



Reserve Activity Plan

2015 - 2019

BELLERIVE-HOWRAH COASTAL RESERVE



ADVICE PREPARED BY
TASFLORA FOR
CLARENCE CITY COUNCIL
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1 BACKGROUND

The Bellerive-Howrah Coastal Reserve (The Reserve) is located within the Clarence municipality on the eastern shore in Hobart. It encompasses a 16 hectare area of coastal dune vegetation, beaches, rocky headlands and areas of rocky foreshore along the Derwent River between Bellerive and Tranmere. The Reserve contributes to the scenic fringe along the Derwent estuarine coastline on Hobart's eastern shore, and forms part of the important visual landscape connection of bushland areas from the foreshore to ridges in the Clarence municipality. It is highly valued by locals and visitors for its natural setting, sandy beaches, scenic views and recreational opportunities.

Ownership of the land within the Reserve is mixed between the Crown (Department of Primary Industries, Water and Environment and the Department of Education) and Clarence City Council (Council), with day to day management of the majority of the Reserve undertaken by Council. The Bellerive-Howrah Coastcare Group has been actively involved in caring for the Reserve over the last 23 years, while the Bellerive Cottage School and Clarence High School have also made significant contributions over a 20 year period.

Two management plans have previously been prepared for the Reserve: the *Bellerive-Howrah Foreshore Management Study* (Hepper et al 1992) and the *Bellerive-Howrah Beaches Management Plan 1998* (de Gryse et al 1998). Since that time, no further on ground management plans have been developed for the entire Reserve. The Bellerive Beach Park Master Plan adopted by Council in 2013 and revised in early 2015 contains recommendations for the parkland and dune area adjacent to Blundstone Arena, including the section of the Reserve occurring in this area.¹ A Bushfire Management Plan has also been prepared for the Reserve for the period 2011-2015 (AVK Environmental Management 2011a).

Tasflora has now been engaged by Council to develop a five year Reserve Activity Plan for on ground management activities within the Reserve, including the development of an implementation plan identifying immediate and ongoing management priorities to be undertaken during the period 2015-2019.²

The recommendations contained within this *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019* are intended to provide guidance for on ground activities that can be implemented by Council, community groups and/or volunteers. It is acknowledged that it may not be possible to undertake all recommended activities due to resource constraints; rather the intent of this plan is to provide a guide to management concepts and outcomes that could be achieved if sufficient funding can be obtained.

¹ The adopted Bellerive Beach Park Master Plan can be viewed at:

http://www.ccc.tas.gov.au/webdata/resources/files/Bellerive%20Beach%20Park_Plans%201.pdf

² The *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019* falls under Council's *Clarence Bushland and Coastal Strategy*, which summarises plans and strategies relevant to Reserves within the Clarence municipality.

2 OBJECTIVES

The objectives of the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019* are to:

- ensure the Reserve is sustainably managed to preserve and enhance its natural, cultural and social values;
- identify priority management activities to be undertaken within the Reserve by Council, community groups and/or volunteers as resources become available during the period 2015-2019; and
- encourage community engagement through raising awareness of the Reserve's values and encourage participation in activities to minimise threats to these values.

3 SITE DESCRIPTION

The coastal area covered by the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019* is illustrated in Figure 1.³ It includes three beaches (Bellerive Beach, Howrah Beach and Little Howrah Beach) and their foredunes, Second Bluff (located between Bellerive and Howrah Beaches) and the rocky foreshore area between Little Howrah Beach and the Tranmere Coastal Reserve. It is bounded inland by multiuse paths, roads and residential dwellings.



Figure 1: Area covered by the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019*, including main Reserve entrances (B1-4, H1-3 & LH1) (base map provided by Clarence City Council).

³ The extremities of this plan are defined by the northern boundary of the *Tranmere Coastal Reserve Activity Plan 2011-2016* (Tasflora 2011) and the western boundary of the *Victoria Esplanade – Kangaroo Bluff Landscape Plan* which was adopted by Council in 2013.

The Reserve is zoned as Recreation under the *Clarence Planning Scheme 2007* (Clarence City Council 2011), with the exception of the Little Howrah Beach Reserve which is zoned as Residential.

4 SITE VALUES

4.1 Native flora

Typical native vegetation in the Reserve is illustrated in Figures 2-4. The dominant native vegetation community within the Reserve is *Eucalyptus viminalis* (white gum) – *Eucalyptus globulus* (blue gum) coastal forest and woodland. This community is listed as a threatened native vegetation community under the Tasmanian *Nature Conservation Act 2002*. Some locally dense areas of *Acacia longifolia* subsp. *sophorae* (coastal wattle) coastal scrub are present along both Bellerive Beach and Howrah Beach, while the vegetation on Second Bluff is dominated by *Allocasuarina verticillata* (sheoak) forest. A full description of each of the three native vegetation communities occurring within the Reserve is provided at Appendix 1.



Figure 2: Typical *Eucalyptus viminalis*-*Eucalyptus globulus* coastal forest and woodland occurring behind Howrah Beach.

Three native plant species recorded in the Reserve are of high conservation value (AVK Environmental Management 2011a; DPIPWE 2014): *Juncus amabilis* (gentle rush), *Lepidium hyssopifolium* (soft peppercress) and *Lepidium pseudotasmanicum* (shade peppercress). Further information on these threatened species is provided



Figure 3: Typical *Acacia longifolia* subsp. *sophorae* coastal scrub occurring between the multiuser path and Howrah Beach.



Figure 4: Typical *Allocasuarina verticillata* forest occurring on Second Bluff.

at Appendix 1.

4.2 Native fauna

The Reserve contains suitable habitat for a range of native wildlife (mammals, birds, reptiles, amphibians and invertebrates), including:

- mature or dead eucalypt trees with hollows, which provide potential den and nest sites for possums and hollow-nesting bird species, including the endangered swift parrot (*Lathamus discolor*) and Tasmanian masked owl (*Tyto novaehollandiae* subsp. *castanops*);
- mature, flowering eucalypt trees that provide a foraging source for possums and birds;
- shrubs and other understorey species that provide nesting, shelter and a foraging source for birds and small mammals (eg brown bandicoot, eastern barred bandicoot);
- fallen timber and leaf litter, which provide shelter and foraging habitat for small birds, reptiles and invertebrates;
- rocky sandstone outcrops on Second Bluff, which provide potential habitat for reptile species;
- rocky foreshore habitat for crabs and other marine life living above or near the high tide mark.

Local residents have reported seeing southern brown bandicoots (*Isodon obesulus*), water rats (*Hydromys chrysogaster*) and bats (species not identified), as well as a variety of birdlife, including the little penguin (*Eudyptula minor*) and hollow-nesting bird species such as the musk lorikeet (*Glossopsitta concinna*). Frogs are known to inhabit wetter areas behind the dunes. While no threatened fauna species have been previously recorded within the Reserve (DPIPWE 2014), the Reserve contains suitable habitat for the endangered swift parrot, Tasmanian masked owl and the vulnerable eastern barred bandicoot (*Perameles gunnii*). Further information on these species is provided at Appendix 1.

The presence of wildlife in the Reserve is valued by local residents, and ongoing preservation of native habitat has been identified as an important management issue.

4.3 Cultural heritage

4.3.1 Aboriginal heritage

A survey of the shores of the Derwent estuary undertaken in 1980 recorded a number of aboriginal heritage sites (including shell scatters, isolated artefacts and middens) within the Reserve, which is thought to have been previously occupied by the Mumirimina band of the Oyster Bay tribe (Hepper et al 1992; Officer 1980).

Under the Tasmanian *Aboriginal Relics Act 1975* (the Aboriginal Relics Act), it is an offence to 'destroy, damage, disfigure, conceal, uncover, expose, excavate or otherwise interfere with a relic' unless a permit has been granted. It is therefore important to ensure that no artefacts or other cultural material are exposed or disturbed without a permit during Reserve management activities. In the event that

an Aboriginal artefact is inadvertently uncovered, an Unanticipated Discovery Plan should be implemented immediately (refer Appendix 2) and the items reported to Aboriginal Heritage Tasmania for advice.

4.3.2 Historic heritage

No significant sites of European cultural heritage have been previously recorded in the Reserve (AVK Environmental Management 2011a). In the 1930s, large quantities of sand were removed from the dunes at the eastern end of Bellerive Beach and near the beginning of Howrah Beach to fill in the “lagoon” which used to exist behind Bellerive Beach.⁴ Sand mining of the dunes behind Howrah Beach was also undertaken in the 1950s and 1960s, resulting in the excavation of large sand dunes almost down to beach level in some areas (Alexander 2003).

4.4 Recreational values

The Reserve is highly utilised year round for a range of recreational activities by local residents, visitors, schools and sporting groups. Bellerive Beach and Howrah Beach are the main suburban beaches in Clarence and both are very popular for walking, jogging, dog exercise and water activities. Little Howrah Beach is also well used by families in summer due to its sheltered environment. The multiuse pathways bordering the Reserve along Bellerive and Howrah Beaches provide a well used off road thoroughfare from Bellerive to Howrah, and are used for walking, jogging, dog exercise and cycling.

Dog walking is a popular activity within the Reserve. Both Bellerive and Howrah Beaches are restricted dog exercise areas under Council's Dog Management Policy, with dogs prohibited between 10am and 6pm from 1 December to 1 March. At all other times, dogs must remain under effective control and are not permitted in the dune areas. Dogs must be kept on a lead between the Bellerive Park toilet block and the western end of Bellerive Beach. Dogs are not permitted at any time on Little Howrah Beach.

4.5 Education values

There is a strong history of community commitment and enthusiasm for caring for the Reserve through the Bellerive-Howrah Coastcare Group, which was established in 1991 and focuses on caring for the dunes behind Bellerive and Howrah beaches as well as Second Bluff. The group was originally formed by a group of local residents concerned about dune erosion, and its activities have included revegetation, mulching, weeding, fencing and rubbish removal. The Group also actively liaises with Council to ensure any development within the Reserve is undertaken with minimal environmental impact. The activities of the Bellerive-Howrah Coastcare Group provide an ongoing opportunity to share knowledge and promote community education of the Reserve's history, natural values and potential threats to these.

The Reserve's coastal environment provides a useful platform for local school

⁴ *The Mercury* 10 September 1935, page 11.

groups to undertake nature and science based studies, and the Bellerive Cottage School and Clarence High School have a long history of involvement with Coastcare activities within the Reserve.

4.6 Landscape setting and connectivity

The Reserve forms part of the important visual landscape connection of bushland areas from the foreshore to ridges in the Clarence municipality. From a landscape perspective, it contributes to the scenic fringe along the Derwent River's estuarine coastline on Hobart's eastern shore, linking with the Tranmere Coastal Reserve to the south to create an extensive strip of remnant vegetation lining the Derwent when viewed from Hobart. The Reserve also provides a significant bushland and coastal backdrop to the multiuser pathway traversing the area as well as many houses in Bellerive and Howrah, and is valued by locals for this landscape setting. Maintaining and enhancing this setting is important for ongoing visual amenity in the area.

Connectivity between areas of bushland provides an important ecological link for flora and fauna to enable gene flow between populations and to allow animals to move across the landscape for foraging, nesting and breeding. While the Reserve is separated from other bushland areas by residential properties, there are indirect linkages with the Tranmere Coastal Reserve to the south and Waverley Flora Park to the north to provide a connection for the movement of flora (eg via seed dispersal) and fauna (eg birds) .

This landscape setting and connectivity is important for the long term viability of Clarence's bushland areas and ongoing visual amenity in the municipality. It is important that these linkages be preserved and strengthened through strategic land use planning.

5 STAKEHOLDER CONSULTATION

A public meeting and community 'walk and talk' session was facilitated by Council and Tasflora on 10 August 2014. The purpose of the session was to seek input from local residents, the Bellerive-Howrah Coastcare Group and other relevant stakeholders on values and management issues associated with the Reserve. Over 20 stakeholders attended the meeting, including representatives from the Bellerive-Howrah Coastcare Group, the Southern Coastcare Association of Tasmania (SCAT) and TasWater. A feedback form seeking input to the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019* was also mailed to local residents and relevant stakeholders.

The draft *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019* was released for community consultation in December 2014. A Bellerive-Howrah Coastal Reserve Report Card was developed as a key tool in encouraging stakeholder feedback on the draft plan and was mailed out to residents and other interested stakeholders. Thirteen submissions on the draft plan were received during the consultation period. A summary of the issues raised in these submissions is provided at Appendix 3.

Where possible, all relevant community feedback has been considered in the

development of the draft *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019*. However some issues identified during the consultation process are beyond the scope of this plan or pertain to management issues outside the Reserve. These issues have been noted by Council and will be addressed through other processes where feasible.

6 WEED MANAGEMENT

6.1 Weed species present

A list of environmental weed species occurring in the Reserve, including their status and recommended control methods, is provided at Appendix 4.⁵ To assist with identification, a picture of each weed species is also provided. Several weed species found in the Reserve are classified as declared weeds under the Tasmanian *Weed Management Act 1999* (the Weed Management Act) and/or Weeds of National Significance (WONS). Where possible, these weeds should be targeted as a priority to prevent their further spread. The current distribution of declared and other environmental weed species is illustrated in Appendices 5-6.

Much work has already been undertaken to eradicate infestations of declared and environmental weeds from the Reserve. Over the last 20 years, the Bellerive-Howrah Coastcare Group has played an active role in removing significant infestations of weeds from the dunes behind Bellerive and Howrah Beaches and on Second Bluff. However, many species still persist, particularly those that are more difficult to control or are located in areas that are difficult to access (eg cliff faces on Second Bluff; the rocky foreshore south of Howrah Point).

6.2 Recommendations for primary weed control work

Weed control work within the Reserve should continue to focus on removing isolated populations of declared and environmental weeds that will require minimal resources to control (eg boneseed and boxthorn) and new weed seedlings (including pine seedlings) in the dune systems along Bellerive and Howrah Beaches.

Recommendation 1: Prioritise the removal of remote, easily controllable populations of weeds on the dunes behind Bellerive and Howrah Beaches.

There is a large patch of blackberry in the dunes adjacent to Howrah Primary School that has not been previously targeted due to land ownership issues and the close proximity to the school. Liaison with the school should be undertaken to allow qualified contractors to undertake targeted blackberry control in this area.

Recommendation 2: Seek permission from Howrah Primary School to undertake weed control in the dunes adjacent to the school.

The majority of weeds remaining on Second Bluff are located on steep cliff faces

⁵ A general overview of weed control techniques is available at:
http://www.nrmsouth.org.au/uploaded/287/15130842_66weedsbookletfinalweb.pdf

and can only be accessed using specialised climbing or abseiling equipment. While contractors have been used in the past to control weeds in some of these areas, further weed control on the cliff faces is not considered an immediate priority due to the significant cost this would entail. Rather, priority should be given undertaking follow-up control of regenerating weeds on the remainder of Second Bluff to ensure that weeds do not become re-established.

Recommendation 3: Removal of weeds on cliff faces on Second Bluff is not considered to be a priority.

6.3 Non-priority weeds

Boxthorn is common along the rocky foreshore between Little Howrah Beach and the Tranmere Coastal Reserve. While this species is a declared weed, control of boxthorn in this area is not considered to be a priority due to the relative inaccessibility of this area and its isolation from other areas of coastal vegetation.

Mature pine trees occur in the dunes adjacent to Bellerive Beach, and seed from these trees is contributing to the ongoing germination of pine seedlings in the dunes. The community consultation process found mixed views on removing mature pine trees due to their present role in providing shade, wind protection, bird habitat and dune stabilisation. Large scale removal of all large pine trees is therefore not considered a priority over the next five years, particularly as removal will be costly and large scale rehabilitation is likely to be difficult. However, the Bellerive-Howrah Coastcare Group, in consultation with Council, has identified a number of smaller mature radiata pine trees (some of which are dying) at the rear of the Bellerive dunes which could be removed to provide space for the establishment of native trees while not significantly impacting the area's visual amenity. All cut pine material should be removed from the dunes. Revegetation with native plants (refer Section 7) should be simultaneously undertaken with plants that can provide shelter for track users from coastal winds and to prevent sand erosion. Pine seedling control should continue to be undertaken on an ongoing basis throughout the Reserve to prevent establishment of new pine trees.

