

Option 1

Banksias maintained at different densities in different areas:

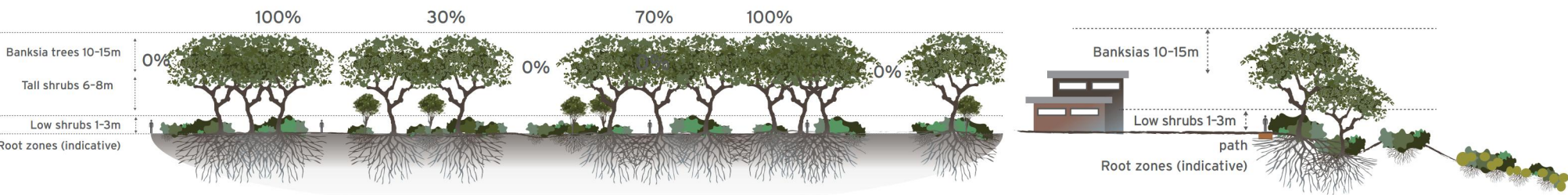
- 0%, 30% 70% and 100% density banksias
- Low, medium and tall shrubs in between

1

Searching for a compromise at Collingwood Beach



Year 20 Elevation

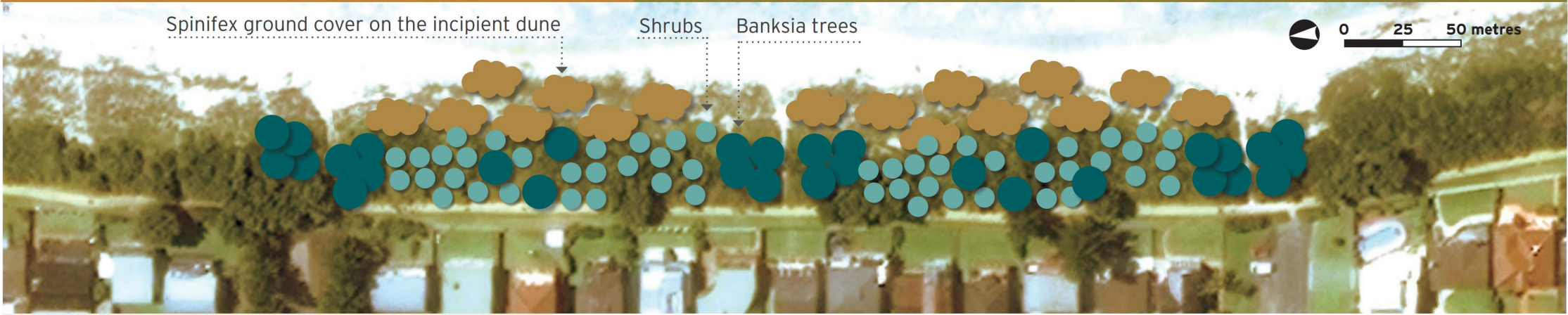


Advantages of Option 1

- Very good dune protection for areas with 70-100% Banksia tree density.
- Views maximised in some areas.
- Good fauna habitat values are retained in many areas (30-100% Banksia tree density).

Disadvantages of Option 1

- Higher likelihood of erosion and damage from storm surge in areas with 0% trees.
- Higher likelihood of degradation to residences and infrastructure from higher salt load, erosion or sand ingress in areas with 0% trees.
- Labour intensive to maintain areas within specific density parameters.
- Potential impacts to vegetation from disturbance as a result of ongoing seedling removal.



Costs & Management

- Moderate cost.
- Management centres on removing seedlings to maintain set densities.

Caveat - This scenario is an approximation of what could be achieved with specific management actions. Advice is based on general ecological and geomorphological literature and not trials at the Collingwood Beach site. Graphics are indicative.

Your feedback is important.
Which option provides the best result?

OPTION 1, 2 or 3? Please fill out a feedback form and tell us. The results of your feedback will be used to develop a detailed Dune Vegetation Management Plan that may combine or adapt the options to achieve a plan that can be supported by the broader community, while also meeting social, environmental and legal requirements for the area.

Please send your feedback to:
Shoalhaven City Council
Attention Karen Rourke
Council@shoalhaven.nsw.gov.au
Or PO Box 42 Nowra, NSW 2541



Option 2

Lift the canopy of existing and naturally regenerating Banksias. Remove tall shrubs.

