

**A Review of the Report of the Independent Scientific
Audit of Marine Parks in New South Wales:
the Implications of the Audit for
Recreational and Commercial Fishers**

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Project No. 2010/226.20



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Table of Contents

1. Introduction	4
2. The Audit Terms of Reference	4
3. Audit Methodology	5
4. The Core Questions.....	6
5. The Findings of the Audit Report	8
6. The Recommendations, Commentary and Analysis	9
7. Confusion of Resource Allocation and the Provision of Adequate Protection	22
8. Conclusions on the Audit Report	24
9. Suggested Response by Commercial and Recreational Fishers to the Audit Report.....	25
9.1 Outcomes from the Audit Report that will require direct involvement of commercial and recreations fishers:	26
Bibliography	27
Attachment 1	29

1. Introduction

This review analyses the findings in the Report of the Independent Scientific Audit of Marine Parks in New South Wales and interprets the relevance of the Audit Panel's recommendations to commercial and recreational fishers. It is not intended that this work should be in any way regarded as an update of the Audit Panel's report: rather it represents an interpretation of the somewhat complex findings and recommendations developed by the Audit Panel.

This report was commissioned by the Fisheries Research and Development Corporation in response to the difficulty commercial and recreational fishers had in understanding the Audit Report and interpreting the implications of its recommendations. The lack of definitive statements in the Report on the standard and relevance of the science that had been used to justify marine parks in NSW and to assess their effectiveness was of particular concern. Therefore, a primary intent of this review is to clarify the relationship between the complex analyses and interpretations in the body of the Report with the recommendations arising from the Audit. In so doing it attempts to interpret the degree to which the detail in the Report addresses the issues of the standard of the science that had been used in the marine parks establishment process and the effectiveness of the parks to date. In turn, this review is also intended to provide a commentary on how the Audit Report delivers against the specific Terms of Reference for the Audit and in particular how the Audit might impact commercial and recreational fishers.

As part of the Marine Parks Audit Process one of the authors of this review (RK) provided comment on the Audit Report in a form of a letter of 28/6/2012 to the NSW Minister for Primary Industries. That letter was made publicly available on the Audit website (Kearney, 2012) and is attached to this review (Attachment 1). It acknowledges the high quality of much of the work of the Audit Panel but highlights the lack of definitive statements on the quality of the science used to establish NSW marine parks and the lack of assessment of their effectiveness. It identifies the failure to succinctly report on the first four of the Audit's Terms of Reference (TORs). This current review builds on that earlier submission. It acknowledges both the quality of the underlying assessments by the Audit Panel and their deviation from directly addressing several of the primary objectives of the Audit. In order to attempt to more tightly relate the quality assessments in the body of the Audit Report to the conclusions that impact recreational and commercial fishers this review has attempted to interpret how the deviation from the TORs has come about.

2. The Audit Terms of Reference

"The Audit Panel was asked to evaluate nine specific terms of reference namely:

- 1. Review the domestic and international commitments to conserving marine biodiversity, current actions for meeting these commitments, and the effectiveness of these actions.*
- 2. Review the scientific data provided to the Panel by NSW Department of Primary Industries and the Office of Environment and Heritage.*

3. Review the degree to which all threats to the varying types of marine environments have been properly identified and prioritised. The Panel will then consider the degree to which the marine parks process is anticipated to address each significant threat.
4. Review the specific science relating to the effectiveness of marine parks in protecting different habitat types and recommend further action and/or alternative management approaches if necessary.
5. Recommend ways to increase the cost-effectiveness of marine park zoning arrangements.
6. Recommend ways to improve inclusion of social and economic impacts into decision-making on marine parks, in particular the design and management of marine parks.
7. Identify and recommend ways to address the most significant information gaps hindering robust, evidence-based decision-making on marine parks.
8. Make recommendations on how all current potential threats to the marine environment could be effectively addressed and which bodies or agencies would be most appropriate to address them.
9. Make other recommendations as appropriate, related to achieving better management of the NSW marine environment”.

3. Audit Methodology

In the conduct of the audit, *“all material considered by the Audit [was] ... made available to the public. The Chair’s recommendation that the Audit use a website as its principal form of communication and public access to material was accepted. The public website (<http://www.marineparksaudit.nsw.gov.au/>) carries all information about the Audit, including a summary of Audit Panel meeting minutes, all documents that were made available to the Audit Panel, submissions, workshop and interview summaries, supplementary material provided during and after workshops and other relevant information”.*

The process used by the panel resulted in a series of *“25 workshops and interviews involving 113 people ... during November and early December 2011. Summaries were prepared and sent to participants for checking. The final workshop summaries of the outcomes were, when agreed to by all participants, then posted on the Audit website”.* In utilising an inclusive process, *“the Audit Panel drew on all of the Audit documentation and submissions in writing [its] report”.* The process of transparency and consultation used by the Audit Panel was laudable; the output was unquestionably transparent and the process as ‘all-inclusive’ as could reasonably be expected.

The Audit Panel stated that the Audit *“is structured around 14 questions that were themselves based on the terms of reference. This format provides a systematic framework for the exploration of each term of reference in the light of the body of material as available on the Audit website. These questions guide the major headings of this report and are in the form they took in the workshop briefing packages”.* The authors of this review do not share the Audit Panel’s opinion that the modified format provides an appropriate ‘systematic framework for the exploration of each term of reference’.

The Audit Panel states that in order to address the complexity of the issues being considered the questions they developed “*cover both the individual terms of reference and the interactions between them*”. While the questions certainly broaden the issues under consideration they themselves represent interpretation of the TORs as set for the Audit by Government. As a result they, to at least some degree, constitute subjective interpretation of the purpose and objectives of the Audit. The use of these questions as the primary focus of the Audit process has resulted in a degree of distancing of the Audit from the specific TORs. It has in turn contributed to varied perceptions by numerous stakeholders (NSW Government, 2012), including commercial and recreational fishers, especially where the Audit Report has not provided unambiguous responses to the key questions asked of the Audit. We believe this has been to the considerable detriment of appreciation of the amount and quality of the work that had gone into the Audit. We also believe that had the first four TORs been more specifically addressed subsequent recommendations, including broad concluding recommendations, could have been more directly related to the full sequence of the TORs, i.e. the purpose of the Audit.

4. The Core Questions

These were stated to be based on the terms of reference and were developed and used as the basis of the Panel’s deliberations, including workshop sessions.

- “1. Do you have any comments on how NSW is contributing to Australia’s international commitments to protect marine biodiversity?”*
- 2. Do you have any comments on how science is conducted and used by the Marine Parks Authority and the departments responsible for managing marine parks in NSW?*
- 3. What are the most significant issues with respect to the management of NSW fishing and the interaction of this with the management of NSW marine parks?*
- 4. What are the most significant threats to the maintenance of the biodiversity of marine parks and are these being appropriately managed?*
- 5. Do you think the NSW marine park system as it is today is the best mechanism for managing the state’s marine biodiversity?*
OR if you prefer
How can NSW more effectively and efficiently achieve marine and estuarine biodiversity conservation?
- 6. Do you think that the social benefits and costs of marine parks are understood / assessed when marine parks are established? And do you have any suggestions for improvements?*
- 7. Do you think that the social benefits and costs are understood and used when the zoning of existing parks is reviewed? And do you have any suggestions for improvements?*
- 8. Do you think that the economic benefits and costs of marine parks are understood when marine parks are established? And do you have any suggestions for improvements?*
- 9. Do you think that the economic benefits and costs of marine parks are understood and used when the zoning of existing parks is reviewed? And do you have any suggestions for improvements?*
- 10. Can you comment on how consultations involving marine parks are conducted? And do you have any*

suggestions for improvements?

Final questions

11. *Considering the answers to date, are there any other significant information gaps hindering robust, evidence-based decision-making on marine parks?*
12. *Considering the answers to date about all current and potential threats to the marine environment, which bodies or agencies would be the most appropriate to address these threats?*
13. *Considering the answers to date, are there any additional mechanisms (legislative or administrative) that would achieve better management of the NSW marine and estuarine environment?*
14. *Do you have any other matters to raise with the Audit Panel?"*

As stated above, these questions represent interpretation of the Government's TORs by the Audit Panel. The prominence given to these questions in the information gathering phase of the Audit resulted in an apparently unintentional, but significant, shift in the Audit process from the direct assessment of the science used to support the declaration of marine parks in NSW and evaluation of actual provision of protection of biodiversity in different types of habitats (areas). These objectives were fundamental to the purpose of the Audit as detailed in the Liberal/National Government's election promises while in opposition. Adherence to subjective questions in the Audit process, including in consultations and workshops, has in turn, resulted in a compilation of comments from individuals that were responses to interpretation of the TORs, not necessarily the specific TORs themselves. Subsequent consideration and assessment of the answers to these questions appears to have further distracted the Audit Panel from precise evaluation of one of the primary reasons for the Audit; determination of what science was actually used as the basis for the establishment of the marine parks process in NSW and what science was available to enable assessment of the effectiveness of the marine parks that had been established.

