

# Ocean Beaches and Headlands Summary Report

Assessment of recreational fishing access on ocean  
beaches and headlands in NSW marine park sanctuary  
zones

December 2013

NSW Government copyright © State of New South Wales 2012.

This publication is copyright. You may download, display, print and reproduce this material provided that the wording is reproduced exactly, the source is acknowledged, and the copyright, update address and disclaimer notice is retained.

#### Disclaimer

The authors of this report are the members of the New South Wales (NSW) Marine Estate Expert Knowledge Panel. The views and opinions contained in this report do not necessarily reflect the views of the NSW Government. The State of NSW takes no responsibility for the accuracy, currency, reliability and correctness of any information included in the report. Some of the information and opinions contained in this report have been provided by third parties, the State of NSW, the authors and the publisher take no responsibility for the accuracy, currency, reliability and correctness of any information included in the report provided by third parties.

#### Recommended citation

Brooks K, Byron N, Fletcher R, Johnston E, McGinnity P & Stoeckel A (2013) *Ocean Beaches and Headlands Summary Report: Assessment of recreational fishing access on ocean beaches and headlands in NSW marine park sanctuary zones*. NSW Government. Pp.1-14

#### National Library of Australia Cataloguing-in-Publication entry

Ocean Beaches and Headlands Summary Report: Assessment of recreational fishing access on ocean beaches and headlands in NSW marine park sanctuary zones

ISBN 978 1 74256 590 3

Publisher: NSW Government. New South Wales

Available on the internet at [www.marine.nsw.gov.au](http://www.marine.nsw.gov.au)

Enquiries regarding this document should be directed to [contact.us@marine.nsw.gov.au](mailto:contact.us@marine.nsw.gov.au)

INT14/18958

## Introduction

### Background

In 2011 the NSW Government commissioned an Independent Scientific Audit of Marine Parks in NSW to advise the government about future management directions for marine parks and on better management of the NSW marine environment generally. The 2012 report of the Audit included recommendations to deliver more effective and evidence-based management of the entire marine estate of NSW, including the existing marine parks.

The Audit concluded that information was lacking for some sanctuary (no-take) zones, specifically for ocean beaches. After consideration of the Audit findings, and public responses during and following the Audit, the NSW Government announced in March 2013 that there would be an amnesty from prosecution for shore-based recreational line fishing in marine park sanctuary zones on mainland open ocean beaches and headlands, except in identified areas excluded for the protection of threatened species. The amnesty was to be in place while the threats and risks associated with this activity were assessed. Although the amnesty does not extend to spearfishing, this assessment also considered the risks associated with allowing spearfishing from headlands, noting that existing rules preventing spearfishing from ocean beaches would remain.

### Vision and Principles for the NSW marine estate

The Marine Estate Management Authority (MEMA) document *Managing the NSW Marine Estate: purpose, underpinning principles and priority setting*, sets out the following **Vision** and **Principles**:

#### Vision

***To have a healthy coast and sea, managed for the greatest well-being of the community, now and into the future***

Principles:

1. Effective community engagement, to identify and inform key benefits and threats
2. Identification of management priorities will be based on threat and risk assessment
3. To evaluate trade-offs, values will be placed on alternative uses of the Marine Estate
4. Best available evidence will be used in trade-off decisions, but judgment will still be required
5. The well-being of future generations will be considered
6. Existing access rights will be respected<sup>1</sup>
7. The precautionary principle will be applied
8. Efficient and cost-effective management to achieve community outcomes
9. Management decisions will be transparent and adjust in response to new information
10. Management performance will be measured, monitored and reported and information pursued to fill critical knowledge gaps.

These principles were applied by the Marine Estate Expert Knowledge Panel in the assessment of shore-based recreational fishing, which is summarised in Table 1.

