



# Executive Summary

For Coastal Zone Management Plan Documents



# Executive Summary

After many years and many studies and investigations, Greater Taree City Council is now at a point where we can adopt a position in relation to coastal management and make a recommendation to the State Government. A report will be submitted to the May Ordinary Meeting of Council recommending adoption of a position of 'planned retreat' for the coastline of the local government area (LGA) with the exception of approximately two kilometres of coastline at Old Bar, between the Surf Life Saving Club in the north and MidCoast Water's exfiltration ponds in the south.

For the majority of the LGA's coastline property, infrastructure and assets are not experiencing the same escalation of risk from coastal hazard as the current rate of recession being experienced at Old Bar. For Old Bar, the decision before the Council, is to adopt one of two strategies, 'planned retreat' or the recommended coastal management option of construction of a rock revetment structure, to be erected in four stages at a cost of \$52M over 25 years. It is proposed that Stage 1, in front of Lewis Street be commenced immediately, with Stage 2 in front of Pacific Parade to follow. Stage 3 north, to the SLSC and south, to the exfiltration ponds, is proposed in the event of continued erosion and recession.

In relation to 'planned retreat', which is effectively implementing no protection strategy for property, infrastructure and assets and allowing coastal erosion and recession to continue, consideration needs to be given to the likely loss of additional property. Without protection, it is considered to be 'likely' that some 30 buildings will be undermined over the next 60 years, and it is considered 'possible' that this will be increased to 50 buildings. It is expected that between 50 and 200 buildings, mainly private homes, but including the 40 unit Meridian Resort, the Old Bar Public School and the Old Bar Surf Club will be at unacceptable risk over this period and will need to be relocated or demolished (RHDHV, 2014).

The recommendations have been arrived at following the work in preparing the Coastal Zone Management Plan for Greater Taree (2013), by WorleyParsons and the preparation of the Coastal Zone Management Plan Amendment Old Bar (2014) by RHDHV. These documents were made available to the public on 8 April 2014 and formally placed on public exhibition for a period of 21 days on 11 April 2014 as is the requirement of the *Coastal Protection Act NSW 1979*.

Supporting this work are hazard definition and management studies, which identify the coastal hazard risks facing each of the locations as well as potential management options, and a significant amount of advice from, and investigation undertaken by, the State government's Office of Environment and Heritage, the University of NSW's Water Research Laboratory and Manly Hydraulics Laboratory.

Council's Coastal Zone Management Plan now comprises a suite of documents including all of the work completed by both WorleyParsons and RHDHV and this is presented with an introduction that summarises the journey that was the preparation of this plan, the legislative context within which it was prepared and a number of complementary activities that have been undertaken or are currently being progressed.

## Introduction

This introduction provides a cover for the suite of work completed in 2008-2013 by WorleyParsons and in 2013-2014 by Royal Haskoning DHV (RHDHV) that has assisted development of the framework that will guide management of the coastline within the Greater Taree local government area (LGA). This work includes a number of studies that identify the hazards and risks that our coastline faces and the options for management of these.

It also summarises the context within which this work has been prepared. That is, the legislative framework and the simultaneous activity that has developed and progressed in the years since Greater Taree City Council (GTCC) commenced preparation of its Coastal Zone Management Plan (CZMP). It proposes to tell the story of where we started, where we currently stand in 2014 and what the next steps are in management of our coastline.

Under the *Coastal Protection Act NSW 1979*, the NSW government requires all coastal councils to prepare CZMPs that propose management options to address risks from coastal hazards along the coastline within the LGA. The CZMP identifies estimated coastal recession due to storm events and sea level rise, and possible management options that can be undertaken to address areas affected by this. In 2008, Council first engaged coastal engineering consultants, WorleyParsons to commence study of the hazards affecting the coastline of Old Bar from Wallabi Point in the south to the southern arm of the Manning River South Channel Entrance (Farquhar Inlet) in the north, as this area had been more excessively and significantly impacted by coastal hazards in recent years. In particular, a number of coastal storms had impacted on the coastline adjacent to Lewis Street, Old Bar and beach erosion had caused recession, threatening development and beach amenity along Old Bar Beach. Because this report (2008) identified significant information/knowledge gaps relating to coastal processes for the entire LGA, the study area was subsequently extended to include 32 km of coastline between Black Head and Crowdy Head. In order to prepare a CZMP as required under legislation, Council engaged WorleyParsons to undertake this work in 2009.

