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Submission by the Australian Marine Science Association NQ Branch
Representative Areas Program – Draft Zoning Plan
4 August 2003

Summary

- The Australian Marine Science Association is the largest association of professional marine scientists in Australia with a membership of ca. 1000. One of AMSA's key roles is to provide an independent voice for the marine science community. AMSA NQ has taken on the task of providing comment on the RAP on behalf of the membership.
- It is widely accepted that marine reserves are a valuable management tool that offers conservation benefits, tourism opportunities and opportunities to study pristine environments. It is also accepted that while the Representative Areas Program (RAP) is not designed as a fisheries management tool, "no-take" marine reserves are likely to offer benefits for adjacent fisheries. The potential benefits of marine reserves are accepted by an overwhelming majority of marine scientists.
- AMSA NQ views that with the increasing pressures applied to the Great Barrier Reef from factors such as climate change, over-fishing and coastal development, it is imperative that action is taken in the short term to relieve such pressures before potential irreversible environmental degradation occurs.
- The RAP is a critical step in addressing these pressures. AMSA NQ fully supports the biophysical principles employed in the RAP process. In particular, the inclusion of an absolute *minimum* of 20% of each bioregion in highly protected "no-take" marine reserves should be viewed as a necessity and an absolute minimum.
- The importance of protecting the suite of biodiversity is also critically important. A carefully designed network of marine reserves offers a vital insurance policy against disturbance events, ensuring that there are "undisturbed" areas that maintain the biological capacity of the ecosystem to recover from disturbances. This is critically important given the potential effects of climate change on the Great Barrier Reef.
- While zoning based management plans such as RAP can address several pressures, they are only a single strategy. To ensure the long-term sustainability of the Great Barrier Reef, the RAP should be complemented with measures to address water quality, over-fishing and climate change.
- Furthermore, resources to support enforcement and continuing education will be necessary if the RAP and other management strategies are to achieve their objectives.
- Scientific research makes a significant contribution to our understanding of the Great Barrier Reef and hence, it's management. Relative to other activities, the majority of research undertaken has relatively little impact compared to other extractive uses, while offering significant benefits. It is essential that scientists are permitted *reasonable* access to the Great Barrier Reef.
- While AMSA NQ supports the increase in area of marine reserves, AMSA NQ believes that there will be instances where limited extractive and manipulative research activities should be permitted in "no-take" marine reserves. AMSA NQ urges the GBRMPA to ensure that a transparent, simplified and logical process is established to assess proposals to conduct these research activities.

- AMSA NQ supports the revision of permit arrangements that allow low impact research to be conducted without the need for specific research permits, and which increase the involvement of the scientific community in managing research activities. Nevertheless, support will be required in the initial stages to ensure that academic and institutional staff fully understand their roles and responsibilities, and are provided some assistance in managing potential cumulative impact and conflict of use in Scientific Research Zones.

Introduction

The Australian Marine Science Association (AMSA) is the largest and most broadly representative national professional body of marine scientists with a membership of ca. 1000. One of AMSA's key roles is to provide independent comment on marine issues and in debate of marine policy at state and national levels. The Association is represented on the Federation of Australian Scientific and Technological Societies (FASTS) which plays an active role in developing science policy. AMSA NQ is the North Queensland branch of AMSA (AMSA NQ) and was established in 2000 to represent marine scientists in North Queensland.

AMSA NQ represents a broad spectrum of expertise and its membership includes world experts in coral reef biology, biodiversity and fisheries. It is this broad range of experience that has been applied in the drafting of this submission. The opinions expressed herein do not represent the views of any one organisation or institute, but rather, they are an amalgamation of the views of marine scientists across many different organisations. As such, the strength of this submission is that it represents a consensus of scientific opinion unique to AMSA NQ and completely independent and distinct from those of any university, body, agency or institute.

AMSA NQ has only provided generic comments about the scientific basis of the RAP and regarding the effects of the new zoning plan on scientific research. However, members have been urged to submit more detailed, specific submissions reflecting the needs of their research activities or views of their organisations.

The benefits of marine reserves

There is a wealth of literature that documents instances where coastal development, fishing, land-based pollution, aquaculture, land use, and shipping practices have altered the structure and functioning of marine ecosystems. These changes include negative impacts on species diversity, population structure, abundance, size structure, size ratios, behaviour, habitat structure, trophic dynamics, biogeochemistry, and biological interactions. The key benefit of a network of marine reserves is that such a system provides an ecosystem-based approach that protects both species *and* the habitats upon which they rely. A carefully designed network of marine reserves also protects the ecological links between different habitats, and thereby the ecological integrity of the greater ecosystem.