Recommendation 4: If selective removal of smaller mature radiata pines is undertaken, remove all cut material from the dunes and simultaneously revegetate with suitable native plants to provide ongoing shade, wind shelter and dune stabilisation.

Two specific pine trees were identified for retention during the community consultation process:

- the single pine tree growing directly adjacent to the beach due to the important role this tree plays in providing shade and dune stabilisation; and
- a second pine tree located about 20 metres east of the stormwater works at River Street due to its shade value.

Recommendation 5: Retain the pine tree growing on Bellerive Beach and another located near the stormwater works at River Street due to their shade and/or dune stabilisation roles.

While not considered an immediate priority, exotic pigface species *Carpobrotus edulis* and *C. aequilaterus* growing on the western end of Bellerive Beach and elsewhere could be removed and replaced with *C. rossii*. Marram grass is not considered a priority target for removal and should not be hand pulled or dug out due to the role this species is currently playing in dune stabilisation. If long term control of marram grass is desired, revegetation with native species is the only means of control required due to the fact that marram grass will eventually 'shut down' when soil conditions become more stable and allow native species to grow amongst it (Cordingley and Petherick 2005). Suitable species for revegetation are discussed in Section 7.

Recommendation 6: Marram grass should not be removed due to its role in dune stabilisation.

Broadleaf weeds and exotic grasses are common through the Reserve and are not considered a priority for control except in revegetation areas and where their removal is desirable as part of an ongoing general Reserve maintenance program (eg along track edges).

Recommendation 7: Undertake control of exotic grasses and broadleaf weeds only in revegetation areas and where necessary as part of a general Reserve maintenance program.

6.4 Maintenance of weed control work

Regeneration of weeds in the Reserve is likely to continue for many years due to the existing seed bank in the soil and the fact that some weed species have an inherent ability to resprout following primary control (eg boxthorn). Weed control activities will not be successful unless a commitment is made to undertaking ongoing follow-up maintenance activities.

Maintenance of primary weed control work should be undertaken annually, preferably in spring and summer when plants are least likely to be dormant. This can be achieved by performing an annual sweep to remove all new germinants of previously targeted weeds and undertake follow-up control on any plants that may have resprouted. Ongoing annual follow-up will be required until the soil seed bank is exhausted.

Recommendation 8: Undertake an annual sweep and follow-up control of all previously targeted weeds.

GPS weed mapping of all environmental weeds occurring within the Reserve has been undertaken during the development of this plan. In order to monitor the success of the weed control program, follow-up GPS weed mapping should be undertaken after five years to assess progress and facilitate planning of future weed control activities. As well, GPS mapping by contractors and volunteers as they control weeds should be encouraged, with data to be provided to Council to enable its database to be updated.

Recommendation 9: Undertake follow-up GPS mapping of all weeds in the Reserve after five years to monitor progress and inform future weed control priorities.

7 REGENERATION AND REVEGETATION

7.1 Regeneration

Natural regeneration should be encouraged within the Reserve as the most cost effective and natural means of restoring the Reserve's original vegetation in areas where disturbance has occurred. Apart from weed control, management activities in areas of intact native vegetation should be limited to encourage the natural regeneration process.

7.2 Revegetation activities

The primary purpose of undertaking new revegetation activities in the Reserve is to provide dune stability, preserve and enhance existing areas of remnant native vegetation, provide habitat for native birds and animals, and improve the visual amenity for users of the Reserve.

Over the last 20 years, revegetation activities have been undertaken by the Bellerive-Howrah Coastcare Group at various locations within the dune system and on Second Bluff, which have resulted in the successful establishment of native plants in many of these areas. Ongoing maintenance of these areas should be considered a priority before establishing new revegetation sites to ensure that existing sites remain weed free and are well maintained (ie dead plants removed, mulch topped up etc). This is particularly important adjacent to high pedestrian traffic areas where visual amenity is desirable. For example, some recent revegetation areas established on Second Bluff (eg alongside the track where dwellings on the southern side of Gunyah Street border the Reserve) require immediate attention to control broadleaf weeds and exotic grasses that are growing up through the mulch.

Recommendation 10: Undertake regular maintenance of existing revegetation areas to ensure successful establishment and ongoing visual amenity.

A large area of revegetation and dune stabilisation work is required at the eastern end of Bellerive Beach where a large area of dune remains cleared following the removal of storm damaged outfall pipes in July 2014 (refer Figure 5). Restoration of the original dune height and revegetation is planned in this area once the replacement outfall pipe has been installed. Erection of brush fences should be considered as an interim measure to minimise sand loss from this area until the pipe laying work has been completed.

Recommendation 11: Restore original dune height and undertake revegetation and dune stabilisation immediately following the installation of the replacement stormwater outfall pipe on Bellerive Beach.



Figure 5: Area of bare dunes remaining following removal of storm damaged outfall pipes at Bellerive Beach.

Further large scale revegetation activities are not considered necessary in the Reserve. However, it is recognised that there is an ongoing desire by members of the Bellerive-Howrah Coastcare Group to undertake some revegetation activities (eg on Second Bluff). Small scale revegetation activities that could be undertaken by this group are summarised in Table 1. Native landscaping is also recommended to improve the visual amenity of several entrances (refer Section 10).

In general, revegetation activities should be avoided in areas where the original soil and water conditions have been modified (eg areas of runoff where enhanced nutrients may encourage prolific growth of weeds and exotic grasses) unless a specific bioremediation planting regime is deemed necessary. As well, in accordance with the Reserve's bushfire management plan, no revegetation activities should be undertaken in the following areas (AVK Environmental Management 2011a):

- on the building protection and fuel modified buffer zone established around assets at risk (eg on Second Bluff), although landscaping to reduce the visual impact of the defendable spaces on Second Bluff may be possible - refer MP5 in the *Clarence Bushfire Management Strategy Best Practice Management Guidelines* (AVK Environmental Management 2011b);
- on fuel breaks; and
- within 2 m of the edge of fire trails.

Table 1: Recommended revegetation activities to be undertaken within the Reserve.

Activity	Purpose	Recommended locations	Priority
Maintain existing revegetation sites	Ensure existing revegetation sites are established and regularly maintained	Second Bluff Dune raising area behind Bellerive Beach	Ongoing in conjunction with other revegetation activities
Dune revegetation	Improve dune stability and/or revegetate areas of bare sand with appropriate local species	Large area of bare sand where stormwater outfall pipe was removed at the eastern end of Bellerive Beach Disturbed areas in the dunes around H1	As soon as new pipe has been installed
Track closure	Use native plants as a mechanism to deter access along closed tracks	Along the closed track through the dunes opposite 11 Alexandra Esplanade (refer Section 11 for further discussion of this area)	As resources become available
		Along small tracks proposed for closure along Howrah Beach (refer Section 11)	As resources become available
Canopy and understorey planting	Improve visual amenity and/or create habitat in areas where natural regeneration is considered unlikely to occur or requires enhancement	Selective planting of <i>Eucalyptus globulus</i> (blue gum) in the dunes to enhance swift parrot habitat and provide future shade The Coastcare Group has indicated a desire to continue some planting in bare areas on Second Bluff	As resources become available
Bioremediation planting	Water sensitive design to improve water quality in areas requiring management of seepage	Seepage area adjacent to Howrah Primary School (refer Section 8)	As resources become available
Revegetation following weed control	May be required if bare patches are created following primary weed control	To be assessed following primary weed control activities. Only to be undertaken if natural regeneration is considered unlikely to occur or if dune stabilisation is required.	Immediately following weed control activities
Landscaping	Improve visual amenity	H3 and LH1 (refer Section 10) Within the defensible space adjacent to Gunyah Street properties bordering	As resources become available

Activity	Purpose	Recommended locations	Priority
		the Reserve (must adhere to best practice management guidelines – refer main text of Section 7.2) Foreshore strip at the western end of Bellerive Beach	
Demonstration native cottage gardens ⁶	Demonstrate how local native plants can be used to create an attractive garden and encourage adjacent landowners to establish the same	Around car park at Reserve entrance H1 (not within the dune system)	As resources become available

Recommendation 12: Undertake revegetation and landscaping at several locations (refer Table 1) to provide dune stability, enhance species diversity, provide habitat for native birds and animals, and improve visual amenity.

Where possible, plants should be grown from the seed or cuttings of plants local to the area to ensure local variants of plants are planted.⁷

Revegetation and landscaping activities will not be successful unless a commitment is made to undertake follow-up maintenance activities. In particular, it is important to ensure that sufficient resources are available for ongoing maintenance (eg weeding, watering) before establishing new sites.

Recommendation 13: New revegetation and landscaping activities should not be committed to unless sufficient resources are available to undertake ongoing regular maintenance of newly planted areas.

8 FAUNA HABITAT MANAGEMENT

As described in Section 4.2, the Reserve plays an important role in providing habitat for a range of wildlife, including mammals, birds, reptiles, amphibians and invertebrates. Native revegetation activities proposed in Section 7 will play a role in enhancing these habitat values of the Reserve.

It is important that fauna habitat requirements are considered when planning future bushfire management activities in the Reserve. The Reserve's current bushfire

⁶ The Adelaide and Mount Lofty Ranges Natural Resource Management Board (2010) has produced a brochure that provides advice on landscaping with native plants in coastal areas. The concepts from this can be adopted within the Reserve using suitable local species. Refer: <http://www.naturalresources.sa.gov.au/files/8f21d173-890c-4d15-9a9a-a27a00da1f47/coastal-gardens-planting-guide-bro.pdf>

⁷ An overview of best practice revegetation and regeneration techniques has been produced by Greening Australia Victoria (2003) and is available at http://live.greeningaustralia.org.au/nativevegetation/pages/pdf/Authors%20C%13_Corr.pdf

management plan recognises this.

Little penguins have been observed nesting in the Reserve over a long period, and an active nesting site is currently monitored by Birdlife Tasmania. Collaboration with Birdlife Tasmania and the Derwent Estuary Penguin Project should continue to ensure nesting sites are managed in accordance with the document *Co-existing with the Little Penguins in the Derwent Estuary - Information and Management Guidelines* (Prior and Wells 2009). This may include installation of artificial burrows, fencing and revegetation at appropriate locations within the Reserve.

Recommendation 14: Collaborate with Birdlife Tasmania and the Derwent Estuary Penguin Project to protect and manage little penguin nesting sites, including installation of artificial burrows, fencing and revegetation where appropriate.

A permanent wet area has been created where an outlet pipe discharges between the multiuse path and Howrah Beach adjacent to Howrah Primary School (refer Figure 6). This area has the potential to provide habitat for aquatic fauna, including frogs and aquatic invertebrates. The potential for using water sensitive urban design (WSUD) to improve the quality of water flowing into this area should be investigated in consultation with the Department of Education (the land owner) and Howrah Primary School, both to enhance fauna habitat and to improve the visual and olfactory amenity of this area.



Figure 6: Wet area near Howrah Primary School requiring water sensitive design to improve its water quality and visual amenity.

Recommendation 15: Investigate and assess WSUD options to improve water quality on Department of Education land where an outlet pipe discharges near Howrah Primary School between the multiuse path and Howrah Beach.

Uncontrolled domestic dogs have the potential to harass or kill native wildlife within the Reserve. While dogs are not permitted in the dune areas within the Clarence municipality, many owners allow their dogs to run through the dunes along both Bellerive and Howrah Beaches. Current advisory signs are above eye height and not likely to be seen by visitors unfamiliar with the Reserve. At a minimum, appropriate signage should be included at eye height at all main entrances to clearly inform dog walkers of dog restrictions in the Reserve and help owners understand that keeping dogs off the dunes prevents harassment of native wildlife.

Recommendation 16: Install signage at eye height at all main Reserve entrances to clearly inform dog walkers of dog restrictions in the Reserve and help owners understand that uncontrolled dogs and cats in the sand dunes can harass or kill native wildlife.

Uncontrolled domestic cats also have the potential to harass or kill native wildlife, particularly when allowed to roam at night. Council promotes responsible cat ownership, and will continue to encourage local residents (particularly those living adjacent to the Reserve) to meet their obligations under the *Cat Management Act 2009* through having their cats microchipped, desexed and under effective control (eg indoors at night). A responsible cat management brochure is proposed to raise community awareness of cat management responsibilities (further discussed in Section 15). Liaison with the Invasive Species Branch of DPIWE and Kingborough Council's Cat Management Project should continue to support the development of a regional approach to cat management.

9 VEGETATION AND FAUNA MONITORING

A survey of the native flora within the Reserve was undertaken in 1992 (Hepper et al 1992). A full flora species list has not since been compiled for the Reserve, although an overview of recorded threatened species locations since that time is provided in the Reserve's Bushfire Management Plan (AVK Environmental Management 2011a). It would therefore be desirable to:

- undertake an in-depth botanical survey of the current species composition of the Reserve;
- update mapped locations of threatened species on DPIWE's Natural Values Atlas; and
- use vegetation transects in conjunction with Council's planned annual aerial photography program to undertake vegetation composition and condition assessments on an annual basis.

Recommendation 17: Undertake an updated flora survey and annual vegetation composition and condition assessments to further inform on ground management activities.

It is recommended that photo points be established at several locations within the Reserve to facilitate monitoring of vegetation condition and annual regeneration growth, particularly in the following areas:

- where native regeneration is occurring following weed control;
- where track closure work has been undertaken;
- in areas where dune raising has been undertaken; and
- following revegetation of the Bellerive Beach dunes where the stormwater outfall pipe work has been undertaken.

Recommendation 18: Establish photo points established at several locations within the Reserve to facilitate monitoring of annual regeneration growth.

The Reserve contains habitat for a range of wildlife species, and it is expected that species diversity could increase over time with ongoing appropriate vegetation management practices and effective control of dogs and cats away from the dune system. Fauna surveys (including mammal, bird, reptile and invertebrate surveys) and habitat assessments to confirm the species present in the Reserve are recommended to be undertaken now and at the end of the plan (ie 2015 and 2019) as a basis for monitoring species diversity over time.⁸ It is noted that little penguin numbers are already being monitored, and a local zoologists has indicated an interest in surveying bat numbers.

Recommendation 19: Undertake fauna surveys in 2015 and 2019 to assess species diversity and further inform on ground management activities.

An analysis of all completed flora surveys, vegetation composition assessments and fauna surveys should be undertaken in 2019 to determine trends and implications for ongoing vegetation management in the Reserve. This should be undertaken in conjunction with a review of the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019* scheduled for 2019 (refer Section 17).

Recommendation 20: Undertake an analysis of all photo points, completed flora surveys, vegetation composition assessments and fauna surveys in 2019 to determine trends and inform future management activities.

10 RESERVE ENTRANCES

There are currently eight main entrances to the Reserve managed by Council, as illustrated in Figure 1. Key management issues identified for these entrances are summarised in Table 2.

All entrances are located adjacent to public streets and most already have off street parking areas. Changes to existing parking areas are proposed as follows.

- B1 & B2 – the Bellerive Beach Park Master Plan adopted by Council in 2013

⁸ If possible, bird surveys should be undertaken in conjunction with BirdLife Tasmania using standard BirdLife Australia monitoring techniques.

Table 2: Recommended management activities to be undertaken at Reserve entrances.

