

## 8 Implementation and Works Prioritisation

---

### 8.1 Introduction

The works proposed throughout the NMBSEMP study area are primarily intended to address existing shoreline erosion trends associated with severe storms and to protect Council assets and local values. Table 8-1 presents a summary of the proposed capital works and prioritisation considerations based on threatened assets, ecological values, legislative compliance and cost. The ranking criteria are described further in Section 8.2.

As described throughout this report, there are significant opportunities to enhance shoreline stability through ongoing vegetation management and maintenance activities. Further detail regarding the implementation of these recommended actions is provided in Section 8.4. These activities have not been explicitly costed and would be expected, in part, to be included within Council's routine maintenance budget.

### 8.2 Ranking Criteria Descriptions

Each promoted shoreline erosion management action has been scored according to the criteria described below. Individual scores for each criterion (between 1 and 3) and short justifications are provided in Table 8-3. The management action total score is considered an indication of the proposed works priority (higher total score is higher priority). Following this approach, minor works or assessments that do not require specific permits typically rank highly.

#### 8.2.1 Threatened Assets and Values

For each section the assets and values within the predicted storm erosion area (defined as part of the Stage 1 assessments) have been considered. Council controlled assets and values may include existing shoreline structures, canoe/boat ramps, stormwater outlets, foreshore open space and minor facilities (seats, benches, rubbish bins, etc.) and passive recreation opportunities.

Shoreline sections with significant threatened assets and/or values have received a higher score (3), while areas with few threatened assets and/or low recreational value have received lower scores (2 or 1).

#### 8.2.2 Ecological Values

Generally, the foreshore areas considered in this study area do not contain Terrestrial Protected Areas; however, the entire study area is designated Marine Park Conservation Zone or Habitat Protection Zone and shorebird habitats are known to exist in some intertidal areas.

Shoreline sections within a Conservation Zone have been assigned a high score (3); while areas within a Habitat Protection Zone have received a medium score (2). Potential constraints associated with undertaking works in these zones are considered under the Legislative Compliance criterion.

### 8.2.3 Cost of Promoted Management Action

Low cost management options or actions assumed to be completed as part of Council's routine maintenance program have received a high score, while the more expensive management options have received lower scores. The cost of the promoted management action has been scored based on the following assumptions:

- Cost less than \$100,000 or part of routine maintenance = 3
- Cost between \$100,000 and \$1,000,000 = 2
- Cost greater than \$1,000,000 = 1

### 8.2.4 Legislative Compliance

Management options where no specific approval requirements are anticipated and that are consistent with statutory instruments have received a high score (3). Standard shoreline management works likely to gain conditional approval have received a medium score (2), while options expected to attract additional scrutiny from regulatory agencies and require detailed assessment have received a low score (1).

## Implementation and Works Prioritisation

Table 8-1 Management Option Prioritisation Considerations

Ranking	Study Area and Shoreline Section	Promoted Management Option and Timing	Assets/Values Under Threat	Ecological Values	Legislative Compliance	Cost Estimate	Total Score
1	Sandstone Point 3. Oxley PI to Godwin Beach	Formalised permanent closure to coastal trail; within 1 year.	Public safety associated with land slippage. <b>Score = 3</b>	Conservation Park Zone <b>Score = 3</b>	No approvals required; consistent with statutory policy (safety over access) <b>Score = 3</b>	routine maintenance <b>Score = 3</b>	<b>Total = 12</b>
2	Toorbul 10. The Esplanade 97-Wilmer Rd	Repair and resurface damaged sections; within 1 year.	Public safety associated with seawall condition <b>Score = 3</b>	Conservation Park Zone <b>Score = 3</b>	Minor maintenance works <b>Score = 3</b>	routine maintenance <b>Score = 3</b>	<b>Total = 12</b>
3	Toorbul General	Structural engineering assessment of seawalls throughout study area to establish design life; within 1 year.	Seawall design life uncertainty <b>Score = 3</b>	Conservation Park Zone <b>Score = 3</b>	No approvals required <b>Score = 3</b>	\$ 50,000 <b>Score = 3</b>	<b>Total = 12</b>
4	Godwin Beach 1. The Esplanade	Foreshore Open Space Master Planning and structural assessment of existing seawall; within 2 years.	Opportunity to enhance open space <b>Score = 3</b>	Conservation Park Zone <b>Score = 3</b>	No approvals required; consistent with statutory instruments <b>Score = 3</b>	\$ 50,000 <b>Score = 3</b>	<b>Total = 12</b>
5	Beachmere General	Formalise policy and obligation regarding shoreline management in areas adjacent to private assets. Provide relevant information to land owners including shoreline structure alignment; within 2	Open space and private lots <b>Score = 3</b>	Habitat Protection Zone <b>Score = 2</b>	No approvals required; consistent with statutory instruments <b>Score = 3</b>	policy and planning budget <b>Score = 3</b>	<b>Total = 11</b>