AMSA has published a position statement on Marine Protected Areas (see http://www.amsa.asn.au/PDF-files/Marine-Protected-Areas.pdf). Key statements include:

- 4.4: AMSA supports the concept of totally protected ("no-take") zones as part of a National system of marine protected areas. Such a system should aim to provide a network

of biogeographically based protected areas containing representative examples of all significant marine habitats.

- 4.5 The prime purpose of no-take marine reserves is to provide maximum protection of their marine ecosystems from human disturbance. As such, they can provide important reference areas by which we can assess the extent to which people have altered similar ecosystems in other places. Reserves should be sufficiently large to meet their conservation
- 5.1 MPA's may benefit human communities and marine environments in other ways. They may:
  • provide educational opportunities
  • help sustain exploited species populations and their fisheries
  • improve scientific understanding of marine ecosystems
  • provide enriched opportunities for non-extractive human recreational activities
  • benefit regional communities through enhanced tourism
- 5.2 Fisheries stock assessments and models are extremely complex and frequently lack necessary information to reliably predict sustainable catches. No-take reserves thus provide a "second line of defense" should current management fail. Protected populations of exploited species may assist stock recovery outside a reserve in two ways:
  • through movement of mature individuals outside reserve boundaries; and
  • by dispersal of planktonic life stages beyond reserve boundaries by water currents which move through a reserve.
- 5.4 Research into no-take marine reserves has shown dramatic increases in size (and as a consequence, also in fecundity) and abundance of commercially exploited marine species within them. The effectiveness of reserves for specific fisheries requires location specific research.

Throughout the world the benefits of marine reserves are being demonstrated for protecting biodiversity and their importance for fisheries (the entire issue of Ecological Applications Vol 13 (1) 2003 is dedicated to articles on the Science of Marine Reserves). Mainstream scientific opinion is that well resourced and appropriately managed marine reserves are effective management tools.

AMSA NQ assessment regarding the scientific principles of the RAP

AMSA NQ strongly supports the scientific principles used in the bio-regionalisation of the Great Barrier Reef World Heritage Area, and fully supports the Biophysical Operational Principles (BOPs) that form the foundation of the RAP. While accepting that uncertainties in mapping the biodiversity of the Great Barrier Reef do exist, it is clear that the present zoning system does not provide adequate protection to the range of biodiversity of the Great Barrier Reef. The use of biodiversity mapping and the application of the best available scientific knowledge in the formulation of the Draft Zoning Plan is consistent with world best practice. Subsequently, AMSA NQ strongly supports the objectives of the RAP, the recommendations of the Scientific Steering Committee and the scientific process involved (the BOPs and biodiversity mapping that forms basis for the RAP and the Draft Zoning Plan). AMSA NQ also emphasises that the following points are of particular importance: That

- an absolute minimum of 20% of each bioregion be protected as marine reserves;
- an adequate level of each type of habitat be included in a network of marine reserves; and
- that there is adequate replication of marine reserves within each bioregion to insure against negative impacts on some part of that bioregion.

Should the RAP achieve these objectives, it will be a major step in ensuring the long term health and preservation of the Great Barrier Reef World Heritage Area for all types of reef users, as well as the wider Australian and International community.

Key issues for the Great Barrier Reef

The Great Barrier Reef World Heritage Area is an undeniably unique and invaluable natural, cultural and economic resource. However, it is widely accepted that the Great Barrier Reef is subject to a suite of pressures from human influences. AMSA NQ views the following issues as key issues, and has provided comments regarding the Representative Areas Program's role in addressing these issues.

Climate Change

AMSA NQ views climate change as the greatest potential medium to long term threat to the Great Barrier Reef World Heritage Area. The third Intergovernmental Panel on Climate Change report (see http://www.ipcc.ch) has refined the likely climate change scenarios, restated that climate change is occurring now, and affirmed that the evidence that climate change is being accelerated by human activities is stronger than ever. The effects of climate change on the Great Barrier Reef are difficult to predict, however they are likely to include increased frequency and severity of coral bleaching events and severe storms, as well as some degree of sea level rise. The Great Barrier Reef is likely to experience at least localised declines due to the increased frequency and severity of major disturbance events over the next few decades.

The RAP will provide limited, albeit important, benefits in addressing the issue of climate change. Including representative areas in a network of protected areas will result in a network of 'pristine' areas that can help to maintain the Great Barrier Reef's ecological capacity to recover from increasingly frequent disturbance events (ie: resilience). Nevertheless, AMSA NQ urges both State and Commonwealth governments to take effective and meaningful action to reduce emissions of greenhouse gases and pursue the development of sustainable energy resources. Without serious efforts to address Australia's contribution to greenhouse gases and to reform energy use and supply, the consequences of climate change could be much more severe and persistent. Without such action to mitigate the potential effects of climate change, the long term benefits of the RAP may be limited.