Issue	Description	Recommendation
Signage	There is no clear sign identifying the Reserve name at main Reserve entrances	Develop identifying names (other than street names) for Reserve Entrances B1, B3, H1 and H3 Large Reserve name signs (with identifying entrance name – see above) to be installed at B1, B3, H1 & H3 Small Reserve name signs to be installed at all other main entrances
	Information about dog restrictions on Bellerive & Howrah Beaches are above head height and not easily seen by visitors unfamiliar with the Reserve	Simple signage should be included at eye height at all main Reserve entrances to clearly inform dog walkers of dog restrictions in the Reserve and help owners understand that uncontrolled dogs in the sand dunes can cause dune erosion and harass or kill native wildlife
	Interpretation signage at B1 needs updating and replacement / there is no interpretation signage at other main entrances	Install interpretation signs at entrances B1, H1 and H3 as detailed in Section 15.
	Signage on adjacent Council land (eg sports fields, Bellerive Park) needs integration with Reserve signage	Develop an integrated signage plan for the Reserve and its immediate surroundings to ensure a thematic and uniform approach to signage in the area
Visual amenity	Some entrances would benefit from landscaping activities	Enhance the Reserve's existing maintenance program to ensure regular weeding and/or slashing is undertaken at all Reserve entrances (slashing should be avoided in areas where native vegetation is present or revegetation activities have been undertaken) Establish demonstration native cottage gardens at H1 (refer Table 1 for further details) Undertake landscaping at H3 as per concept landscape plan detailed in Appendix 7 Engage a landscape architect to develop a thematic landscaped entrance design for LH1, including seats, picnic/BBQ facilities, shade structures, planting of trees for shade and direct stepped access to the beach from the grassy area directly north of the toilet facilities. All comments on this area received during the RAP consultation process should be considered. To be released for public consultation prior to

Issue	Description	Recommendation
		implementation.
	The trees around the toilet facilities at LH1 are overgrown	Prune trees around toilet facilities at LH1 to create a hedge of even height. Maintenance to be undertaken until proposed landscape plan (see above) has been approved and implemented.

and updated in early 2015 proposes changes to the location of the current car parks at these entrances.

- H3 – formalisation and landscaping of this parking area is recommended to make it more visually appealing.

Recommendation 21: Improve Reserve entrances improved by installing additional signage and undertaking landscaping activities as recommended in Table 2.

11 TRACKS AND TRAILS

Much work has been done in recent years to rationalise the number of tracks leading through the dunes to Bellerive and Howrah Beaches from the multiuse pathways bordering the Reserve. Efforts have also been made to close tracks running in an east-west direction along dune crests to prevent dune erosion. Key activities have included fencing, construction of stepped access points and signage to encourage users to use designated tracks rather than cutting through the dunes.

A small number of users continue to traverse the natural dunes or allow their dogs to access the dunes, despite efforts to rationalise beach access and to protect the dunes and their wildlife. To prevent this from occurring on an ongoing basis, consideration should be given to prohibiting dune access by all users including dogs and pedestrians, with access to the beaches only to be permitted via formal, signposted tracks. If this approach is adopted, signage stating that dune access is not permitted would need to be erected on each formal access track and on the front of the dune in locations where informal tracks have developed. If access continues to occur, then associated fines may be introduced as a further deterrent.

Recommendation 22: Consider prohibiting access to the natural dunes by pedestrians and dogs, with access to the beaches only to be permitted via formal, signposted tracks.

Recommendation 23: If Recommendation 22 is adopted, erect signage noting that dune access is not permitted at each formal access track and on the front of the dune in locations where informal tracks have developed.

Other key management identified with the Reserve's existing tracks and trails are summarised in Table 3.

Recommendation 24: Improve the Reserve's existing track network by installing new educational signage, controlling and improving beach access and making improvements to the track network on Second Bluff.

Table 3: Track management issues identified within the Reserve.

Issue	Description	Recommendation
Signage	Existing signage does not clearly tell users that dogs and pedestrians are not allowed on the dunes	Install small signs on beach marker poles and/or track entrances stating “Dogs and pedestrians not permitted on dunes” (or other appropriate wording). Smart phone QR codes (or similar) could be used in some locations instead of obtrusive signage. Ensure proposed interpretation signs at B1, H1 and H3 include educational information about dog restrictions and the importance of staying off the dunes
Beach access	Bellerive Beach is not easily accessible to wheelchairs, mobility scooters, prams or water equipment (eg kayaks) due to stepped access points	Implement the Bellerive Beach Park Master Plan proposal for a ramp near B1 to facilitate access to Bellerive Beach by all users
	People continue to gain access to Bellerive Beach via a closed track through the dunes opposite 11 Alexandra Esplanade despite barriers and regeneration efforts	Lay natural slash, dead wood or boulders along the regenerating track and interplant with more native plants
	Access tracks to Howrah Beach require rationalisation to protect the dune system, as several informal tracks lead from the multiuse path to Howrah Beach	Erect fencing at the following locations to rationalise access to Howrah Beach: <ul style="list-style-type: none"> on the multiuse path side of the dunes near Howrah Primary School where native vegetation is absent to act as a deterrent to cutting across the dunes⁹ across the entrance to the smaller beach access track to the south of the Salacia Avenue play area to encourage users to use the formalised track to the east Lay slash and undertake revegetation along all tracks to be closed (refer Section 7.2)
	The ramped access to Little Howrah Beach has a stepped drop at the end	Build a ramped access from the end of the walkway to the sand (depth must allow for sand movement)
	There is no direct access to Little Howrah Beach from the seat and grassy area directly north of the toilet facilities (users must walk back to the road and follow the winding track via the toilet block)	Include a direct stepped access to the beach from the grassy area directly north of the toilet facilities in the proposed thematic landscaped entrance design for LH1 (refer Table 2)

⁹ A similar approach has been successfully used along Bellerive Beach to rationalise beach access points.

Issue	Description	Recommendation
	The area between Howrah and Little Howrah Beaches is rocky and not easily accessible by the elderly or prams	Improve access between Howrah and Little Howrah Beaches through levelling
Tracks on Second Bluff ¹⁰	Sight lines are poor along some sections of the main track along Second Bluff	<p>Selectively prune lower branches overhanging tracks to a maximum height of 2.5 m</p> <p>Remove dead trees and limbs adjacent to the path (to a maximum width of 3m) along the length of the main Second Bluff track. Dead material that may provide native fauna habitat (eg where overgrown with native <i>Rhagodia</i> and <i>Tetragonia</i>) should only be removed where it has been assessed as hazardous to users.</p>
	The western section of the Second Bluff track does not follow the foreshore and many users are unaware of a minor track leading to a very scenic lookout area with views towards Hobart and Mt Wellington	Formalise and widen the existing narrow track from the main Second Bluff track opposite 6 Wentworth Street to the scenic lookout point / fishing area.
	Safety risk to users using informal, unsigned tracks leading to the steep rocky foreshore and caves directly south of 2 Wentworth Street	<p>Rationalise the tracks leading to the steep rocky foreshore and caves directly south of 2 Wentworth Street.¹¹ The following approach is recommended.</p> <ul style="list-style-type: none"> confirm the preferred track to be used for access to the cave area and foreshore; install visually appealing fencing along the southern side of the main Second Bluff track between the Wentworth Street cul-de-sac and the bend in the main track adjacent to 6 Wentworth Street;¹² and install a child proof gate and warning signage at the entrance to the preferred track.

¹⁰ Prior to any development of tracks on Second Bluff, an assessment of Aboriginal heritage values and consultation with the Coastcare Group should occur. Any development in this area should protect native vegetation where possible.

¹¹ The purpose of rationalising entrance points and installing a gate and fencing along the main track is to ensure that users (particularly children) unfamiliar with the Reserve do not inadvertently follow informal tracks to the cliff edge without being aware of its presence. This approach allows users to continue to enjoy the natural setting of the caves and rocky foreshore in this area without the need for safety fencing on cliff edges. A similar approach has been adopted at Sphinx Rock on Mt Wellington, where users must pass through a fenced gate warning them in advance of a steep rock face ahead.

¹² The layout and installation of the new fence should aim to minimise removal of native vegetation.

Consultation during the development of this plan has indicated that there is a level of desire for some form of foreshore pathway to be constructed between Little Howrah Beach and the start of the Tranmere Coastal Reserve to eliminate the need to travel along Howrah Road / Tranmere Road between Little Howrah Beach and the Tranmere Coastal Reserve. This is a critical missing link along the Clarence Foreshore Trail, and similar feedback was received during the development of the *Tranmere Coastal Reserve Activity Plan 2011-2016* (Tasflora 2011).

The grassy headland and foreshore between Little Howrah Beach and Howrah Point (ie 15 Howrah Point Court) is Crown land managed by Crown Land Services. A short section of track could be constructed from the southern end of Little Howrah Beach to the grassy headland to formalise public access and make an out and back walk with a seat at the point (refer Figure 7).¹³ This approach would create a pleasant walking track to the point and, combined with new signage, would also deter public access to the point via the adjoining private property (the property boundary is not currently evident on site apart from signs discouraging people from parking on the grass on private property). To be consistent with the restrictions at Little Howrah Beach, dogs should not be permitted in this area.



Figure 7: Potential location of a walking track between Little Howrah Beach and grassy headland at Howrah Point (map provided by Council).

¹³ A similar approach has been adopted at Blinking Billy Point at Lower Sandy Bay within the Hobart municipality, which finishes at a dead end but formalises public access to the point through a pleasant out and back walk.

Recommendation 25: Negotiate with Crown Land Services to construct a new track from Little Howrah Beach to the grassy headland at Howrah Point to formalise public access.

The section of foreshore between the Crown land at 15 Howrah Point Court and the Tranmere Coastal Reserve is in private ownership to high tide mark. While it is acknowledged that development of a foreshore walkway in this area may be difficult to achieve due to land ownership issues and its rocky nature, the feasibility of developing an intertidal walking track similar to that recently built between Geilston Bay and Limekiln Point should be investigated as a means of developing this link. Liaison with private land owners will be required as part of this process.

Recommendation 26: Undertake a feasibility study into developing an intertidal walking track link between Howrah Point and the Tranmere Coastal Reserve.

12 INFRASTRUCTURE

There is currently limited community infrastructure located within the Reserve, and the Reserve's natural environment would be enhanced through minimising significant additional infrastructure installation in the dunes and on Second Bluff.

A large number of fences have been erected throughout the Reserve over many years to facilitate dune protection, rationalise beach access points and provide a safety barrier from steep cliff edges on Second Bluff. Many of these fences require replacement or removal as they are either no longer fulfilling their intended purpose, are visually unappealing, pose a safety risk or are no longer required.

The following fencing activities have been identified as priorities within the next five years:

- replace detached wire and add ring lock fencing on the formalised access tracks to Bellerive and Howrah Beaches to help restrict dune access;
- remove unsightly erosion control fencing along Howrah Beach (at a minimum remove shade cloth and detached wire), which has been deemed no longer useful by Council due to tidal events continually washing these fences away;
- erect new fencing along the access track to Bellerive Beach at the end of Lower River Street (once pipe laying activities are complete) to discourage dune access from this track;
- erect new fencing to rationalise access to Howrah Beach (refer Table 3 in Section 11 for recommended locations); and
- erect fencing and a safety gate along the southern side of the main Second Bluff track caves between the Wentworth Street cul-de-sac and the bend in the main track adjacent to 6 Wentworth Street to rationalise access to the steep rocky foreshore and caves (refer Table 3 in Section 11 for further details of this proposal).

Recommendation 27: Erect new fencing to rationalise beach access and discourage dune access at several locations along Howrah and Bellerive Beaches and to rationalise access to the steep rocky foreshore and caves on Second Bluff.

Recommendation 28: Remove or repair several fences along Howrah Beach to improve safety and visual amenity.

The Reserve is a highly popular destination for dog exercise. While dog waste bins and bag dispensers are present at many locations, it is recommended that dog waste bins and bag dispensers be installed in visible locations at all main entrances and at the end of each beach access track to accommodate the varying access routes local residents may use to gain access to the beach. The installation of additional dog waste bins will also fulfil a dual role of providing additional rubbish bins within the Reserve.

Recommendation 29: Install dog waste bag dispensers and bins at all main entrances and at the end of all beach access points within the Reserve.

Due to the high usage and popularity of the Reserve, it is recommended that new outdoor seats be installed at strategic positions within the Reserve to enable rest opportunities and encourage contemplation of the coastal environment. There is currently limited seating within the Reserve for recreational walkers using the multiuse pathway, and clusters of seats in some locations would be desirable to enable groups of walkers to sit together and enjoy the Reserve. Depending on the level of funding available, the following initial locations are suggested (an assessment of additional seat locations should be undertaken if significant funding becomes available).¹⁴

- along the multi-use pathway between Beach Street and High Street to enable users to rest along this section;
- at the lookout point at the end of the track opposite 6 Wentworth Street to allow appreciation of the views across the Derwent to Hobart and Mt Wellington;
- near the existing seat to the south of Correa Street (this area offers direct views to the Derwent and would be enhanced by a cluster of two or three additional seats and removal of dead dune vegetation in front of the existing seat);
- on the grassy area at Little Howrah Beach (location to be determined during the development of the proposed thematic landscape design for this area - refer Table 2 in Section 10); and
- at the grassy headland on Howrah Point once the proposed track has been constructed (refer discussion in Section 11).

Vandal-proof bench seats, such as those already used in the Reserve, should be coloured to blend in with the environment (ie seat painted green) and set into a

¹⁴ Additional seating may also be installed at various locations at the western end of Bellerive Beach as the Bellerive Beach Park Master Plan is implemented.

concrete foundation with a hardened under surface (eg compacted gravel or concrete) extending in front of the seat. Alternatively, seats could be constructed from natural stone to deter vandalism. Shade structures should be included where possible as there is limited shade in these areas.

Recommendation 30: Install new outdoor seats at several locations in the Reserve.

Feedback was received during public consultation regarding the appearance of the track marker poles along Bellerive Beach, which some users feel are visually unappealing and take away from the natural setting of the beach. It is noted that no feedback was received about the marker poles along Howrah Beach, which are set back further into the dunes and are therefore less conspicuous while still serving their purpose. With this in mind, it is recommended that the track marker poles along Bellerive Beach be moved further back into the dunes or that the red paint be replaced with a more aesthetically pleasing colour. Reflective markers could be placed on each pole to assist night users to locate tracks.

Recommendation 31: The track marker poles on Bellerive Beach should be moved further back into the dunes or painted a less obvious colour.

The ocean in front of the Reserve is a popular kayaking area. With the proposed ramped access at Reserve entrance B1 (refer Table 3) as well as existing beach access from Reserve entrance H3, the opportunity exists to promote these two entrances as preferred kayak launching sites. The grassy area at the Howrah Point end of Little Howrah Beach has also been identified as a suitable kayak launching and washdown area. Proposed interpretation signage at B1 and H3 (refer Section 15) could include information promoting an eastern shore kayak trail, including preferred launching sites and wash down areas.

Recommendation 32: Promote preferred kayak launch sites at B1 and H3, and establish a kayak wash down area at the Howrah Point end of Little Howrah Beach.

While new infrastructure development proposed as part of the Bellerive Beach Park Master Plan is likely to be implemented by Council, any additional installation of new infrastructure within the Reserve will be subject to limited funding. With this in mind, no additional infrastructure beyond that discussed above is proposed within the next five years unless significant funding becomes available.

A further review of the infrastructure requirements of the Reserve should be undertaken in 2019.

Recommendation 33: Undertake a review of the infrastructure requirements of the Reserve in 2019.

13 BUSHFIRE MANAGEMENT

A five year Bushfire Management Plan encompassing the Reserve was developed for Council in 2011 (AVK Environmental Management 2011a). Key recommendations in the plan include:

- maintaining building protection zones and/or fuel modified buffer zones on Second Bluff between the walking track and residences;
- removing dead shrubs on the southern side of the track on Second Bluff;
- maintaining existing mown areas;
- advising residents backing onto vegetated section of the Reserve to maintain a defensible space around their dwellings; and
- ensuring that aboriginal middens are not damaged when undertaking bushfire management activities.

The Bushfire Management Plan is scheduled for review in 2016.

