

# Faith, Conservation and Science

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Science is about asking questions and attempting to answer them by structured enquiry and investigation. Faith is about acceptance without evidence, normally concerning things that would be wonderful if only they were true. Conservation faces tensions from both, but in marine fisheries and ecosystem management I fear it is currently being influenced at least as much by faith as by science, particularly in New South Wales. The science of fish resource conservation and management is under siege from numerous sources, including by the adoption by an unfortunately large number of scientists, of the uncritical perception that when the goal is conservation as they perceive it, the rigor of good science becomes optional.

Two of the basic tenets of good science are precision and accuracy. Australian universities' role as Australia's conscience continues to decrease; politicians progressively favoring opinion polls of public perceptions and wants over precise determinations of the country's needs. None the less, Australians still respect science and scientists: the deserved and hard-earned record of scientists being chosen as Australian of the Year is testimony. This respect is largely the result of the integrity implied in honest enquiry and accurate reporting which have underpinned many high profile discoveries. As a result there is great political benefit for governments in having the public believe that policies are based on science. Political merit can also be derived from the public's individual lack of confidence to challenge statements that are stated to be scientific.

In faith, and in politics, the two fundamental pillars of precision and accuracy are largely replaced by perception and advocacy. In modern Australian politics perception is assessed though the emerging 'science' of market research. In politics, perception is reality: whether it is the perceived presence of weapons of mass destruction, or children overboard, if the voting public believes, the truth is irrelevant, at least until accuracy and precision can be forced back into the debate. If advocacy of the faith is well funded, targeted at those who do not have proof to the contrary, and well lobbied, the relevance of truth is quickly diminished.

Unfortunately many Australian scientists have neglected the need for rigorous enquiry in the cause of advocacy for their beliefs. Scientists have as much right as anybody to be advocates, indeed we should be encouraged to be so, but when we use our position or qualifications as scientists to support a cause or a position the obligation to science should not be conveniently overlooked. In fisheries science and many aspects of related marine science the imprecision that results when advocacy replaces rigorous enquiry is threatening not only the wise use of valued resources but the credibility and therefore the status of science.

In an era of reluctant political acceptance of the limits of our globe to accommodate ever increasing human populations and subsequent demands, an unfortunately large number of scientists espousing poorly defined precaution has helped nurture confusion between conservation and preservation. Misinterpretation of 'the precautionary principle' to support advocacy for an inadequately researched 'precautionary' position is unfortunately common. The fundamental difference between sustainable use and total preservation is all too often deliberately overlooked. This has fueled an increasing drift towards acceptance without due diligence that resource use must be contrary to conservation. One result has been that all forms of fishing have tended to be lumped into a category that can be demonized to promote the perception that any restriction of fishing is in the interests of conservation and that areas in which all fishing is banned are magically protected.

In earlier parts of my career I spent considerable time in conflict with sectors of Australia's fishing industry as I worked to align management with science by promoting cuts in quotas, or in fishing effort, for species such as gemfish, orange roughy and southern bluefin tuna. Acrimony from the industry was at times extreme, even to the point of death threats on one occasion. I am not an apologist for the fishing industry, but it is not scientific to blame this industry for things for which it is not guilty nor to exaggerate possible benefits from restrictions on fishing.

Contrary to claims by numerous 'environmental' activists and advocates, many of whom display scientific qualifications, most fisheries in Australia result in relatively little direct environmental impact; extremely little when compared to the clear-felling, ploughing and deliberate introduction and cultivation of non-indigenous species that form the basis of much of Australia's other method of local food supply, agriculture. Even trawling, the most demonized form of fishing, has been shown to have no detectable impact on bottom biota in estuaries (Underwood 2007). No Australian fish species has ever been documented to have been fished to extinction. The contrast with terrestrial activities is striking.

Furthermore, worldwide over-exploited fish species, or even those that have been accidentally impacted, tend to respond relatively quickly to correct management. For example, the Arctic cod, amongst the most frequently quoted victim of devastation by fishing, has since 2000 steadily increased by a total of 450% to more than a million tonnes (International Council for the Exploration of the Sea, ICES, website 7/11/2009).

The overfishing that does occur throughout the world is more often an economic issue rather than an environmental one (Hilborn 2007): this is particularly true in Australia. Even in Australia's most populous state, New South Wales, only three of the more than 90 fish species

that have been assessed are suggested to be significantly overfished (Scandol *et al.* 2008) and there is serious doubt whether fishing has been the cause of the declines for at least two of these. Recovery plans that address the impacts of fishing are in place for all three species, but, unfortunately, the non-fishing impacts on these species are not subjected to similar stringent management.

Fish-trawling on hard bottoms with associated plant and/or invertebrate communities is the obvious major exception to good fisheries management in Australia. 82% (14 of 17) of the species that are classified as over-fished in Commonwealth managed fisheries in the Australian Exclusive Economic Zone have been so reduced as the result of one fishery, the fish trawl fishery in south eastern Australia (data from McLoughlin 2006), even though this fishery accounts for little more than 4% of the value of Australia's fisheries production (from data in ABARE 2007). Incidental by-catch in a number of fisheries can, and does, have significant negative ecological consequences, but in most fisheries Australia has made great progress in addressing these problems and mitigating impacts; examples include sea-birds in long-line fisheries, seals in fish-trawl fisheries and turtles and other non-target species in prawn-trawl fisheries. More work is unquestionably needed in a number of fisheries, but appropriate management of fish-trawl fisheries would overcome the majority of the major negative environmental impacts of commercial harvest fisheries in Australia (Kearney 2008).