### Recreational shore-based fishing assessment

The Marine Estate Expert Knowledge Panel was tasked by MEMA to assess shore-based recreational fishing of the sanctuary zones included in the amnesty. This included an assessment of risk to the ecological values from shore-based recreational fishing activities over the next five years on ocean beaches and headlands in sanctuary zones, as well as risks to the social and economic benefits provided by the marine estate. There are 25 sanctuary zones

---

<sup>1</sup> The principles define that future management of the estate will **recognise and respect existing rights and arrangements**, but retain the option to modify them over time to maximise community benefits.

included in the amnesty: four are in Cape Byron, five are in Solitary Islands, six are in Port Stephens-Great Lakes, four in Jervis Bay and six are in Bateman marine parks.

An economic study assessed the marginal cost of restricting shore-based recreational line fishing at beach and headland sites subject to the current amnesty. Recreational fishers at three NSW marine parks were interviewed to understand their most likely behavioural responses to restricting access at these sites.

To examine the social implications a wide selection of coastal users in two marine parks were interviewed to provide detailed information about the social values associated with beaches and headlands. In addition, two online surveys were conducted to understand broader community values associated with ocean beaches and headlands in marine parks and to gather views on the future management of these areas. Nearly 7000 people responded to the surveys.

An ecological risk assessment involved an assessment of impacts on ecological assets including intertidal and subtidal ocean soft-sediments (beaches) and rocky reefs (headlands), fish assemblages, and key threatened fish and shorebird species associated with these habitats. The ecological risks were assessed against specific objectives, and risk levels were determined on the basis of the consequence and likelihood of shore-based fishing at the various locations, with risk levels grouped into four ratings of minimal, low, moderate and high. This is consistent with the approach identified in the MEMA document *Managing the NSW Marine Estate: purpose, underpinning principles and priority setting*, and it is a key component of the overall threat and risk framework that will be applied in broader assessments of NSW marine estate management once it is finalised.

The entire suite of information that has been generated was used to provide advice to MEMA on whether the amnesty at each of the sanctuary zones should remain or be removed. Table 2 details the three scenarios and related decision rules defined by the Marine Estate Expert Knowledge Panel that cover the range of likely objectives used in the risk assessment. Table 3 contains the separate risk appraisals for each of the components used in the overall assessment. This is followed by a description in which the alignment between the assessment outcome and the MEMA vision is discussed.

**Table 1. Putting principles into practice: Applying the MEMA Principles to the amnesty on shore based recreational fishing from open ocean beaches and headlands in Marine Park Sanctuary Zones.**

MEMA Principles applied	Assessing the management of shore-based recreational fishing from beaches and headlands
<b>Stage A. Identify how the Community Benefits from the Estate</b>	
1. Effective community engagement to identify and inform key benefits and threats	Surveys and other information were used to identify community benefits derived from beaches and headlands, conflicts among those benefits, and threats posed to those benefits by shore-based recreational fishing.
<b>Stage B. Assess Threats and Risks to Benefits</b>	
2. Identification of management priorities will be based on threat and risk assessment	<p>An ecological risk assessment was conducted on the effects of shore-based recreational fishing, including spearfishing, on open ocean beaches and rocky headlands in NSW sanctuary zones. The ecological assets (or values) assessed were intertidal and subtidal ocean soft-sediments (beaches) and rocky reefs (headlands), fish assemblages, and threatened fish and shorebird species associated with these habitats.</p> <p>Given the intention to introduce new legislation governing marine parks and the entire marine estate, three decision rules regarding ‘acceptable’ risks that span the likely objectives have been used.</p>
<b>Stage C. Assess Management Options to Maximise Benefits</b>	
3. To evaluate trade-offs, values will be placed on alternative uses of the marine estate	The assessment identified community benefits that would result from the removal of the amnesty at a number of sites for social, ecological protection or scientific reference purposes. The current review is limited to assessing the risks of allowing continued recreational fishing at the study sites over a five-year time frame. A more comprehensive evaluation of these risks will be available through the forthcoming comprehensive review of marine park zoning and management arrangements.
4. Best available evidence will be used in trade-off decisions, but judgment will still be required	While there are maps of habitats available for all sites assessed, and there is some information on the ecological assets of habitats, there are no studies that specifically address the impact of recreational shore-based fishing at the amnesty sites or at similar sites in NSW. While there are some relevant studies of rocky headland and reef habitat in NSW, and in comparable habitats in other temperate locations, there is limited information available on the ecological assets on ocean beach habitats.
5. The well-being of future generations will be considered	Given the knowledge limitations regarding the impact of current management settings, the judgments and recommendations regarding the maintenance or lifting of the amnesty at certain sites should be considered preliminary and subject to further review in the context of the threat and risk assessment to be carried out for the entire marine estate, or future marine park zoning reviews.
6. Existing access rights will be respected	Shore-based recreational fishers, along with the rest of the community, are custodians of the NSW marine estate and therefore have rights of access, unless that gives rise to significant community concern or ecological threat.
7. The precautionary principle will be applied	The proposed adaptive and precautionary approach therefore includes removing the amnesty from some sanctuary zones at a set of sites to represent different bioregional, habitat and ecosystem types to deal with potentially unknown impacts and to use as scientific reference sites.