## Implementation and Works Prioritisation

Ranking	Study Area and Shoreline Section	Promoted Management Option and Timing	Assets/Values Under Threat	Ecological Values	Legislative Compliance	Cost Estimate	Total Score
		years.					
6	Toorbul 9. The Esplanade 101-97	Upgrade and realignment of unapproved structure (approx. 90m); within 2 years.	Existing seawall in poor condition and unapproved; stormwater outlet; foreshore open space and facilities (1 unit); coastal pathway; road (Esplanade). <b>Score = 3</b>	Conservation Park Zone <b>Score = 3</b>	Conditional approval expected (Development Application process commenced in 2014) <b>Score = 3</b>	\$ 540,000 <b>Score = 2</b>	<b>Total = 11</b>
7	Donnybrook 2. The Esplanade North-Caravan Park	Relocate (setback) playground equipment; within 3 years.	Foreshore open space, public safety <b>Score = 1</b>	Conservation Park Zone <b>Score = 3</b>	Minor works; consistent with statutory instruments <b>Score = 3</b>	\$ 25,000 <b>Score = 3</b>	<b>Total = 10</b>
8	Beachmere 10. Biggs Ave (former Huntley St)	Upgrade existing rigid concrete seawall with rock revetment seawall (approx. 600m); within 3 years.	Existing seawall in poor condition; stormwater outlets (2); foreshore open space and facilities (1 unit); canoe/boat ramp; private lots in storm erosion area (12). <b>Score = 3</b>	Habitat Protection Zone <b>Score = 2</b>	Conditional approval granted <b>Score = 3</b>	\$ 3,840,000 <b>Score = 1</b>	<b>Total = 9</b>
9	Deception Bay 4. Captain Cook Pde Park	Upgrade and potential realignment of stone pitched seawall (approx. 120m) with shotcrete repair; within 3 years.	Existing seawall in poor condition; stormwater outlets (2); foreshore open space and facilities (approx. 11 units); canoe/boat ramp; CCTV cameras	Habitat Protection Zone <b>Score = 2</b>	Multiple approvals; land realignment matters <b>Score = 2</b>	\$ 720,000 <b>Score = 2</b>	<b>Total = 9</b>