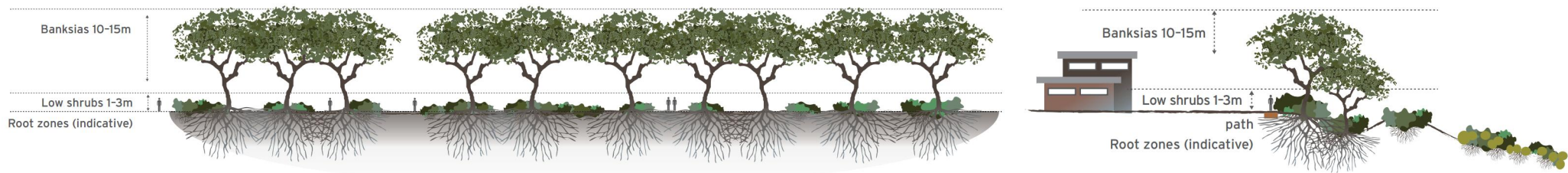
Provides good dune stability across a broad area while providing filtered lower level views. (Note: image portrays less tree density than desirable or than will regenerate naturally)

2

Searching for a compromise at Collingwood Beach



Year 20 Elevation

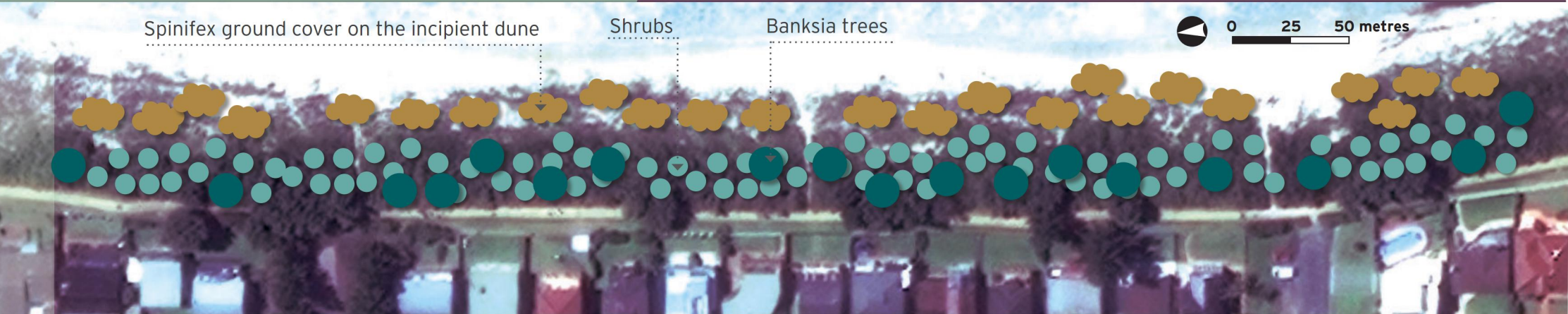


Advantages of Option 2

- Very good dune protection at moderate to high Banksia tree density.
- Low level views maximised in most areas.
- Good fauna habitat values where canopy connectivity is retained.

Disadvantages of Option 2

- Time: the Banksias need to obtain a certain height before pruning can commence. Views may be obstructed during this time.
- Labour intensive management, requires ongoing pruning and removal of tall shrubs.
- Risks to long term survival of the Banksias (e.g. risk of disease from pruning, instability due to modified, top heavy tree structure).
- Potential increased risk to public safety from trees/branches falling in high wind events.
- Loss of high level views.



Costs & Management

- Moderate to high cost.
- Management centres on pruning trees and removing seedlings.

Caveat - This scenario is an approximation of what could be achieved with specific management actions. Advice is based on general ecological and geomorphological literature and not trials at the Collingwood Beach site. Graphics are indicative.

Your feedback is important. Which option provides the best result?

OPTION 1, 2 or 3? Please fill out a feedback form and tell us. The results of your feedback will be used to develop a detailed Dune Vegetation Management Plan that may combine or adapt the options to achieve a plan that can be supported by the broader community, while also meeting social, environmental and legal requirements for the area.

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Option 3

Restrict the height of naturally occurring Banksia trees and tall shrubs (shrubs up to 3 m).