**Stage D. Implement Preferred Management Options**

**Stage E. Be Accountable**

8. Efficient and cost-effective management to achieve community outcomes	The Marine Estate Expert Knowledge Panel has assessed only the options of maintaining or removing the amnesty at a whole-of-site level. That is, modification of boundaries applying to the amnesty or the introduction of alternative marine park or fisheries management arrangements was not considered. This approach was taken as the Panel considered that finer-scale review of boundaries is more appropriately done through a more comprehensive zoning review for each marine park, and because maintaining the current approach will help to facilitate community understanding and minimise management costs.
9. Management decisions will be transparent and adjust in response to new information	The proposed option for changes to the current amnesty settings will be further reviewed in the context of the threat and risk assessment for the entire marine estate and future reviews of marine park zoning and management arrangements. The most up-to-date available information will be made transparent to the community to facilitate broad community involvement in those further decision-making processes.
10. Management performance will be measured, monitored and reported and information pursued to fill critical knowledge gaps.	The potential to further develop a cost-effective monitoring regime to enhance understanding of recreational shore-based fishing impacts will be considered relating to a five year timeframe undertaken in Fisheries NSW work programs. Existing knowledge gaps means there is value in maintaining scientific reference sites.

## Scenarios and decision rules

In making the risk assessment, the international definition of risk has been used. That is, risk is the impact of uncertainty on achieving objectives (ISO 31000:2009).

Existing legislation (*Marine Parks Act 1997*) covering sanctuary zones describes objectives that emphasise conservation. Whilst the NSW Government has announced its intention to maintain the six existing marine parks, it has also announced that new legislation covering the entire marine estate, including marine parks, will be developed in 2014 and that social and economic factors will also be included along with environmental issues in determining ‘best use’ of the estate.

To allow for the potential of different objectives in the new legislation, Table 2 outlines three different scenarios and related decision rules covering a range of likely objectives developed by the Marine Estate Expert Knowledge Panel. These have been used in the assessment by the Panel to identify the locations under each scenario where fishing could be allowed and not allowed.

Table 2. Details of the three scenarios, related decision rules and explanations covering the range of likely objectives used in the risk assessment.