Core question three provides one example of how interpretation has distracted the Audit from a core task set for it by Government and is of particular interest to commercial and recreational fishers. Fishing was singled out by the Panel from the comprehensive set of threats to marine biodiversity in a core question, when fishing is not so identified in the TORs. The TORs specifically require the Audit to "*Review the degree to which **all** (emphasis added) threats to the varying types of marine environments have been properly identified and prioritised. The Panel will then consider the degree to which the marine parks process is anticipated to address **each** (emphasis added) significant threat*". This prioritisation of fishing adopted by the Audit Panel is the more distracting when other well-documented, and arguably much greater, threats to the marine environment were not so prioritised. Threats such as pollution in its many forms, climate change and variability, introduced organisms, other resource extraction and inappropriate coastal development while acknowledged in the Audit process were not given the same specific attention, implying that they are of less significance than fishing. An end-result of this unfortunate elevation of the priority given to fishing above that given to all threats is that it reinforces the incorrect interpretation by many that the control of fishing is the primary action that is necessary to protect marine biodiversity, particularly in marine parks.

The prominence given to fishing is particularly puzzling as the Panel's Report recognised fishing in NSW waters to be already well managed. The absence of assessment by the Panel of the effectiveness of existing management of all other threats makes the priority given to further investigation of a well-managed threat concerning. It may well be that the Panel was hoping that by increasing the focus on fishing it would lead to assessments that fishing had been disproportionately treated when the marine parks were created, but the Panel's intent is not explicitly stated. No evidence, or statement, is given that other threats are equally well managed and no science is identified to demonstrate how the marine parks process has, or is anticipated to, address 'each significant threat' (TOR 3)! The failure to equally consider all threats and the management measures necessary to address each distracts public pressure on Government to manage all threats in proportion to the magnitude of the threat (as agreed by the Audit Panel and later discussed).

5. The Findings of the Audit Report

The report itself is long and complex, as acknowledged in its Conclusion. This is not surprising as it deals with complex issues. The report correctly identifies the matter of marine conservation and management as being complex and difficult: *"the NSW Marine Estate is owned by all people and has to be managed for all people. It has also been emphasised that this is not a simple task with simple solutions. Instead, it is a classic 'wicked problem'"*. Wicked problems are characterised as being boundless, complex and difficult or even impossible to define; they are often open to very different interpretations by a range of stakeholders that may have very different ideologies or vested interests. There are characteristically no simple solutions and uncertainty often dominates.

The Audit Report represents a laudable degree of very transparent consideration of a great deal of information and discussion. It contains considerable quality scientific, social and economic evaluation of evidence and many rational conclusions drawn from the assessment of that evidence. However, the Report acknowledges that it does not represent a straightforward assessment of the individual TORs. The Report's Conclusion includes the statement, *"The Audit Panel has grouped terms of reference and reviewed the issues associated with the grouping to arrive at recommendations that cover both the individual terms of reference and the interactions between them"*. We believe that this deviation from the specific TORs, including via the subjective questions that structured much of the work of the Audit, has unfortunately, significantly added to subjectivity and has actually facilitated, presumably unintentionally, differing opinion, and even vested interests, to gain expression at the expense of specific responses to the TORs. We believe that by deviating from the specific and individual TORs the Audit has added complexity and uncertainty, the bases of most 'wicked problems'. This is indeed unfortunate as it detracts from the quality of the discussion in the body of the Report while at the same time distancing some of the recommendations from the Government's directions for the Audit. This problem is largely restricted to the Panel's consideration of matters relating to the first four TORs.

6. The Recommendations, Commentary and Analysis

The report contains “two over-arching recommendations”.

“A. The governance of the NSW Marine Estate be reorganised by bringing the entire estate under one legislative and administrative structure that is closely aligned with the five catchment management authorities covering the NSW coastal drainage systems”.

“B. Science for the NSW Marine Estate be reorganised under an independent Scientific Committee. The Audit Panel also makes recommendations about the organisational approach that this new committee should take and suggests a number of research priorities. In particular, these priorities call for greater emphasis on research in the social and economic sciences and the application of these findings to management”. The 16 further recommendations within the report should be considered carefully in conjunction with the initial and ‘overarching’ recommendations A and B.

By suggesting such major changes as envisaged by two these recommendations in combination the Panel makes it obvious that it found serious problems with the process that led to the establishment and management of marine parks in NSW. That process needed to be fixed. If the recommendations are implemented in the context of the assessment of the real threats to marine ecosystems in NSW, indicated throughout the body of the Report, they appear likely to represent a logical long-term approach to the management of the total marine estate, not just marine parks. In fact the first of the two over-arching recommendations in particular appears more relevant to the changes that are necessary to the management of the total NSW natural resource estate, both terrestrial and marine, than to the more specific TORs for this Audit. However, the status of both recommendations as ‘over-arching’ for the actions that are necessary to address the fundamental findings of this Audit is questionable.

The first of the ‘over-arching’ recommendations addresses TORs 8 and 9 and not the earlier, more specific, TORs. As such it appears more a ‘concluding’ recommendation than an ‘overarching’ one. An ‘overarching’ recommendation implies action which should underpin and normally precede that outlined in other recommendations arising from all TORs. A recommendation that underpins the others would carry much more conviction if it was obviously founded on evidence-based assessment of the objectives of earlier TORs, including what management action was necessary in response to each, and the relative urgency of recommended actions. While there is considerable evidence in the body of the Report to confirm that the NSW marine parks process was not appropriately founded on science (details are provided in Attachment 1), the failure of the Audit Report to specifically address each of the TORs in turn as a basis for a unifying recommendation is unfortunate. It makes it difficult to fully assess the need for this recommendation, its relationship to the purpose of this Audit and its likely acceptability to Government or its implications for stakeholders. Whether or not this recommendation can, or should, be adopted and what time-frame should

be set for its implementation are largely matters for Government and cannot be easily evaluated by the commercial and recreational fishing industries.

Of direct concern to commercial and recreational fishers is the degree to which this recommendation being considered as 'overarching' distracts, or delays, Government from addressing urgent operational issues, such as review of the zoning arrangements, that have been identified in the Report as priorities.

The conclusion, that a major consolidation of management arrangements is required for the entire NSW marine estate, is consistent with the evidence and assessments given in the body of the Report. The concept appears worthy of support. However, it is most unfortunate that this conclusion has been expressed in a recommendation that was proposed by the Panel as 'over-arching' and not as a longer-term objective for the evolution of the management process for the entire marine estate and potentially for the total natural resource estate. The Panel did clearly stress the long-term nature of the necessary actions and not their immediacy by stating, "*proposals such as these will require a transitional plan*". In subsequent interviews the Chair of the Panel indicated that this recommendation was intended to guide changes in Government direction over the next decade or more, not to represent a pre-condition for more immediate action; it was more aspirational than a prerequisite for progress. As a management guideline it could be most useful. However, great care must be taken to ensure that difficulty in fully accommodating this recommendation in the short- to medium-term does not distract priority from the urgent need to implement review of the zoning arrangements based on the threats-based approach described in the Report.

The second 'overarching' recommendation has similarly been given priority that is not aligned with strict adherence to the individual TORs and logical progression of well-explained responses to each TOR (later discussed).

The presence of two 'overarching' recommendations at the beginning of the Report has been interpreted by many to mean that these recommendations are prerequisites for other actions. This is indeed unfortunate as it does not appear to be the true intent of the Panel.

Several of the remaining recommendations are not clearly aligned with the words used in the individual TORs. This is largely because, as discussed above, the "*Panel has grouped together the terms of reference and reviewed the issues associated around focusing questions*". Because the Report does not specifically, and in our opinion adequately, address each specific TOR in turn its delivery on the intended purpose of the Audit is diminished and many of its recommendations are open to interpretation. Misinterpretation of how the Report, or individual recommendations, complies with the mission of the Audit is facilitated by the deviation from the TORs. This is a failing that can be exploited either erroneously or purposefully. The promotion of individual statements which may be supported by, or even aligned with, answers to the Panel's questions more than with the specific TORs, can easily be used to promote advocacy and vested interests.

In this review, the additional recommendations are considered in numeric order. Where appropriate, relevant additional details from the body of the Report pertaining to the recommendations are listed, including an analysis and commentary describing the meaning and assumed intent of the recommendations.

“(R1) In a strict sense, NSW is obliged to do only what it agrees with the Australian Government, which is the Party to the international conventions and agreements covered by the Environment Protection and Biodiversity Conservation Act 1999 (Cwlth). In the Audit Panel’s opinion, the current arrangements pose no risk to the NSW Government that in regard to its management of marine parks it will be found in breach of international conventions”.