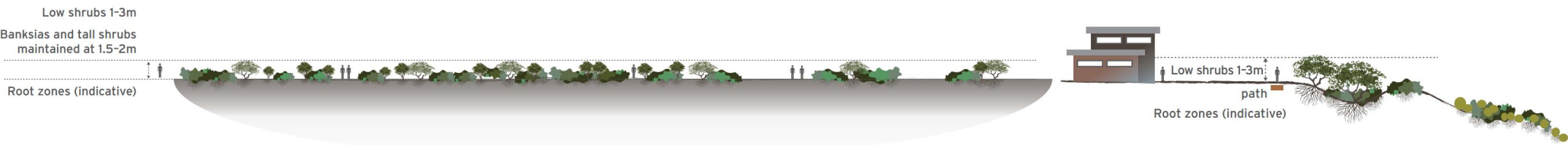
Provides reasonably good dune stability across a broad area while providing for higher level views.

3

Searching for a compromise at Collingwood Beach



Year 20 Elevation



Advantages of Option 3

- Reasonable dune stability although roots would not be as deep as for higher growing trees.
- Provides high level views .
- Provides dense connecting habitat for small birds.

Disadvantages of Option 3

- Labour intensive management, requires ongoing pruning of dense thickets.
- Risks to long term survival of the Banksias (e.g. risk of disease from pruning).
- Potential increased risk to public safety from sharp branches .
- Possibility of degradation to residences and infrastructure from higher salt load.
- Loss of amenity: 'unnatural' appearance of vegetation.
- Low vegetation less able to keep sand volumes seaward.



Costs & Management

- High cost.
- Management centres on pruning trees.

Caveat - This scenario is an approximation of what could be achieved with specific management actions. Advice is based on general ecological and geomorphological literature and not trials at the Collingwood Beach site. Graphics are indicative.

Your feedback is important.
Which option provides the best result?

OPTION 1, 2 or 3? Please fill out a feedback form and tell us. The results of your feedback will be used to develop a detailed Dune Vegetation Management Plan that may combine or adapt the options to achieve a plan that can be supported by the broader community, while also meeting social, environmental and legal requirements for the area.

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Collingwood Beach FACT SHEET 1

1

Your 'stake' in the decision

Collingwood Beach – the story so far

In the 1960's, dune vegetation was cleared along Collingwood Beach to make way for residential development. Storms in the early 1970's showed that the loss of a vegetated dune system has left the area vulnerable to storms and erosion. The impact of coastal erosion¹ on public and private assets (these include the pathway, roads, water and sewer lines and private houses) has been identified as a high risk; about 100 private properties in this area could be affected¹. The value of public assets at risk is approximately \$2.2 million².

The need to compromise

The Council reserve foreshore provides many 'services' to the community. These include:

- Providing views of the bay.
- Providing natural areas.
- Protecting assets against sand ingress, erosion and salt spray during storm events.



The Collingwood Beach Dune Vegetation Management Project aims to manage the beach foreshore vegetation to address competing interests in a sustainable manner from the Northern end of Ilfracombe Avenue to Susan Street.

While some dune management options sound appealing and address some of the issues, they do not address others. This is the 'compromise' problem.

Vegetation management must taking into account all issues and must be supported by the community to be effective³. The Shoalhaven City Council is seeking community input into the Vegetation Management Plan so that it can be supported by the broader community, while also meeting social, environmental and legal requirements for the area.

Who are the Stakeholders?

Many people will be affected if the dune fails and erosion takes away the foreshore. It is important to understand the views of everyone who will be affected. Who are the key stakeholders?

