

# MAXIMISING THE POTENTIAL FOR BOTH SUSTAINABLE FISHERIES AND ALTERNATIVE USES OF FISH HABITAT THROUGH MARINE HARVEST REFUGIA

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**D.A. Pollard**

*Fisheries Research Institute  
P.O. Box 21  
Cronulla NSW 2230*

The main aim of this session of the Workshop, as I interpret it, is to stimulate and provoke discussion on the management of "fish habitat" in relation to maximising the compatibility of alternative non-consumptive uses with the consumptive uses of fisheries resource harvest.

As the term "fish habitat" is a very broad one, and could include most aquatic ecosystems, in introducing this discussion I will concentrate mainly on the marine/estuarine system. Although the problems of management of freshwater/inland aquatic systems are in many ways both qualitatively and quantitatively different, any discussion from the floor of the applicability of what I have to say in relation to freshwater ecosystems would also be most welcome.

I don't intend to go into the details of the relative importances of different types of fish habitats, which are discussed in other sessions of the workshop, though such shallow water inshore marine and estuarine nursery habitats as seagrass meadows, mangrove swamps, and rocky and coral reefs could be kept in mind because of their ecological importance and vulnerability. Neither do I intend to go into the details of the many and varied alternative human uses of aquatic ecosystems, though I would like to emphasise that we should not regard the destruction of fish habitat through such activities as dredging and reclamation for foreshore

development as being legitimate "uses" in this context. The sort of acceptable alternative non-consumptive uses to which I will be referring could be broadly grouped as recreational, educational, scientific and aesthetic—the demands for all of which might be expected to increase with increasing affluence, leisure time and tourism in the not too distant future.

What I would like to do to stimulate discussion is to consider a future *scenario* in which demands for these alternative uses, and also the demand for fisheries products, have greatly increased, and to consider an appropriate *management regime* to address the inevitable ecological pressures and use-conflicts which will arise.

The marine/estuarine system has, of course, traditionally been regarded as a "commons" (but see footnote below\*), and until relatively recently a generally open slather approach to its usage has been dominant and almost universal. Needless to say, this "let her rip" *laissez faire* approach cannot be allowed to continue, and

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\* "Despite widespread usage of the term 'commons', our current institutional structure for ocean management does not meet one critical criterion for common property: community control. The tragedy of the ocean is not the tragedy of the commons, but the tragedy of overuse. Overuse may result from fragmented and ineffective ownership. Overuse may also result from short-term profit taking by private owners. It is a red herring to link overuse to common ownership" (Hanna 1990).

viewing the system from a multiple-use perspective, the compatibility and conflicts of the many different potential uses urgently need to be considered in terms of both ecological sustainability and user equity.

In this regard we need to consider the most appropriate management regime to achieve these basic aims of sustainability and equity.

Overall, I would consider that the maintenance of ecosystem biodiversity, in terms of both the sustainability of the fish (i.e. the stocks of renewable, and thus potentially harvestable, resources) and the preservation of their habitats (i.e. both the biotic and non-biotic components of their environments), should be the most critical and primary management objective. While it obviously needs to be considered concurrently with the above, effective management for equity of use allocation amongst the many different competing user groups can only really be achieved once the maintenance of biodiversity has been seriously addressed.

At present, the management of "fish" and their habitats in most areas of the marine/estuarine system involves the piecemeal management (sometimes successful, but often not) of individual species, stocks, habitats and uses, carried out by a plethora of different and often competing management authorities, each often working within its own narrow and conflicting legislative and jurisdictional framework. While this is obviously an improvement over the previous practically unmanaged state, in my view this approach cannot hope to assure the maintenance of biodiversity, and thus equity of use, in the longer term. What I therefore suggest is needed is a much more holistic approach to aquatic ecosystem management.

In listening to the papers presented and the subsequent discussion over the past day and a half of this Workshop, I have started to get the impression that, on this habitat issue in general, maybe most of us have been, like Nero, fiddling (in our case with our nets and our computers) while Rome burns.

Over the many years we have all spent seeking the details of whether and why juvenile banana or tiger prawns preferred seagrasses or mangroves, or whether and why juvenile blackfish or leatherjackets preferred *Zostera* or *Posidonia*, vast areas of these valuable fish habitats have been degraded and destroyed. Now, I'm not suggesting that we stop carrying out this type of detailed ecological research, but we certainly shouldn't wait to do something practical until we've found out all the answers.

After nearly 30 years in this field, to me, two things have become increasingly obvious: the first is that we are never going to understand very much about how aquatic ecosystems really work (e.g. exactly why do those baby banana or tiger prawns prefer seagrasses or mangroves?); and the second is that, in the longer term, we are not going to improve much on, or be able to replace, Nature's fine work in creating the fish habitats that we already have.

The natural habitat we see around us—for fish and everything else—is about as good as it's ever going to get. For the continued maintenance of wild stocks, there is really only one obvious and immediate thing to do, and that is to preserve as much as possible of that which remains in its natural state, while we still have the chance. If we do so, we can continue harvesting part of its productivity for our own purposes in perpetuity.

There is thus not such an urgent need to understand the details of exactly how "fish habitat" works—that it does work has already been taken care of for us. To reiterate, what is most urgent is to preserve as much of it as possible in its natural intact state. Thus, maybe one of our most vital tasks as an informed scientific Society should be to preach this message much more strongly out there in the community in general—not only to the fishermen, engineers, planners, policy makers, etc., but also to the committed (though sometimes uninformed) 'greenies', the school kids, and all the rest.

In providing some food for serious thought then, I'll be provocative and suggest that the *only long term solution* may lie in the total protection from consumptive uses of very large areas of the marine and estuarine environment. The establishment of such extensive "marine habitat refugia", coupled with the use where necessary of more conventional but less holistic management measures in the surrounding fished areas, would help to replenish the fishable stocks in these areas through protection of both adult spawning stocks and juveniles in their nursery habitats. Apart from providing continuous recruitment of harvestable resources to fished areas, such marine habitat refugia would also thus be available for those alternative and relatively non-consumptive recreational, educational, scientific and aesthetic uses mentioned earlier, with existing conflicts between the two being greatly reduced.

Although it only affects the waters adjacent to one State, the Great Barrier Reef Marine Park provides a model which demonstrates that a multiple-use management approach based on the general principles of ecological sustainability and user equity can successfully operate within a suitable framework of Commonwealth/State co-operation. I suggest, however, that with increased usage the declaration of much larger areas of totally protected habitat as marine harvest refugia will be necessary in order to maintain biodiversity in the longer term, in not only the waters of the Great Barrier Reef but of Australia in general.

Details of how such refugia may work, and assessments of their effectiveness, may be found in the references which follow.

## References (not cited in text)

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