This is a statement and not strictly a recommendation. It should be noted that the overriding, relevant international convention, the Convention on Biological Diversity (CBD), consists of a non-binding framework to **effectively manage** (emphasis added) biodiversity and environments. No evidence is given by the Panel, or included in the available documentation, that the existing system of marine parks is the most appropriate, or even an appropriate, mechanism for addressing such a framework. NSW may not be at risk of failing to meet the Australian Government’s interpretation of the adequacy of provision of marine protection simply because the Commonwealth Government has misinterpreted Australia’s commitment! Indeed both governments have followed the same process in implementing marine parks. Neither, however, provides evidence of the provision of ‘effective management’ that is the fundamental international commitment to the CBD. In fact both have gone so far as to replace ‘effectively managed’ with ‘adequate’ in the principle, Comprehensive, Adequate and Representative (CAR) that has been used as a basis for the system of parks. This Audit does not provide any scientific evidence of how the actions taken in the marine parks process in NSW constitute ‘effective management’ as required under the CBD. However, the Report does later emphasize that the key threats are not being managed and there is great need to manage each and every threat in proportion to the magnitude of the threat.

It is important to note that the first TOR for this Audit calls for assessment of the effectiveness of the current marine park system for conserving marine biodiversity. The Audit Report does not provide a succinct statement on this effectiveness, nor does it provide evidence of relevant scientific data and analyses that would enable an assessment of this effectiveness. The discussion in the body of the Report strongly suggests that no data were made available to the Audit to enable assessment of the effectiveness of current actions for conserving marine biodiversity. The failure of the Report to make a definitive statement to this effect is extremely unfortunate; in consequence, the key component of the first TOR has not been addressed.

“(R2) The Audit Panel is of the further opinion that the current system of marine parks as established in NSW be maintained and mechanisms be found for enhancing the protection of biodiversity in the identified gaps, namely within the Hawkesbury and Twofold Shelf marine bioregions”.

This recommendation is stated to be an opinion and not a considered recommendation. Furthermore, it is imprecise and its intent is unclear. As a result it is open to interpretation. In the absence in the Report of

assessment of the effectiveness of current actions to conserve marine biodiversity it is difficult to align this recommendation with the relevant TORs.

As worded the recommendation can be interpreted to project the Panel's opinion that the existing marine parks are an appropriate management solution (they need to be maintained), at least for the areas in which they have been proclaimed, and that more should be added in the two named areas. However, this interpretation is not consistent with the statements provided throughout the body of the Audit Report, particularly the Panel's discussion of the paucity of the available science and the lack of evidence for effective conservation.

Further clarification of the substance of this recommendation is found in section 2.8.3 of the report. It is stated that *"[i]t is the finding of the Audit Panel that the best design for a system that can achieve the sustainable management of the NSW coast is one that is managed as a single and continuous system"*. This supports actions that are contrary to current management in discrete and often isolated areas (marine parks). More specifically, *"The recommendation of the Audit Panel is therefore that the management of the NSW Marine Estate be continuous from the Victorian border to the Queensland border. Further the Audit Panel is of the view that the NSW Government should explore the matching of the sections of the NSW Marine Estate with the five coastal catchment management authorities on the adjacent mainland"*. It is significant that, to the limited extent that management of specific areas is implied, the Panel suggests alignment of management with catchment management authority areas and not with the multiple bioregions that have been used in the establishment of the current system of marine parks.

When the Panel's recommendations are considered collectively it is evident that their major thrust is the need to fundamentally change the way that the marine estate is managed, i.e. it should be managed as a single entity. This represents a need to move away from the present disproportionate reliance on management based on distinct marine areas (marine parks). The inadequacy of the current approach of having areas that are claimed, without evidence, to be protected, but where specific threats are not addressed, is identified by the Panel. The overall thrust of the Report is to support the management of the wider marine environment against all identified threats, particularly those from land-based activities.

In recognising the difficulties in making such a major change as the creation of an overarching management body, *"The Audit Panel recognises that proposals such as these will require a transitional plan. While a transition plan is being developed, the current management arrangements for NSW marine parks should remain in place"*. Clearly the intent is that more parks should not be created, certainly not until the management of the whole estate has been realigned with a more comprehensive approach.

"(R3) The Audit recommends the formation of a Scientific Committee, which is independent of government agencies and established to oversee strategic research in the Marine Estate in NSW. It is further recommended that this Committee be composed of experts in the marine sciences, economics and social science with an independent chair who reports directly to the Minister(s)".

The Panel's deviation from the first four specific TORs, as discussed above, has resulted in the lack of specific comment on the current state of science and its management. Without an authoritative statement on this subject this recommendation lacks justification. The body of the Report gives many examples of the lack of science to support the management measures that are already in place but no summary statement is given on the lack of science to support the creation or maintenance of the current system of marine parks. It can be argued that the recommendation to create an independent committee to oversee the science relating to marine parks in NSW is merely an abrogation of the responsibilities for this Audit defined in TORs 2 (*"review the scientific data provided to the Panel"*) and 4 (*"Review the specific science relating to the effectiveness of marine parks in protecting different habitat types"*). Regardless of why these two TORs have not been more strictly adhered to it is most unfortunate that they have not.

Justification for why a new Scientific Committee needs to be independent of Government agencies is not given. The concept of having independent evaluation of research, including but not limited to that of a strategic nature, is sound and is not questioned. Independence from all vested interests, including non-government entities that stand to benefit, should be encouraged. But the need to maintain involvement of Government researchers and managers, including research managers, playing key roles in strategic direction, including determination of funding priorities and assessment of the management implications of research outputs and outcomes, must not be overlooked. Much hinges on the Audit Report's dimensionless use of the word 'oversee' as a requirement for the Scientific Committee. The quality and relevance of the independent advice that can be made available in the suggested role of independent scientific scrutiny is also critical, but assessment of how these attributes can best be provided is not given.

The suggested composition of the Scientific Committee calls for expertise in the 'marine sciences'. While this category may be assumed to include fisheries science the predominance given by the Panel to fishing in the marine parks process, discussed above, should have warranted more specificity on the need for experienced fisheries scientists and managers with first-hand experience of what works in NSW and similar locations. It can also be argued that as management within marine parks is more directly aligned with natural resource management and conservation principles and disciplines than with marine biological 'sciences' more generally the priority given to 'marine sciences' may not be appropriate! It does not appear to be sufficiently specific. In the absence of detail on the current state of science and the case for this independent Scientific Committee its intended role and its composition are open to interpretation. This provides little assurance on the quality of the oversight and little comfort for commercial and recreational fishers.

The remainder of this recommendation is consistent with the expectations of ecological sustainable development in linking marine resource science with economics and social science. It is in turn consistent with the CBD and IUCN guidelines that call for sustainable and equitable natural resource use (CBD, 1992, IUCN, 2012).

"(R4) The Audit Panel recommends that funding be allocated to addressing research shortcomings".

This recommendation is consistent with other recommendations and the logical need to address shortcomings. But again the failure of the Audit to provide a succinct statement on the current 'research shortcomings', that is the inadequacies or failings of current research in the light of its strengths, obscures the intent of the recommendation and leaves it open for interpretation.

It is stated that for public funded research "*priority should be given to projects on the potential threats to marine and estuarine biodiversity and ecological integrity within NSW waters that are considered by experts likely to be most significant*". Research "*should include all five classes of threats identified by the Natural Resource Management Ministerial Council Marine Biodiversity Decline Report*". The threats identified by this Council are broad-scale threats to marine biodiversity and include climate change, resource use, land-based impacts, marine biosecurity and marine pollution (Marine Biodiversity Decline Working Group, 2008). Identification of these areas as requiring additional priority implies, but does not state, that current research on these issues is inadequate or inappropriate; they are identified as research 'shortcomings'. The direction inferred in the recommendation would carry much more weight if the Audit had provided a succinct assessment of the adequacies and inadequacies of current research and linked this to a more specific recommendation. Again the imprecision in the Report detracts from delivery against assessment of the way in which the available science, or lack of it, has impacted management actions; an issue that was fundamental to the establishment of this Audit as expressed in the first four TORs.

Research on resilience and multi-stressor impacts was highlighted as being necessary. Again the wording is open for interpretation, but it appears that evaluation (research) is necessary to determine if resilience and multi-stressor research are appropriate approaches, not just that more of these types of research is necessary. The emphasis given by the Panel to the need for independent and strategic assessment of research (R 3) would necessitate assessment of against what threats resilience is needed and whether resilience is being, or can be, effectively delivered by the current system of marine parks, or is likely to be cost-effectively enhanced by the parks. Resilience is a measure of the ability of an ecosystem to "*absorb disturbances [... and be] forgiving of external shocks*" (Resilience Alliance, 2012) and multi-stressor analysis could, if properly conducted, assist in the understanding of ecosystem functions that are subject to many and varied natural and human impacts. In combination these two research priorities are consistent with the Panel's recommendation to take an integrated or holistic approach to the utilisation of the marine environment. They both would be greatly enhanced by assessment of each of the threats that constitute the multiple stressors and exactly how resilience against each, and against the combination of all, is to be cost-effectively provided.

