

An aerial photograph of a vast, shallow reef flat with varying shades of blue and green. A small, white twin-engine propeller plane with red accents is flying over the water on the right side of the frame.

BY WALTER A. STARCK II

WHY WE DON'T NEED TO SAVE THE BARRIER REEF

The potential for developing our most unspoiled resource is unlimited

Almost a decade ago in the Solomon Islands, I noticed a "SAVE THE BARRIER REEF" bumper sticker on the dinghy of a visiting Australian yacht. Initially I thought it was a joke — someone poking fun at the hysterical fringe of the environmental movement. Surely no-one could seriously believe that one of the oldest, richest, most robust and least exploited or threatened of ecosystems needed to be saved. Saved from what?

Now, having lived in far north Queensland for the past six years, and having explored the Reef from Torres Strait to the Capricorns with a back-

Photos courtesy of the Queensland Tourist and Travel Corporation





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ground of a lifetime of coral reef research and exploration around the world, I have found the Reef to be as rich, unspoiled and unthreatened as I had expected. The majority of Australians, however, really do believe the Reef is threatened by a variety of dangers, and saving the Reef from one imaginary bugaboo or another seems to be a perennial political issue.

How has the prevailing opinion become so out of touch with reality? The answer lies in the fact that public opinion is strongly influenced by academia, special interest groups and the mass media.

Academia, with its respected expertise and its dominant influence on the values of the educated middle class, sets the general tone. But unfortunately, scientific knowledge of coral reefs in general, and the Great Barrier Reef in particular, is still in a very primitive state. At this point we do not even know what lives on the Reef, much less how it all works. (On a recent expedition, two colleagues and I discovered 30 different species not previously known to occur in Australia, including a half a dozen that were new to science.) Despite the paucity of knowledge, academics routinely form "expert" opinions which are usually based on broad generalisations taken from very limited data. Such an approach is more likely than

not to lead to erroneous conclusions. To put it differently, "expert" opinion is one of our best sources of misinformation on the Reef.

Having staffed our universities with so-called "experts", we send our young people to tertiary institutions where they are not so much educated as indoctrinated with the attitudes and values of their teachers. With little to occupy their time, they are attracted to a variety of social movements like civil rights, disarmament and the environment. These special interest groups offer the delicious feeling of righteousness and of being among the enlightened few, as well as a very clear and simplified definition of good and evil.

Of course it's no good being so self-righteous if a cause doesn't exist — and the Reef is a natural. Why not? It's one of the world's greatest natural wonders. A unique part of Australia's heritage. Who could not be concerned? Very few people are directly affected personally. Practically nobody has enough real information to refute or even question allegations. The media will love it.

Before dealing with specific issues, however, I would like to clarify a few of the grosser conceptual errors fostered by the environmentalists. The first is the unquestioned presumption that any detectable effect of man on nature is of negative value. A sort of "nature is good, man is bad" viewpoint. In fact, every creature affects

The Great Barrier Reef remains our most picturesque, unspoiled and undeveloped resource. The only industries on the Reef, tourism and fishing, could easily be expanded with no detrimental effects on the pristine beauty of the place. Oil drilling, too, is not the great threat to the Reef that it has been portrayed as.

the ecosystem and those effects may be beneficial or destructive depending on whether they serve to increase, maintain or reduce the abundance, diversity and healthy condition of life. Man is no exception and his effect is perhaps as often beneficial as not.

Another misconception involves the words "delicate" and "fragile". The Reef never seems to be mentioned without use of these terms. All living things are of course delicate and fragile, in the sense that a rock or cannonball is not. In terms of durability and adaptability, however, coral reefs make rocks and cannonballs seem like passing fads. Coral reefs in one form or another have been around for at least half a billion years and many present-day reefs including the Great Barrier Reef have survived for 20 million to 40 million years.

The unique durability of reefs resides in their very richness, for unlike simpler natural communities with limited numbers of interacting species, vital functions on reefs are shared between many species.

A failure by one is compensated for by others. Relationships form networks rather than chains and severing a web in a net is not nearly so disastrous as breaking a link in a chain. The coral reef may be likened to a spacecraft with backup systems for backup systems.

A community which has survived ice ages, great variations in sea level, and even mass extinctions, and which still bounces back after devastating damage from the severest storms is hardly accurately described as "fragile" or "delicate." At Eniwetok Atoll I was immensely impressed to see that even the destruction wrought by 30 nuclear bombs had been repaired by the reef community in less than two decades.

Another favorite word of the environmentalists is "endangered", meaning "faced with possible extinction." While our species has in fact been responsible for the extinction of far too many animals, it is also a fact that despite our best efforts we have never exterminated a single species of marine fish or invertebrate. These creatures generally have such large, widespread and inaccessible populations and such vast reproductive capacities that extermination is next to impossible.