The first stage of this expanded volume of work was to prepare a Coastline Hazard Definition Study (2010) to identify the risks for the study area and then a Coastline Management Study (2010) that articulated management options for addressing the risks identified, including:

- Storm erosion;
- Long term recession due to sediment loss and sea level rise and;
- Inundation due to wave run-up overtopping the dune system.

The resulting documentation being prepared by WorleyParsons was the:

1. Coastal Hazard Definition Study (2010) Volume 1 Report
2. Coastal Hazard Definition Study (2010) Volume 2 Figures Part A
3. Coastal Hazard Definition Study (2010) Volume 2 Figures Part B
4. Coastal Hazard Definition Study (2010) Volume 2 Figures Part C

5. Coastline Management Study (2010)
  - a. Coastline Management Study Appendix A
  - b. Coastline Management Study Appendix B
  - c. Coastline Management Study Appendix C
6. Coastal Zone Management Plan for Greater Taree (2013)

Both the Coastline Hazard Definition Study (2010) and Coastline Management Study (2010) were placed on public exhibition from October to November 2010 to obtain feedback from the community in relation to the content of the studies and the management options proposed. Submissions were received and collated and the matter reported to Council in February 2011.

While the Coastline Management Study (2010) covered 32km of coastline, it identified that the two areas most at risk were, Diamond Beach and Old Bar Beach, where residential development located on the foredune is sited seaward of the 50 year hazard line and in some cases seaward of the immediate hazard line. A number of property options as described below, were examined and costed over 50 years (taken to be the design life of existing dwellings and the protection works), with 'planned retreat' proposed as the management option beyond the 50 year planning period (as redevelopment/ new development would be required to be relocatable or landward of the 100 year hazard line).

- Diamond Beach (southern end): temporary geotextile revetment; buried seawall; beach nourishment; and groyne field and beach nourishment.
- Old Bar Beach (in the vicinity of Lewis Street): revetment (with and without beach nourishment); massive beach nourishment; Farquhar Inlet entrance structure and beach nourishment; groyne field and beach nourishment; and offshore reef and beach nourishment.

In addition to these, the following 'planned' retreat options were considered: rezoning, Local Environmental Plan provisions and development controls for future development; purchase/partial acquisition of existing properties; and relocation of holiday park structures and public infrastructure.

In the absence of significant funding commitments to implement any of the costly management options, Council at its February 2011 Ordinary Meeting, resolved to prepare the draft Coastal Zone Management Plan (2013) on the basis of 'planned retreat' being the preferred management response. With all other management options remaining in the event they could be funded by private landowners or other levels of government. As erosion continued at Old Bar Beach in particular, this effectively meant that the removal of property by order had become imminent. This work is completed, but public exhibition was delayed pending coastal planning reform until April 2014.

At the same time, WorleyParsons had also been commissioned to prepare an Emergency Action Plan (2011) that specifies the actions to be taken before, during and after a coastal erosion emergency by GTCC and the site-specific requirements for owner constructed emergency protection works.

The Minister for the Environment, the Hon. Robyn Parker MP, certified the Greater Taree Coast Emergency Action Plan (2011) under the Coastal Protection Act 1979 on the 28 February 2012. As per the Minister's direction and as required under section 55H of the Coastal Protection Act 1979, GTCC published the Plan in the NSW Government Gazette on 17 August 2012.

In relation to progressing GTCC's CZMP, discussion between GTCC and the State government's Office of Environment and Heritage (OEH) would then continue to finalise the document with consideration of GTCC's position before it could be formally exhibited and the endorsement of the Minister for the Environment could be sought, as is required under the coastal planning legislative framework. In 2012, coastal planning reform was announced by the State government and finalisation of GTCC's CZMP was placed on hold pending the Stage 2 coastal planning reform. The status of the CZMP remains that it is not adopted by Council nor is it endorsed by the State government.