Mitigation of the negative effects of non-fishing environmental degradation on fish, fisheries and freshwater and coastal aquatic ecosystems appears infinitely more elusive. Most of the fish and ecosystems seriously impacted are those in freshwater and inshore environments: 75% of the 56 fish species in Australia that are classified from critically endangered to vulnerable are fresh water species (ASFB 2001). Anthropogenic environmental impacts on these species and ecosystems are disproportionately terrestrially based and their management is seldom the responsibility of fisheries agencies. In most freshwater systems commercial fisheries have been completely destroyed by habitat destruction in the form of dams and weirs, siltation and other impacts of agricultural run-off, water extraction for irrigation and impacts of introduced species such as carp and trout. Access to the few remaining significant native freshwater fish populations has been allocated exclusively to recreational users.

The major threats to estuarine and even inshore environments are not dissimilar and include pollution, including siltation from agricultural industrial and urban run-off, habitat destruction in the name of development or the provision of services such as airport runways and shipping terminals, and introduced aquatic organisms, particularly weeds from household aquaria and invertebrate animals from ballast water (Kearney 2008). Coastal aquatic ecosystem destruction is not well documented in NSW but episodic total kills of all estuarine biota are common in northern rivers, such as the Richmond (Walsh *et al.* 2004) where ongoing alterations to drainage regimes have impacted more than 80% of historic wetlands that

provide fundamental support to estuarine ecosystems and fisheries (Copeland 2009). And yet fishing is still projected by 'conservation' advocates (for example Winn 2008) based on misinformation (Kearney 2009) and by the actions of the NSW Government as the major threat to coastal biodiversity: 'sanctuary zones' in NSW marine parks are fishing closures that are designed to not address major threats such as habitat destruction, pollution and introduced species but are still called 'marine protected areas' (Marine Park Authority 2008) .

In fisheries management and conservation the gap between good science and management action appears to be widening. Several oversimplified generalizations are progressively used as a substitute for accurate and precise assessment of individual situations. They are being uncritically accepted to the extent that they have become akin to articles of faith. They include the assumption that the world's fisheries resources are predominantly seriously overfished, that all fishing is a serious threat to the environment, and that international examples of overfishing or destructive practices are directly relevant to the conservation of Australia's aquatic resources and biodiversity. These are frequently coupled with the uncritical assumption that the conservation benefits that may result from area management in terrestrial environments are transferable to aquatic ecosystems. This combination is then used to foster the mistaken belief that fishing closures in designated areas, regardless of why those areas have been selected, offer protection against the real threats to coastal ecosystems. The end result is exemplified in New South Wales, where the demonization of fishing has been used by the Government to establish a system of marine parks that are acknowledged, even in the documentation used by the Government to support their establishment (Marine Park Authority 2008), to be little more than fishing closures which do not address the prominent known threats. The establishment of this system of marine parks has been used as a substitute for the management that is necessary to address the real threats.

The system of marine parks in NSW creates the illusion that effective action is being taken to address our rapidly deteriorating coastal ecosystems, yet nothing is being managed except fishing, which has been projected, mistakenly and without data, to be the significant threat to estuarine and marine ecosystems. Even in those cases where fishing may be excessive, for example the recreational catch of mulloway, the current system of marine parks is not the appropriate management tool. This is particularly so in estuaries where not only are the fish species predominantly migratory but even the habitats are mobile with tidal movement and especially vagile in times of flood. However, the perception of marine parks as portrayed by the Marine Parks Authority, as a panacea for the conservation of aquatic ecosystems because they contain supposedly 'protected areas', negates pressure for proper controls, even on fishing.

In falsely claiming NSW marine parks provide protection against the real threats, particularly in estuaries and on ocean beaches, public support for the proper conservation

of marine systems and for fisheries management is being abused. The current system of marine parks in NSW is an attempt by the Government to create the appearance of being green and of being seen to take action, without actually confronting the real issues. It appears little more than a cover-up of appalling failure by the Government to address the real threats to our coastal biodiversity and ecosystems. Yet a large number of scientists are prepared to collectively support this process, and even to advocate more of the same. I believe the Australian Marine Science Association (AMSA) position statement of May 2008 is a good example that even takes support to the extent of unjustifiably hitching it to the climate change bandwagon.

Science is under siege, and scientists must, unfortunately, carry a share of the blame. In spite of science's guiding principles of rigorous inquiry we appear far too eager to uncritically accept those things that would be wonderful

if only they were true, particularly if they appear to be in the interests of conservation and we are able to find others who share our faith. In the interests of conservation of our estuaries it would indeed be wonderful if drawing lines on the water and banning fishing inside them actually protected biodiversity, ecosystems and fish stocks from the real threats. But, unfortunately, fishing is neither the major threat nor an irreversible one and area management is not an effective tool for managing migratory species or for protecting even benthic biodiversity in incredibly open and interconnected habitats that are themselves largely mobile. As we scientists appear not to have the conviction, or perhaps the courage, to take on polluters, developers, the agriculture and aquarium industries and government infrastructure projects that represent the real threats, then we might as well just reach a consensus that this would be a good time to pray.

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