Research was also recommended to assess the effectiveness of marine parks against the "*primary objectives of conserving biodiversity and maintaining ecosystem integrity and function*". The Panel clearly recognised the lack of research to demonstrate the effectiveness of marine parks in NSW for biodiversity conservation and/or ecosystem function, but again, why it did not make an unambiguous statement to this effect is puzzling, particularly noting the priority given to this in the TORs for this Audit.

As stated above the Panel has deviated from the TORs and singled out fishing for particular attention even though it has stated that fishing has not been identified as a threat. This is again emphasised in this recommendation as follows:

“The NSW Government needs to ensure that complementary fisheries research is done to improve the understanding of the threat that fishing poses to the conservation of biodiversity in NSW and the environmental protected values of the Marine Estate. The focus of this research should include:

- a. expanding the scope of ongoing assessments of fish stocks to assess ecological sustainability and management of fisheries rather than just stocks (for example, data-driven assessment of effects on habitats from by-catch, trophic flow-on and ecosystem-wide impacts)*
- b. developing strategies for improving fish stocks and managing them in a positive way to meet the reasonably expected needs of recreational anglers*
- c. estimating recreational fish catches (currently estimated to equate to around 30 per cent of the commercial catch in NSW)”.*

The components of this recommendation are sound and consistent with the concepts of ESD but their relationship to the TORs, or to marine park management more generally, is not adequately explained. Similar recommendations for each and every threat to marine biodiversity would appear to be at least equally justified by the TORs and the discussion given in the body of the Audit Report. This would be particularly so noting that NSW already has considerable research on the impacts of commercial and recreational fishing, including by-catch and habitat impacts and is required by the Fisheries Management Act to manage such impacts. The special consideration given to research on fishing, at the expense of uniform consideration of ‘each significant threat’ is inconsistent with the TORs, unless fishing had been identified as a threat of the highest magnitude, and it has not. It confirms the unfortunate outcome of greater priority being given to the possible impacts of fishing above other more direct threats, as discussed above.

Point ‘a’ is likely to be of particular interest to the commercial fishing industry and recreational fishers. Assessments, such as proposed, could assist in further improving the sustainability of fishing and public understanding of this sustainability. They could also be useful in allaying the expressed fears of numerous environmental organisations and sections of the public that have an anti-fishing stance which is commonly based on irrelevant ‘evidence’ from geographical areas where fishing is far less sustainable (well-managed) than it is in NSW.

“(R5) From the information available to the Audit Panel, it would appear that there is a need to further extend the Monitoring, Evaluation and Reporting (MER) system to include a greater focus on marine, estuarine and inshore environments as a priority. This should include monitoring for invasive species in and around areas where boating or shipping activity is particularly intense”.

This recommendation is consistent with sound management practices in that it addresses a known threat

to marine biodiversity, invasive species. It is of particular importance because it acknowledges the need for research, and presumably subsequent management action, across all areas where invasive species are a problem and not just in marine parks. In fact the priority areas for research will be where exposure is greatest (*“areas where boating or shipping activity is particularly intense”*), such as where boat-moorings and vessel traffic are concentrated, for example around marinas and vessel loading and unloading facilities; such areas are predominantly not in marine parks.

The report also highlights stormwater management, dredging, and indirect effects such as anchor damage from fishing and tourist activities as being worthy of greater scrutiny: it includes the statement *“[t]hreats to marine parks should be assessed as part of a statewide risk assessment, including any indirect effects of activities such as tourism and fishing (for example, anchoring)”*. This statement is puzzling as it is inconsistent with a primary thrust of the Report, to manage the entire marine estate. No justification is given why threats to marine parks should require special consideration: it is biodiversity across the entire estate that should be assessed and protected, not marine parks *per se*. The need for protection of a park as an entity from specific threats is particularly questionable in the absence of assessment of threats to parks and the lack of evidence that marine parks represent effective and efficient conservation of marine biodiversity! Furthermore, most of the threats identified by the Panel as requiring management occur in and to, areas outside marine parks.

Consistent with the CBD (CBD, 1992 pp. 1-2), it is stated in the Report that *“management actions should be in proportion to risk and must be cost-effective”*. The Audit has actually identified that the bulk of the real threats to marine biodiversity arise outside marine parks and many disproportionately impact areas outside parks; hence the necessary management action should be concentrated outside marine parks to the benefit of the entire marine estate. Furthermore, noting the Panel’s conclusion that the available evidence confirms that fishing is not a significant threat, *“there is clear evidence that most of the assessed fisheries are being well managed”* and *“all fishing methods (including trawling) are not a threat in all circumstances, just as none are necessarily always benign”*, the inappropriateness of special consideration of fishing is further exposed. Perhaps the Panel has anticipated that the primary outcome of this research could be expected to be a diminution of the need for management of fishing and greater need for management of the known, and/or yet to be properly described and managed, major threats?

“(R6) Recognising the continuing improvement in fisheries management and resulting recovery and improvement in the status of several fish stocks, the Audit Panel sees the need for the following:

- 1. Better information is needed on the ecosystem effects of fishing and the integration of this information into the annual stock assessment of commercial and recreational fishing.*
- 2. Recreational fishing (including distribution of effort, catch, discards of by-catch and ecosystem impacts) must be evaluated and the results of that incorporated into marine park management.”*

Again fishing has been singled-out for special attention even though it is recognised in the Report that recent

research casts serious doubt over whether any form of fishing that is well managed actually represents a major threat. The Report also acknowledges the continued improvement in the effectiveness of traditional fisheries management. It should also be noted that the NSW Fisheries Management Act already requires management of the ecosystem effects of fishing. On the other hand the effects of other threats, such as pollution in many forms and introduced organisms appear to be continuing to worsen and they are not being addressed anywhere near as effectively as the effects of fishing. They are certainly not subjected to the same degree of 'status report' assessment as is fishing. Specific recommendations to address these other threats would appear to have been more in keeping with the TORs!

Concentration of new research on properly identified threats in areas where the threat occurs and in proportion to the severity of each threat is the logical approach to sound management of marine biodiversity and ecosystems. The findings of this Audit correctly confirm that all threats need be addressed wherever they occur across the whole of the marine estate. The lack of a specific recommendation to this effect is surprising.

"3. Approaches to zoning should be re-assessed to be based upon management objects that are specifically geared to ecological and biodiversity outcomes, rather than being merely surrogacy-based, and that utilise economic and social assessments in their implementation and evaluation. This will of necessity require:

- a. clarifying the role and purpose of the various types of zones currently in use*
- b. reviewing of the 1998 ANZECC approach to zoning in marine parks, which is currently based on principles of being comprehensive, adequate, and representative (CAR) and uses habitat as a surrogate for biodiversity per se*
- c. taking into account social and economic objectives and utilising appropriate tools*
- d. recognising that the needs of user groups should be included in any future zoning in the context of a much expanded NSW Marine Estate. This could extend to innovation such as havens for particular forms of fishing or other specific uses. This would be facilitated by the amendments to legislation and administration suggested in Recommendations R12 to R15."*

This recommendation most specifically expresses the priority for the management of NSW marine parks. As such it best reflects the overall intent of the Audit and the apparent conclusions of the Audit Report. It stresses the need for review of the zoning arrangements within NSW marine parks.

The fundamental need to align management priorities with desired ecological and biodiversity outcomes, as detailed in the third part of this recommendation and the first qualifying comment, is correctly identified. Management, in this case zoning, must be based on clear assessment of threats and the benefits of addressing them, not on areas that are predetermined on the basis of ideology or assumptions about area management, including the relevance of habitat surrogates.

Commercial and recreational fishing interests would be well served by management that is based on thorough scientific assessment of all threats, including those that can be attributed to fishing. For this to

occur in NSW marine parks the principles of zoning must be revisited and the management within each and every zone based on a cost-effective contribution to the management of each threat in proportion to the magnitude of the threat.

“(R7) Rigorous social impact assessments are to be made a central component of the methods used to establish and manage NSW marine parks. The social impact assessment framework needs to analyse, monitor and manage the intended and unintended social consequences (both positive and negative) of marine parks and any social change processes that are invoked. The ongoing evaluation of social impacts and benefits are to be reported in the same reporting cycle as environmental impacts”.

An analysis of social impacts is consistent with TOR 6 and the underlying principle of ESD. The Panel’s comment that *“Managing the marine estate effectively should be grounded in information from both natural and social sciences”* is particularly relevant to commercial and recreational fishers. While the primary purpose of this Audit was assessment of the natural sciences that underpin the declaration and management of marine parks many fishers were acutely aware of the failure of the process that led to the declaration of the parks to take due account of the social ramifications of the actions that further restricted fishing of all forms and impacted negatively on the seafood industry in general. The Audit Report has correctly identified the lack of determination of true social and economic benefits from the system of parks by the Marine Parks Authority and the need for considerable improvement.