Declining water quality

It is widely accepted that land use in catchments adjacent to the Great Barrier Reef has dramatically changed since European settlement of the region. While a reef-wide decline of inshore habitats has not been documented, localised declines have been recorded and it is widely accepted that the level of terrestrial pollutants (including nutrients, pesticides and nutrient laden or increasingly fine sediments) pose a risk to the Great Barrier Reef. It is vital that land use practices be improved not only to prevent further deterioration of the water quality entering the Great Barrier Reef, but also to maintain both the ecological sustainability of the terrestrial ecosystems being degraded as well as the viability of the industries that rely on the ecosystem services these areas provide. The success of the joint State and Commonwealth Government *Reef Water Quality Protection Plan* is essential. While the RAP may provide ecological insurance that can help the Great Barrier Reef tolerate declining water quality, steps need to be taken to improve water quality and land use practices to ensure the long term sustainability of the Great Barrier Reef.

Unsustainable fisheries

The sustainability of fisheries in the Great Barrier Reef is an issue. There are significant information gaps and a lack of adequate management plans for some major commercial fisheries such as shark, inshore and estuarine net fisheries and reef line fisheries. Furthermore, there is a serious lack of information regarding the impact of recreational fishing, and the efficacy of existing management strategies for recreational fishers has not been assessed. Furthermore, while some efforts have been made to ensure the sustainability of fish stocks, apart from the CSIRO study of the impacts of trawling in the Northern GBR, there has been little effort invested in assessing the potential ecosystem effects of fishing activities. Models have shown that over-fishing can have unpredictable and potentially serious impacts on the ecosystem by altering the community composition and trophic networks of fish assemblages.

Increasing the area of marine reserves through RAP will greatly improve the capacity of fish stocks to cope with fishing activities in adjacent areas. It has also been demonstrated around the world that marine reserves result in more numerous, larger and more productive fish that can "spill over" into adjacent fishing grounds. However, displacement of fishing effort from newly formed marine reserves into adjacent open areas is of concern. It follows that the RAP must be accompanied with effective fisheries management plans for reef line fisheries, inshore fin-fish fisheries, trawl fisheries and recreational fisheries to ensure that displacement does not lead to a concentration of effort such that the open areas are over-fished. These plans may by necessity, require significant reductions in fishing effort.

Enforcement, communication and education

Effective enforcement and education are critical to the success of the RAP. Enforcement needs to act as a strategy to deter users from abusing the Marine Park and if breaches are detected, to penalise the offenders. However, this will require significant commitment to funding and support for surveillance and enforcement in the Marine Park, but also in the successful prosecution of offenders. Although the courts have the power to confiscate fishing gear and impose heavy fines, it is apparent that magistrates seldom impose penalties that act as meaningful deterrents. Rezoning the Marine Park is meaningless if offenders have little chance of being detected, or when prosecuted, are given menial fines that can be recovered by a single day's activities.

Similarly, education programs to educate Marine Park users about the potential impacts of their activities, best environmental practices and how they can contribute to the management of the Marine Park are important. Marine Park users need to be involved in the management of the Great Barrier Reef. While the efforts taken by the GBRMPA to provide the community with opportunities for input and comment during the consultation phases of the RAP are encouraging, this communication and involvement of the community is vital in the long term if support for the RAP is to be maintained. Compliance is likely to be much higher if stakeholders and the community have been actively involved in the drafting of the management plan.

The need for action

The issues above largely relate to pressures placed on the Great Barrier Reef. It is emphasised that these pressures do not exist in isolation from each other, and the cumulative pressure from these issues and lesser, site specific pressures on the Great Barrier Reef are a cause of significant concern. Worldwide, coral reefs are in serious decline and it cannot be assumed

that the Great Barrier Reef is too large or isolated to be vulnerable. Similarly, it is naïve to state that further action is not required because there has not been a significant, persistent reefwide decline in the health of the Great Barrier Reef. Clear pressures on the Great Barrier Reef exist. Action is required now to ensure that the Reef remains in good condition, and that pressures are reduced before significant reef-wide declines occur. As such, AMSA NQ strongly endorses the launch of the RAP as a key tool in the sustainable management of the Great Barrier Reef. AMSA NQ also emphasises that the RAP alone is not enough, efforts to mitigate the effects of climate change, declining water quality, over-fishing and renewed support for education and enforcement are critical to the long term health of the Great Barrier Reef.