## Implementation and Works Prioritisation

Ranking	Study Area and Shoreline Section	Promoted Management Option and Timing	Assets/Values Under Threat	Ecological Values	Legislative Compliance	Cost Estimate	Total Score
			(2); coastal pathway. <b>Score = 3</b>				
10	Donnybrook 2. The Esplanade North-Caravan Park	Removal of informal erosion control materials and stabilisation with vegetation and foreshore landscaping (Stage 2 Open Space Master Plan); within 3 years.	Informal erosion control materials; foreshore open space and facilities (approx. 8 units). <b>Score = 1</b>	Conservation Park Zone <b>Score = 3</b>	Minor works; consistent with statutory instruments <b>Score = 3</b>	\$ 150,000 <b>Score = 2</b>	<b>Total = 9</b>
11	Donnybrook 3. Grant Ln-The Esplanade South	Removal of informal erosion control materials and stabilisation with vegetation and foreshore landscaping (Stage 3 Open Space Master Plan); within 5 years.	Informal erosion control materials; stormwater outlet (2); foreshore open space and facilities (approx. 13 units). <b>Score = 1</b>	Conservation Park Zone <b>Score = 3</b>	Minor works; consistent with statutory instruments <b>Score = 3</b>	\$ 100,000 <b>Score = 2</b>	<b>Total = 9</b>
12	Toorbul 3. The Esplanade 135-128	Upgrade and realign (consider setback) rock and concrete seawall (approx. 120m). Existing seawall possibly an unapproved structure; within 10 years.	Existing seawall in poor condition and possibly unapproved; foreshore open space and facilities (2 units); canoe/boat ramp; coastal pathway. <b>Score = 2</b>	Conservation Park Zone <b>Score = 3</b>	No immediate approvals required; FHA & Conservation Zone <b>Score = 2</b>	\$ 720,000 <b>Score = 2</b>	<b>Total = 9</b>
13	Toorbul 4. The Esplanade 128-120	Upgrade and realign (consider setback) stepped concrete with shotcrete repair	Existing seawall in fair condition; public safety issue with seawall design; stormwater	Conservation Park Zone <b>Score = 3</b>	No immediate approvals; land realignment matters; FHA & Conservation	\$ 840,000 <b>Score = 2</b>	<b>Total = 9</b>

## Implementation and Works Prioritisation

Ranking	Study Area and Shoreline Section	Promoted Management Option and Timing	Assets/Values Under Threat	Ecological Values	Legislative Compliance	Cost Estimate	Total Score
		seawall (approx. 140m); within 10 years.	outlet; foreshore open space and facilities (approx. 5 units); canoe/boat ramp; coastal pathway. <b>Score = 2</b>		Zone <b>Score = 2</b>		
14	Toorbul 2. The Esplanade 141-135	Upgrade of stormwater outlet and formalise groyne-like effect. Re-profile and realign shoreline; within 10 years.	Stormwater outlet in poor condition; shoreline erosion downdrift of outlet; foreshore open space; coastal pathway. <b>Score = 2</b>	Conservation Park Zone <b>Score = 3</b>	Multiple approvals; FHA & Conservation Zone <b>Score = 1</b>	routine maintenance <b>Score = 3</b>	<b>Total = 9</b>
15	Toorbul 5. The Esplanade 120-108	Upgrade and realign (consider setback) stepped concrete with shotcrete repair seawall (approx. 190m); within 10 years.	Existing seawall in fair condition; public safety issue with seawall design; stormwater outlet (3); foreshore open space and facilities (approx. 20 units); coastal pathway. <b>Score = 2</b>	Conservation Park Zone <b>Score = 3</b>	No immediate approvals; land realignment matters; FHA & Conservation Zone <b>Score = 2</b>	\$ 1,140,000 <b>Score = 1</b>	<b>Total = 8</b>
16	Toorbul 6. Public Boat Ramp 130m	Upgrade sloping concrete seawall adjacent to boat ramp (approx. 130m); within 10 years.	Existing seawall in fair condition; public safety issue with seawall design; canoe/boat ramp. <b>Score = 2</b>	Conservation Park Zone <b>Score = 3</b>	No immediate approvals required; FHA & Conservation Zone <b>Score = 2</b>	\$ 780,000 <b>Score = 2</b>	<b>Total = 8</b>
17	Toorbul 10. The Esplanade 97-Wilmer Rd	Upgrade sloping concrete seawall (approx. 340m); within	Existing seawall in fair to poor condition; public safety issue with seawall damage;	Conservation Park Zone <b>Score = 3</b>	No immediate approvals required; FHA & Conservation	\$ 2,040,000 <b>Score = 1</b>	<b>Total = 8</b>

## Implementation and Works Prioritisation

Ranking	Study Area and Shoreline Section	Promoted Management Option and Timing	Assets/Values Under Threat	Ecological Values	Legislative Compliance	Cost Estimate	Total Score
		10 years.	stormwater outlet (2); foreshore open space and facilities (approx. 5 units); coastal pathway. <b>Score = 2</b>		Zone <b>Score = 2</b>		
18	Godwin Beach 1. The Esplanade	Upgrade deteriorating sloping concrete seawall; within 10 years.	Existing seawall in fair condition; stormwater outlets (5); foreshore open space and facilities (approx. 10 units); canoe/boat ramp. <b>Score = 2</b>	Conservation Park Zone <b>Score = 3</b>	Multiple approvals <b>Score = 2</b>	\$ 3,000,000 <b>Score = 1</b>	<b>Total = 8</b>

### 8.3 Works Prioritisation Summary

A summary of the proposed works prioritisation is provided in Table 8-2 and the total estimated cost for each study area is summarised in Table 8-3. These indicative cost estimates have been provided for budgetary planning purposes and may not reflect the actual cost to implement the promoted strategy.