“(R8) In order to improve approaches to zoning, the Audit Panel recommends that:

The Marine Parks Authority and the NSW Department of Primary Industries allocate significant resources to research that are directed at operationalising the policy use of the available high-quality analytical tools for guiding the socially optimal zoning of marine park and NSW Marine Estate areas”.

This recommendation reinforces the need to review the zoning arrangements in marine parks in the context of the management of the total marine estate. In keeping with other recommendations the zoning review should accommodate assessment of the effectiveness of the current arrangements for conserving biodiversity, which has unfortunately not been included in the outputs from this Audit.

The suggestion that *“the work should be focused for the next three years at least on one marine park, namely the Solitary Islands Marine Park, where in 2010–11 a project trialled, among other things, Marxan applications”* is not substantiated. Its conviction is diminished by the lack of evidence on which the statement is based. It is reasonable to expect that some data that would enable assessment of the effectiveness of the applications of Marxan in 2010-11 should be available and that careful assessment of these data should precede consideration of the further use of such operational tools. Evaluation of a zoning tool such as Marxan before it, or a similar tool, is further applied across the marine estate, would seem sensible; it could add a level of objectivity to the use of such tools in the zoning process within the entire estate. Marxan is stated to be *“designed to help inform the selection of new conservation areas for minimal*

cost, and facilitate the exploration of trade-offs between conservation and socio-economic objectives” (Marxan, 2012). Accordingly, Marxan does not provide support for the declaration of marine parks, but is applied to the preferential allocation of areas to the various zones after the decision to have a certain amount of area included in parks has been made. As with many such tools key assumptions, such as the applicability of area management to the protection of marine environments, must be carefully scrutinised before the type and amount of zoning is determined. As the Audit Report correctly points out, the management of the NSW marine estate should first be based on the management of threats and not on allocations within pre-determined areas. The lack of evaluation of the earlier application of Marxan in NSW and the lack of evidence of effective outputs from it detract from this recommendation for further experimentation.

A later point in R8 *“Public participation and education for sustainability protocols be developed for marine parks along with sufficient resourcing for these processes to be undertaken effectively”* is, in the absence of evidence of effectiveness of current parks, at odds with the earlier promoted concept of effective management of the complete marine estate.

“(R9) *The proposed Coastal and Marine Management Authority (see Recommendations R12 to R15) should include in its legislation drafting brief the following:*

- 1 NSW Marine Estate planning is required to incorporate properly constituted cost-benefit evaluations that cover all values into decision-making frameworks, and that these be in conjunction with appropriate social impact assessments.*
- 2 In NSW Marine Estate planning, social and economic benefits and impacts are assessed as an integral part of zoning and management process.*
- 3 Better integration of land-use planning regulations with NSW Marine Estate management protocol is to be mandatory. For instance, any land-based development or activity proposal that is within a prescribed distance upstream from a marine park ought to be automatically referred to the Coastal and Marine Management Authority for assessment of potential impacts under State Environmental Planning Policy No 71. In addition the Coastal Protection and Marine Management Authority should have a concurrence role in local government planning decisions.*
- 4 Provide for the design and management protocols of the NSW Marine Estate to be overseen by the Independent Scientific Committee (Recommendation R3). Each of the five proposed sections of the NSW Marine Estate should have appointed, in collaboration with the relevant catchment management authority and the regional bodies proposed in this report, a local scientific committee for planning of sections of the Marine Estate (see Recommendations R3 and R12 to R15). The bodies would have expertise in both natural and social sciences”.*

The general thrust of this recommendation in requiring cost-benefit analyses before decision making is sound but some aspects of it are inconsistent. For example, part 3 recommends evaluation of proposed land-based actions upstream from marine parks; the remainder of the recommendation stresses the need

for management of the entire estate and strongly implies the need to manage for protection of biodiversity across the whole estate, not just in marine parks. To be consistent with the wise management of the entire estate all activities, including land-based activities upstream from all marine areas, should be managed primarily on the basis of assessment of what the local and total effect on the marine estate might be, not on an assumption of the potential indirect impact on a downstream marine park, the benefit of which has not been determined. Protection of marine parks that do not themselves provide effective protection of biodiversity does not constitute sound management. The objective should be the cost-effective protection of the biodiversity of the whole marine estate and addressing each and every threat in proportion to the magnitude of each threat to the total of that estate. This objective will be best served by the targeted protection of biodiversity against properly identified threats, as stressed by the Audit Panel, not protection of marine parks *per se*. This is particularly pertinent in the absence of evidence that individual parks or the system of parks in NSW actually provides effective protection.

“(R10) Local Indigenous knowledge and expertise of land and sea management to be explicitly incorporated into the establishment and ongoing management of NSW marine parks and the NSW Marine Estate. To facilitate this, the Audit Panel recommends the employment of an Aboriginal Liaison Officer in each marine park, along with ongoing support of the Aboriginal Cadet Program in each marine park”.

In view of the priority given throughout the Audit Report to the management of the entire marine estate it is difficult to see why the employment of Aboriginal Liaison Officers and the Aboriginal Cadet Program, regardless of the potential benefit of such actions, are aligned with marine parks! It would seem logical to independently assess where such officers and/or programs would best meet the needs of the total aboriginal community and the conservation of the entire marine estate. This may or may not be in marine parks, but based on the Panel’s identification of the need to manage the entire estate and to align management with the existing five terrestrial regions in NSW (Recommendation 13) the priority given to existing marine parks is inconsistent with the thrust of the Report.

“(R11) The Audit Panel recommends that the NSW Government mandate better integration of land-use planning regulations with the NSW Marine Estate and marine park management as follows:

- 1. Overhaul and standardise the structure and process for stakeholder and public participation with clear principles that correspond with the objectives of the Marine Parks Act 1997 (NSW) and relevant management strategies.*
- 2. Acknowledge the biophysical realm as having intrinsic value in NSW Marine Estate planning.”*

This recommendation correctly recognises the need for integrated management of terrestrial and marine environments. It emphasises the importance of the whole marine environment while encouraging societal involvement in its management, presumably in accordance with ESD.

“(R12) The Audit Panel recommends the replacement of the Marine Parks Authority, the Coastal Management Panel, NSW Fisheries and any other relevant bodies with a Coastal and Marine Management Authority. This Authority should be supported by a rationalisation of the plethora of legislation that currently overlays the NSW Marine Estate. This new Authority, to be effective, must be given concurrent rights on land use developments that have the potential to affect the NSW Marine Estate.

The entire NSW Marine Estate should be seen as a continuum because of the connectivity between its various parts/areas/components. Connectivity is one of the strongest arguments for an approach to the management of the whole NSW Marine Estate that sees the entire area as a continuum. Some parts of this continuum will be managed under higher levels of protection, but all of the continuum should be managed”.

The unified marine estate and expanded governing body would integrate marine management with terrestrial management – this concept is further reinforced in recommendations 13-15. It is conceptually a laudable goal but its implications for public-sector management could be considerable and may not be acceptable to Government, particularly in the current tight financial environment. Insufficient information is given in the Report to enable evaluation of the feasibility of implementing this recommendation.

“(R13) The Audit Panel recommends that the NSW Marine Estate be managed by the Coastal and Marine Management Authority, with the estate being divided into five sections that correspond with the adjacent catchment management authorities. An issue that will have to be resolved in determining these boundaries is that of the marine bioregions that do not entirely correspond to terrestrial boundaries. This will clearly be a technical issue for resolution”.

This recommendation in itself acknowledges that management of the marine estate should be aligned with adjacent catchment management authorities, at least in part because primary threats to the marine estate come from terrestrial activities. In combination with the call to manage the whole estate as a continuum it represents a logical concept for managing all clearly identified threats by the most direct and cost-effective means. However, as noted in the recommendation, it is a technical issue for resolution and insufficient data or analyses are given in the Report to justify comment on how it may be best resolved, or even addressed.

“(R14) The Audit Panel recommends that new legislation consolidating all relevant Acts be drafted, and that this legislation give this authority real powers to coordinate with the activities of the Natural Resources Commission and work on a day-to-day basis with the catchment management authorities, terrestrial and marine park authorities, and local government (inasmuch as it relates to the coastal environment)”.

And;

“(R15) The Audit Panel recommends that there be a formal relationship between the Coastal and Marine Management Authority and the independent Scientific Committee (Recommendation R3). This would probably best achieved by the chair of the Scientific Committee being a member of the Coastal and Marine Management Authority.”

If the overarching coordinating body is to be created then recommendations 14 and 15 would be one way of integrating activities. It is not possible to assess from the information made available whether or not it represents the most appropriate or effective way of doing so.

“(R16) The Audit Panel recommends that compliance rangers be integrated with other ranger staff in the new authority and that no staff carry batons, handcuffs or any other such intimidating paraphernalia.”

This final recommendation endorses the accepted concept that through education and participation, compliance will become more voluntary and less dependent on enforcement; rangers will be seen as working with the community rather than against it. Such an approach should be supported, but expectations on the time taken for effective compliance to come from education must be tempered by realism.

