every citizen. 10% is a rallying cry.

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## Why take out insurance?

When we know a lot about a system, it still seems sensible to guard against the unpredictable: natural disasters, human error, accidents and other unknowns. For example, supermarkets are very well understood systems, but a good supermarket manager, despite all the detailed knowledge, will have:

- ▣ fire insurance
- ▣ cash reserves
- ▣ membership of some trade association
- ▣ third party insurance, etc.

All of these cost real money, yet none of them have an exactly-foreseen function. They are a protection against potential hazard. Of course, there are smoke detectors, fire extinguishers, staff training, fire walls, inspections, etc. but there is also fire insurance. It is a sign of good management to not assume that one can foresee everything in precise terms, and to take general precautionary action as well. Furthermore, there will be no complaints from the owners if, after many years, no fires occurred and all the fire insurance money could be said to have been unnecessary! The owners also understand the need to cover against human error, natural disasters and other labels for hazard.

Oddly enough, when we know very little about a system, reasons for sensible precautions are not yet predictable. Compared to supermarket systems, where there are books about the best arrangement of the shelves, we know very little about any of the systems in the sea. But in the sea we tend to be satisfied with little or no insurance.

If we are told that a fisheries management program is the best practical option for the particular stock or species, we tend to say "Fine, no problem!" rather than "What are the risks and how can we guard against them?" It seems that if ignorance is both great and widespread, we lose sight of the need for precautionary principles just when we need them most.

Even when attempts have been made to measure the risks in fisheries and other marine management systems, we tend to accept very high risk levels. Warned of impending dangers, politicians and the public tend to worry about false alarms rather than the price to be paid if the warning is accurate. This is partly because of communal ownership of marine resources, but mainly because everyone has great difficulty in assessing the risks, or even imagining their nature. In the marine field, the "experts" are those who realise how ignorant they are - the others don't even know that much.

In the sea we tend to say, "What harm is it doing?" and challenge someone to produce clear evidence before we will even consider precautions or controls. We fail to notice that even the measurement of "harm" will be difficult if our "management" is general and our knowledge poor. What sounds like a sensible "If it's not broken, don't fix it." is really more like "We will take out insurance only when we can see the flames".

Marine reserves are not a substitute for careful and intelligent marine management, but they are a sensible part of it. At the very least they are a useful precaution against the unforeseen hazard. Every citizen knows this is wise even when we have good

understanding and a high level of control. You put more oil in your car before you can "prove any harm". You keep a straight edge in the workshop so you can measure kinks and bumps. You keep some savings in the bank in case of unforeseen developments. You insure your property against fire, theft, and natural disasters.

But in the sea, we just "go for it" with a single management plan for each activity. When some reservation is suggested, we say "What exactly will this achieve?"

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