Issues regarding protected species

These comments concern the proposal to extend the list of protected fish (Schedule 5 of the Regulations) through the RAP re-zoning process to include:

- all sizes of potato cod, hump-headed Maori wrasse and barramundi cod
- all other fish species of the genus *Epinephelus* (cods and groupers) greater than 100cm in length

AMSA NQ supports the notion of protection for species that are potentially vulnerable to overexploitation or endangered by any sector of the fishery. The proposed "zero bag limit" species and other large cods and groupers are highly valued alive by the Queensland tourism industry and have a high iconic value to the community. Hence, we believe that it is reasonable to protect these iconic species to ensure an equitable allocation of fisheries resources amongst stakeholder groups, including the non-extractive stakeholders. In addition, increasing concerns regarding the status of a number of large groupers (including the barramundi cod and potato cod) and the Maori wrasse in some other countries has lead to the listing of a number of groupers and the Maori wrasse as Vulnerable on the IUCN Red List (2002 ICUN Red List of Threatened Species). This precedent, and the relative rarity, long life-spans and slow population growth characteristics of these species, indicate the potential vulnerability of these species to be overexploited by Queensland fisheries. It is for these reasons that we support the proposed "zero bag limit" regulation. Following this reasoning, other species that would warrant consideration for this proposed regulation include the Queensland groper, *Epinephelus lanceolatus*.

The Plan has taken steps to protect some of the larger species of cods and groupers with maximum size limits. AMSA NQ recognises a number of benefits including:

- Maximum size limits will help to protect large breeders with likely high reproductive values and to maintain sex ratios. This is important for fish species such as cods and groupers which change sex and have life history traits that render them particularly vulnerable to fishing pressures.
- Large cod and grouper species with considerable iconic values to the GBR will be protected.
- The application of a blanket maximum size limit across this group of fish (cods and grouper) will aid stakeholders, management and enforcement agencies in their respective activities within the fishery. This should facilitate better compliance, particularly for species where positive identifications are difficult.

The Association supports the immediate introduction of Regulations such as size limits as a pro-active step in minimizing the effects of future increases in exploitation. This is an

important step in maintaining the World Heritage Values and ensuring the long term sustainability of the reef line fishery, particularly since the global demand for both target and non-target reef fish species is likely to increase dramatically with the declining ability of other reef fisheries around the world to meet this demand.

Key issues regarding scientific research

The impacts of scientific research

AMSA NQ views scientific research as vital to the management and understanding of the Great Barrier Reef. While scientific research provides tangible benefits to the management of the Great Barrier Reef, AMSA NQ does *not* feel that researchers are entitled to special treatment. Nevertheless, it is clear that the current management arrangements for research in the Marine Park are overly complex and restrictive. While there may be a perception that extractive research results in impacts comparable to other extractive activities such as fishing, AMSA NQ believes that the majority of research undertaken in the Marine Park poses a lesser environmental risk compared to other extractive activities. Furthermore, researchers are subject to peer review and (in some cases) ethics approval, in addition to assessment by the GBRMPA, which provides additional levels of oversight. It is our opinion that placing quadrates, data loggers or star pickets, laying transects, surveying fish, collecting a small number of biological samples, or collecting small numbers of fish cannot be equated to commercial or recreation activities aimed at maximising economic or recreational gain. Furthermore, under the current system researchers are subject to permit approvals for activities that are "as of right" for other users of the Marine Park which is clearly inequitable.

As such, AMSA NQ welcomes the current review of research permit arrangements, especially the intention to simplify the permit process by arranging for low impact research to occur without the need for a specific permit. AMSA NQ will work with the GBRMPA on the Draft Research Policy to help refine the species lists, definitions of research and research permit assessment processes. However the production of detailed lists, definitions of research and low or high impact etc is complex and will require considerable time and effort from the research community. While AMSA NQ is fully supportive of this, the process will take time.

Scientific research in Marine Reserves and Highly Protected Areas

While acknowledging the necessity for an increase in the area of marine reserves, AMSA NQ has some reservations relating to the reduction in access to these areas for scientific research. The Draft Research Policy implies that researchers will be unable to undertake research projects that require the collection of samples or manipulative methods in "no-take" marine reserves. The only alternative would then be that scientists conduct extractive or manipulative field studies in adjacent zones or in the nearest Scientific Research Zone (SRZ). However, this may compromise the research program if:

- there is no easily accessible SRZ or suitable alternative site;
- the SRZ is an inappropriate site for the field study (eg: subject of study exists predominantly inside the marine reserve); or
- the study requires data from a pristine area that is not otherwise exploited and potentially over-fished.