No discussion or justification for the recommendation relating to *“intimidating paraphernalia”* is given and the logic behind it is elusive. In the absence of such information it is difficult to confirm its merit.

7. Confusion of Resource Allocation and the Provision of Adequate Protection

“The Audit Panel believed that more clarity was needed over the zoning of multiple-use parks in NSW and the intentions of each type of zone. For example, along with the creation of multiple-use marine parks in NSW, the buy-out of commercial fishing licenses has also created recreational fishing havens. Such havens are a valid consideration of recreational fishing interests, and given the apparent pleasure angling gives to so many people, their extension is probably desirable.”

To conclude that because recreational fishing havens are desired by many recreational fishing interests *“their extension is probably desirable”* more generally does not represent a conclusion from transparent and robust analysis. ‘Havens’ may be desired by recreational fishers but this should be considered in the broader total resource use, conservation and allocation debate. The creation of recreational fishing havens is a resource allocation action. No relationship with efficient biodiversity conservation has been demonstrated in this Audit.

The contrast between allocation and conservation is apparent in the Audit Report in the statement that follows the one cited above; *“On the other hand, there are also valid biological arguments for the extension of biodiversity havens (sanctuaries) to meet the conservation objectives of larger inter-breeding populations”*. While there could be valid arguments to meet the conservation objectives of ‘larger inter-

breeding populations' none have been identified in the Report. No species have been identified to be recruitment limited in NSW and the existing marine parks have not been assessed to provide benefits from protecting any specific populations. Biodiversity havens are not supported by the evidence given.

The Report continues; *"Such trade-offs can only be achieved efficiently if the entire Marine Estate is under one management regime"*. This appears true, but even more importantly they can only be 'achieved efficiently' if they are based on clear identification of the total suite of problems, proper assessment of the cause of each problem and execution of management that targets specific problem(s) in proportion to their magnitude.

The report notes that CAR principle underpins much of the current zoning in NSW marine parks; *"...which is currently based on principles of being comprehensive, adequate, and representative (CAR) and uses habitat as a surrogate for biodiversity per se"* and *"while zoning is aimed at protecting a CAR system, it does not necessarily reflect the functional ecology of each area"*. The Panel clearly has concerns with uncritical acceptance of the CAR principle as the basis for marine parks in NSW.

The CAR principle was developed for conservation of a very specific form of natural terrestrial system, old-growth trees that were demonstrably threatened with removal that constituted a clearly identified, very specific and effectively irreversible threat. In such cases acceptable alternatives for managing the competing objectives of extraction and conservation could not be identified (Kearney et al., 2012). The principles that underpin the necessary protection of marine biodiversity in NSW are fundamentally different and the transposition of the CAR principle has not been justified. The combination of the CAR principle and the application of the term 'protected area' to areas where threats have not been adequately identified and most not even attempted to be managed, is seriously misleading. It has resulted in unrealistic expectations of the conservation benefits of marine parks in NSW.

Furthermore, Australia's international commitment, as discussed under Recommendation 1 above, is to have as system of marine reserves that is Comprehensive, Effectively Managed and Representative, but Australia, including NSW, has replaced "Effectively Managed' with 'adequate'. This not only seriously diminishes the requirement to effectively manage for biodiversity conservation but it also replaces the concept of effective management across the entire estate with an unproven proxy, the declaration of pre-determined areas as 'protected'. The concept that an 'adequate amount of area declared' is a substitute for effective management and conservation of the biodiversity of the whole area is folly; "Australia's replacement of 'effectively managed' with 'adequate' in the definition that drives its marine conservation strategy has led the MPA process to become decoupled from the pursuit of cost-effective management" (Kearney et al., 2012).

The Audit Report is further critical of the use of the CAR principle in NSW marine parks by noting that areas have been declared on the basis of surrogates and not the distribution of biodiversity itself.

8. Conclusions on the Audit Report

In summary the Audit Report represents a laudable degree of very transparent consideration of a great deal of information and discussion. It contains considerable quality scientific evaluation of evidence and many rational conclusions drawn from that evidence. However, the detailed conclusions and recommendations in the Report deviate from strict adherence to the Terms of Reference for the Audit; as a consequence the first four TORs have not been directly addressed in sufficient detail. This is most unfortunate as the resulting uncertainty and unfulfilled expectations of numerous stakeholders seriously detracts from public understanding of the Report and appreciation of it.

By giving prominence to two 'overarching' recommendations the Report implies that these two recommendations are prerequisites for action on other recommendations. The discussion in the body of the Report, and subsequent interviews of the Chair of the Audit Panel, do not support this conclusion. The first 'overarching' recommendation in particular represents a suggested solution to the problems that have been identified in the body of the Report that is extremely broad and far-reaching. In fact it appears more to represent a change in approach to the management of the total NSW natural resource estate, both terrestrial and marine, than to represent a response to the specific TORs for this Audit. While it may well represent a scholarly, innovative and correct approach to a much larger problem the possibility that it may distract Government from acting on the more specific needs for correcting marine park management in NSW is concerning.

By focussing the audit process on questions that were developed as interpretations of the TORs the Panel has moved a degree of freedom away from the specific directions provided by Government for the Audit. In so doing the Panel has inadvertently diminished the priority given to the primary purpose of the Audit, to audit the science underpinning the marine parks process and assess the effectiveness of the process in protecting marine biodiversity.

The Report provides ample evidence of a great deal of quality work assessing the literature and many submissions on marine parks. It is, however, unfortunate that the Audit Report does not make a succinct statement on the (lack of) availability of science to enable an assessment of costs and benefits of outcomes from the system of marine parks in NSW. By failing to do this the Report unfortunately fails to precisely and adequately address the specific Terms of Reference that relate to the science underpinning the marine parks process, TORs 2 - 4. As a result the intent of numerous recommendations and their relationship to the purpose of the Audit is unfortunately ambiguous and open to interpretation.

Notwithstanding the deviation from the specificity of the TORs the body of the Report debates the TORs and the conclusions reached leave little ambiguity in the assessment by the Panel that fundamental changes are required in the management of the current system of marine parks in NSW.

The primary thrust of the Audit's conclusions, as reflected in the collective recommendations, is that the management of the parks needs to be aligned much more with the outputs of risk-assessments and redirected to more directly address assessed threats across the entire marine estate. The necessary changes are most clearly expressed in the identification of the need for a thorough review of the zoning arrangements within all parks. Existing management zones should be revisited to *"more explicitly and transparently consider the assessment of risks"* (Recommendation 3) and rezoning is obviously necessary to directly address the greatest threats cost-effectively; *"Management actions should be in proportion to risk and must be cost-effective"* (R 3). Revision of the zoning arrangement is the most urgent requirement arising from the Audit Report.

9. Suggested Response by Commercial and Recreational Fishers to the Audit Report

The commercial and recreational fishing industries have much at stake in the way in which NSW marine environments and the resources they support are protected. The Audit Report represents a key document in the changing management of the marine estate and the role commercial and recreational fishers have in the management of that estate, most specifically in the access that they have to the resources that make up the estate.

As the Audit Report is a document that will influence marine resource management policies in NSW it is essential that commercial and recreational fishers fully understand the assessments upon which its conclusions and recommendations are based. This review is intended to help industry sectors understand the interpretation of the principles and science behind the Audit Report and in so doing to facilitate the involvement of industry in the ongoing management process. It also suggests actions industry should consider as contributions to the ongoing management process.

While the Audit Report is a key document in the marine resource management process its likely impact cannot be fully assessed until the NSW Government indicates how it will respond to it. It had been anticipated that this response was to be available by about September 2012 (Hodgkinson and Parker, 2012), however no Government response has yet (19/02/2013) been made public. This unfortunately seriously limits the confidence that can be placed in predictions of what management actions are likely as a result of the Audit Report. In turn it constrains confidence in advice that can be given on the priorities for industry in the next phase of management.

Regardless of the exact response from Government to the Audit it will be necessary for both commercial and recreational fishers to work with Government on modifications to the marine parks management process. In so doing it is essential that industries have a thorough understanding of the information that has

underpinned the Audit Panel's conclusions and the principles and objectives that appear to underlie its recommendations. It would be in the interests of both industries to consider the likely responses to the Audit in the context of the broader, strategic issues of marine resource conservation and allocation. It is noted, however, that neither the commercial nor recreational industries have a proud record of unity and cooperation in addressing long-term, strategic issues. Localised priorities and short-term interests of individuals have marred negotiation of conservation and resource allocation outcomes that truly reflect the best possible outcomes for marine conservation, security of access and sustainability of seafood supply.