14 COASTAL EROSION AND INUNDATION

Prior to undertaking any on ground work within the Reserve, the *Tasmanian Coastal Works Manual: A best practice management guide for changing coastlines* (Page and Thorp 2010) should be consulted to ensure best practice coastal management techniques are implemented.

Recommendation 34: The Tasmanian Coastal Works Manual should be consulted prior to undertaking any on ground activities.

An assessment of potential climate change impacts on the Reserve was undertaken in 2009 as part of a wider integrated assessment undertaken of climate change risks to Clarence's coastal areas (SGS Economics & Planning and UNSW Water Research Laboratory 2009). The following conclusions were made.

- Bellerive Beach has a medium term risk (25-75 years) of climate change impacts such as storm surge damage and inundation as a result of sea level rise, in particular the area between Beach Street and Lower River Street. The report recommends that the fore dunes be monitored and maintained so they remain above the design inundation level. Dune raising is recommended as a mechanism for reducing the risk.
- Howrah and Little Howrah Beaches have a long term risk (75 years and beyond) of climate change-induced storm surge damage and inundation. The report recommends dune raising along Howrah Beach as a mechanism for reducing the risk.

The draft annual Clarence City Council Beach Monitoring Report 2013-14 includes coastal erosion and recession maps for Bellerive and Howrah Beaches created using a time series of ortho-rectified aerial photos from 1957 to 2014 (refer Appendix 8). These indicate areas of receding dunes along Bellerive Beach and a slow consistent recession at the far eastern end of Howrah Beach. An assessment of adaptation management options in these areas should be undertaken, including dune building and/or sand nourishment. While work has already been undertaken to raise low points in the dunes behind Bellerive Beach to the south of Beach Street, it has been identified that further dune raising could be undertaken to the west of this site to further protect this area from potential inundation.

Recommendation 35: Assess adaptation management options (including dune building and/or sand nourishment) in locations along Bellerive and Howrah Beaches where significant recession is occurring.

Recommendation 36: Consider undertaking further dune raising and revegetation in the dunes to the south of Beach Street.

Some concerns were raised during community consultation regarding erosion caused by the stormwater outfall pipe at the eastern end of Bellerive Beach. It is recommended that engineering advice be obtained regarding the functionality of the pipe and whether its use could be discontinued and the pipe removed, or reconstructed to emerge at ground level.

Recommendation 37: Obtain engineering advice regarding the future treatment of the stormwater outfall pipe at the eastern end of Bellerive Beach.

Annual high resolution imaging of Bellerive and Howrah Beaches is currently undertaken by Council as a means of assessing coastline changes over time (Phil Watson, Clarence City Council, pers. comm.). This imaging program could be complemented by regular monitoring of shoreline movement on both beaches through participation in the Tasmanian Shoreline Monitoring and Archiving Project (TASMARC). TASMARC aims to monitor a number of Tasmanian beaches on a monthly basis to provide an indication of monthly and seasonal shoreline movement, as well as long term beach movement observations. The TASMARC project requires recordings to be made approximately monthly, and if possible after an onshore storm. The observation techniques are suitable to be undertaken by Coastcare groups and other interested community members, and it would be desirable to establish and regularly monitor at least three sites along Bellerive and Howrah Beaches. Interpretation signage or a QR code (or similar) should be erected at one or more of these transect locations to provide information about coastal recession and explain the importance of the TASMARC surveying and aerial monitoring in relation to planning for future adaptation.

Recommendation 38: Establish and regularly monitor at least three transect sites along Bellerive and Howrah Beaches using the TASMARC surveying program with the support of the Bellerive-Howrah Coastcare Group.

Recommendation 39: Install interpretation signage or a QR code (or similar) at one or more of the TASMARC transect sites to show the coastal recession map and explain the importance of the TASMARC surveying and aerial monitoring in relation to planning for future adaptation.

15 COMMUNITY PARTICIPATION AND AWARENESS

There is a strong history of community commitment and enthusiasm for caring for the Reserve through the Bellerive-Howrah Coastcare Group, which has been actively involved in caring for the Reserve over the last 23 years. The Bellerive Cottage School and Clarence High School have also made significant contributions over a 20 year period. Ongoing engagement with these groups should continue

where appropriate to encourage ongoing participation in Reserve management activities.

Outside these groups, community participation and awareness has an important role to play in protecting the natural, cultural and recreational values of the Reserve. Education of locals, visitors and some residents living adjacent to the Reserve is desirable to foster behavioural change and encourage community ownership and appreciation of the Reserve's values. Key management issues identified as requiring community awareness and enforcement are summarised in Table 4.

Table 4: Management issues requiring community education and awareness within the Reserve.

Issue	Description
Garden waste dumping	Dumping of garden waste in the Reserve encourages the spread of weeds and is visually unattractive for all users.
Removal of native vegetation	Removal of native vegetation in the Reserve (eg to improve views, reduce bushfire risk, collect fire wood) is illegal. It encourages the establishment of weeds and reduces species diversity and animal habitat. Seed collection should only be undertaken with Council approval.
Environmental weeds	Weeds in adjacent gardens pose a threat to existing native vegetation within the Reserve.
Wildlife	Trapping and relocation of native wildlife is not permitted
Cats and dogs	Cats and dogs can kill native wildlife. Dogs restrictions apply within the Reserve and should be adhered to. No dogs are permitted in dune areas. Cats should be microchipped, desexed and kept indoors at night.
Beach litter	Beach users should take all rubbish with them when leaving the beach

Recommendation 40: Consider, and fund as necessary, community education to facilitate behavioural change and encourage ownership and appreciation of the values of the Reserve.

Community consultation indicates that there is some concern that native vegetation has been intentionally removed on Second Bluff to improve the views from neighbouring residences. While a letterbox drop to adjacent landowners on this issue is recommended as a first step towards addressing this issue, engagement with individual property owners and enactment of enforcement procedures may be required.

Several submissions expressed concern about cats killing wildlife within the Reserve. A responsible cat management brochure should be developed and distributed to all residents bordering the Reserve, particularly in areas near known little penguin nesting sites, to raise community awareness of cat management responsibilities. This brochure can also be distributed to residents bordering other

Reserves within the Clarence municipality.

Recommendation 41: Develop and distribute a responsible cat management brochure and distribute to residents bordering the Reserve.

Interpretation signs provide an important opportunity to display information on the Reserve's natural values and the impact certain activities can have on these. Interpretation signs are proposed at Reserve entrances B1, H1 and H3 to provide information on flora and fauna values, historic and cultural values, the reasons for keeping people and dogs off the dunes, dog walking restrictions and opportunities for community involvement in managing the Reserve (eg through Coastcare Group activities). A kayak trail map could also be included on the signs at B1 and H3 indicating where preferred kayak launching sites and wash down areas are proposed (further discussed in Section 12).

Recommendation 42: Install interpretation signs at Reserve entrances B1, H1 and H3 to facilitate visitor interpretation.

Many volunteers undertake work within the Reserve through the Bellerive-Howrah Coastcare Group. Under the Tasmanian *Work Health and Safety Act 2012*, volunteers are considered 'workers' when working for Council on Council owned land. Council therefore has a duty of care to provide a safe workplace for volunteer workers.

- **All volunteers have rights and responsibilities.** Volunteers have the right to a safe work environment, to be treated fairly and with respect, to public liability insurance, to safe equipment, tools and personal protective equipment (PPE), to adequate instruction to perform tasks, to contribute their suggestions and to receive acknowledgement for their contributions. Volunteers also have the right to refuse work if they consider it unsafe.
- **Volunteers also have the responsibility** to care for the health and safety of others, to respect others, to follow policies, procedures and instructions, and to care for their own health and safety.

With this in mind, all volunteers need to refer to the relevant Council Safe Work Method Statements (SWMSs) before undertaking works in Council Reserves, including cut and paste work, brushcutting and spreading of mulch. These are available from Council's Natural Areas Volunteer Coordinator (Chris Johns, phone 6245 8773 or email cjohns@ccc.tas.gov.au). All spot spraying should be undertaken by certified operators (eg Council staff, contractors).

16 IMPLEMENTATION PLAN

Maps illustrating the location of on ground management activities recommended within the Reserve are provided in Figures 8-10. These are based on the key recommendations contained within this plan, which are summarised in detail at Appendix 9.

Based on these recommendations, an Implementation Plan with associated performance measures has been developed and is provided at Table 5. It identifies three stages of management activities to be undertaken within the



Figure 8: Overview of key proposed on ground management activities at the Bellerive Beach end of the Reserve (aerial photo sourced from Google Earth).



Figure 9: Overview of key proposed on ground management activities between Second Bluff and the western end of Howrah Beach (aerial photo sourced from Google Earth).



Figure 10: Overview of key proposed on ground management activities along Howrah Beach and Little Howrah Beach (aerial photo sourced from Google Earth).

Table 5: Implementation Plan for undertaking recommended management activities within the Reserve.

Priority	Rec. No.	Action	Seasonal timing	Performance measure	Responsibility	Estimated funding ¹⁵
Weed control						
1,2&3	R1	Undertake ongoing primary control of declared and environmental weeds in the dunes behind Bellerive and Howrah Beaches and on Second Bluff	Spring – summer for spot spraying; all year round for other techniques	Significant reduction in weeds occurring in the dunes over the next 5 years	Council, contractor and/or volunteer groups	\$3,000 per annum
1,2&3	R2	Liaise with Howrah Primary School to control weeds in dunes adjacent to the school	N/A	Weeds controlled in the dunes adjacent to Howrah Primary School	Council	
1,2&3	R8	Undertake annual sweep and follow-up control of all previously targeted weeds	Ongoing on an annual basis	All targeted weeds are eradicated from the Reserve	Council, contractor and/or volunteer groups	\$3,000 per annum
3	R9	Undertake follow-up GPS mapping of all weeds	Spring - summer	Weed maps and Council database are updated within 5 years	Council, contractor and/or volunteer groups	\$600
Regeneration and revegetation						
1,2&3	R10,R11, R12, R13	Undertake revegetation activities as detailed in Section 8	Autumn – winter	Revegetation sites established and maintained for 5 years	Council, contractor or volunteers	\$1,500 per annum
Fauna habitat management						
2	R15	Investigate and assess WSUD options to improve water quality on DED Land where an outlet pipe discharges near Howrah Primary School	N/A	WSUD options developed and implemented.	Council	N/A

¹⁵ Funding estimate is based on total costs required to undertake all recommended activities over the period 2014-15 to 2018-19.

Priority	Rec. No.	Action	Seasonal timing	Performance measure	Responsibility	Estimated funding ¹⁵
Vegetation and fauna monitoring						
1	R18	Establish photo points at several locations within the Reserve	N/A	Photo points established and annual photos taken	Council, contractor or volunteers	\$600
2	R17	Undertake a flora survey and annual vegetation composition and condition assessments	Spring	Flora survey completed	Contractor	\$2,000
1,2&3	R17	Undertake annual vegetation composition and condition assessments	N/A	Annual vegetation composition assessments completed	Council	N/A
1,3	R19	Undertake surveys to update the fauna record of the Reserve	N/A	Terrestrial fauna surveys and bird surveys completed 2015 & 2019	Contractor and/or BirdLife Tasmania and/or University of Tasmania	\$6,000
Reserve entrances						
1	R21	Develop identifying names (other than street names) for Reserve Entrances B1, B3, H1 and H3	N/A	Identifying names developed for B1, B3, H1 and H3	Council	N/A
1	R21	Install Reserve Entrance name signs as per Table 1	N/A	Reserve Entrance name signs installed as per Table 1	Council	
2	R21	Develop an integrated signage plan for the Reserve and its immediate surroundings to ensure a thematic and uniform approach to signage in the area	N/A	Integrated signage plan developed and costed	Council	N/A
2	R21	Undertake native landscaping at Reserve entrance H3 as per Appendix 7	Autumn - winter	Landscaping completed at Reserve entrances H3	Council, contractor or volunteers	Up to \$2,500
2	R21	Install interpretation signs at entrances B1, H1 and H3	N/A	Three new interpretation signs installed	Council or contractor	\$3,000

Priority	Rec. No.	Action	Seasonal timing	Performance measure	Responsibility	Estimated funding ¹⁵
3	R21	Establish demonstration native cottage gardens at H1	Autumn - winter	Native cottage gardens established at H1	Council, contractor or volunteers	\$1,500
3	R21	Engage a landscape architect to develop a thematic landscaped entrance design for LH1	N/A	Concept design completed and costed, and timeframe for implementation established	Council or contractor	\$3,000
1,2&3	R21	Regularly prune trees around toilet facilities at LH1 to create a hedge of even height.	N/A	No complaints from users	Council or contractor	\$300
Tracks and trails						
1	R23	Install small signs on beach marker poles and/or track entrances stating "Dogs and pedestrians not permitted on dunes" (or other appropriate wording)	N/A	No pedestrians or dogs seen accessing the dunes	Council or contractor	To be assessed if approach is adopted
1	R24	Lay natural slash, dead wood or boulders along the closed track through the dunes opposite 11 Alexandra Esplanade	N/A	No pedestrians observed accessing this track	Council, contractor and/or volunteers	\$300
2	R24	Erect fencing to rationalise access to Howrah Beach at locations indicated in Table 3	N/A	No evidence of use of closed tracks	Council, contractor and/or volunteers	TBA
1	R24	Build a ramped access from the end of the walkway to the sand at Little Howrah Beach (depth must allow for sand movement)	N/A	Ramped access to sand level at Little Howrah Beach is constructed	Council or contractor	\$2,500
1,2&3	R24	Selectively prune lower branches to 2.5 m off trees adjacent to the main Second Bluff track and remove dead trees and limbs within 3m of the path along the length of the main Second Bluff track	N/A	Sight lines maintained along main Second Bluff track	Council or contractor	\$600 per annum

Priority	Rec. No.	Action	Seasonal timing	Performance measure	Responsibility	Estimated funding ¹⁵
3	R24	Formalise and widen the existing narrow track from the main Second Bluff track opposite 6 Wentworth Street to the scenic lookout point / fishing area	N/A	Track formalised	Council or contractor	\$5,000
3	R24	Rationalise the tracks leading to the steep rocky foreshore and caves directly south of 2 Wentworth Street as described in Table 3	N/A	No safety incidents reported No new tracks created in this area	Council or contractor	To be determined
3	R24	Improve access between Howrah and Little Howrah Beaches	N/A	Level access achieved between Howrah and Little Howrah Beaches	Council or contractor	To be determined
2	R25	Negotiate with Crown Land Services to construct a new track from Little Howrah Beach to the grassy headland at Howrah Point to formalise public access	N/A	Track constructed from Little Howrah Beach to the grassy headland at Howrah Point	Council or contractor	\$20,000
3	R26	Undertake a feasibility study into developing an intertidal walking track link between Howrah Point and the Tranmere Coastal Reserve	N/A	Feasibility study completed	Council or contractor	\$20,000
Infrastructure						
1	R27, R28	Develop costing for fence upgrade and removal program as described in Section 12	N/A	Costing developed and work program commenced	Council or contractor	TBA
1	R29	Install new dog waste bag dispensers and bins at beach access tracks where required	N/A	Dog waste bag dispensers and bins installed	Council or contractor	\$1200
2	R30	Install five bench seats at various location in the Reserve	N/A	Five bench seats installed	Council or contractor	\$2,500

Priority	Rec. No.	Action	Seasonal timing	Performance measure	Responsibility	Estimated funding ¹⁵
2	R31	Move track marker poles on Bellerive Beach further back into the dunes or paint them a less obvious colour	N/A	Track marker poles less conspicuous along Bellerive Beach	Council	N/A
3	R32	Establish a kayak wash down area at the Howrah Point end of Little Howrah Beach	N/A	Kayak wash down area established at the Howrah Point end of Little Howrah Beach	Council or contractor	\$11,000
3	R33	Review the infrastructure requirements of the Reserve in 2019	N/A	Infrastructure review completed in 2019	Council	N/A
Coastal erosion and inundation						
3	R35	Assess adaptation management options (including dune building and/or sand nourishment) in locations along Bellerive and Howrah Beaches where significant recession is occurring	N/A	Assessment completed	Council	N/A
2	R36	Investigate opportunities for further dune raising and revegetation in the dunes to the south of Beach Street	N/A	Assessment completed	Council	N/A
3	R37	Obtain engineering advice regarding the stormwater outfall pipe at the eastern end of Bellerive Beach	N/A	Decision made regarding the future of this infrastructure	Council	N/A
1,2&3	R38	Participate in TASMARC monitoring of the Reserve's shoreline	Monthly	Three transects established and monthly observations made and provided to TASMARC	Council or volunteers	N/A

Priority	Rec. No.	Action	Seasonal timing	Performance measure	Responsibility	Estimated funding ¹⁵
2	R39	Install interpretation signage at one or more of the TASMARC transect sites to show the coastal recession map and explain the importance of the TASMARC surveying and aerial monitoring in relation to planning for future adaptation.	N/A	Interpretation signage installed.	Council or volunteers	\$500
Community participation and awareness						
2	R41	Develop a responsible cat management brochure and distribute to residents bordering the Reserve.	N/A	Cat brochure developed and distributed	Council	\$3,000
2	R42	Install interpretation signs at Reserve entrances B1, H1 and H3 to facilitate visitor interpretation.	N/A	Interpretation signage installed.	Council, contractor or volunteers	\$3,000
Implementation plan						
1,2&3	R43	Undertake annual review against all performance measures	N/A	Review of all performance measures completed annually	Council	N/A
3	R44	Undertake a full review of the <i>Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019</i>	N/A	<i>Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019</i> reviewed within five years	Council and/or contractor	\$10,000

Reserve:

- Priority 1 - immediate (6-12 months) management activities.
- Priority 2 – medium term (1-3 years) management priorities.
- Priority 3 – long term (5 years) management priorities.