Scenarios	Decision rules	Explanation
<b>SCENARIO 1</b>		
Having multiple, complete no-take sanctuary zones within each marine park to provide a more robust and precautionary approach to meeting the new marine protected area principles and other objectives.	The amnesty will be removed from zones where there are identified ecological risks (> low), where there is already a monitoring program in place, or significant impacts on other social objectives may occur. The amnesty will also be removed from zones unless it can be shown that there is already <b>more than one</b> complete no-take zone representing ocean beach and headland habitats present in the park. Subject to the above, preference will be given to maintaining the amnesty at locations where there is a clear net social benefit from allowing shore-based recreational fishing to continue, compared to other activities.	<i>This scenario is the most precautionary as it recognises there are ecological impacts associated with historic and current levels of fishing, but that these impacts are not well understood. In addition it recognises the limitation of the current risk assessment of shore-based fishing that could not consider the cumulative effects of multiple stressors or the indirect ecological impacts of fishing. It provides a replicated set of sanctuary zones, particularly for non-pelagic species associated with ocean beaches and headlands, and replicated opportunities to better understand the ecological effects of fishing within these habitats for each marine park. It also recognises that there are benefits for non-fishing users of the marine parks if the amnesty is removed from a range of areas that they can access, and therefore it is the scenario that maximises the benefits for those user groups.</i>
<b>SCENARIO 2</b>		
Having a limited set of the sanctuary zones within each marine park that is complete no-take is considered sufficient to meet likely new marine protected area principles, considers opportunities for current and potential future scientific programs and achieves net social objectives.	The amnesty will be removed from zones where there are identified ecological risks (> low), where there is already long term monitoring program in place, or significant impacts on other social objectives will occur. In addition, if there is no zone included above that represents a ‘major habitat type – ocean beach and headland’, then the zone of this type with the lowest ‘cost’ to fishing should be added.	<i>This scenario is somewhat precautionary in allowing fishing only where there is low risk over the next five years. It also recognises that the ecological impacts associated with historic and current levels of fishing in NSW are not well understood and it therefore provides for at least one reference site in each marine park that could be used to compare effects of fishing on ocean beach and rocky headland ecosystems. It could also provide some additional benefits to non-fishing users of these areas.</i>
<b>SCENARIO 3</b>		
As long as there are low risks from shore-based recreational fishing and spearfishing within a sanctuary zone, this is considered adequate to meet new marine protected area principles over the next five years.	The amnesty will be removed from zones only where this activity will generate clearly unacceptable ecological risks (moderate or higher) over the next five years, or where there is a moderate or high risk that allowing shore-based recreational fishing could affect monitoring programs that have been in place for some time.	<i>This scenario addresses only clearly unacceptable ecological risks associated with the shore-based recreational fishing identified for specific sanctuary zone locations over the next five years. It does not consider cumulative pressures on the ecosystem or whether the impacts of fishing will increase over the longer term (e.g. as a result of population growth or increased accessibility to areas). If adopted, the Panel would consider this an interim approach until a more robust and comprehensive threat and risk assessment can be undertaken for the NSW coast, and zoning of marine parks is reviewed.</i>

**Table 3. Risk levels for all ecological, social and economic values sanctuary zones determined in the assessment, and amnesty decision. All footnotes at end of table.**