The Coastline Management Study (Worley Parsons, 2010), identified the most likely option to provide coastal protection for Old Bar was a revetment wall, but legislative constraints did not allow it to be recommended as the preferred option at the time. Since then, the community has called for investigation of artificial offshore reefs as a viable solution. In particular, the Old Bar Beach Sand Replenishment Group engaged ASR Limited to design an artificial reef solution. The design proposed by ASR Limited comprises two small offshore submerged multipurpose reefs. In response, the OEH engaged the University of NSW's Water Research Laboratory (WRL), firstly to peer review the reef solution proposed by ASR and secondly to undertake a review of artificial reefs constructed worldwide.

In regard to the ASR proposal, the peer review by WRL highlighted a number of deficiencies including an uncertainty on the number of reef structures required and the degree of hazard reduction that could be achieved.

In their review of artificial reefs constructed worldwide, which examines the track record and performance of reefs for coastal protection purposes, WRL concluded a reasonably high risk that submerged offshore structures, such as those proposed by ASR Ltd., will underperform their coastal protection purpose compared with design predictions. WRL found that approximately ½ of the 32 reefs that they examined also delivered no significant improvement in beach width. In the majority of cases when reefs were able to provide some protection, they were used in conjunction with other measures such as groynes (structures that extend into the ocean and are not parallel to the shoreline) and beach nourishment.

This review is available on WRL's website at <http://www.wrl.unsw.edu.au/site/projects/a-review-of-artificial-reefs-for-coastal-protection-in-nsw/>

It is the opinion of WRL and other coastal engineering experts agree, that an emergent structure (one visible above the water level) of substantially larger scale and significantly greater cost than those proposed by the community would be required to have an impact on protection of the coastline of Old Bar. However, the complex coastal processes and rapid recession of the Old Bar coastline means that there is a significant risk that even large scale emergent structures would not provide the required protection to property, infrastructure and assets.

The ongoing durability and integrity of an offshore reef at Old Bar has been questioned by WRL and examined further by RHDHV, both of which state that the long term performance of such a structure in such a high wave environment is uncertain.

GTCC and the NSW OEH agree that sufficient research and investigation has now been undertaken in relation to artificial offshore reefs. With both agencies satisfied that the size of

structure that would be required for Old Bar is far greater than any proposed, would be cost prohibitive and would be difficult to construct and difficult and costly to maintain, with no degree of certainty about its success. It is therefore recommended that no further action be taken in relation to the investigation of artificial offshore reefs.

Faced with continuing threat to property and in the absence of an endorsed position in relation to coastal management, in 2012, a group of property owners lodged a development application (DA) to construct a sand filled geotextile container seawall on a stretch of sand in front of their properties in Lewis Street. GTCC received the application for consideration, but was informed that it would be assessed by the State government's independent NSW Coastal Panel.

In determining the DA lodged by property owners in Lewis Street in July 2012, the NSW Coastal Panel identified that the current legislative framework would not allow for approval of the project as it could not be satisfied that:

- the works would not unreasonably limit public access to, or the use of, the beach;
- maintenance works had been addressed;
- restoration of the beach, or adjacent property, should the works have a negative effect, were adequately addressed.

Following refusal of the DA by the NSW Coastal Panel, GTCC and the NSW OEH reached an agreement to work together, in consultation with the affected landowners, to develop an integrated solution. A partnership was formed to investigate a technically viable coastal protection solution for Old Bar.

In September 2013, with funding from the State government, GTCC commissioned the Old Bar Coastal Protection Structure Design Investigation. RHDHV was engaged to undertake the investigation and prepare the study, which would determine whether a suitable structure can be designed and constructed to protect private and public assets along Old Bar Beach from coastal erosion. The defined study area extends from the MidCoast Water exfiltration ponds in the south almost 2km to the Surf Life Saving Club at the main section of the beach.

In November 2013, RHDHV delivered the Study, which recommends a rock revetment structure as the most technically viable solution for protection of property, infrastructure and assets in Old Bar. It is proposed that the structure be constructed in four stages, commencing adjacent to the most affected area in front of Lewis Street. The RHDHV does provide assessment of all other options canvassed in GTCC's CZMP (2013) and also the reef solution submitted by the Old Bar Sand Replenishment Group (OBSRG) and an interlocking pre fabricated concrete block seawall design proposed by AUSseawalls, but none provide the same certainty, for protection of property, infrastructure and assets, as the rock revetment structure.