The adopted ranking approach favours minor works or assessments that do not require specific permits. The top five ranked management options do not involve significant capital costs or require approval and it is therefore anticipated that these options could be implemented within a relatively short timeframe (within 2 years). A key priority for Toorbul is the proposed structural engineering assessments of seawalls throughout study area. These assessments would be intended to define the design life of the existing structures and may identify alternative options to extend the life of the structures, thereby delaying the need for costly capital works.

Council has commenced planning to upgrade seawalls at Toorbul (Section 9 The Esplanade 101-97) and Beachmere (Section 10 Biggs Ave). Considering the condition of the existing structures and present threat to assets and values, these actions are the priority capital works within the study area.

The SEMP seeks to promote the maintenance of natural shorelines wherever feasible. The shoreline throughout Donnybrook is generally free of formal structures with vegetation management and shoreline re-profiling the preferred management options (discussed further in Section 8.4). Table 8-2 gives an indicative timeframe of with 5 years for works at Donnybrook, however, it is noted that a relatively low erosion threat exists. From a cost perspective, it would be advantageous to implement shoreline erosion management options in conjunction with foreshore landscaping recommended as part of the Donnybrook Open Space Master Plan (Place Planning and Design, 2012).



## Implementation and Works Prioritisation

Table 8-2 Priority Ranking and Summary of Proposed Management Actions

Ranking	Study Area and Shoreline Section	Promoted Management Action and Indicative Timing	Cost Estimate (\$)	Approvals
1	Sandstone Point 3. Oxley PI to Godwin Beach	Formalised permanent closure to coastal trail; within 1 year.	routine maintenance budget	n/a
2	Toorbul 10. The Esplanade 97-Wilmer Rd	Repair and resurface damaged sections; within 1 year.	routine maintenance budget	PTW DA <sup>1</sup> MP <sup>2</sup> permit
3	Toorbul General	Structural engineering assessment of seawalls throughout study area to establish design life; within 1 year.	\$ 50,000	n/a
4	Godwin Beach 1. The Esplanade	Foreshore Open Space Master Planning and structural assessment of existing seawall; within 2 years.	\$ 50,000	n/a
5	Beachmere General	Formalise policy and obligation regarding shoreline management in areas adjacent to private assets. Provide relevant information to land owners including shoreline structure alignment; within 2 years.	policy and planning budget	n/a
6	Toorbul 9. The Esplanade 101-97	Upgrade and realignment of unapproved structure (approx. 90m); within 2 years.	\$ 540,000	PTW DA MP permit
7	Donnybrook 2. The Esplanade North-Caravan Park	Relocate (setback) playground equipment; within 3 years.	\$ 25,000	Reserve purpose revision
8	Beachmere 10. Biggs Ave (former Huntley St)	Upgrade existing rigid concrete seawall with rock revetment seawall (approx. 600m); within 3 years.	\$ 3,840,000	PTW DA Quarry material
9	Deception Bay 4. Captain Cook Pde Park	Upgrade and potential realignment of stone pitched seawall (approx. 120m) with shotcrete repair; within 3 years.	\$ 720,000	PTW DA MP permit Quarry material