9.1 Outcomes from the Audit Report that will require direct involvement of commercial and recreations fishers:

1. Stakeholders must pressure Government to not become distracted from the urgent need for re-zoning. There is concern that prominence will be given to the two 'overarching' recommendations to the detriment of urgent action to address the recommendations arising from the specific TORs, in particular re-zoning. It is in the interests of both commercial and recreational fishers to ensure that the current zoning arrangements in marine parks are reviewed as the highest priority.
2. It seems reasonable to assume that the primacy of the conclusion in the Audit Report that the zoning process needs review is such that review of zoning will be an urgent and central component of the Government's actions in response to the Audit. The current zoning is based on assumptions, primarily related to the amount and types of areas in each marine park, and not on evidence-based delivery of sound marine conservation. As a result the current management of zones cannot be shown to represent the most cost-effective approach to the conservation and use of the total marine estate of NSW, nor even of that within marine parks. The commercial and recreational fishing industries must ensure they understand as fully as possible the issues at stake in the zoning process and the principles of resource conservation and use that should dominate the review of those arrangements. They must ensure they are actively involved in the review of zoning in NSW marine parks and that their position(s) are considered, consolidated and where possible evidence-based. To this end they should support the risk-based approach to the conservation of the total NSW marine estate. Such an approach should include basing any proposed restrictions on fishing on clear identification of exactly which form of fishing represents a threat in each location where restrictions are being evaluated. Where proposed management actions are evidence-based and in correctly assessed proportion to the severity of all threats they should be supported across all sectors of the fishing industry.
3. Assessment of each and every threat to the total marine estate and to any area proposed for special management must precede management action. Industries should maintain pressure on the Government to "Review the degree to which all threats to the varying types of marine environments have been properly identified and prioritised" (TOR 3 for the Audit). In particular the fishing industries must pressure Government to provide the scientific evidence to support the assumption that fishing as managed in NSW represents a major threat to marine environments and habitats and that blanket bans on fishing in 'sanctuary' zones represent a necessary and appropriate action to manage this threat.
4. Government agencies must be pressured to devote much greater effort to evaluation of all of the threats posed to marine biodiversity (TOR 3). Known major threats such as pollution, introduced organisms and

inappropriate coastal development must receive urgent attention. Evidence-based assessments of how each type of threat should be managed are essential.

5. Ensure that review of the zoning arrangements is based on rigorous risk-assessment and evidence-based review of the cost-effectiveness of existing zones in accordance with TOR 5, *“Recommend ways to increase the cost-effectiveness of marine park zoning arrangements”*. The Audit did not adequately evaluate the outcomes that were claimed or anticipated for the marine parks process even though some evidence should have been available. The Report partially excuses the lack of demonstration of benefit from existing marine parks by exclaiming that, *“Many of the potential effects on biodiversity or ecosystem function would not be expected to be detectable until at least 10 to 15 years after park establishment, but three of the six NSW marine parks were established less than 10 years ago”*. This ignores the reality that some of the benefits should be discernible more quickly and, in any case, at least part of one of the parks (The Solitary Islands Marine Park) has been established as a ‘sanctuary’ zone for more than 20 years; more than ten years longer than asserted to be necessary for assessment of outcomes. Yet no benefits have been described in the Audit Report from the Solitary Island or any other Park. Logical management progression should require demonstration of benefit from existing management areas as a prerequisite for the review of the broader rezoning process, including consideration of possible continuation of management in existing zones or areas.
6. Recreational and commercial fishers must actively support efforts to ensure that the re-zoning arrangements within marine parks are done in the context of the contribution of the management in each zone to the conservation and use of the total estate, not how the zoning arrangements relate to the preservation of the park *per se*. It is the effectiveness of the provision of protection that must be assessed, not the amount or types of zones that are declared as being protected within parks.

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Attachment 1

Submission 85 (S85) on the Report of the Independent Scientific Audit of Marine Parks in NSW (Kearney, 2012)

The Hon Katrina Hodgkinson MP

Minister for Primary Industries

Dear Minister,

I provide below comments on the recent Report of the Independent Scientific Audit of Marine Parks in NSW.

The Report provides ample evidence of an extremely transparent and thorough consideration of a multitude of inputs into the Audit. The complexities of the issues and the difficulties in providing solutions that will suit all interested parties are correctly highlighted. The intent and obvious consideration of the issues in the collective recommendations is commendable, particularly noting the strong opinions and variable interpretations that exist and the need for the Audit Report to present a consensus view of the varying opinions of the members of the Panel. However, noting the high quality of the discussion in the body of the Report it is unfortunate that the way in which several of the key recommendations have been presented and worded leaves unfortunate ambiguity in how they can be interpreted. As a result there is considerable confusion amongst the many interested parties as to exactly what it is the Report is recommending and what actually needs to be done and when. This in turn detracts from the 'power' of the Report and likely its subsequent value to Government. It appears that a relatively small number of imprecise statements have had a disproportionate impact on public interpretation of the intent of the Audit Report. I believe this problem, while serious, can be easily fixed by clarification of a relatively small amount of ordering and wording, specifically in the first few recommendations. Accordingly I have restricted my comments to the first six recommendations.

As the key statements that require clarification relate to complex issues my explanation of why they need clarification is much longer and more complex than the small amount of clarification that is necessary to address the issues with what is otherwise a quality review.

Specific Comments.

The location at the beginning of the Report of two "over-arching recommendations" and the way they are emphasized and given priority strongly implies that they need to be implemented before other recommendation are addressed. This is unfortunate as both these recommendations require actions that the Government may wish to address in stages, as is actually acknowledged later in the Report. The resulting indication of priorities appears likely to detract from the need for immediate actions that are necessary to respond to other recommendations on specific Terms of Reference (TOR). By presenting these two recommendations at the very beginning as 'over-arching' it is implied that they are pre-requisites for other action that based on the body of the Report are far more urgent. This is unfortunate.

Furthermore, the 'over-arching recommendations' do not specifically relate to the primary TORs, but rather TOR 9, "other recommendations as appropriate". Both 'over-arching recommendations' call for major structural changes; first the creation of the 'Coastal and Marine Management Authority' to oversee the governance of the 'Marine Estate' and second, the creation of an independent Scientific Committee. The conclusions that all NSW marine and coastal waters need to be managed as a continuum, the total marine estate, and that marine parks do not represent adequate management of the State's marine biodiversity against the obvious threats are logical. However, the proposed creation of the 'Coastal and Marine Management Authority' to enact the necessary change to management may be idealistic; it may not be acceptable to Government for a number of reasons, such as practicality or financial priority; the Audit Report actually acknowledges that its implementation will take time. However, more immediate actions are necessary to address specific recommendations, such as correcting the many problems with the current zoning arrangements.

Similarly the creation of the Scientific Committee appears wise, but delays in its creation should not preclude the existing science management structure from immediately re-directing research efforts to address the lack of data and assessment of the effectiveness of the current parks, as highlighted throughout the report. For these critical reasons acceptance of these two recommendations as 'over-arching' appears inappropriate; they would be more appropriate as concluding comments under the last TOR.

Comments on the key recommendations, aligned with the relevant TOR:

TOR 1

R 1. The slant of the wording of this recommendation is toward providing assurance to the Government that it is not in breach of international conventions in managing its marine parks. While this may be re-assuring to Government the accuracy of the recommendation is questionable. The discussion and documentation given in the report strongly suggest that this conclusion is actually an optimistic interpretation of the way current arrangements meet total obligations. All Australian governments, following the lead from the Commonwealth, have signed on to the NRSMPA, which is based on commitment to establish a comprehensive, **adequate** (emphasis added) and representative (CAR) system of marine parks. The CAR principle is peculiar to Australia and not an international obligation. There are serious problems with this principle and the Audit Report acknowledges concerns with its application to NSW. International conventions to which Australia is a signatory actually call for a system of comprehensive, **effectively managed** (emphasis added) and representative system of parks. This removal of 'effectively managed' by Australia as a whole, including NSW, is not simply editorial, it is extremely significant. It has led to misdirecting conservation efforts in marine parks towards having more and bigger areas (supposedly bigger is more 'adequate') closed to fishing and away from addressing threats and cost-effectively managing them. Removing a commitment to effectively manage against properly identified threats and replacing it with closing areas to fishing, which is already effectively managed, is the primary reason why marine parks in NSW do not conform to logical conservation practices and international objectives. The failure to 'effectively manage' is one of the fundamental reasons why benefits from the NSW marine parks have not been able to be described (discussed under TOR 2). Details of Australia's deviation from international objectives and accepted practices, and the problems that have resulted, are provided in Kearney et al, Marine Policy, In Press, Accepted June 5, 2012, (Attachment 1).