The construction is recommended over a period of 25 years, depending on continued rates of coastal recession. Because construction of a rock revetment coastal protection structure on Old Bar beach would likely result in scouring and loss of sand in front of the wall and eventually a deep water front, public foreshore access was considered with the concept design including a pedestrian/cycleway on the structure.

On Thursday 21 November 2013, a community forum was held at Club Old Bar. The session was well attended by almost 100 hundred members of the community. The session had been scheduled at the commencement of the project with the intention of gauging community sentiment to a change to beach access and amenity through construction of a

permanent coastal protection structure, as this was one of the key concerns raised by the NSW Coastal Panel in their consideration of the Lewis St DA.

Feedback received at the forum, through both face to face conversations and on feedback forms left by attendees, and in the numerous submissions received since the forum, informs us of a divided community. Views range from agreement that protection of property, infrastructure and assets is paramount to the future of Old Bar to those that maintain an uninterrupted sand beach is an essential element of the Old Bar village environment.

At its Ordinary Meeting in December 2013, Council resolved that the rock revetment structure recommended by the RHDHV, be included in the CZMP legislative framework. In January 2014, with further funds from the State government, RHDHV was engaged to prepare this body of work, which required a revised Hazard Definition Study and a revised CZMP. To minimise cost and time associated with completing the work, it was agreed that an addendum to the original CZMP and Hazard Definition Study would be completed for the identified study area. In relation to the Hazard Definition Study, an updated version was required due to the increased rate of erosion experienced since the WorleyParsons work was undertaken. RHDHV was also commissioned to recommend an assessment framework that would enable the consent authority to assess future development in the area threatened by the coastal hazards in the event an active coastal management option was not developed. This is to ensure that a consistent approach is applied to consideration of any development within the hazard zone, in order to minimise risk and reduce the imminent cost of removal of structures that remain in the path of coastal erosion. This framework would result in restricted development within the identified hazard zone and would apply specifically in the event 'planned retreat' is adopted, but would not apply if a rock revetment structure was adopted as such a structure is designed to protect property, infrastructure and assets.

In saying this the current body of work (Hazard Definition Study and CZMP amendments Old Bar, RHDHV, 2014) apply only to the defined study area extends from the MidCoast Water exfiltration ponds in the south almost 2km to the Surf Life Saving Club at the main section of the beach, and should be read in conjunction with the 'planned retreat' option proposed in the 2010 CZMP for the same area.

The work of WorleyParsons (2010), the Hazard Definition Study and Coastline Management Study, and the CZMP (2013) remain relevant for the remainder of the LGA coastline.

In conjunction with the recent work undertaken in relation to preparation of the CZMP Amendment Old Bar (2014), GTCC acknowledges that beach nourishment is worthy of further investigation to offset any disruption or change to the beach amenity to the south due to the implementation of a coastal management structure. However, it is also acknowledged that coastal dynamics of Old Bar Beach are unique. The erosion and recession rates at Old Bar Beach have intensified in recent years and unlike many other coastal sites, there is no evidence of where the sediment is transported to.

While sand nourishment may be an option to enhance the existing beach amenity at the main section of the beach as a complementary activity to improve amenity for beach visitors, it is a costly exercise. For obvious reasons, Local or State government would be reluctant to commit public funds to any beach nourishment activity if the likelihood of success was unknown. In light of this, we have sought funds to implement a sediment tracing project that will identify where the sediment in the main section of the Old Bar Beach is travelling to and whether it is retrievable. The project also proposes to identify whether particles dredged from Farquhar Inlet would be suitable for use and whether they would provide a more, or less, stable beach environment at Old Bar Beach. MidCoast Water is a partner in this project and

should funds be made available, it is anticipated that the project would commence immediately, prior to the winter storms.