The case of the potato cod is a good example of how far the endangered species hysteria can go. A group of a dozen or so tame cod was drawn together at Cormorant Pass (east of Lizard Island, on the outer Reef) by skindivers feeding them. A rumor started that someone had killed some of them. Environmentalists jumped on the issue with the claim that this was virtually the entire population of a rare and endangered species. After a period of media attention a national park was declared to save the potato cod.

During the entire episode no-one ever seemed to question just how rare or endangered the species really was. The opinions of sports divers who lived thousands of kilometres away and who knew the area from occasional short visits were accepted as gospel. Knowledgeable ichthyologists or commercial fishermen were never consulted.

The potato cod (*Epinephelus tukula*) is in fact not a rare species at all. It is found from the east coast of Africa right across the Indian Ocean and throughout the western Pacific as far north as Japan. In the northern area of the Great Barrier Reef it is well known to commercial fishermen and those who dive the outer reefs. Like most larger reef predators it is never abundant, but certainly not rare. During extensive diving on the Reef and in many other locations throughout the Indo-West Pacific region I have seen many more potato cod than I have seen tiger sharks or hammerheads, yet no-one considers these rare or endangered species.

When a line was drawn on a map around Cormorant Pass and a park

declared the matter dropped from public attention. Except for three months of the year when gameboats may be in the area, if you visit Cormorant Pass you will almost certainly have the place to yourself to do as you choose. The tame cod are no safer than they were before.

Air breathing marine animals are a different kettle of fish for they are not only accessible but also produce only a few offspring as compared with the thousands or even millions produced by fish and invertebrates. The reef animals in this category, turtles, dugongs and sea snakes, fortunately have large, widespread and healthy populations on the Reef which are not threatened by any present or foreseeable dangers. In summary, there are no endangered species on the Reef.

Let's consider the alleged threats to the Reef. The one which seems to generate the most concern is oil drilling. The bad guys are of course those ultimate symbols of multinational capitalism — the oil companies. When oil drilling on the Reef was proposed, the unholy trinity of academics, environmentalists and the media had a field day. They imagined greedy capitalists callously destroying our most precious heritage and began shouting "rape."

The truth is that had oil drilling occurred the environmental effect would have been unimportant. Unlike the environmentalists I base my claims simply on what has ac-

tually happened in oil spills and with thousands of oil wells already drilled in coral reef areas.

Oil is toxic. So can be salt, water and anything else you wish to name. Oil, like salt and water, however, has a very low level of toxicity. Every major oil spill receives headline publicity accompanied by dire predictions of disastrous long-term ecological damage. When such damage does not eventuate (and it never has), the spill is long since out of the news; no-one is interested in a disaster that did not happen.

Petroleum is an organic product and has been seeping into the biosphere for eons. When spilled at sea the more volatile fractions evaporate in a matter of days. The heavier residue is broken down by micro-organisms and becomes fertiliser, which enriches rather than degrades the biosphere.

The main damage from oil spills comes not from toxicity but from the smothering effect on intertidal organisms and air breathing marine animals. Detergents used in attempts to clean up oil spills have proved to be far more toxic, and have caused more long term damage than the oil itself.

Oil floats. Coral reefs don't. Damage to reefs is restricted to the small portion that may be exposed at low tide. This area of a reef is under constant destruction and repair from natural causes. Unusually





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calm weather coinciding with unusually low tides can kill it through drying. Heavy rain (when it is exposed) can kill it. Storms periodically wreak havoc with shallow reefs. Such damage — either from oil or other causes — is rapidly repaired.

Thousands of oil wells have been drilled in coral reef areas in the Gulf of Mexico, the Red Sea and the Persian Gulf. Occasional blowouts and spills have occurred. Numerous ships loaded with oil have gone down in coral reef areas. None of these has resulted in extensive damage to reefs. In fact, the best fishing in the Gulf of Mexico is around the oil rigs.

Oil companies are in business to sell oil, not spill it. In the highly unlikely event of a massive spill the worst we could expect would be a temporary mess on a section of coast, a few deaths among seabirds and possibly some short-term damage on the shallow portion of a few reefs out of the 2500 which comprise the Great Barrier Reef. There is no risk at all without a substantial amount of petroleum being present. Such a risk would seem to be minimal and entirely acceptable considering the benefits involved.

Siltation, whether from mining, farming, real estate development or whatever, seems to be another favorite among supposed Reef threats.

Many species of corals live only in clear oceanic water. Others can tolerate turbid conditions. In a couple of instances involving small bays on islands, man-generated turbidity has resulted in temporary damage to clear water corals. From this has grown the blind belief that any man-induced turbidity destroys reefs. In fact,

nothing could be further from the truth.