Furthermore, and equally significantly, this first recommendation in the Report merely implies that the Government will not be found in breach of its obligations by not meeting commitments; it does not cover what the Government has incorrectly claimed that it was required to do. Most importantly the Government is not required to have any specific type of closures in areas in order to meet its commitments. This is particularly significant as fishing restriction in 'sanctuary zones', that are the most contentious issue in NSW marine parks, are not a requirement under any of Australia's commitments. It is indeed surprising, noting the weight that is given in the text of the Report to the need to revisit zoning in NSW marine parks, that the Audit Report does not cover the fact that NSW is not required to further restrict fishing in any of its marine parks. In reality NSW's fisheries are already 'effectively managed' and therefore the State has already met its commitments under international conventions to have areas that are comprehensive, effectively managed and representative, as far as the management of fishing is concerned. Here it should be noted that the Chair of the Audit Panel, A/Professor Beeton, in his radio interview following the release of the Report stressed that zoning must be based on threats and that it had not been demonstrated that fishing as managed in NSW was actually a threat.

It should also be noted that the discussion in the body of the Report is consistent with global acceptance that marine protected areas should be based on wise management of those areas, including their use and protection against identified threats, and not just the declaration of areas as 'no take' zones that exclude fishing.

R 2. The imprecise wording and structure of this critical 'Recommendation' is responsible for much of the confusion and greatly varying interpretations of the intent of the package of recommendations in the whole of the Audit Report. The statement that the "current system of marine parks as established in NSW should be maintained..." is part of a key 'recommendation' but is stated to be only an 'opinion' of the Audit Panel. More important than this ambiguity is that created by the critical statement that the 'current system' of marine parks should be maintained. Advocates for more marine parks are arguing that the system of parks under the former Labor Government is what should be maintained and that two new parks need to be created to accommodate the second phrase in this recommendation. However, the system under the current Government (therefore the current system) includes a moratorium on new parks. Therefore Recommendation 2 should be interpreted to mean that there should be no more new parks, at least until such time as the zoning arrangements have been thoroughly reviewed and correctly aligned with threats and cost-effective management. It is extremely significant that in response to the specific question on ABC radio of whether this recommendation called for two new marine parks, the Chair of the Audit Panel stated that this recommendation was intended only as an interim measure. He stressed it did not call for two more parks, but rather a review of the threats to the all areas (the 'Marine Estate'), including to those where there were no parks, and identification of the measures that were necessary for the protection of biodiversity in all areas. This interpretation is in keeping with the substance of the body of the Audit Report that stresses that the zoning arrangements need complete review and zoning needs to be based on clearly identified threats and management carried out in proportion to the magnitude of each threat. Here it is again relevant that, as stated above, the Chair of the Audit stressed that it had not been demonstrated that well-managed fishing, such as we have in NSW, was actually a threat.

Great emphasis is correctly given throughout the Report (including Recommendation 5) to the need to review the zoning arrangements which constitute the primary operating arrangement of the

current 'system' of marine parks. In particular the Report stresses that zoning and rezoning should be based on addressing clearly identified risks, which the system of marine parks set up under the Labor Government quite deliberately did not do. As no compelling scientific argument for continuation of the system of marine parks is given in the Report it appears that the recommendation by the Audit Panel that a system of marine parks needs to be maintained may well be an interpretation by the Panel of the political difficulty of removing the Labor Party's system completely.

The interpretation of Recommendation 2 that would be consistent with the body of the Report is that a system of marine parks be maintained, but this system should be considerably different to the one the current Government inherited from its predecessor.

As mentioned above, the ambiguity in this recommendation is seriously confounded by further imprecise expression in the second phrase. The stated opinion that the current system of marine parks should be maintained is continuous with the statement "and mechanisms be found for enhancing the protection of biodiversity..." in two other areas. The loose wording in this recommendation implies that the current system effectively enhances the protection of biodiversity in other areas and therefore should be extended to areas where it currently does not apply. By combining these two statements it is being argued by uncritical marine park advocates that the Audit is recommending two more marine parks similar to the current ones. The substance of the Audit Report and the recorded interview by the Chair make it quite clear that this is not what was intended. What the evidence in the Report supports is that the whole system, but especially the zoning, needs restructure to address the properly identified threats to biodiversity throughout the marine estate and not just in current or proposed marine parks.

TOR 2.

R 3. The primary purpose of this Audit was to assess the science relating specifically to the system of marine parks in NSW; three of the eight TORs, numbers 2, 3 and 4, specifically call for review of the science provided by the Government agencies that relates to how threats have been identified and addressed in the NSW marine parks process and the assessment of the effectiveness of this process in protecting biodiversity in different types of habitats. The failure of the Audit Report to unambiguously state that these analyses have not been carried out by the Marine Parks Authority and that there are insufficient data to enable the Audit Panel to do such assessments, seriously exposes the basis and intent of the recommendations in the whole of the Report. By so doing it greatly diminishes the effectiveness of the Audit. This major problem would be very simply fixed by a succinct statement that there had been no scientific assessment that demonstrated benefits from marine parks in NSW and there was insufficient data to enable to Audit team to carry out such assessment.

Not only has no assessment of the science been presented in the Audit Report or elsewhere but no compilation of science relating to the effectiveness of marine parks in NSW has been provided. In response to questions of Government officials and members of the Audit Panel as to why there were no assessments of benefits I was advised that this was not possible because the Marine Parks Authority did not actually have science to enable such assessments. In spite of the lack of a succinct statement consideration of the detail in the body of the Audit Report does actually confirm that the science available in NSW is completely inadequate to demonstrate cost-effective benefit from the parks (see for example "as far as the Audit Panel can determine research remains focused on ecosystem structure" not conservation outcomes; "Spatially explicit data that allow and examination

of 'fisheries benefits outside marine protected areas' have not been collected in NSW"; "Research on specific environmental impacts in the marine parks has not progressed far"; "... the Audit Panel has reservations about both the quantity and quality of the social and economic research on marine parks that has been conducted and used by the Marine Parks Authority and relevant departments" and "One of the major recommendations of the Fairweather et al (2009) report was that the emphasis of the research should shift from habitat characterisation and assessment to monitoring the effectiveness of marine parks and their zones against stated objectives. The 2010-2015 research framework has not addressed this recommendation").

One of the primary reasons (excuses) given in the Report for the lack of assessment of benefits was, "the short time that some NSW marine parks have been operated (as little as about five years), many of the potential effects on biodiversity or ecosystem function would not be expected to be detectable for at least another five to 10 years", a total of 10 to 15 years after creation. This assessment when properly interpreted is actually damning. While it is true that some of NSW marine parks have not been in operation for much more than five years, others have been in operation for much longer. For example the Solitary Islands Marine Park has been an 'Aquatic Reserve' and closed to fishing, and effectively a marine park as currently determined, for more than twenty years, five to 10 years longer than the period stated to be necessary for assessment of possible benefit. And yet none have been described!

Recommendation 3 does not specifically address the relevant TOR, # 2. It does, however, indirectly acknowledge the lack of appropriate science and the paucity of the current science process that were the subject of this TOR. It recommends the formation of an independent Scientific Committee to review strategic research. In effect the Audit Report is recommending the formation of another independent committee to carry out one of the primary tasks for which this Audit was created. A brief, succinct statement in the Report that the reason the Audit Panel could not do this was because there was no science to demonstrate benefits from the marine parks in NSW would justify this recommendation and correct this fundamental problem.

R 4 acknowledges the research shortcomings and provides well-argued priorities for additional funding. Significantly it draws attention to the severe lack of socio-economic and resource-use input into the marine parks process in NSW. Equally significantly it highlights the need to base publicly funded research on projects that address threats to marine biodiversity. This contrasts the historical and existing priorities for research which are based on describing what is in areas, mostly only physical structures as surrogates for biodiversity, at the expense of identifying and addressing what biodiversity and ecosystems should be protected, what they need protection from and what the outcomes are of attempting to protect them by the current zoning arrangements. To this end R 4 also very correctly reinforces calls for assessment of the performance of marine parks in NSW, which obviously has not been done.

TORs 3, 4 and 9

R 5 by recommending comprehensive changes to existing actions and processes to address prioritised threats this recommendation effectively confirms that the threats to the various types of marine environments have not been adequately identified and prioritised in the current system of marine parks. It very correctly stresses the need to comprehensively change the zoning process, concentrating on assessment and management of properly identified risks for the many and varied types of habitats.

As discussed under TOR 2 the lack of “specific science relating to the effectiveness of marine parks”, as required under TOR 4, can be determined from the bulk of the Report, but unfortunately it is not made obvious and specifically stated. The recommendation that “Zoning and rezoning should also more explicitly and transparently consider the assessment of risks” and that “Management actions should be proportionate to risk and must be cost-effective” identifies the real problems with the current marine parks and correctly adds priority and direction to how to fix them.

TOR 5, 6 and 9

R 6 identifies the need to determine what threats commercial and recreational fishing do actually pose to ecosystems. As stated above the Chair of the Audit in his radio interview did not accept that evidence has been provided that fishing as managed in NSW is actually a threat. Most significantly it again stresses the needs for zoning to be re-assessed based on addressing real threats and not just “merely surrogacy-based” closures of areas. It also stresses that the roles and purpose of zones already declared must be revisited (re-assessed).

As stated in the introduction I have restricted my comments to the first six recommendations.

Yours sincerely

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