<sup>1</sup> Prescribed tidal works development approval

<sup>2</sup> Marine park

## Implementation and Works Prioritisation

Ranking	Study Area and Shoreline Section	Promoted Management Action and Indicative Timing	Cost Estimate (\$)	Approvals
10	Donnybrook 2. The Esplanade North-Caravan Park	Removal of informal erosion control materials and stabilisation with vegetation and foreshore landscaping (Stage 2 Open Space Master Plan); within 3 years.	\$ 150,000	PTW DA MP permit
11	Donnybrook 3. Grant Ln-The Esplanade South	Removal of informal erosion control materials and stabilisation with vegetation and foreshore landscaping (Stage 3 Open Space Master Plan); within 5 years.	\$ 100,000	PTW DA MP permit
12	Toorbul 3. The Esplanade 135-128	Upgrade and realign (consider setback) rock and concrete seawall (approx. 120m). Existing seawall possibly an unapproved structure; within 10 years.	\$ 720,000	PTW DA MP permit
13	Toorbul 4. The Esplanade 128-120	Upgrade and realign (consider setback) stepped concrete with shotcrete repair seawall (approx. 140m); within 10 years.	\$ 840,000	PTW DA MP permit
14	Toorbul 2. The Esplanade 141-135	Upgrade of stormwater outlet and formalise groyne-like effect. Re-profile and realign shoreline; within 10 years.	routine maintenance budget	PTW DA FHA DA MP permit
15	Toorbul 5. The Esplanade 120-108	Upgrade and realign (consider setback) stepped concrete with shotcrete repair seawall (approx. 190m); within 10 years.	\$ 1,140,000	PTW DA Reserve realignment MP permit
16	Toorbul 6. Public Boat Ramp 130m	Upgrade sloping concrete seawall adjacent to boat ramp (approx. 130m); within 10 years.	\$ 780,000	PTW DA MP permit
17	Toorbul 10. The Esplanade 97-Wilmer Rd	Upgrade sloping concrete seawall (approx. 340m); within 10 years.	\$ 2,040,000	PTW DA MP permit
18	Godwin Beach 1. The Esplanade	Upgrade deteriorating sloping concrete seawall; within 10 years.	\$ 3,000,000	PTW DA MP permit

**Table 8-3 Summary of Study Area Proposed Management Action Cost Estimates**

Study Area	Total Management Action Cost Estimate (\$)
Deception Bay	\$720,000
Beachmere	\$3,840,000
Godwin Beach	\$3,050,000
Sandstone Point	\$50,000
Toorbul	\$6,160,000
Donnybrook	\$275,000

## 8.4 Vegetation Management

Over all, five broad categories of vegetation management are recommended at one or more beach units. Key implementation considerations are briefly introduced for each below. Additionally, generic planting advice is also provided for future reference, focusing on appropriate species for consideration in revegetation and landscaping works.

### 8.4.1 General Monitoring

#### ***Relevant Beach Units - All***

General monitoring of shoreline vegetation health would aim to facilitate the maintenance and/or enhancement of existing foreshore vegetation condition. It should focus on vegetation that is intertidal or immediately adjacent to the shoreline. Monitoring could be undertaken either opportunistically or regularly, ideally being incorporated into routine shoreline, foreshore or parkland maintenance. Monitoring would provide an opportunity to identify any potential issues (e.g. weed encroachment, poor vegetation condition or symptoms of plant stress, mangrove dieback, physical disturbance), which can then be addressed appropriately. Minor issues requiring only routine maintenance could be addressed as required, while other more major issues may require further investigation to determine the most appropriate course of action.

### 8.4.2 Shoreline Rehabilitation and Revegetation

#### ***Relevant Beach Units – Donnybrook, Toorbul, Sandstone Point***

For eroding natural shorelines, or those deemed vulnerable to imminent erosion, shoreline rehabilitation and revegetation is one means of promoting shoreline resilience to erosion and better facilitate adaption of the natural landscape to sea level rise. Shoreline rehabilitation would primarily be desirable at locations where erosion does not significantly threaten key infrastructure or land (e.g. shorelines adjacent to open space). It would focus on intertidal land and areas immediately adjacent (i.e. typically below HAT).

In order to achieve a desired outcome, rehabilitation and/or revegetation would typically be required to address multiple works components. It is likely that a combination of two or more of the following would need to be incorporated, noting that each section of shoreline should be considered and assessed on a discrete basis:

- Removal of undesirable materials (e.g. informal erosions controls structures);

- Weed management;
- Reprofilng;
- Revegetation and landscaping;
- Management of pedestrian access; and
- Monitoring and Maintenance.