Turbidity is a normal and even necessary condition for many coastal and lagoon reefs. Reef lagoons and coastal areas around large land masses are usually blanketed with fine sediments — what most of us would call mud. Storms and large schools of bottom-grubbing marine life such as mullet or threadfins periodically stir up these sediments and reduce visibility to a metre or less. Such periodic stirring of the sediments returns trapped nutrients, in particular phosphates, to the biosphere.

The corals and other organisms which grow under such conditions are, of necessity, silt-tolerant species. Such is the case in the inner portion of the Reef. Turbidity from human activities in coastal Queensland produces conditions which are little different from those which occur naturally — and are no more destructive.

The crown-of-thorns starfish has been seen as a more popular threat to the Reef. When the supposed starfish advance was first brought to public attention two decades ago, the phenomenon was claimed to be unprecedented. Widespread publicity was quickly followed by a rash of reported outbreaks all over the Indo-Pacific area.

Public interest generated political pressure and researchers leapt on to the bandwagon. Others not on the bandwagon suggested the whole thing might just be some natural cycle nobody had noticed before. Scientific opinion quickly polarised, and remains so to this day, but the preponderance of opinion has steadily swung in the direction of the natural cycle theory. It now appears the crown-of-thorns may even play an important role in maintaining coral diversity by its preference for

Previous page: Searching for the elusive potato cod at Cormorant Pass, near Lizard Island on the Outer Reef. Left: The Great Barrier Reef encompasses 230,000 square kilometres of reef and lagoon area, roughly 30 percent of the total coral reef area on Earth. The Reef has been much the same as it is now for 20 million to 40 million years.

fast-growing branching and platelike forms over the slower-growing massive species.

Dire predictions of ecological disaster due to the crown-of-thorns never eventuated and affected reefs recovered as quickly and completely as they would have from storm damage. Except for the cries of its original proponents, the controversy is over.

Taiwanese clam poaching is another Reef threat that has received widespread public attention. Poachers have in fact virtually stripped many remote reefs of giant clams. Few would disagree with the undesirability of destroying populations of unique and beautiful creatures for short-term profit and no-one wants to see foreigners illegally enter the country and rip off our resources.

There has never been any question about the desirability of stopping clam poaching. The problem has always been how to effectively do so. The area is vast and remote; apprehending poachers is difficult and expensive. Considering the magnitude of the task the government appears to have done everything within reason and, judging from the decrease in sightings of poachers, the arrests made have proved a significant deterrent.

To all this the environmentalists have contributed little but exaggerations. Their claim that the clams were an endangered species totally ignored vast populations which existed in areas too frequented by local vessels for the poachers to risk visiting. Also, they predicted dire ecological consequences for the entire Reef community due to the role of giant clams in filtering and purifying the water. Again, they ignored or were ignorant of the fact that giant clams are only one of hundreds of filter feeding reef creatures, or that healthy reef communities exist in many areas where giant clams do not occur, or even that rich reef communities are sustained around many Pacific islands where island people have for generations removed any large clams they could find.

When there are no obvious evils to combat, devout environmentalists enlarge on trivia. Tourists walking on coral, and anchor damage are such issues. One article in a recent magazine even warned against touching live coral lest the touched spot die and disease spread over the entire colony.

Obviously the writer had never noticed the mobs of parrotfish happily munching away at the coral on any reef or watched a

reef repair itself from the devastation of a violent storm.

Marine organisms live in a biological soup and have developed amazing powers of recuperation from injury. No one who has seen the destruction caused by even a moderate gale and watched the process of repair could seriously consider the breaking of a bit of coral by a tourist's foot as any more serious than a deer trampling a blade of grass or browsing a branch in the wilderness.

Heron Island has been the focus of environmentalists' concern regarding tourist damage to the Reef. This is the only place on the entire Great Barrier Reef where considerable numbers of tourists regularly have access to an exposed reef. Despite this, Heron Island Reef is still without question rich and beautiful. That some effect of tens of thousands of human visitors may be detectable seems a small price to pay for the pleasure and appreciation generated. We are after all dealing with only about 10 hectares of the Reef.

I've saved the best threat for last: overfishing. Out on the Reef I frequently go for weeks without seeing a commercial fishing vessel. At most I might see one or two small line fishermen in a couple of weeks. Around me I find an abundance of fish that would bring tears of joy to the eyes of reef fishermen anywhere.

Ashore I hear about how the reef fishing is stuffed and that there is a moratorium on the granting of commercial fishing licences in Queensland due to overfishing.

To understand what is going on you have to realise that people everywhere remember dramatic occurrences and forget the uneventful. A few good catches long ago dominate our memories of that period and become in retrospect the way things were back then. In the Florida Keys area of the USA old-timers have a standing joke about residents of just a few years telling recent arrivals about how the fish were so thick when they first came to the area you could walk on them.

