

Zone 2

- Fell exiting dead trees and shrubs (retain felled material)
- Establish existing foliage using foliage cover assessment methodology
- Thin existing trees and shrubs if cover exceeds 70% (preferentially retain larger more mature trees and trees and shrubs adjacent to beach access ways or storm water outlets)
- Maintain tree and tall shrub cover between 50% 70% through ongoing seedling removal and pruning
- Monitor using foliage cover assessment methodology

Zone 3

- Under-prune Norfolk Island Pine trees as indicated
- Establish existing foliage using foliage cover assessment methodology
- Thin existing trees and shrubs if cover exceeds 70% (preferentially retain larger more mature trees)
- Maintain tree and tall shrub cover between 50% - 70% through ongoing seedling removal and pruning
- Monitor using foliage cover assessment methodology

Zone 4

- Under-prune mature trees (those over 4m)
- Fell all tall shrubs and young trees less than 3m tall where they occur underneath the canopy of under-pruned trees
- Remove young seedlings of all tall shrub species and tree species where they occur underneath the canopy of under-pruned trees. Tree seedlings that occur outside of the mature under-pruned tree canopy would be retained

- · Fell exiting dead trees and shrubs (retain felled material)
- Retain trees as indicated
- Prune trees and tall shrubs to a minimum of height of
- Prune low shrubs within the 1.5-2.5m view window to between 30% and 50% foliage cover.
- Monitor using foliage cover assessment methodology

TO BE IMPLEMENTED IN ALL ZONES Retention of felled/trimmed material

Coarsely break up or mulch felled/trimmed material and spread thinly over the ground in the immediate vicinity (no greater than 5cm deep for mulch)

Weed Control

- Conduct inspections to identify the presence of noxious or invasive weeds
- Carry out control activities appropriate to target weed species

Identification and removal of hazardous vegetation

- Conduct inspections of trees to identify trees that pose a risk to public safety
- Conduct removal of hazardous trees/limbs
- Conduct removal of overhanging vegetation along beach access ways and the shared pathway

Full details of zone protocols are provided in Section 10 of the Collingwood Beach Dune **Vegetation Management Plan**

PROPOSED VEGETATION MANAGMENT - MAP 4

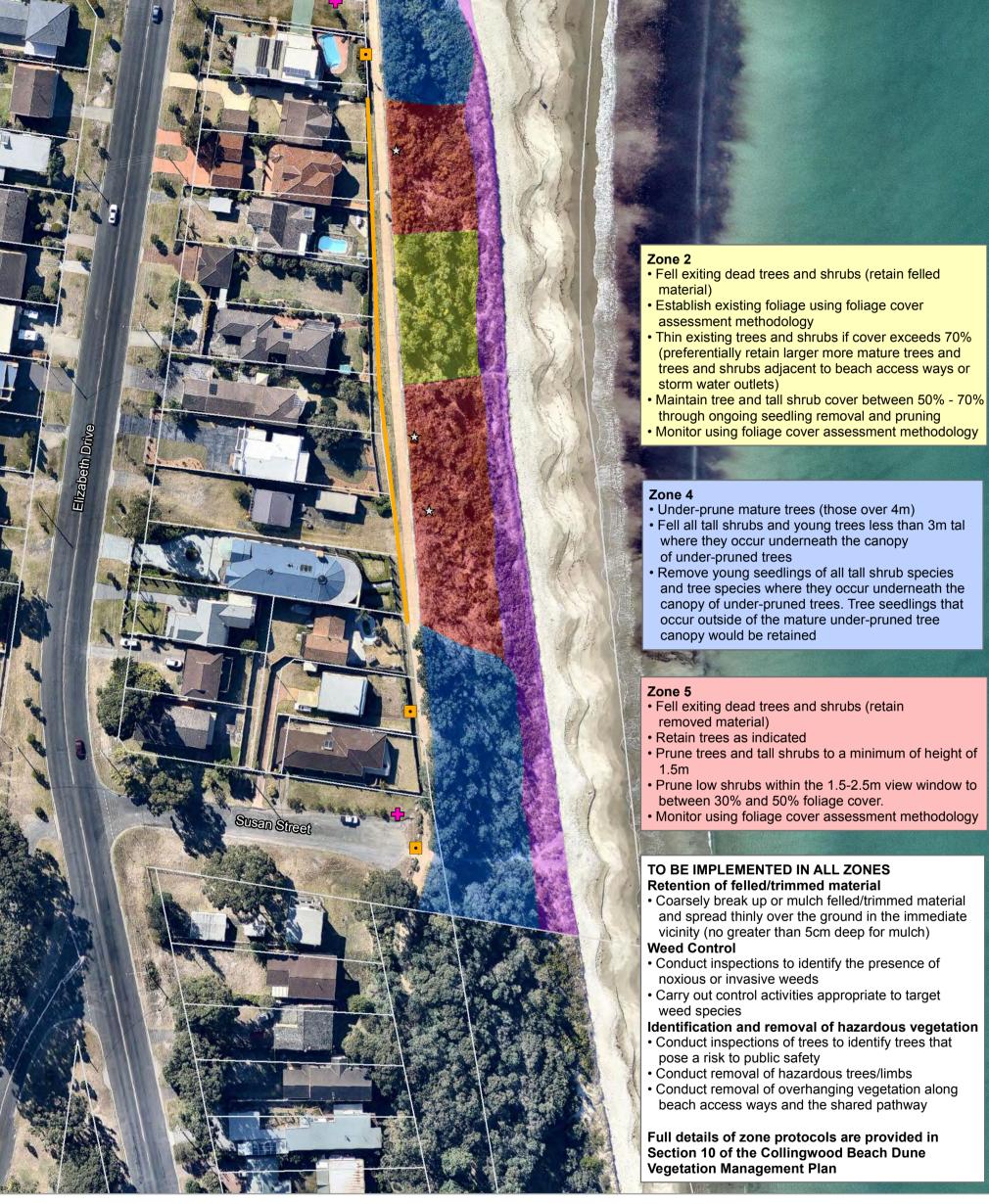
Collingwood Beach Dune Vegetation Management Plan