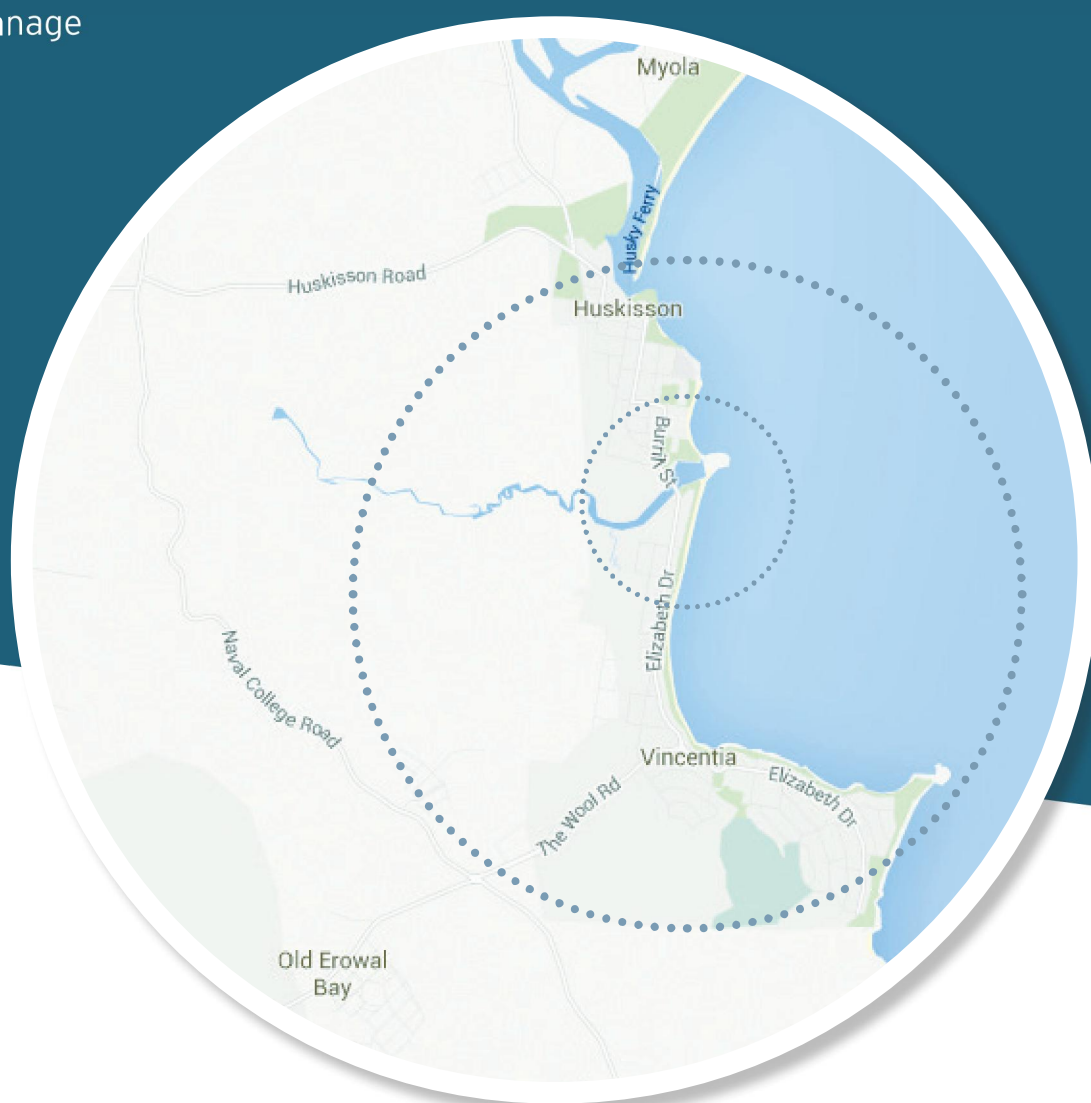
- Near residents - properties most at risk and most impacted by changes to vegetation management of the reserve.
- The local community - approximately 3000 residents in Vincentia, many of whom may also be highly impacted. From Susan Street to the northern end of Illfracombe Avenue represents about 40% of the Collingwood Beach foreshore.
- Local special purpose and special interest groups. These groups may be formed around a single issue or set of issues, important to them. For example; bird watching or paddle board clubs, residents groups.
- The broader community - including tourists and other visitors.
- The Council and other government agencies, who have responsibilities under environmental legislation to protect and appropriately manage the reserve.

In developing a plan that recognises the views of all stakeholders, we need to hear from you. What is your main interest? What do you value most about the area? What would you like to see happen?

Where to now?

Three options have been developed that aim to balance the competing issues in an acceptable way (see the separate 3 POSTER SET). Which option provides the best result in your opinion: Option 1, 2 or 3?

The results of your feedback will be used to develop a detailed Dune Vegetation Management Plan that may combine or adapt the options to achieve a plan that can be supported by the broader community, while also meeting social, environmental and legal requirements for the area.



References

1. Coastal Hazards Studies and Plans , SMEC 2009
2. Shoalhaven Public Asset Coastal Risk Management Review (BMT WBM) 2012
3. Beardsmore, A., Gangaiya, P. and Mischkiewicz, T. (no date). 'Winding Back the Clock in Dune Management at Wollongong'.



Collingwood Beach FACT SHEET 2

The role of vegetation in protecting the foreshore

Dune under threat

Collingwood Beach is one of the most vulnerable beaches in the Shoalhaven Local Government Area from coastal processes¹. Specific risks include coastal erosion, coastal inundation and entrance instability at Moona Moona Creek. The erosion could affect the entire length of the beach whilst wave inundation could occur in areas where the dune is lower (between Berry and Albion Park).