Another project underway currently, is a socio/economic cost benefit analysis of three options against a base case of 'do nothing', being 1. Stage 1 Rock revetment Lewis Street, 2. Stage 1 rock Revetment Lewis Street and Stage 2 Rock Revetment Pacific Parade and 3. 'planned retreat'. This body of work has been commissioned by the OEH and in general terms, the aim of such work is to determine whether a project is desirable from the point of view of social welfare, through analysis of the economic costs and benefits of the project. This body of work will evaluate the net economic impact of the each of the options described options and provide an understanding of the impact of each on local tourism, housing, jobs, population, supporting industries and the long term viability of Old Bar as a community. The resulting report will be available in May.

GTCC's CZMP suite of documents now comprises:

1. Coastal Zone Management Plan (2014) GTCC Introduction
2. Coastal Hazard Definition Study (2010) Volume 1 Report
3. Coastal Hazard Definition Study (2010) Volume 2 Figures Part A
4. Coastal Hazard Definition Study (2010) Volume 2 Figures Part B
5. Coastal Hazard Definition Study (2010) Volume 2 Figures Part C
6. Coastline Management Study (2010)
  - a. Coastline Management Study Appendix A
  - b. Coastline Management Study Appendix B
  - c. Coastline Management Study Appendix C
7. Hazard Definition Study Amendment Old Bar (2014)
8. Coastal Zone Management Plan (2013)
9. Coastal Zone Management Plan (2014) Amendment Old Bar

With support documentation including:

Old Bar Coastal Protection Design Investigation (2013)

- a. Appendix A: Meeting Notes
- b. Appendix B: Site Inspection Notes
- c. Appendix C: Design of Gabion Wall at Entrance to Racecourse Creek
- d. Appendix D: Available Borehole Logs for Old Bar Beach
- e. Appendix E: Assessment of Recession Trends, Design Wave Heights and Scour Levels
- f. Appendix F: Drawings



- g. Appendix G: Preliminary Cost Estimates
- h. Appendix H: Survey Responses From Community Drop-in Session Held at Club Old Bar Thursday 21 November 2013.

A significant amount of work completed by external agents is referred to and acknowledged throughout the individual documents and we acknowledge that of the University of NSW Water Research Laboratory in particular, which has provided advice and support to this project. The significant contribution by the NSW Office of Environment and Heritage and the NSW Minister for the Environment, the Hon Robyn Parker, MP, is also acknowledged. In particular, we would like to indicate our appreciation to the State government for acknowledging the severity of the coastal management issues that we are facing and for supporting us in our endeavours to reach some resolution in a timely manner through identifying Old Bar as a case study to inform policy reform.

The requirement of Council is to now recommend a preferred option to the State government for the Minister of the Environment's endorsement. This recommendation is required by June 2014 and it is intended that a report will be submitted to the May Ordinary Meeting of Council.

With regard to coastal management at Old Bar, the two principal options before GTCC are 'planned retreat' and a rock revetment coastal protection structure. In relation to 'planned retreat', which is effectively implementing no protection strategy for property, infrastructure and assets and allowing coastal erosion and recession to continue, consideration needs to be given to the likely loss of additional property. Without protection, it is assessed to be 'likely' that some 30 buildings will be undermined over the next 60 years, and it is assessed to be 'possible' that this will be increased to 50 buildings. It is expected that between 50 and 200 buildings (mainly private homes but including the Meridian Resort, the Old Bar Public School and the SLSC) will be at unacceptable risk over this period and need to be relocated or demolished (RHDHV, 2014).

Should 'planned retreat' be the endorsed option, there will be a requirement for restricted development for any property in Old Bar that is at risk of coastal hazard threat and the zone to which this applies is not limited to those properties under current threat. Restricted development will likely be applied in terms of removable structures and limited additional size to existing dwellings.

Council at its Ordinary Meeting on Wednesday 21 May 2014 adopted the Coastal Zone Management Plan Amendment Old Bar (2014), which is to provide for coastal protection through the construction of a rock revetment structure at a cost of \$55M in four stages over a period of 25 years as the continued effects of recession are experienced in Old Bar.

Council also its Ordinary Meeting on Wednesday 21 May 2014 adopted the Coastal Zone Management Plan 2013 which uses the management measure of planned retreat for the remaining extent of the coastline within the Greater Taree LGA. The intention is for continued monitoring of this coastline and the management response will be revisited if significant erosion occurs.