Sanctuary zone	Habitat/location main type	Risk to direct habitat effects	Risk to captured fish assemblage	Risk to threatened species	Social risk to line fishers*	Social risk /access conflict	Risk to scientific reference sites	Economic risks to fishers if fishing is not allowed **	Decision to allow or not allow fishing under scenarios 1, 2 and 3***
<b>Cape Byron Marine Park</b>									
Byron Bay	Beach :Tyagarah	Minimal	Minimal	Minimal	Low	Low	Low	Low	<b>Fishing allowed</b>
	Beach: Belongil	Minimal	Minimal	Moderate (birds)	Low	Low	Moderate	Low	<b>Fishing not allowed (1,2)</b> <b>Fishing allowed (3)</b>
	Beach: Wategos The Pass	Minimal	Low	Low (fish)	Low	Moderate	Low	Low <sup>(1)</sup>	<b>Fishing not allowed (1)</b> <b>Fishing allowed (2,3)</b>
	Rocky reef: East Cape Byron	Minimal	Minimal	Low (fish)	Low	Minimal	Low	Low	<b>Fishing allowed</b>
Broken Head	Beach and rocky reef	Minimal	High	Low (fish and birds)	Low	Low	Low	Low	<b>Fishing not allowed</b>
Lennox Head	Rocky reef	Low	Minimal	Minimal (birds)	Low	Minimal	Low	Low	<b>Fishing allowed</b>
The Moat	Rocky reef	Low	High	Low (birds)	Low	Moderate	Moderate	Low	<b>Fishing not allowed</b>
<b>Solitary Islands Marine Park</b>									
Northern Section – southern	Beach	Minimal	Minimal	Minimal	Low	Low	Moderate	Low	<b>Fishing not allowed (1)</b> <b>Fishing allowed (2,3)</b>
Jones Beach/	Beach	Minimal	Minimal	Minimal	Low	Minimal	Low	Low	<b>Fishing allowed</b>
Jones Point	Rocky reef	Minimal	Moderate	Minimal	Low	Minimal	Moderate	Low	<b>Fishing not allowed</b>
Central Section – northern	Rocky reef	Minimal	Moderate	Low (birds)	Low	Minimal	High	Low	<b>Fishing not allowed</b>
Flat Top Point	Rocky reef	Minimal	Moderate	Low (fish)	Low	Low	High	Low	<b>Fishing not allowed</b>
Southern Section	Beach	Minimal	Minimal	Minimal	Low	Low	Moderate	Low	<b>Fishing not allowed (1)</b> <b>Fishing allowed (2,3)</b>



Table 3. Continued

Sanctuary zone	Habitat/location main type	Risk to direct habitat effects	Risk to captured fish assemblage	Risk to threatened species	Social risk to line fishers*	Social risk /access conflict	Risk to scientific reference sites	Economic risks to fishers if fishing is not allowed **	Decision to allow or disallow fishing under scenarios 1, 2 and 3***
<b>Port Stephens-Great Lakes Marine Park</b>									
The Pinnacle	Beach	Minimal	Minimal	Moderate (fish)	Low	Minimal	Low	Low	<b>Fishing not allowed</b>
Celito South	Beach	Minimal	Minimal	Minimal	Low	Minimal	Low	Low	<b>Fishing allowed</b>
Fiona	Beach	Minimal	Minimal	Minimal	Low	Low	Low	Low	<b>Fishing allowed</b>
Yacaaba	Rocky reef	Minimal	Minimal	Minimal	Low	Low	Low	Low	<b>Fishing not allowed (1) Fishing allowed (2,3)</b>
Zenith	Beach	Minimal	Moderate	Minimal	Low	Moderate	Low	Low	<b>Fishing not allowed</b>
Fingal Island	Rocky reef	Minimal	Minimal	Minimal	Low	Minimal	High	Low	<b>Fishing not allowed</b>
<b>Jervis Bay Marine Park</b>									
Hammer Head	Beach	Minimal	Minimal	Minimal	Low	Low	High	Low	<b>Fishing not allowed (1,2) Fishing allowed (3)</b>
Point Perpendicular/ Crocodile Head	Rocky reef	Minimal	Minimal	Low	Low	Minimal	High	Low	<b>Fishing not allowed (1) Fishing allowed (2,3)</b>
Bowen Island	Rocky reef	Minimal	Minimal	Low (birds)	Low	Minimal	Low	Low	<b>Fishing not allowed (1) Fishing allowed (2,3)</b>
St Georges Head/ Steamers Head	Rocky reef	Minimal	Minimal	Minimal	Low	Minimal	High	Low	<b>Fishing not allowed</b>