Depending on the scope of works for a particular section, varying degrees of planning and preparatory work would be required. This could include, for example, significant approval requirements (e.g. for works involving tidal works or marine plant disturbance etc.). For each significant work package, it would also be prudent to develop a suitable Rehabilitation Plan detailing the rehabilitation implementation strategy. As such, for works outside normal day-to-day maintenance and operational procedures, it is recommended that appropriately qualified internal or external personnel are consulted accordingly.

### 8.4.3 Engage Private Residents

#### ***Relevant Beach Units - Beachmere***

This option is specific to the Beachmere beach unit, since it has numerous private lots directly adjoining the shoreline at locations where the shoreline consists of sandy dunes and associated vegetation. Given the role vegetation provides in the stabilisation of sandy shorelines, it is advisable to maintain – or enhance – coastal vegetation along the shoreline, particularly that along the berm and associated dune. At Beachmere, this area is often directly on or bordering private land, which limits options for broad scale council driven intervention. As such, effective public awareness campaign(s) with local residents present a practical option for encouraging improved resident-driven management of shoreline vegetation.

Any such campaign should raise awareness of the value of coastal vegetation in shoreline erosion management, and provide advice detailing appropriate measures residents can take to maintain and enhance the resilience of their shoreline. These could include, for example, weed management, management of pedestrian-related physical disturbance and revegetation. Recommendations should be consistent with the Queensland Coastal Dune Management Guidelines, as appropriate. Further information regarding dune specific revegetation is provided in Appendix C.

### 8.4.4 Onshore Landscaping for Seawall Resilience

#### ***Relevant Beach Units - Deception Bay, Beachmere***

One issue undermining the durability of the existing seawalls is the direct exposure to coastal processes during severe storm events. Given the time and cost constraints associated with redesigning such large expanses of seawall, it is likely that seawall maintenance following storm events will be an ongoing issue for Council. One novel approach that could be trialled to improve the resilience of existing (and potentially future) seawalls to overtopping and scour would be to place vegetative buffers at the top of the wall. Vegetation, in the form of landscaped gardens or

partial revegetation, would aim to provide a physical barrier dissipating overtopping wave energy, and to act as a stabiliser to minimise soil loss.

Initially, it is recommended that a small scale trial would be undertaken at a few 'hotspots' in order to determine the effectiveness of such measures. This could include, for example, creating a landscaped garden on the hotspot and surrounding area. In this instance it would be advisable to consider providing an ongoing source of excess soil by slightly raising the garden bed, and ensure plantings are dominated by dense ground cover species to assist with soil retention. Specific design details should be vetted by appropriately qualified coastal engineers to ensure that such measures will not risk further undermining existing shoreline protection infrastructure. The design can also be integrated with the existing landscaping and public foreshore uses. If implemented, it is recommended that the species used for planting are reasonably cheap (as there is a risk that they could be lost during a significant event), hardy and salt tolerant. Where possible, the use of coastal species that are native to the local region would also be desirable. *Lomandra spp.* are commonly used in adjacent public landscaping and have proven to be reasonably hardy to local conditions. Examples of coastal groundcover species that could be considered for plantings include: pigface (*Carpobrotus glaucescens*), scented fan-flower (*Scaevola calendulacea*), goat's foot convolvulus (*Ipomoea pes-caprae*) and bead weed (*Sarcocornia quinqueflora*).

#### 8.4.5 General Landscaping (Terrestrial)

##### **Relevant Beach Units – Godwin Beach, Toorbul**

General enhancement of landscaping on public parklands and foreshores adjacent to the shore would complement other shoreline management incentives. While, they would not necessarily provide direct benefit to shoreline erosion, they would add value to the local assets in terms of improved aesthetics and environmental value. Indirect shoreline erosion management benefits could be achieved where, for example, enhanced landscaping and landscaping maintenance buffers shoreline vegetation from weed encroachment and associated effects. If implemented, such actions should be carefully designed in order to provide optimum fauna and habitat benefits; incorporating improved flora diversity and appropriate maintenance.