The intent of the Implementation Plan is to provide a guide to outcomes that could be achieved within the Reserve by Clarence City Council, contractors and/or volunteer groups within the period 2015-2019 if sufficient resources are available.

The Implementation Plan provides an indication of the level of funding required to achieve these outcomes.¹⁶ While it would be desirable to undertake all the recommended activities, it is acknowledged that this may not be possible due to resource constraints, and implementation will ultimately be guided by what is achievable with resources as they become available. Federal, State and Local Government grants programs may provide an opportunity to obtain resources to implement many of the recommendations contained within this report.

A review of progress against all performance measures should be undertaken annually during the period 2015-2019 to help prioritise available resources.

Recommendation 43: Review progress against all performance measures identified in the Implementation Plan annually.

17 FUTURE PRIORITIES

A review of the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019* should be undertaken in 2019. The purpose of this review should be to:

- assess progress towards achieving the objectives of the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019*;
- assess progress against all performance measures;
- analyse photo point data and all completed flora and fauna assessments to determine trends and implications for ongoing vegetation management; and
- determine ongoing management priorities for the Reserve for the next five years.

Recommendation 44: Review the Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019 in 2019 to assess progress and determine ongoing management priorities for the Reserve.

¹⁶ Funding details are based on an internal Council document which provides a detailed five year cost estimate for all planned activities. This has been developed primarily for Council budgetary processes and potential grant applications. Specific details may be sought by contacting Council's NRM Planner.

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APPENDIX 1: CONSERVATION SIGNIFICANCE OF THE RESERVE'S NATIVE FLORA AND FAUNA

The Bellerive-Howrah Coastal Reserve contains three native vegetation communities (AVK Environmental Management 2011a), one of which is listed as a threatened native vegetation community under the Tasmanian *Nature Conservation Act 2005*. These are summarised in Table A1.1.

Table A1.1: Conservation status of native vegetation communities occurring within the Reserve.

Community name	TASVEG code	Description	Conservation status
<i>Eucalyptus viminalis</i> – <i>Eucalyptus globulus</i> coastal forest and woodland	DVC	Coastal woodland community dominated by <i>Eucalyptus viminalis</i> (white gum) and some <i>Eucalyptus globulus</i> (blue gum) trees with a shrubby and grassy understorey. Typical subspecies include <i>Acacia longifolia</i> subsp. <i>sophorae</i> (coastal wattle), <i>Banksia marginata</i> (silver banksia), <i>Bursaria spinosa</i> (prickly box), <i>Dodonaea viscosa</i> (native hop) and <i>Myoporum insulare</i> (boobyalla). Occurs along the eastern half of Bellerive Beach and the majority of Howrah Beach.	Vulnerable
<i>Acacia longifolia</i> coastal scrub	SAC	Coastal dune vegetation dominated by <i>Acacia longifolia</i> subsp. <i>sophorae</i> (coastal wattle). Occurs in the dunes adjacent to the western end of Bellerive Beach and Howrah Beach.	Not threatened
<i>Allocasuarina verticillata</i> forest	NAV	Vegetation dominated by <i>Allocasuarina verticillata</i> (sheoak) trees. Dominant on Second Bluff.	Not threatened

Three flora species recorded in the Reserve are listed as threatened species under the Tasmanian *Threatened Species Protection Act 1995* (the TSP Act) and/or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). These are summarised in Table A1.2.

The Reserve also contains potential habitat for several threatened fauna species listed under the TSP and/or EPBC Acts, including several endangered species. These are summarised in Table A1.3.

Table A1.2: Flora species of conservation significance recorded within the Reserve.

Flora species	Common name	Conservation status ¹⁷	Habitat / Comments
<i>Juncus amabilis</i>	gentle rush	Rare	Grows in moist areas, generally where there is seepage (eg roadsides). Recorded within damp areas near the rear of the dunes along Bellerive and Howrah beaches.
<i>Lepidium hyssopifolium</i>	soft peppercress	Endangered ENDANGERED	Found within the growth suppression zone beneath large trees and is associated with bare ground. Recorded near the rear of the dunes adjacent to Wentworth Park.
<i>Lepidium pseudotasmanicum</i>	shade peppercress	Rare	Generally found on bare ground in grassland or grassy woodland. Recorded on Second Bluff.

Table A1.3: Fauna species of conservation significance for which suitable habitat exists within the Reserve.

Fauna species	Common name	Conservation status ⁹	Habitat / Comments
<i>Lathamus discolor</i>	swift parrot	Endangered ENDANGERED	Nesting habitat is hollows in mature eucalypts with stem diameter >70cm at breast height. Forages in mature <i>Eucalyptus globulus</i> and <i>E. ovata</i> trees. Potential nesting and foraging habitat exists within the Reserve.
<i>Tyto novaehollandiae</i> subsp. <i>castanops</i>	masked owl (Tasmanian)	Endangered	Inhabits dry eucalypt forest and woodland with old growth eucalypts containing hollows. Potential nesting habitat exists within the Reserve.

¹⁷ Lower case = TSP Act; UPPER CASE = EPBC Act

Fauna species	Common name	Conservation status⁹	Habitat / Comments
<i>Perameles gunnii</i>	eastern barred bandicoot	VULNERABLE	Inhabits grassy woodlands, native grasslands and mosaics of pasture and shrubby ground cover. Potential nesting and foraging habitat exists within the Reserve.

APPENDIX 2: UNANTICIPATED DISCOVERY PLAN

Unanticipated Discovery Plan

For proponents and consultants dealing with Aboriginal Heritage in Tasmania

This paper provides a Plan that should be followed when dealing with unanticipated discoveries of Aboriginal Cultural Heritage such as sites and objects. The plan provides guidance to project personnel so that they may meet their obligations with respect to Aboriginal heritage in accordance with the *Aboriginal Relics Act 1975* and the *Coroners Act 1995*.

The Unanticipated Discovery Plan is in two sections. The first section primarily explains mitigation strategies that should be employed when any Aboriginal Cultural Heritage sites or items are discovered excluding skeletal remains (burials), while the second process deals specifically with skeletal remains (burials).

Discovery of Cultural Heritage Items

- Step 1: Any person who believes they have uncovered Aboriginal Cultural Heritage material should notify all employees or contractors that are working in the immediate area that all earth disturbance works must cease immediately.
- Step 2: A temporary 'no-go' or buffer zone of at least 10m x 10m should be implemented to protect the suspected Aboriginal Cultural Heritage site or relics. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected Aboriginal Cultural Heritage relics have been assessed by a recognised Aboriginal Heritage Officer or Archaeologist.
- Step 3: Aboriginal Heritage Tasmania (AHT) in Hobart (ph 6233 6613) needs to be notified and consulted as soon as possible and informed of the discovery. AHT will then provide further advice in accordance with the *Aboriginal Relics Act 1975*.

Discovery of Skeletal Material

- Step 1: Call the Police immediately. Under no circumstances should the suspected skeletal remains be touched or disturbed. The area must now be considered a crime scene. It is a criminal offence to interfere with a crime scene.
- Step 2: Any person who believes they have uncovered skeletal material should notify all employees or contractors that are working in the immediate area that all earth disturbance works must cease immediately.
- Step 3: A temporary 'no-go' or buffer zone of at least 50m x 50m should be implemented to protect the suspected skeletal remains. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected skeletal remains have been assessed by the Police and or Coroner.
- Step 4: Should the skeletal remains be determined to be of Aboriginal origin, the Coroner will contact the Tasmanian Aboriginal Land and Sea Council (TALSC) to arrange for repatriation of the remains, as per the *Coroners Act 1995*.

Unanticipated Discovery Plan

**Guide to the most common sites of Aboriginal Significance****Stone Artefact Scatters**

Stone artefacts are the tangible evidence found in regard to past Aboriginal lifeways. Stone artefacts indicate areas that were used by Aboriginal People, either for camping, hunting or other activities such as the manufacture of stone tools. Archaeologists can also determine the duration a site may have been occupied, the amount of times that the site may have been occupied, and the number of people that the area may have supported at any given time.

Some stone artefacts are the result of Aboriginal People fracturing or 'flaking' fine-grained rocks to produce sharp cutting or scraping implements. These were then used, for example, for cutting up animals and then scraping the hides. Volcanic rocks such as basalt were flaked and then ground down to form axes for a number of chopping and cutting tasks. The results of such activities can be seen in the archaeological record (i.e. scatters) in the form of modified stones such as cores, retouched flakes, hammerstones and flaked pieces. From these scatters, by understanding site density and frequency patterns, inferences can be made in relation to past Aboriginal lifeways.

Shell Middens

Shell middens by definition are prehistoric refuse pits. They are the leftover waste of resources exploited which formed the basis of Aboriginal diet. Midden sites can range in size from large mounds to small scatters of shell. Middens usually also contain as well as shell, the remains of animals exploited for food as well as artefacts of stone, bone and shell. These sites are usually found near waterways and coastal areas.

Rockshelters

Rockshelters can either be shelters which contain archaeological deposits from living floors or art rock shelters, and may occur in any area of rocky terrain. Sediments on the floor of the rockshelter can contain preserved stratified deposits of archaeological material. Art types found in rockshelters can vary greatly. It can be in the form of painting, stencils of body parts, tools and equipment, or engravings. Style variations in painting can cover animal or human figurines, supernatural beings, and geometric patterns. Engravings can have similar variations as they can depict tools, humans, human parts, animals and birds and their tracks, geometric patterns and supernatural beings. Pecking is also a form of engraving.

Quarries or Stone Procurement Sites

Quarry sites occur where outliers of suitable tool-making stone appear. A quarry can be generally recognised by evidence of human manipulation and extraction of suitable material and the debris left by the processing of the suitable material. Some quarries can cover vast areas with extremely high amounts of lithic discard. Ochre or pigment was also quarried.

Burials

Burials can occur anywhere, though they are generally found close to areas where there was a high population concentration. Burials can occur where there are soft sediments such as sand hills, they can be found in caves and rockshelters and sometimes they can be associated with hollow trees.

APPENDIX 3: SUMMARY OF STAKEHOLDER CONSULTATION

During July - August 2014, identified stakeholders were invited to provide comments relevant to the development of the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019*.

A public meeting and community 'walk and talk' session was facilitated by Council and Tasflora on 10 August 2014. The purpose of the session was to seek input from local residents, the Bellerive-Howrah Coastcare Group and other relevant stakeholders on values and management issues associated with the Reserve. Over 20 stakeholders attended the meeting, including representatives from the Bellerive-Howrah Coastcare Group, the Southern Coastcare Association of Tasmania (SCAT) and TasWater.

Key issues raised during the walk and talk included:

- the natural environment should be maintained and enhanced for visual amenity and to provide habitat for native birds and animals;
- tree removal along the foreshore means there is no shade on Bellerive Beach;
- interpretation signs are important, particularly to educate users why it is important to stay off the dunes;
- dune stability and erosion issues;
- weed control is needed in front of Howrah Primary School.
- the red poles along the beach are very unattractive;
- some pine trees amongst Bellerive Beach dunes should be retained to maintain the cultural landscape;
- additional seating is needed for people to sit and enjoy the views;
- several improvements are required to improve the visual and recreational amenity around Little Howrah Beach;
- concerns over the potential impact of development near Blundstone Arena on the Reserve; and
- concern that car parking is generally unavailable for Reserve users when a sporting event is on at Blundstone Arena.

A feedback form seeking input to the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019* was also mailed to local residents and stakeholders. Written responses were received from 32 stakeholders, and are summarised in Table A3.1.

The draft *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019* was released for community consultation in December 2014. A *Bellerive-Howrah Coastal Reserve* Report Card was developed as a key tool in encouraging stakeholder feedback on the draft plan and was mailed out to residents and other interested stakeholders. Thirteen submissions on the draft plan were received during the consultation period. A summary of the issues raised in these

Table A3.1: Summary of written responses received during initial stakeholder consultation on the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019*.