Table 3. Continued

Sanctuary zone	Habitat/location main type	Risk to direct habitat effects	Risk to captured fish assemblage	Risk to threatened species	Social risk to line fishers*	Social risk /access conflict	Risk to scientific reference sites	Economic risks to fishers if fishing is not allowed **	Decision to allow or disallow fishing under scenarios 1, 2 and 3***
<b>Batemans Marine Park</b>									
North Head	Rocky reef	Minimal	Low	Low (fish)	Low	Low	High	Low	<b>Fishing not allowed</b>
Burrewarra (North)	Rocky reef	Minimal	Low	Low (fish)	Low	Low	High	Low <sup>(2)</sup>	<b>Fishing not allowed (1) Fishing allowed (2,3)</b>
Burrewarra Point (South)	Rocky reef	Minimal	Low	Low (fish)	Low	Low	High	Low	<b>Fishing not allowed</b>
Broulee Island	Rocky reef	Minimal	Minimal	Minimal	Low	Low	High	Low	<b>Fishing not allowed</b>
Mullimburra	Beach and rocky reef	Minimal	Minimal	Minimal	Low	Low	Low	Low	<b>Fishing not allowed (1,2) Fishing allowed (3)</b>
Brou Beach	Beach Rocky reef	Minimal Minimal	Minimal Low	Minimal	Low	Minimal	Low	Low	<b>Fishing not allowed (1) Fishing allowed (2,3)</b>
Bullengella Lake-Corunna Lake	Beach and rocky reef	Minimal	Minimal	Minimal	Low	Low	Low	Low	<b>Fishing allowed</b>

\* Note: this relates to the social risk to recreational fishers of maintaining the amnesty – i.e. allowing shore-based fishing in these in these areas (estimated from online survey that over 60% of fishers indicated that they supported maintaining the amnesty).

\*\* Note: this is the economic risks to fishers if the amnesty is removed and fishing is not allowed in these areas.

\*\*\* As described in the text. Numbers in brackets refers to the scenario for each decision. Where there is no number, the three scenarios make no difference.

<sup>(1)</sup> While costs were considered low, this site accounted for the majority of costs associated with restricting access in Cape Byron Marine Park.

<sup>(2)</sup> While costs were considered low, this site accounted for the majority of costs associated with restricting access in Batemans Marine Park.

## How the decisions on the amnesty on shore-based recreational fishing align with the NSW Government’s vision

The Marine Estate Management Authority’s vision for the estate is to have a **healthy coast and sea, managed for the greatest well-being of the community, now and into the future**. This vision encapsulates the three key elements of managing the NSW marine estate to maintain and enhance the estate’s natural assets while allowing access and use in a way that maximises economic, social and environmental benefits to the people of NSW, over the long-term (see Figure 1).

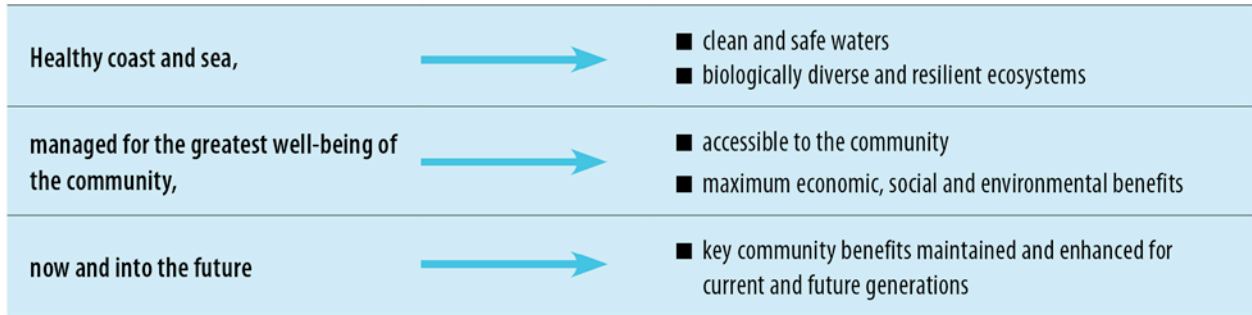


Figure 1. MEMA’s vision for the NSW marine estate

The decisions made on the amnesty on shore-based recreational fishing aligns with the vision in the following ways:

### 1. Clean and safe waters

Shore-based recreational fishing was generally found not to be a source of significant levels of debris or contamination of our shores and waters at most locations, nor a source of significant safety risks to other users. There is very limited information available regarding marine debris in NSW and further research is required to confirm this assessment.