While AMSA NQ is mindful of the "one out, all out" position taken by some lobby groups, we are concerned that the relative impact and potential benefit of scientific research will not be considered. As stated above, the majority of scientific research has very limited impact in comparison with certain activities such as commercial or recreational fishing. Furthermore,

researchers already work with additional controls and levels of oversight, and the benefits of most research programs research are not for economic gain or recreation but to increase scientific understanding of the Great Barrier Reef. While AMSA NQ does not support unrestricted access to marine reserves for extractive or manipulative research, the Association would like to see a clear, transparent and efficient system to assess applications for extractive or manipulative research activities within marine reserves. While recent moves such as the introduction of the Permits database on the GBRMPA website are promising, more information on the criteria against which research projects are assessed would be beneficial.

AMSA NQ is also concerned that the approval of proposed extractive or manipulative research programs may be conditional upon there being some direct management benefit to the GBRMPA. While AMSA NQ fully supports the integration of scientific knowledge with management, primary research without an obvious management link should not be unduly restricted. The scientific knowledge acquired during primary research may have management applications in the future and extends our knowledge and understanding of the Great Barrier Reef. AMSA NQ feels it is appropriate that during the assessment process, all research permit applications involving marine reserves should demonstrate that they seek to minimise extractive activities within marine reserves and should include a full justification for proposed research in marine reserves including a demonstration of consideration for non-reserve areas.

AMSA NQ agrees that scientific research should be excluded from Preservation Zones unless there is an exceptionally strong case to support the use of a Preservation Zone as a study site over alternative sites.

Research Stations

The expansion of Scientific Research Zones around the island research stations is welcomed. However, it is disappointing that the lee side of Lizard Island has not been zoned as an SRZ as this is an important research site, especially in certain weather conditions.

Research may often extend some distance from the research stations and thus additional SRZs placed within 50 km of the island should be considered. AMSA NQ is supportive of the proposal to give research stations greater responsibilities in managing research activities, however this may require some support from the GBRMPA to ensure that academic and institution staff clearly understand their obligations and are able to carry out their responsibilities. Furthermore, AMSA NQ believes that the potential cumulative impact and conflict of use in intensively used SRZ's is an issue that needs particular attention in preparing the new research permit arrangements. AMSA NQ also suggests that University or Institute senior scientists be the permit holders instead of the institutional administrators as senior scientists are relatively more aware of the specific research projects and may be able to administer such permits more closely.

Conclusions

The Great Barrier Reef is an invaluable natural asset to Australia that is today in relatively good condition. Nevertheless, given the increasing pressures facing the Great Barrier Reef such as climate change, declining water quality and over-fishing, it is critical that action be taken now to ensure the ecological sustainability of the Great Barrier Reef. Coral reefs around the world have decline dramatically due to unchecked pressures from fishing, coastal development and overuse. Australia is an enviable position having a relatively low population, high GDP, a large and remote coral reef ecosystem and world renowned marine scientists and institutions. The Commonwealth government has an opportunity to demonstrate how coral reefs can be managed sustainably by using the best available scientific information to protecting biodiversity and natural values while allowing appropriate levels of use.

Subsequently, AMSA NQ strongly supports the RAP and the Biophysical Operational Principles used to develop the Draft Zoning Plan. The Association particularly supports the recommendations to include a minimum of 20% of each bioregion in a network of protected areas and to have adequate replicate protected areas within each bioregion. However, the Association emphasises that the success of the RAP in ensuring the long term sustainability of the Great Barrier Reef will require improved management of water quality, over-fishing and enforcement, but also a meaningful and committed approach to address climate change.

AMSA NQ believes that scientific research is a reasonable use of the Marine Park that has relatively little impact in comparison with large scale commercial activities, and has benefits for all of Australia. While the Association supports general restrictions on extractive and manipulative research in marine reserves, AMSA NQ believes that at times such research will be necessary and that a transparent, efficient and reasonable process is required to assess this research. As such, AMSA NQ welcomes the opportunity to be involved in development of the GBRMPA Research Policy but stresses that this will take considerable time and effort. The Association is broadly supportive of the SRZ's around island research stations however, detailed individual submissions from research institutions and research stations have been called for and must be considered.

Should you wish to contact AMSA NQ regarding this submission, please contact Andrew Chin, President (07 4750 0810).

Sincerely

Andrew Chin
President
On behalf of the Council
Australian Marine Science Association NQ Branch

Monday, 4 August 2003