Management issue	No. of respondents
Weed management	
Undertake weed control activities	2
Retain mature pine trees along Bellerive Beach & dunes for shade	3
Undertake staged removal of pines at the rear of Bellerive dunes	1
Remove blackberries in front of Howrah Primary School	2
Engage contractors to control blue periwinkle and other weeds on steep slopes on second bluff	1
Regeneration and revegetation	
Plant trees to screen Blundstone Arena	3
Plant more native trees for shade along Bellerive Beach	2
Plant more trees for shade at Little Howrah Beach	1
Replacement planting should be undertaken if mature trees are removed	1
Revegetate the dunes where storm water pipe work has been undertaken	1
Encourage undergrowth for bandicoots	2
Replace ugly trees and shrubs above Little Howrah beach and near car park with low native plants	1
Keep as much natural vegetation as possible	2
Plant some low vegetation around the frog habitat at the end of High Street to prevent it from drying out	1
Bellerive-Howrah Coastcare Group intends to continue revegetation activities on Second Bluff	1
Don't plant too many trees to block the views of the Derwent	1
Coastal erosion and inundation	1
The stormwater outfall near Beach Street is contributing to coastal erosion and jeopardising the dunes	1
Rehabilitate the dunes (restore height and revegetate) where storm water works have been undertaken at Lower River Street	1
Restore the dune to the west of the rebuilt dune at Beach Street to its original height when suitable sand becomes available	1
Reserve entrances	
Improve the area near the car park entrance to Little Howrah beach with a path, planting and seating	1
Continued monitoring of access points should be a priority	1

Management issue	No. of respondents
Tracks and trails	
Signage should be consolidated in style, content & location and refer to the fact dogs are prohibited in the dunes and vehicles are not permitted to drive on the beach & dunes	1
Widen the footpath along the beach between Little Howrah Beach & Howrah Point (boardwalk?)	1
Remove vegetation and widen track on Second Bluff to improve safety	1
Can we have small but frequent paths to the beach	1
The number of beach access tracks is adequate	1
The east-west track along the dune crest should not be reestablished	1
Close small track access to Howrah beach	1
Trial a ramp (eg at Little River Street entrance) as an alternative to steps at Bellerive Beach to facilitate access by prams, windsurfers etc	1
Need a safe walking/cycling access around Howrah Point	1
Build a promenade from Bellerive waterfront to Howrah	1
Infrastructure	
Track marker poles along the beach are too conspicuous	1
More general rubbish bins are needed	2
Install more seats along the bike & walking paths and along both beaches	3
Install some covered, waterproof day shelters at Bellerive near fish and chip shop	1
Council's plans in relation to upgrading the storm water system should be included in the RAP	1
Install a toilet block at Wentworth Street end of Bellerive Beach	1
Fencing on the second bluff is very poor (eg star pickets & fencing need repair)	1
Fence the western side of the Lower River Street accessway immediately	1
Fence the eastern side of the Lower River Street accessway as part of the proposed dune rehabilitation in May 2015	1
Remove wooden and mesh fence on the bluff as the track behind has been blocked off	1
Install a dog waste dispenser and bin at the beach end of each access track	1
Install dog waste bins at the northern end of each beach access track	1
Install a dog waste bin on the second Bluff	1

Management issue	No. of respondents
Community awareness and education	
Install interpretation signs about why users need to stay off the dunes	3
Install interpretation signs about the natural environment	2
Council should have a 'shaming' policy in relation to unauthorised removal of flora from the foreshore (eg to improve views)	1
Other Reserve management issues	
Maintain the existing natural area	1
Bellerive Bluff should be opened up – remove vegetation and make it more park like and a safe, open area	2
Waste material and fallen trees/shrubs have not been removed from Bellerive Bluff / a general clean up should be undertaken on Bellerive Bluff	3
Bellerive Bluff is often used as a toilet	1
A residential pipe under the track at Bellerive Bluff should terminate more appropriately	1
Consider opening up some areas of native vegetation so the river can be seen from the walking track	1
Leave the beaches, second bluff and dunes alone – don't build anything that isn't needed	1
Continue with the existing good maintenance regime	1
Undertake sensitive dune stabilisation activities	1
Remove the stormwater outfall at the eastern end of Bellerive Beach (visually unattractive and encourages dune access)	1
The RAP should address management of the stormwater outfall in front of Howrah Primary School	1
Tidy up the area behind Gunyah Street	1
Make pipes on the beach more visible to nighttime users (eg reflective markers)	1
Turn the wet area below Howrah Primary School into a conservation area for birds and frogs and plant natives	1
Remove the brick fence at Little Howrah beach to allow public access	1
Remove unwanted vegetation adjacent to seawall at Howrah Point end of Little Howrah Beach	1
Do something about the pipes along both beaches	1
Vegetation removed/disturbed for the bike track has just been left beside the track and is unsightly and a fire hazard	1
There are wasp nests of the second bluff point	1

Management issue	No. of respondents
Vigilance is required to prevent fire and vandalisms	1
Please implement the final plan	1
Please have regard for the hard work done by the Coastcare Group	2
Do not alter the dog rules on the beaches	
Any work on the walking tracks and dunes should comply with the State Coastal Policy	1
Build a sea wall now behind the dunes between Bellerive Bluff and Howrah Bluff in anticipation of future sea level rise	1
Natural building materials should be used for any construction (eg rocks at Howrah end of Bellerive Beach)	1
Consider a jetty off Little Howrah Beach	1
Management issues outside the Reserve's boundary/outside the scope of the RAP	
No further intrusion on Bellerive Park for sporting interests	1
Do not move the exercise equipment in Bellerive Park	1
Consider a coffee shop near foreshore near Blundstone Arena & Bellerive Beach	1
The Bellerive Park Master Plan places car parking ahead of all other options	1
Link commercial operators (eg cafe, icecream shop, water equipment & bike hire) with the beach and bike path	1
More community events on the beaches	1
Parking for event patrons should be restricted and/or the 2 hr limit enforced in car parks near Blundstone Arena to allow Reserve users unrestricted access to the Reserve	1
Remove the unsightly light towers from Blundstone Arena	1
More paths and improved gardens in the Wentworth Park area	1
Can Council acquire the vacant blocks / house beside the Little Howrah beach reserve to top up views	1
Can Council purchase some land to enable better access to Howrah Point	1
Reduce speed limit along Howrah Road to 50 km/h	1
Remove ugly overhead power poles along Howrah Road	1
Concern over failure of "whale" pipe contract	1
Concern over a potential accident occurring as cyclists are not using bells to forewarn pedestrians they are coming	1

submissions is provided in Table A3.2.

Where possible, all relevant community feedback has been considered in the development of the *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019*. However some issues identified during the consultation process are beyond the scope of this plan or pertain to management issues outside the Reserve. These issues have been noted by Council and will be addressed through other processes where feasible.

Table A3.2: Summary of written responses received on the draft *Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019*.

Issue	Comment
Site values (Section 4)	
There are several omissions from the list of fauna: namely bats and water rats.	The plan will be updated to include these species in section 4.2.
Where are the areas identified as "informal link" (page 11)? Is the area bordering 17-23 Nankoor Crescent one of these areas? In the last 1-2 years have noticed activity of possums, bandicoots and an owl.	Section 4.6 identifies that Tranmere Coastal Reserve and Waverley Flora Park provide indirect linkages to the Reserve for the movement of flora and fauna. While the small area of vegetation bordering 17-23 Nankoor Crescent may also provide a minor indirect link, it is not recommended that this be specifically mentioned in the plan due to its very small size.
There has been a reduction of understorey around Wentworth Park, and when the hillside of Howrah is viewed from the coast there has been removal of a great deal of vegetation in the residential area and suitable link areas are becoming rarer.	No change to plan required. Wentworth Park is outside the scope of the plan. Section 4.6 notes that linkages should be preserved and strengthened through strategic land use planning.
Weed management (Section 6)	
Exotic pigface species <i>Carpobrotus edulis</i> and <i>C. aequilaterus</i> on the western end of Bellerive Beach and elsewhere should be removed and replaced with <i>C. rossii</i>	Section 6 could include a recommendation for control of these species and replacement planting with <i>C. rossii</i> .
Have attempts been made to engage Howrah Primary School in taking an active role in caring for "their" piece of foreshore reserve?	No change to plan required. All the local schools have a long history of caring for the dunes.
If the pine tree is retained on Bellerive Beach, particular care should be taken to prevent the establishment of offspring from this large tree	No change to plan required. Section 2 already notes that control of new pine seedlings is a priority.
There is little benefit in retaining the pine tree on Bellerive Beach. It provides shade for at most a few people when on a warm day there are hundreds on the beach. People can bring their own shade devices. The tree is to me is an imposition on the otherwise native-looking beach.	No change to plan recommended. The plan currently notes that this tree also plays an important dune stabilisation role.
Fully support recommendation to retain the pine tree on Bellerive Beach.	No change to plan required.
A second pine tree located about 20 metres	Section 6 will recommend that this tree be

Issue	Comment
<p>east of the stormwater works at River Street should also be retained for its shade value.</p>	retained.
<p>The Bellerive-Howrah Coastcare Group, in consultation with Council, has identified a number of smaller mature radiata pine trees (some of which are dying) at the rear of the Bellerive dunes which could be removed immediately. The removal of those trees will provide space for the establishment of native trees while not making a major visual impact in the area.</p>	Section 6.3 will be amended to note this.
<p>All cut pine material should be removed from the dunes rather than being burnt.</p>	<p>Section 6.3 will be amended to recommend that all cut pine material should be removed from the dunes.</p>
<p>Appendix 4 should include control techniques for weeds that have been initially controlled by the Bellerive-Howrah Coastcare group but may return, or weeds that are commonly found germinating in the Reserve from neighbouring gardens. These include bridal creeper, fennel, lupin, tree lucerne, sweet pittosporum, cotoneaster and gazania.</p>	<p>Appendix 4 will be updated to include these weed species.</p>
Regeneration and revegetation (Section 7)	
<p>More banksias and dodonaeas should be planted for dune stabilisation, and <i>Carpobrotus rossii</i> on the foredunes.</p>	<p>These native species shall be noted as suitable species for revegetation activities in the dunes.</p>
<p>It is probably unrealistic to expect eucalypts to grow successfully enough to provide shade close to the foredune. There are no large eucalypts that have naturally established in a position to provide significant shade onto the beach</p>	<p>No change to plan recommended. Planting of eucalypts is recommended to enhance swift parrot habitat and improve visual amenity, as well as providing potential shade along the walking tracks and beaches.</p>
<p>Maintenance of "visual amenity" (refer recommendation 10) should not mean cultivation of park-like gardens</p>	<p>No change to plan required. As noted in the supporting text, the intent of this recommendation is to ensure revegetation areas are well maintained in high pedestrian traffic areas through regular weeding, topping up of mulch and removal of dead plants.</p>
<p>There is substantial loss of sand from the unstabilised dune area at the end of Bellerive Beach. The sand blows onto the adjacent streets. Several low brush fences or a cover of mulch may prevent excessive</p>	<p>Section 7.2 currently notes that revegetation and dune stabilisation is planned in this area following pipe installation. A recommendation could be included to erect brush fences as an</p>

Issue	Comment
<p>sand loss.</p> <p>Restoration of the dune to its original height should be included as a priority action in addition to dune revegetation and stabilisation.</p> <p>Damaged areas in the dunes around H1 should be restored to a natural state with appropriate native trees, shrubs and groundcovers, rather than demonstration cottage gardens.</p>	<p>interim measure to minimise sand blowing onto adjacent streets.</p> <p>Recommendation will be amended to read: <u>"Restore original dune height and undertake revegetation and dune stabilisation immediately following the installation of the replacement stormwater outfall pipe on Bellerive Beach"</u>.</p> <p>Demonstration native cottage gardens are proposed in existing grassy and/or gravel areas around the car park at H1 to improve visual amenity. No cottage gardens are proposed within the dune system. Table 1 will be updated to emphasise that any revegetation in the dunes around H1 should be with appropriate native species.</p>
Fauna habitat management (Section 8)	
<p>Recommendation should be amended to include cats.</p>	<p>Recommendation will be amended to read: "Install signage at eye height at all main Reserve entrances to clearly inform dog walkers of dog restrictions in the Reserve and help owners understand that uncontrolled dogs <u>and cats</u> in the sand dunes can harass or kill native wildlife".</p>
<p>Is there evidence that dogs significantly harass and kill fauna?</p>	<p>No change to plan required. Local residents have observed dogs chasing wildlife, and this is recognised as a dune management issue at many beach locations in Tasmania and on the mainland.</p>
<p>Most ground-based fauna are nocturnal. This makes them vulnerable to cats more than dogs. I have often seen cats prowling in the evening through the dunes.</p>	<p>Section 8 notes that both cats and dogs have the potential to harass or kill native wildlife.</p>
<p>Cats entering the dunes to hunt wildlife is part of a wider problem of cats not confined to their own properties and causing a nuisance in the neighbourhood.</p>	<p>Section 8 notes that cats have the potential to harass or kill native wildlife, and that Council continues to encourage local residents to meet their obligations under the <i>Cat Management Act 2009</i>. A recommendation to develop and distribute a cat management brochure for local residents living near the dunes will be included.</p>
<p>Some active management of little penguin</p>	<p>Section 8 will be updated to include a</p>

Issue	Comment
nesting sites should be considered – eg concrete nests	recommendation to install artificial nesting burrows with appropriate plantings of dense shrubs around as burrow protectors at suitable locations within the Reserve.
Consideration could be made to encourage bats by providing nesting boxes.	A recommendation for this could be included in Section 8, although this is not considered to be a priority.
Consideration should be made for providing suitable protective habitat for water rats to give them greater protection from dogs, which instinctively will seek them out.	No change to plan required. Protecting the vegetation on the dunes from dogs and human impacts will help maintain habitat values for this species.
Vegetation and fauna monitoring (Section 9)	
Fauna surveys should include bats, water rats and little penguins, as well as the many small mammals such as antechinus, bandicoots etc.	Mammal, bird, reptile and invertebrate surveys are recommended in 2015 and 2019. Section 9 will be updated to make specific note of bat and little penguin surveys due to recent observations and/or interest expressed by local zoologists and ornithologists in surveying these creatures.
Reserve Entrances (Section 10)	
The Bellerive-Howrah Coastcare Group is attempting to establish appropriate native groundcovers at Reserve entrances so that slashing is not necessary. In the past slashing has often destroyed native plants. Mulching and establishing native groundcovers is our preferred approach.	Slashing of grasses is required at entrances that have grassy areas adjacent to them (ie H1, H2, LH1). Table 2 will be updated to note that slashing should be avoided in areas where native vegetation is present or revegetation activities have been undertaken.
Tracks and trails (Section 11)	
Is pedestrian access to the dunes especially damaging? To appreciate the flora of the dunes it is necessary to walk along them. There has been an informal track along the dunes for more than 50 years. What has been the consequence of this? Where else in Tasmania is access to dunes prohibited? Is there a legal precedent for banning human access to a reserve?	Work has already been undertaken to close the track running along the length of the dunes. Closing dunes to dogs and pedestrians is a major dune management technique already in place with fines attached along urban dune systems in Perth Region and other capital cities. Council staff believe that Bellerive and Howrah Beaches have reached a level of use that warrants serious consideration to halt the trampling of native vegetation and prevent dogs accessing the dunes.
The proposed signage (recommendations 22 and 23) is intrusive and is made redundant very quickly through degradation and vandalism. A better solution would be to	While signage may be perceived as intrusive, some signage is necessary to provide information to users who don't carry smart phones. Section 11 will be updated to note that smart phone QR




Issue	Comment
<p>have information available via smartphone.</p> <p>Recommendation should be amended to include controlling beach access</p>	<p>codes (or similar) should be used where possible in conjunction with signage.</p> <p>Recommendation will be amended to read: "Improve the Reserve's existing track network by installing new educational signage, <u>controlling and</u> improving beach access and making improvements to the track network on Second Bluff".</p>
<p>The seawalk promenade should not be constructed (comments received included there is no need for it, it will detract from the natural nature of the dunes, dune stability issues, it will be used by joggers of beach users, the views from the beach are more than adequate).</p>	<p>The seawalk promenade is no longer included in the Bellerive Beach Park Master Plan (as per Council meeting of 12 January 2015). All references to this will be removed from the final RAP.</p>
<p>Consider a ramped access at one of the access points towards the eastern end on Bellerive Beach as well as at B1</p>	<p>This is not considered a priority within the next five years as a new ramped access is proposed at B1. However, this issue should be reconsidered when the RAP is reviewed in 2019.</p>
<p>Do not consider that sight lines are insufficient for the traffic utilising the main track. The track is used by pedestrians and cyclists travelling at low speed, there are no apparent safety issues. Council staff and contractors have been over zealous in cutting vegetation in other areas and must be closely supervised if any removal of vegetation is considered necessary. Branches overhanging the track may occasionally require trimming to a height of two metres. No other removal of vegetation is needed. There is no need to prune branches to three metres.</p>	<p>Several submissions received during the initial consultation process raised concerns regarding sight lines and/or the quantity of unsightly dead vegetation adjacent to the walking track on Second Bluff. In contrast, concerns have been raised since community consultation that some dead trees and limbs within 3m of the track may provide habitat for native animals, particularly where these are overgrown with native <i>Rhagodia</i> and <i>Tetragonia</i>. With these comments in mind, the following changes to Table 3 of the plan are proposed:</p> <ul style="list-style-type: none"> • Dead trees and limbs that have the potential to provide fauna habitat should only be removed where they have been assessed as hazardous to users. • Lower branches are to be selectively pruned no higher than 2.5m (to allow ample head room for taller pedestrians).
<p>Prior to any development of tracks on Second Bluff, an assessment of Aboriginal heritage values and consultation with the Coastcare Group should occur. Any development in this area must protect the</p>	<p>These issues will be noted in Table 3.</p>