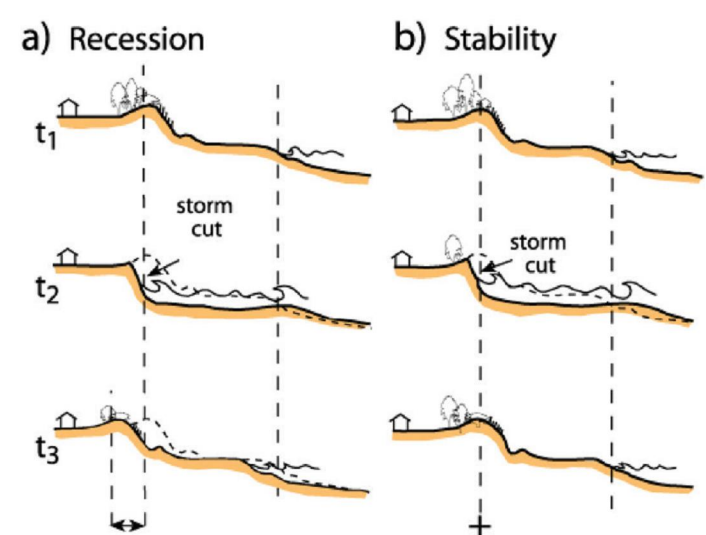
The severe storms of 1974 demonstrated how erosion can threaten assets. By 1978, the effects of erosion and associated lack of vegetation on the dune included: wind-blown sand covering roads, lawns and gardens, blocking stormwater drains and causing 'sand blast' damage to houses and vehicles as well as causing ceiling collapse. These impacts are known to have affected real estate values and the wellbeing of many local residents². As these type of events can be decades apart, it can be easy to forget the lessons learned and repeat historical mistakes.

The lessons

A three year vegetation rehabilitation effort commenced in 1978, shaping the dune and planting grasses and trees. Monitoring demonstrated that the results of this work could create a dune more resilient to storms³. It was also noted as being aesthetically and ecologically harmonious. Importantly it also fostered a 'dune care' ethic important to maintaining the support of the local community in protecting the dune.



Unstable sand is the enemy. Vegetation creates a net above and below the ground to slow its movement.



Receding beach profile compared to stable beach profile. The dotted line can be thought of as the 'risk line', moving closer to houses and other assets in picture a), above⁴.

The role of vegetation

Using vegetation to manage erosion is called a 'soft' technique. It is much less expensive than 'hard' engineering solutions, such as groynes or rock walls, and does not have the negative consequences of 'hard' structures such as loss of beach, amenity and environmental impacts. As set out above, there is good evidence that 'soft' technique can work at Collingwood Beach and that it can provide additional aesthetic and ecological benefits.

Important functions that vegetation can provide include:

- Trapping airborne sand and salt - vegetation height and density is important to achieve this. The higher and denser the vegetation, the more sand and salt will be kept seaward, away from houses and public assets.
- Trapping sand at the ground surface - vegetation structure is important to achieve this. Grasses that cover the ground surface and act as a net, hold sand in place and increase stability.
- Trapping sand beneath the ground surface - root structure is important for this. The deeper the roots penetrate and denser they are, the more stable the overall land form will be.

Additionally, the shape of the dune is important. A dune that has a wedge shape (low near the water, higher near the residences) will provide better wind and salt spray protection.

Our impact on vegetation

Management activities can also have a large impact on how well the vegetation performs these functions. In developing a stable and resilient dune system, it is important to know that:

- Weeding or pruning activities that require people to walk over the vegetation, will impact the health of smaller plants, like grasses and seedlings.
- Pruning plants will increase susceptibility to disease and restricting the height of plants will affect the depth of the root ball. Both of these actions may impact on the long term stability of the dune.
- Removing plants or otherwise disturbing the soil can increase erosion and weeds.
- Taller more robust species will provide greater long term protection, although they will block out some views from the path and residences.

Where to now?

Three options have been developed that aim to balance the competing issues in an acceptable way (see the separate 3 POSTER SET). Which option provides the best result in your opinion: Option 1, 2 or 3?

The results of your feedback will be used to develop a detailed Dune Vegetation Management Plan that may combine or adapt the options to achieve a plan that can be supported by the broader community, while also meeting social, environmental and legal requirements for the area.

Comparative root systems and above ground height of trees, shrubs and ground covers at Collingwood Beach.