### 2. Biologically diverse and resilient ecosystems

A review of the literature found no studies that specifically address the impact of recreational shore-based fishing at the amnesty sites or at similar sites in NSW. In general, such studies are often based on the comparison of habitats or fish assemblages between fished and unfished areas, and such studies in NSW are limited in their extent or duration. However, the review did identify a range of information on the habitats and other ecological assets associated with the sites, including key threatened fish and shorebird species. This provides an evidentiary basis for an assessment of the ecological risks associated with shore-based recreational fishing from ocean beaches and rocky headlands.

Overall, the assessment found that for the majority of the sanctuary zones that were assessed, the increased ecological risk of recreational shore-based fishing is minimal or low, primarily because of the following:

The ecological risk is inherently lower in intertidal and subtidal ocean beach habitats because they are naturally highly disturbed from waves and currents, and they have a higher inherent resilience to disturbances. This is due, in part, to the functional differences in the structure of nearshore soft-sediment habitats, which generally have lower diversity of sessile plants and animals.

The majority of fish species harvested off ocean beach habitats have ecological and life-history characteristics that result in relatively high resilience to impacts from shore-based recreational fishing.

In many locations, the areas that are subject to the amnesty are relatively remote or otherwise have limited or restricted access: they were therefore assessed as likely to attract relatively low levels of shore-based fishing over

the five-year time frame. This includes several rocky reef dominated locations where the ecological assets generally have lower levels of resilience.

Moderate levels of ecological risk were determined at six locations in three of the marine parks, with this risk level attributed to the characteristics of a number of harvested fish species associated with rocky reefs and headlands that generally have lower levels of biological resilience; and at several sites, risks to the threatened grey nurse shark from incidental catch and threatened shorebirds due to levels of disturbance.

High levels of ecological risk were determined at two locations with unique characteristics, with high impacts on fish assemblages relating to a range of harvested species reflecting their overall stock status or ecological and life-history characteristics, which results in relatively lower resilience. Levels of current and future access to these locations are also expected to increase over the next five years given their proximity to several large townships and high visitor numbers to the region.

Overall, there was an adequate basis for assessing the increased risks of direct impacts on target fish populations and physical damage to habitats, but there was inadequate information to assess indirect or consequential ecological impacts.

There is the potential for higher level of risk from spearfishing at some rocky headlands in situations where waters that are inaccessible to a shore-based line fisher could be accessible to more proficient spearfishers.

In summary, based on the available information, the direct ecological risk of allowing shore-based recreational fishing was generally found to be minimal for ocean beaches and low to moderate for most rocky headlands. When combined with likely increases in a range of resource-access pressures brought about by population growth and coastal development, the decision to establish scientific reference sites and increased monitoring will assist in dealing with potentially unknown, indirect or cumulative impacts. It will also increase the likelihood that the levels of future impacts can be adequately assessed to ensure biologically diverse and resilient ecosystems are maintained.

### **3. Accessible to the community with maximum economic, social and environmental benefits**

In most circumstances, the amnesty has not led to significant social or economic costs to the community, and therefore allowing fishing and the access rights of recreational fishers in those situations could provide direct benefits to fishers, without loss of benefits to other users of the areas. It was also found that, in general, the presence of sanctuary zones that excluded shore-based fishing would not lead to significant social or economic costs to fishers. This is due to the relatively small size of sanctuary zones and their proximity to similar fishing sites. In a few cases, the areas that are subject to the amnesty are relatively remote or otherwise inaccessible, and therefore they are expected to attract only relatively low levels of shore-based fishing. Very little fishing is expected to occur at several of the sites due to their almost inaccessible locations.