Issue	Comment
<p>native vegetation.</p> <p>The installation of the proposed fencing along the southern side of the main track between the Wentworth St cul-de-sac and the bend adjacent to 6 Wentworth St is supported provided that the vegetation along the track is not removed.</p>	<p>Avoidance of all native plants may not be possible depending on the final layout of the proposed fence. However, Table 3 will be amended to note that the layout and installation of the new fence should aim to minimise removal of native vegetation.</p>
<p>The proposed intertidal walkway between Little Howrah Beach and the Tranmere Coastal Reserve would not be feasible as properties own to high water mark.</p>	<p>No change to plan recommended. The proposed feasibility study will determine whether or not the proposal is feasible. These comments should be considered by the feasibility study.</p>
<p>Local residents would like to be consulted when Council conducts the feasibility study in an intertidal walkway between Little Howrah Beach and the Tranmere Coastal Reserve.</p>	<p>No change to plan recommended. Section 11 notes that this will be required as part of the feasibility study process.</p>
<p>Strongly opposed to an intertidal boardwalk or pathway between Little Howrah Beach and the Tranmere Coastal Reserve as this would adversely affect our privacy and security.</p>	<p>No change to plan recommended. Although important feedback, this comment is not necessarily representative of the broader user community. Section 11 notes that liaison with local residents to gauge views will be undertaken as part of the feasibility study process. These comments should be considered by the feasibility study.</p>
<p>The south facing nature of this foreshore means it subject to strong coastal wave action and swells. The Council's own planning scheme shows the area as subject to sea level rise and storm surge. In addition any construction below high water mark would have a significant impact on the coastal wildlife and ecosystems.</p>	<p>No change to plan recommended. The proposed feasibility study will determine whether or not the proposal is feasible. These comments should be considered by the feasibility study.</p>
<p>Can a path be constructed between Howrah and Little Howrah Beaches – the area is rocky and not easily accessible by the elderly</p>	<p>Table 3 in Section 11 will be updated to include a recommendation to improve access between Howrah and Little Howrah Beaches</p>
<p>Over the years there have been a number of instances where dune, landscape and path improvements have been carried out. It is apparent to me that the Council is pretty proactive in doing improvements but rates poorly in carrying out maintenance. Why make a path and paint lines and then doing nothing to maintain. It should save the</p>	<p>No change to plan recommended. This feedback should be forwarded to relevant Council staff.</p>




Issue	Comment
<p>money in the first place.</p> <p>Infrastructure (Section 12)</p> <p>To make the beach track markers less conspicuous would defeat the purpose of the markers. Alternatives may include changing the colours on the poles, TRACK could be painted vertically on the poles and reflective markers could be installed at the access points to assist night users of the beach.</p> <p>Covered seating should be established in Bellerive Beach Park near the car park. Walkers should have some shade/shelter from rain/wind in both Bellerive and Howrah Park areas.</p> <p>Install a workout park at the Howrah end of the walking track (maybe near Wentworth Park) and a bike street track at Wentworth Park, like the one at Drew point in Margate.</p>	<p>Feedback received during initial community consultation was that the track marker poles along Bellerive Beach are too conspicuous and detract from the natural setting of the beach. The plan's current recommendation will be amended to recommend that the track marker poles be moved further back into the dunes <u>or</u> painted a less obvious colour. The suggestion to place reflective markers on each pole to assist night users could be adopted.</p> <p>No change to plan recommended. The Bellerive Beach Park Master Plan adopted by Council includes covered seating in this area. The Wentworth Park area (Howrah) is outside the scope of this plan. However, this feedback should be forwarded to relevant Council staff for consideration.</p> <p>No change to plan recommended. The Wentworth Park area is outside the scope of this plan. However, this feedback should be forwarded to relevant Council staff for consideration.</p>
<p>Coastal erosion and inundation (Section 14)</p> <p>Smartphone access would be preferable to signage about TASMARC monitoring</p>	<p>Recommendation 40 could be changed to recommend installation of a QR code at the TASMARC monitoring site rather than a sign</p>
<p>Community participation and awareness (Section 15)</p> <p>Interpretative signage should also address historic and cultural use of the area.</p> <p>Community education is needed for the people who use the beach on a hot day and leave all their rubbish behind: bottles, food containers, cigarette butts etc.</p>	<p>Section 15 will be amended to note these issues for inclusion on proposed interpretation signage.</p> <p>Table 4 will be updated to include beach litter as an issue requiring community education and awareness.</p>
<p>Other comments</p> <p>People riding bikes not for recreation but at speed on pathways is a danger to pedestrians. What is the Council doing to</p>	<p>No change to plan recommended. This issue should be forwarded to relevant Council staff for consideration.</p>




Issue	Comment
mitigate these risks?	




APPENDIX 4: WEED SPECIES PRESENT AND RECOMMENDED CONTROL TECHNIQUES

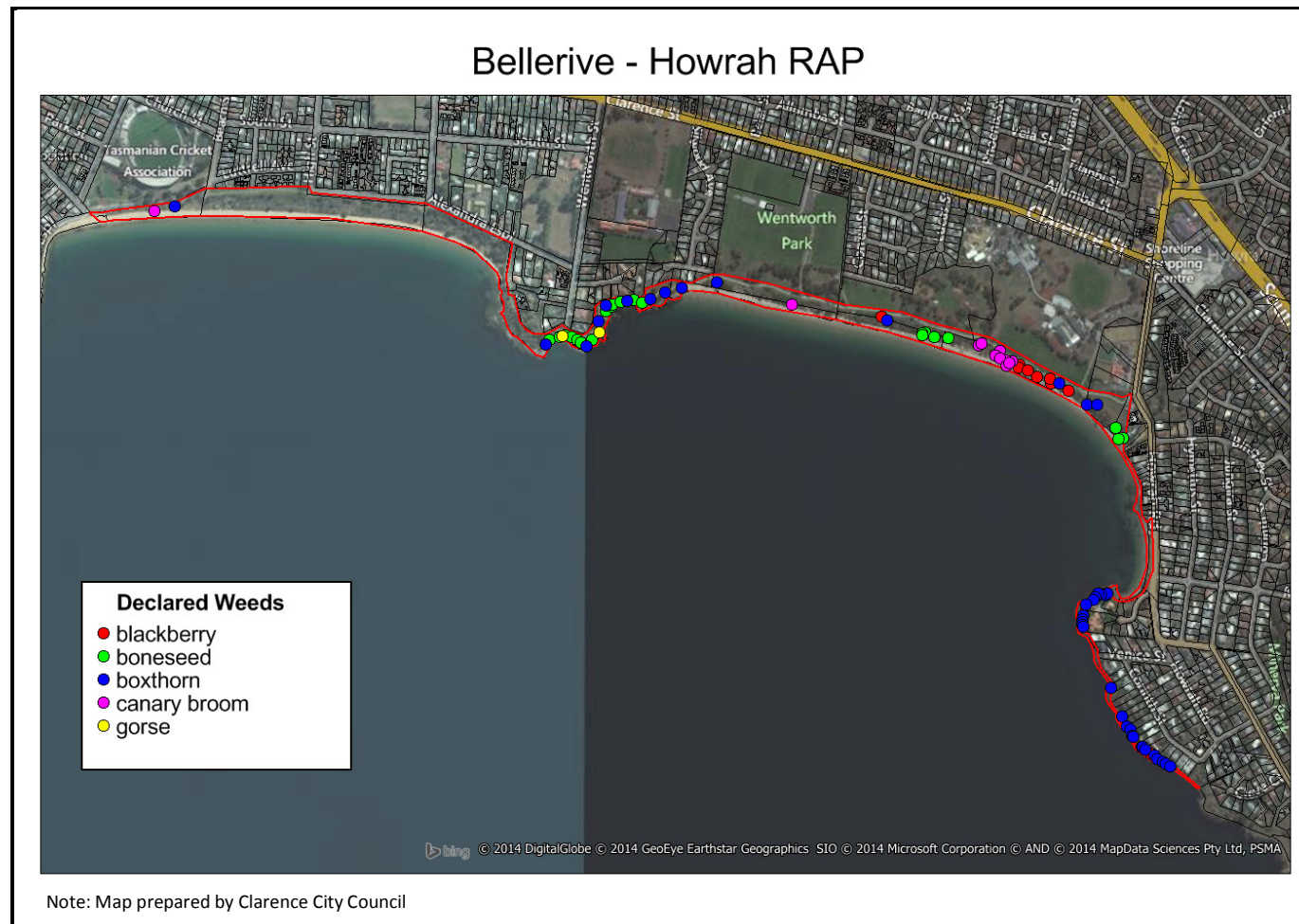
Common name	Species	Status	Picture	Recommended control technique
<u>DECLARED WEEDS</u>				
African boxthorn	<i>Lycium ferocissimum</i>	Declared WONS		Cut and paste or spot spray. Care should be taken to avoid the spines on this species as they can produce painful puncture wounds and/or an allergic reaction.
Blackberry	<i>Rubus fruticosus</i> aggregate	Declared WONS		Large stands - spot spray larger using an appropriate herbicide (as per the DPIPWE Control Guide) in non-fruiting periods Isolated patches - spot spray or cut and paste
Boneseed	<i>Chrysanthemoides monilifera</i>	Declared WONS		Hand pull seedlings. Cut and paste larger plants. Fruit should be bagged and disposed of responsibly.

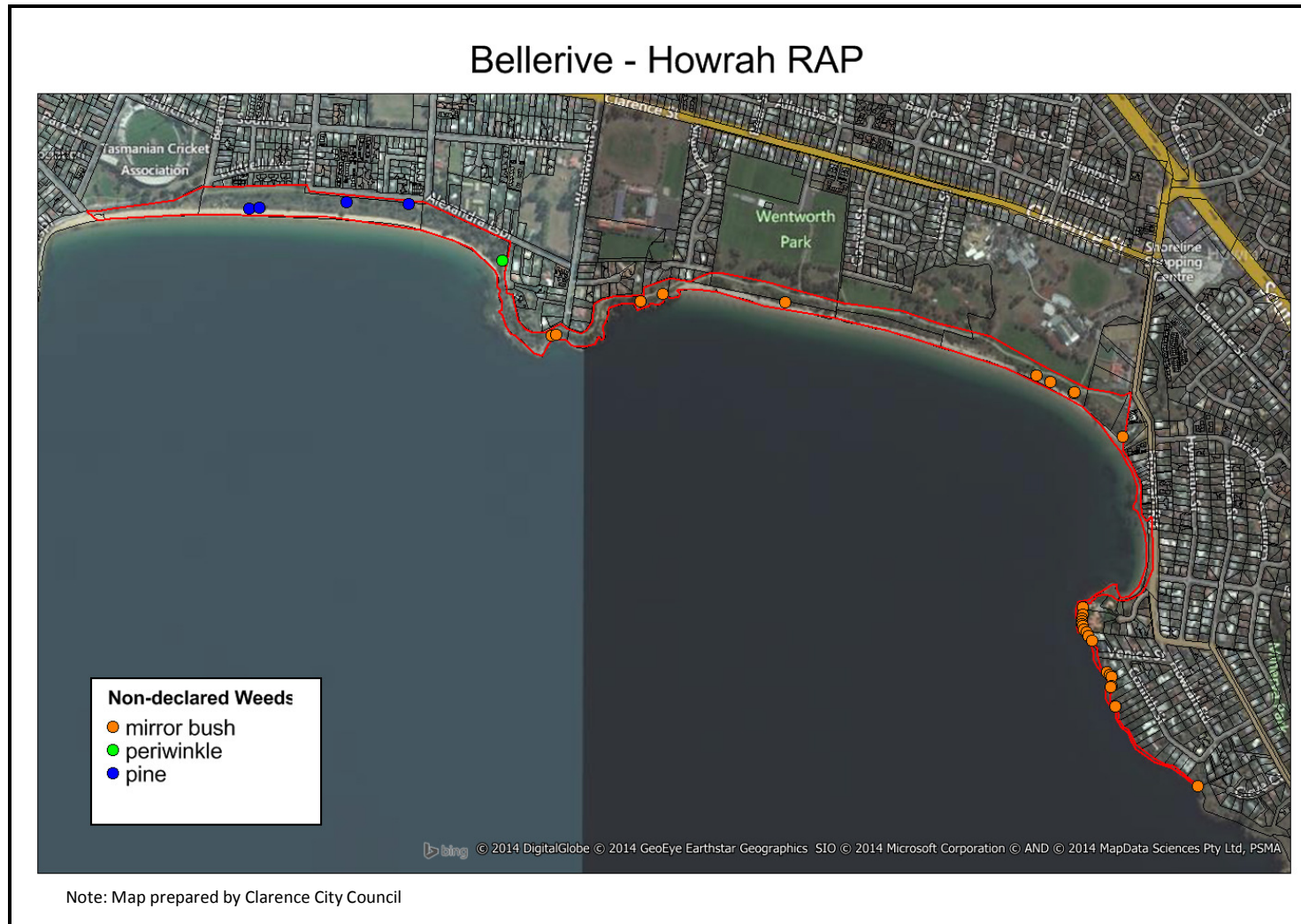
Common name	Species	Status	Picture	Recommended control technique
Bridal creeper	<i>Asparagus asparagoides</i>	Declared WONS	 <p>Source: http://stca.tas.gov.au/</p>	Hand dig isolated individuals (remove all root material) or spot spray.
Canary (Montpellier) broom	<i>Genista monspessulana</i>	Declared WONS		Hand pull seedlings. Cut and paste larger plants. Spot spraying may be appropriate for larger infestations.
Fennel	<i>Foeniculum vulgare</i>	Declared		Cut and paste or spot spray.

Common name	Species	Status	Picture	Recommended control technique
Gorse	<i>Ulex europaeus</i>	Declared WONS		Hand pull small plants. Cut and paste larger plants. Spot spraying may be appropriate for larger infestations.
<u>OTHER ENVIRONMENTAL WEEDS</u>				
Blue periwinkle	<i>Vinca major</i>			Brushcut followed by spot spraying. Repeated follow-up spot spraying required.
Cotoneaster	<i>Cotoneaster</i> sp.			Hand pull seedlings. Cut and paste larger plants.