Proposed management zones

- Zone 2 Up to 70% cover of trees and tall shrubs
- Zone 3 Up to 70% cover of trees and tall shrubs and under-prune tall trees Photopoints (additional to foliage cover assessment)
- Zone 4 Under-prune mature trees and remove tall shrubs
- Zone 5 Prune trees and tall shrubs to 1.5m high
- Zone 6 Protection of incipient foredune vegetation
- Lot boundaries
- Foliage cover assessment methodology
- ★ Trees to be retained in Zone 5
- △ Norfolk Island Pines to under-prune in Zone 3
- Recommended Eucalypt planting

- Vegetation data digitised by nghenvironmental - Aerial imagery sourced from Nearmap courtesy
- of Shoalhaven City Council. Image date Aug 2014





PROPOSED VEGETATION MANAGEMENT - MAP 5

Collingwood Beach Dune Vegetation Management Plan

Proposed management zones

- Zone 2 Up to 70% cover of trees and tall shrubs
- Zone 4 Under-prune mature trees and remove tall shrubs Photopoints (additional to foliage cover assessment)
- Zone 5 Prune trees and tall shrubs to 1.5m high
- Zone 6 Protection of incipient foredune vegetation
- Lot boundaries
- Foliage cover assessment methodology
- ★ Trees to be retained in Zone 5
- Recommended Eucalypt planting

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- Vegetation data digitised by nghenvironmental
- Aerial imagery sourced from Nearmap courtesy of Shoalhaven City Council. Image date Aug 2014

APPENDIX B DIGITAL IMAGE ANALYSIS FOR MONITORING FOLIAGE COVER

Digital image analysis provides a quantifiable and repeatable methodology for determining the percent cover foliage in an area. A series of digital images can be stitched together to form a continuous image of each zone or a representative section of the zone.

For zones where it is required, a 'view window' is defined. In this case it has been set as 1.5m – 2.5m for Zones 2, 3 and 5 (refer to Figure B-1). This is the most relevant height when retaining views from the walkway and single storey residences.



Figure B-1 Example of the view window as it applies to Zone 5

Using digital image processing software, it is a simple process to determine the percent foliage cover over the background view in the view window. This can assist in determining:

- Whether management is required
- What extent of management is required

Examples are provided below for each management zone 1-5 to get an understanding of the results.



Zone 1: Up to 100% foliage cover





Existing vegetation

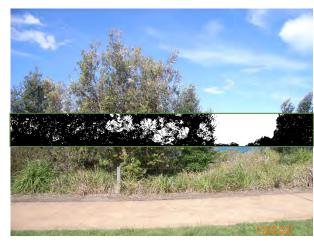
Before foliage cover percentage: 90%

No foliage cover reduction proposed for this zone.

Zone 2: Up to 70% foliage cover in the 1.5m-2.5m view window (including trees and shrubs)



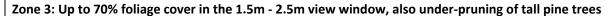




Existing vegetation

Before foliage cover percentage: 90%

After foliage cover pecentage: 70%









Existing vegetation

Before foliage cover percentage: 90%

After foliage cover percentage: 70%