The assessment identified that community benefits would be enhanced by not allowing fishing at some sites for social, ecological protection or scientific reference purposes.

### **4. Key community benefits maintained and enhanced for current and future generations**

This review of shore-based recreational fishing on ocean beaches and headlands in marine park sanctuary zones is only a partial assessment for a five-year timeframe, and it precedes a broader assessment of NSW marine estate management. That broader review will consider a range of resource access pressures and will provide an important opportunity to consider the most efficient and equitable mix of management options.

## Conclusions

An assessment of shore-based recreational line fishing and spearfishing on ocean beaches and headlands in sanctuary zones within NSW marine parks has been completed. The assessment is consistent with the NSW Government and MEMA's vision for the marine estate. The assessment included a risk assessment of ecological values from shore-based recreational fishing activities, a survey of social values of these areas, and an assessment of economic costs.

The international definition of risk has been used in this assessment: that is, risk is the impact of uncertainty on achieving objectives (ISO 31000:2009).

Existing legislation (*Marine Parks Act 1997*) covering sanctuary zones describes objectives that emphasise conservation. Whilst the NSW Government has announced its intention to maintain the six existing marine parks, it has also announced that new legislation covering the entire marine estate, including marine parks, will be developed in 2014. It is proposed that social and economic factors will also be included along with environmental issues in determining 'best use' of the estate.

To allow for the potential of different objectives in the new legislation, three different scenarios and related decision rules covering a range of likely objectives have been developed.

**Scenario one** emphasises conservation and non-fishing benefits as intended in existing legislation, but with the addition of consideration of social and economic effects. **Scenario two** also recognises the potential benefits of having at least one no-take area for each habitat category in each marine park. **Scenario three** incorporates the implied objectives in the amnesty already granted, subject to this review: that is, shore-based recreational fishing is allowed except where there are moderate-to-high ecological impacts.

An additional consideration has been the lack of knowledge on the full ecological impacts of shore-based recreational line fishing, especially on ocean beaches. These impacts occur over time, and the knowledge base gradually accumulates. The environmental, social and economic impacts of an activity like line fishing in a particular area can be assessed by studying the differences between sites where the activity is allowed and similar areas where it is not. Therefore, to build the knowledge, it is important to have some scientific reference sites on representative habitat areas that preserve a no-take stance. *Accordingly, the assessment has recommended the eight sanctuary zones already identified as scientific reference sites across the five marine parks should maintain their sanctuary zone status.*

Under scenario one, which includes having multiple scientific reference sites for each habitat type in each marine park, the recommendation would be for fishing to be not allowed at 23 of the 30 sites. Scenario two, which requires having at least one scientific reference area for each habitat type in each park, fishing would be not allowed at 15 sites. Under scenario three, 12 sites would disallow fishing. That is, applying scenario three compared to scenario two sees an additional three sites with a recommendation to allow fishing. The difference between scenarios one and two is that it is recommended fishing is allowed on another eight sites under scenario two.

It is important to note that whatever is decided now could be superseded by forthcoming reviews. First, the management of marine parks and zones is to be reviewed in relation to new objectives set by the NSW Government. Second, a risk assessment of the whole marine estate is to be undertaken and a Marine Estate Management Strategy developed. Third, new knowledge will arise over time with the monitoring already in place. Consistent with the document *Managing the NSW Marine Estate: purpose, underpinning principles and priority setting* adopted by the MEMA, where new information and understanding implies a desirable change in the management of any part of the estate, a change will be recommended to MEMA, which can then decide whether or not to recommend a change to the NSW Government. In short, over the medium term, all of the issues in this assessment will be revisited, albeit in a broader geographical and activity context, and what is recommended today could be different to what is desirable in the near future.