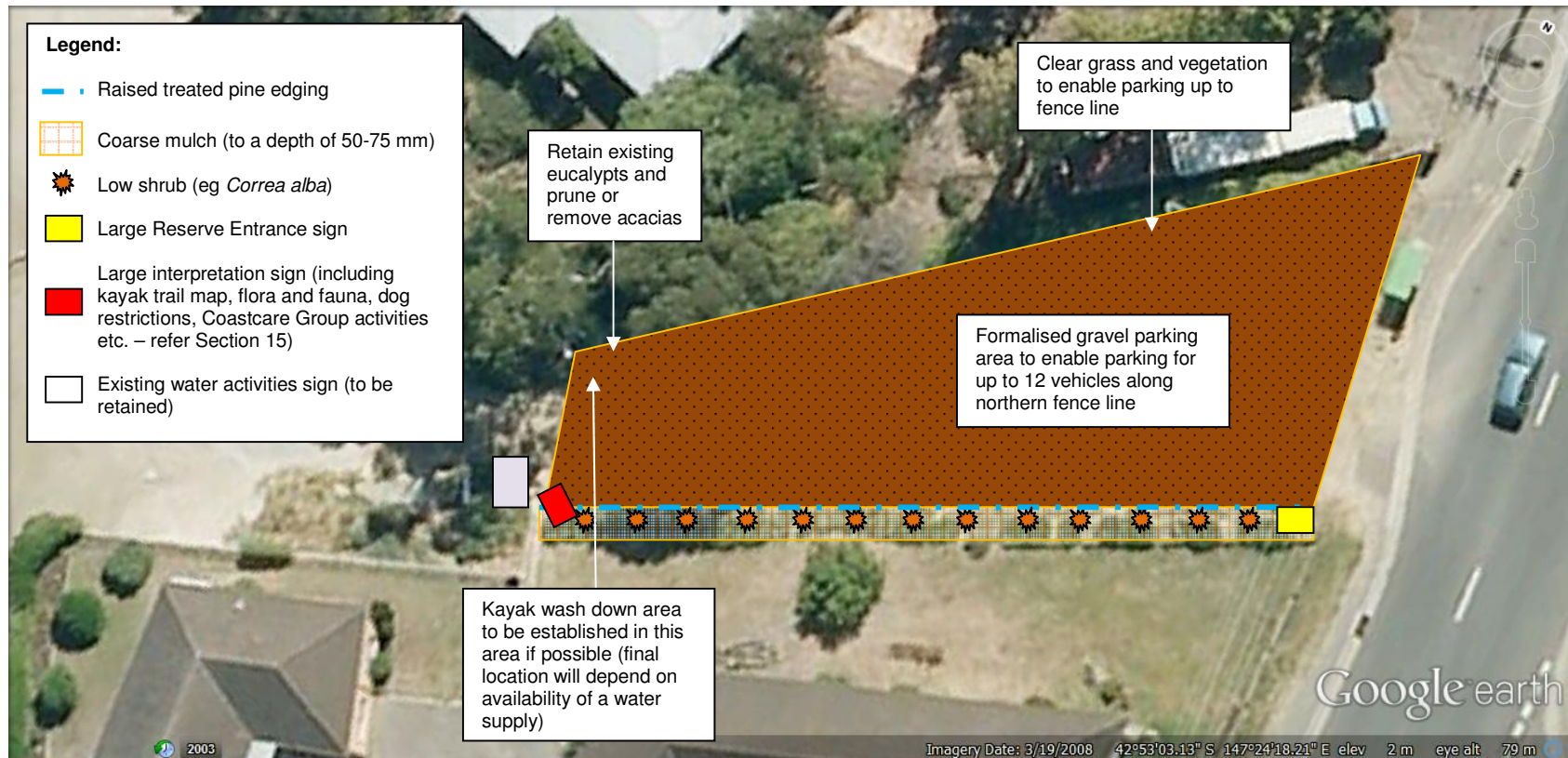
Common name	Species	Status	Picture	Recommended control technique
Gazania	<i>Gazania</i> sp.			Hand pull, dig or spot spray.
Lupin	<i>Lupinus</i> sp.			Hand pull seedlings. Cut and paste larger plants.
Mirror bush	<i>Coprosma repens</i>			Hand pull seedlings. Cut and paste larger plants.

Common name	Species	Status	Picture	Recommended control technique
Radiata pine	<i>Pinus radiata</i>			Hand pull small plants. Cut and paste larger plants (mature trees should be removed by a qualified arborist).
Sweet pittosporum	<i>Pittosporum undulatum</i>			Hand pull small plants. Cut and paste larger plants.
Tree lucerne	<i>Chamaecytisus palmensis</i>			Hand pull seedlings. Cut and paste larger plants.

APPENDIX 5: LOCATION OF DECLARED WEEDS

APPENDIX 6: LOCATION OF NON-DECLARED ENVIRONMENTAL WEEDS

APPENDIX 7: CONCEPT LANDSCAPE PLAN FOR RESERVE ENTRANCE H3



Note: Aerial image obtained from Google Earth.

APPENDIX 8: EXCERPT FROM DRAFT CLARENCE CITY COUNCIL BEACH MONITORING REPORT 2013-2014¹⁸

Bellerive

Bellerive Beach showed a slight recession trend when compared to the 2013 shoreline data averaging 34 cm the length of the beach. There was a high degree of variability ranging from 2.4 metres growth to 2.9 metres recession (Figure 20). The results indicate that the shoreline movement at Bellerive is far more variable than most other beaches surveyed with beach works, modification of the foredune, pedestrian access and consistent collapse of the 2011 erosion scarp likely causes (Figure 21).

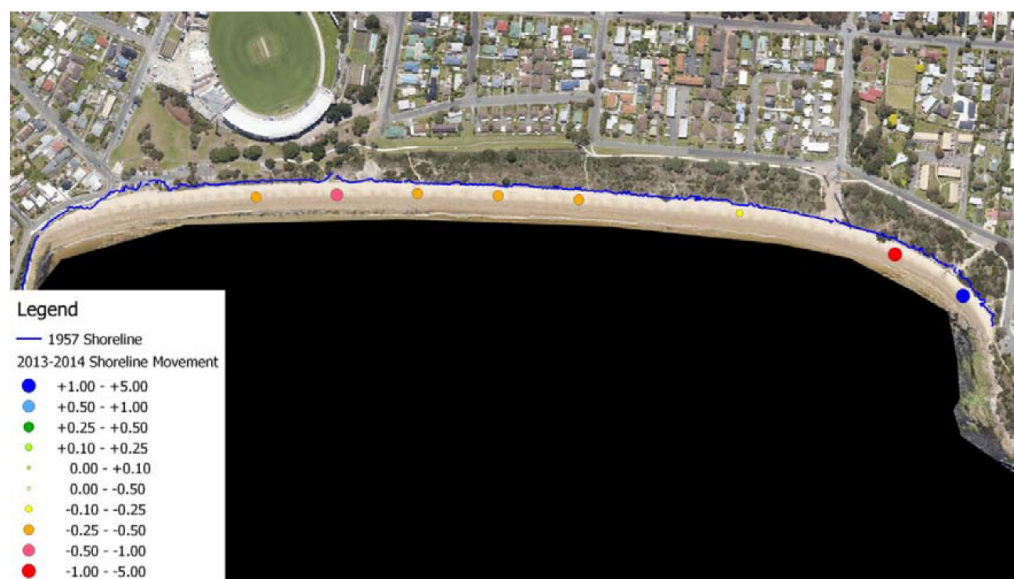


Figure 20 – Net shoreline recession of Bellerive Beach, 2013-2014.

Bellerive and Howrah beaches are generally more susceptible to erosion caused by storm tide events than the beaches of Storm and Frederick Henry Bays. This is due to the large water discharge of the Derwent River, which can elevate the abnormally high storm tides and when combined with the associated swell and wind cause significant erosion .

It is recommended that a detailed ground control monitoring and control network be established and that both Bellerive and Howrah beaches be used as the control sites for the 2015 survey.

¹⁸ Provided by Matt Dell, University of Tasmania (principal author and researcher).

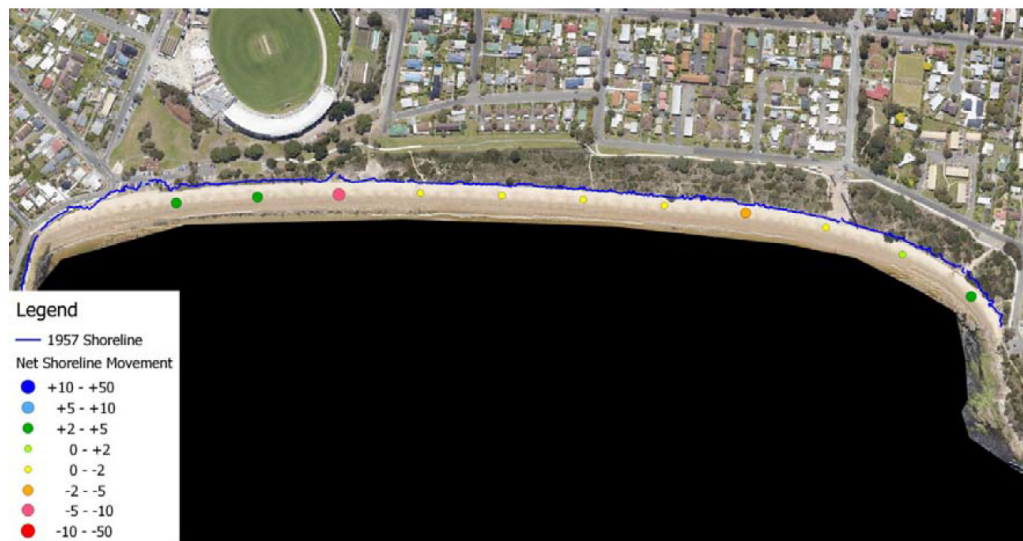


Figure 21 – Net shoreline recession at Bellerive Beach, 1957-2014.

Howrah

Howrah Beach showed a slight recovery trend on the Western two thirds of the beach compared with the 2013 survey. While there was moderate levels of erosion in the eastern third of the beach the recorded changes in the shoreline were subtle with an average recession of 13 cm recorded from the 13 transects which is within the 2013 surveys +/- 20 cm margin of error (Figure 22). There appears to be a consistent slow recession at the far eastern end of the beach which may need to be considered for stabilisation (Figure 23).

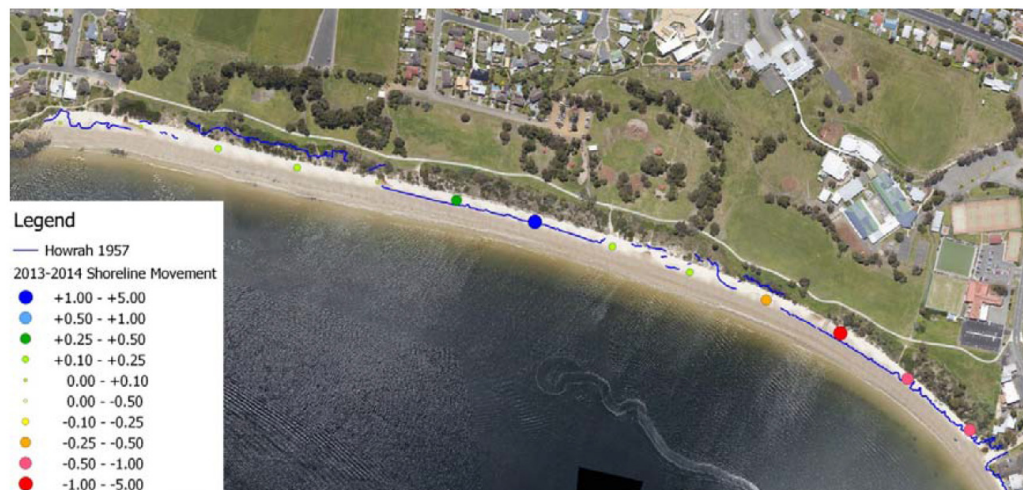


Figure 22 – Net shoreline recession of Howrah Beach, 2013-2014.



Figure 23 – Net shoreline recession of Howrah Beach, 1957-2014.

APPENDIX 9: SUMMARY OF ON GROUND MANAGEMENT RECOMMENDATIONS

Weed management	
R1	Prioritise the removal of remote, easily controllable populations of weeds on the dunes behind Bellerive and Howrah Beaches
R2	Seek permission from Howrah Primary School to undertake weed control in the dunes adjacent to the school
R3	Removal of weeds on cliff faces on Second Bluff is not considered to be a priority
R4	If selective removal of smaller mature radiata pines is undertaken, remove all cut material from the dunes and simultaneously revegetate with suitable native plants to provide ongoing shade, wind shelter and dune stabilisation
R5	Retain the pine tree growing on Bellerive Beach and another located near the stormwater works at River Street due to their shade and/or dune stabilisation roles.
R6	Marram grass should not be removed due to its role in dune stabilisation.
R7	Undertake control of exotic grasses and broadleaf weeds only in revegetation areas and where necessary as part of a general Reserve maintenance program
R8	Undertake an annual sweep and follow-up control of all previously targeted weeds
R9	Undertake follow-up GPS mapping of all weeds in the Reserve after five years to monitor progress and inform future weed control priorities
Regeneration and revegetation	
R10	Undertake regular maintenance of existing revegetation areas to ensure successful establishment and ongoing visual amenity
R11	Undertake revegetation and dune stabilisation immediately following the installation of the replacement stormwater outfall pipe on Bellerive Beach
R12	Undertake revegetation and landscaping at several locations (refer Table 1) to provide dune stability, enhance species diversity, provide habitat for native birds and animals, and improve visual amenity
R13	New revegetation and landscaping activities should not be committed to unless sufficient resources are available to undertake ongoing regular maintenance of newly planted areas
Fauna habitat management	
R14	Collaborate with Birdlife Tasmania and the Derwent Estuary Penguin Project to protect and manage little penguin nesting sites, including installation of artificial burrows, fencing and revegetation where appropriate.
R15	Investigate and assess WSUD options to improve water quality on Department of Education Land where an outlet pipe discharges near Howrah Primary School between the multiuse path and Howrah Beach
R16	Install signage at eye height at all main Reserve entrances to clearly inform dog walkers of dog restrictions in the Reserve and help owners understand that uncontrolled dogs and cats in the sand dunes can harass or kill native wildlife
Vegetation and fauna monitoring	
R17	Undertake an updated flora survey and annual vegetation composition and condition assessments to further inform on ground management activities
R18	Establish photo points established at several locations within the Reserve to facilitate monitoring of annual regeneration growth
R19	Undertake fauna surveys in 2015 and 2019 to assess species diversity and further inform on ground management activities

R20	Undertake an analysis of all photo points, completed flora surveys, vegetation composition assessments and fauna surveys in 2019 to determine trends and inform future management activities
Reserve Entrances	
R21	Improve Reserve entrances improved by installing additional signage and undertaking landscaping activities as recommended in Table 2
Tracks and trails	
R22	Consider prohibiting access to the natural dunes by pedestrians and dogs, with access to the beaches only to be permitted via formal, signposted tracks
R23	If Recommendation 22 is adopted, erect signage noting that dune access is not permitted at each formal access track and on the front of the dune in locations where informal tracks have developed
R24	Improve the Reserve's existing track network by installing new educational signage, improving beach access and making improvements to the track network on Second Bluff
R25	Negotiate with Crown Land Services to construct a new track from Little Howrah Beach to the grassy headland at Howrah Point to formalise public access
R26	Undertake a feasibility study into developing an intertidal walking track link between Howrah Point and the Tranmere Coastal Reserve
Infrastructure	
R27	Erect new fencing to rationalise beach access and discourage dune access at several locations along Howrah and Bellerive Beaches and to rationalise access to the steep rocky foreshore and caves on Second Bluff
R28	Remove or repair several fences along Howrah Beach to improve safety and visual amenity
R29	Install dog waste bag dispensers and bins at all main entrances and at the end of all beach access points within the Reserve
R30	Install new outdoor seats at several locations in the Reserve
R31	The track marker poles on Bellerive Beach should be moved further back into the dunes or painted a less obvious colour
R32	Promote preferred kayak launch sites at B1 and H3, and establish a kayak wash down area at the Howrah Point end of Little Howrah Beach.
R33	Undertake a review of the infrastructure requirements of the Reserve in 2019
Coastal erosion and inundation	
R34	The Tasmanian Coastal Works Manual should be consulted prior to undertaking any on ground activities
R35	Assess adaptation management options (including dune building and/or sand nourishment) in locations along Bellerive and Howrah Beaches where significant recession is occurring
R36	Consider undertaking further dune raising and revegetation in the dunes to the south of Beach Street
R37	Obtain engineering advice regarding the future treatment of the stormwater outfall pipe at the eastern end of Bellerive Beach
R38	Establish and regularly monitor at least three transect sites along Bellerive and Howrah Beaches using the TASMARC surveying program with the support of the Bellerive-Howrah Coastcare Group
	Install interpretation signage at one or more of the TASMARC transect sites to show the

R39	coastal recession map and explain the importance of the TASMARC surveying and aerial monitoring in relation to planning for future adaptation
Community participation and awareness	
R40	Consider, and fund as necessary, community education to facilitate behavioural change and encourage ownership and appreciation of the values of the Reserve
R41	Develop a responsible cat management brochure and distribute to residents bordering the Reserve.
R42	Install interpretation signs at Reserve entrances B1, H1 and H3 to facilitate visitor interpretation
Implementation Plan	
R43	Review progress against all performance measures identified in the Implementation Plan annually
R44	Review the <i>Bellerive-Howrah Coastal Reserve Activity Plan 2015-2019</i> in 2019 to assess progress and determine ongoing management priorities for the Reserve