References

1. Haskoning Australia Maritime & Waterways (2014). Shoalhaven Coastal Erosion Remediation Adaptive Works Strategy for Transitioning from "Make- Safe/Make-Good" to "End-State" Protection. Report prepared for Shoalhaven City Council, July 2014.
2. SMEC (2011). Site Specific Emergency Action Plans for Shoalhaven City Council. Report prepared for Shoalhaven City Council, May 2011.
3. Davies P.T. & Kesby N.A. (no date). Coastal Protection Hard or Soft.
4. Woodroffe C.D. 2014. Collingwood Beach Jervis Bay, Geomorphological background. Presented at Collingwood Beach public forum.



Collingwood Beach FACT SHEET 3

Management of dynamic natural systems

Collingwood Beach – a highly modified landscape

In the 1960's, dune vegetation was cleared along Collingwood Beach to make way for residential development. The vegetation types and structure that occur in the Council reserve today are a result of:

- An extensive vegetation rehabilitation effort that commenced in 1978
- Natural colonisation from surrounding vegetation remnants
- Management actions (legitimate as well as illegal) including weeding, pruning and poisoning of dune vegetation

Over time, the vegetation can be expected to continue to change. This occurs as a natural process called 'succession' as some plants grow to outcompete or replace others. As they grow plants may create more sheltered conditions for other species to survive. A natural vegetation system that changes over time in response to natural conditions generally becomes more resilient. We can influence the vegetation types and vegetation structure but we need to work with these natural processes for it to be both resilient and cost effective.

Banksias: friend or foe?

The local coastal vegetation is derived from the 'Coastal Foredune Scrub' vegetation community. Coast Banksia (*Banksia integrifolia*) is the most common tree in this vegetation type. It commonly occurs in dune vegetation. It is likely to have naturally occurred prior to initial clearing for housing in the 1960s (it can be found on Myola spit which had little human interference).

At Collingwood Beach, Coast Banksia is a very successful competitor. It produces many



3



seedlings. Its deep and dense root system helps dune stability and it creates habitat for smaller species less able to tolerate the harsh conditions. Its height blocks airborne sand and salt, keeping it seaward. Whilst Banksias contribute to a resilient dune system, their increasing prevalence causes concern for some members of the community. In several locations, dense Banksia thickets block out views of the bay and reduce the scenic vistas that were present when the dune had less vegetation following subdivision and major erosion event of the 1970s.

Management options for the reserve

A management plan is being developed for the Council reserve, to take into account the many 'services' to the community that the vegetation provides; natural areas and wildlife habitat, protection for assets against sand ingress, erosion and salt spray during storm events whilst acknowledging community requests for more views of the bay.

Management options are influenced by the resources available. While 'soft' vegetation management is considered to have many advantages over 'hard' engineering solutions, the costs are still substantial. The vegetation that exists at Collingwood Beach today has cost the community time as well as money, as many community members have contributed to planting efforts:

- In 1978 over 2500 trees were planted, dunes were reformed, access tracks stabilised, grasses planted¹
- Around \$44,000 was spent between 1978 - 1981 under the direction of the Soil Conservation Service²
- A cost for actively managing a 2km section of dune at Woonona beach has been estimated to cost \$150,000³
- A 'hard' engineering solution to the Collingwood Beach risks has been estimated at approximately \$ 18 million and was therefore deemed to be unaffordable⁴

Where to now?

Three options have been developed that aim to balance the competing issues in an acceptable way (see the separate 3 POSTER SET). Which option provides the best result in your opinion: Option 1, 2 or 3?

The results of your feedback will be used to develop a detailed Dune Vegetation Management Plan that may combine or adapt the options to achieve a plan that can be supported by the broader community, while also meeting social, environmental and legal requirements for the area.

References

1. Collingwood Beach Dunecare Group, Vincentia Ratepayers and Residents Association and Department of Conservation and Land Management Nowra (1993). 'Are you aware of importance of the dunes?' Flyer.
2. Davies P.T. & Kesby (1989). 'Collingwood Beach - Ten Years On'. Australian Journal of Soil and Water Conservation Vol. 2 November 1989.
3. Beardsmore, A., Gangaiya, P. and Miskiewicz, T. (no date). 'Winding Back the Clock in Dune Management at Woolongong'.
4. Haskoning Australia Maritime & Waterways (2014). 'Shoalhaven Coastal Erosion Remediation Adaptive Works Strategy for Transitioning from Make- Safe/Make-Good to End-State Protection'. Report prepared for Shoalhaven City Council, July 2014.