Fishermen have their own particular biases. Fishing is hard work. Most fishermen do as much of their fishing as possible in pubs and only put to sea when money and excuses run out. An energetic, self-disciplined minority actually spend most of their time fishing and do well. Those doing well have no complaints.

To be fair it must be agreed that fishing is not as easy as it used to be on the Reef, and a deficiency is involved. The shortfall, however, is not in the numbers of fish but in the skills of the fishermen. Reef fishing is primarily line fishing which, unlike net fishing, depends on the active cooperation of the fish. In unfished areas the crudest techniques are at first productive, but in time the surviving fish learn to be wary. Fish are abundant but difficult to catch. The fish have become smarter than the fishermen.

Smart fishermen try different bait, rigs

and methods of presentation and continue to succeed. Others blame overfishing for their declining catches and whinge for the government to protect them.

This point was reached in the Florida Keys in the Thirties. The best fishermen tried new methods and remained successful. Today, 50 years later, a thriving fishing industry continues and fish are still abundant. Commercial fishing on the Reef is now at a similar point in its development as the Florida fishery of 50 years ago. Whether the Queensland fishery adapts or is strangled by misguided restrictions remains to be seen.

A few hard facts are in order. Coral trout are among the most sought after and commercially important of reef fishes. They are also supposedly overfished. During 1983 the Great Barrier Reef Marine Park Authority conducted a survey of trout populations on 56 reefs between the Whitsunday Islands and Lizard Island. Two

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Reef is a vast renewable
resource which can yield an
annual harvest 100 times
or more greater than
we now take

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teams of two divers each made multiple counts by standardised methods at each reef.

Trout were abundant at all reefs. Counts generally ranged from five to 15 fish per hectare. There were no significant differences between reefs which were the most heavily fished and those which were virtually unfished. The most heavily fished reef in fact had more (but slightly smaller) fish than average. This is not unexpected. Removal of larger individuals of a territorial species permits more small individuals to establish themselves. Since smaller individuals grow faster, productivity may actually be enhanced by some degree of fishing. The overall picture was that of a virtually untouched resource, not a depleted one.

Elsewhere in the world well-developed coral reef fisheries generally yield one to five tonnes of fish per square kilometre of reef and lagoon area per year on a sustained, year after year basis. Some of the most intensively fished areas where smaller species are also utilised yield up to 10 tonnes per square kilometre. The Great Barrier Reef encompasses 230,000

square kilometres of reef and lagoon area, roughly 30 percent of the total coral reef area on Earth. The current Queensland Yearbook offers figures for commercial landings of Reef fish during the 1980-81 year. Total Reef fish came to 1063 tonnes — or .004 tonnes per square kilometre per year.

As a further comparison, the Florida Keys have a reef and lagoon area of about 2500 square kilometres. In 1980 (the most recent year for which statistics are available) Queensland produced 201 tonnes of cod and coral trout compared with the 402 tonnes of the Florida Keys, 38 tonnes of red emperor compared with the 444 tonnes of the Florida Keys, and 824 tonnes of mackerel compared with the 2345 tonnes of the Florida Keys. In total, Queensland produced 1063 tonnes of reef fish; the Florida Keys produced 5427.

The Florida Keys, with one percent of the reef area of Queensland, produces over 300 percent more reef fish and still shows no indication of overfishing. Either we are harvesting only one-half to one-tenth of one percent of the Barrier Reef's potential yield or we have the most impoverished reef in the world — a national embarrassment rather than a national treasure.

All of these imagined threats to the Reef have certain features in common. They are all purely hypothetical and predict dire consequences that have never occurred anywhere. All reflect ignorance of the fundamental nature of coral reef communities: their diversity, variability, adaptability, resilience and productivity. None take into account knowledge from elsewhere, where the imagined threats have already taken place and the consequences are observable.

False or exaggerated claims of environmental damage serve more to discredit environmental concern than they do to protect the environment. Mindless attacks on the productive sector of society contribute more to undermining the basis of our unprecedented quality of life than they do to solving any problems.

The Great Barrier Reef is a vast renewable resource which can yield an annual harvest 100 times or more greater than we now take. It is also a tough, resilient natural community which can accommodate other human activities. It is not a fragile endangered basketcase which requires coddling. With sensible management we can have our cake and eat it too.

The Great Barrier Reef Marine Park Authority now has management authority over a vast natural resource. They enjoy a unique opportunity to set a precedent in total resource management. Whether they take an enlightened approach or simply erect a barricade of restrictions and then retreat into air-conditioned offices to shuffle papers remains to be seen. ○