Other invasive weed species may occur after the initial weeding phase. These species should be removed during the maintenance period for this plan.

The extent of weed infestations present and intensity of weed control/removal works required vary throughout the riparian areas. Figure 2 identifies the extent of areas within the site requiring high, medium and low intensity weed removal and regeneration works.

The initial stages of the weeding phase of this plan are estimated to take approximately four weeks, while the ongoing maintenance period for the restoration process should continue for at least two years in order to be effective.

Monitoring of the progress of weed removal, plant growth and natural regeneration should be undertaken on a minimum of a yearly basis with progress reports, including photographs, prepared and forwarded to Gosford City Council and the Department of Energy and Water.

2.3 DETAILED PROPOSED REGENERATION AND REPLANTING ACTIVITIES TO BE CARRIED OUT WITHIN RIPARIAN AND BUFFER ZONE AND PRIVATE CONSERVATON LAND

The native vegetation within the site subject to this Riparian and Buffer Zone Vegetation Management Plan is generally restricted to the Riparian Zone and the 10 metre wide Buffer Zone between the Riparian Zone and future development. It is expected that removal of the weed species in these areas in accordance with Section 2.2 will allow natural regeneration of the locally endemic native species. Additionally where supplemental planting is required the species identified in Table 2.2 should be considered for replacement planting. Revegetation will ensure bed and bank stability along the subject watercourse and increased biodiversity for cleared land on the upper-slopes of the site.

While a mixture of species have been recommended it would be appropriate that these be planted in groups of at least 10 plants of the same species at appropriate spacing for each species. This will achieve a clumping effect for planted species.

Additionally it is anticipated that natural recruitment of the tree, shrub and groundcover layers will occur within the buffer adjacent to retained native riparian vegetation.

Replanting stock is to be grown from cuttings and seeds of plants growing on the site. Exotic species are not to be used for replanting or rehabilitation works. These plants are then to be planted into suitably prepared areas within the buffer zone. The combination of planting species has been selected to provide a continuation of the moist forest/vegetation with mesic elements characteristic of the riparian vegetation.

This mesic / riparian type vegetation also has a lower bushfire risk to nearby developments than the drier open forests dominated by large eucalypts.

Planting rates for areas to be replanted within the buffer zone will vary according to the presence of existing vegetation. Planting rates greater than 12-18 plants per 100 square metres (for the tree, shrub and ground layers combined) are recommended to achieve the closed forest/rainforest type vegetation proposed.

TABLE 2.2 RECOMMENDED SPECIES FOR RE-PLANTING	
Scientific Name	**Common Name**
Trees	
Eucalyptus saligna	Blue Gum
Eucalyptus pilularis	Blackbutt
Acacia prominens	Gosford Wattle
Acmena smithii	Lillypilly
Alphitonia excelsa	Red Ash
Archontophoenix cunninghamiana	Bangalow Palm
Elaeocarpus reticulatus	Blueberry Ash
Livistona australis	Cabbage Tree Palm
Sloanea australis	Maidens Blush
Shrubs	
Acacia binervia	Coast Myall
Acacia suaveolens	Sweet Scented Wattle
Omalanthus populifolius	Bleeding Heart
Pittosporum revolutum	Yellow Pittosporum
Polyscias sambucifolia	Elderberry Panax
Wilkiea heugeliana	Wilkiea
Dianella caerulea var. *producta*	Blue Flax Lily
Dichelachne micrantha	Short-hair Plume Grass
Doodia aspera	Rasp Fern
Entolasia marginata	Bordered Panic
Gymnostachys anceps	Settlers Flax
Lepidosperma laterale	Variable Sword-sedge
Note: Natural germination and establishment of other native species is to be encouraged	
Note: Other native species present within the site can be added if required	

In addition to the riparian and buffer areas, vegetation replanting is proposed for the road batters above the creek culvert that flows under Kings Avenue. This area is to be revegetated to consolidate the connectivity of creekline vegetation with other areas offsite.

2.4 DETAILS OF ANY ONGOING MONITORING AND MAINTENANCE ACTIVITIES TO BE CARRIED OUT WITHIN RETAINED VEGETATION OF THE SITE

It is recommended that regular monitoring inspections be undertaken at 6 monthly intervals for 2 years after weeding and replanting works have been undertaken. This will allow the determination of the health of the vegetation and may include identification of any areas suffering from disturbance or in need of rehabilitation, weed control, sediment or storm water control, bank and soil stabilisation or maintenance of rehabilitated or regenerating areas.

Monitoring and review will include a performance evaluation of the works and will include assessment for replanting where losses have occurred, addressing any deficiencies observed, and determining a successful outcome. A successful outcome is usually defined as a minimum of 80% survival rate for all plantings and a maximum of 5% weed cover for the treated riparian corridor is achieved.

Following these monitoring inspections a report with accompanying photos (taken at repeatable locations) will be submitted to Council and Department of Water and Energy. Photo points will be located by GPS or shown on survey maps.

Maintenance is to be undertaken within the regenerating bushland every week for the first 12 months. Maintenance will include watering, replacement planting, weeding (herbicide or low impact weeding as required), re-erecting sediment fencing, mulching, removing rubbish and regular inspections and performance assessment.

All monitoring and maintenance post development is to be the responsibility of the Community Association.

2.5 SOIL EROSION AND DRAINAGE ISSUES

The objective of stormwater management is to ensure drainage from upstream and the nearby residential areas and associated infrastructure does not have a negative impact on vegetated areas, dwellings and surrounding waterways.

Erosion and sediment control measures are to be implemented to minimise adverse effects as a result of increased erosion and sediment loading. These include:

- Coordinated work practices aimed at minimising land disturbance;
- Implementation of appropriate erosion and sediment control measures;
- The minimisation of groundcover disturbance through the dedication of vegetation protection zones encompassing the Riparian Zone and the Buffer Area;
- Routine site inspections of drains, channels, sediment control structures and water quality;
- Identification of potential erosion areas;
- Installation and maintenance of flow control structures and soil stabilising vegetation wherever required;
- Construction of all watercourse crossings in accordance with the DWE guidelines.

The minimisation of soil erosion will be achieved through soil stabilisation measures, sediment fencing and water control techniques. Soil stabilisation measures to be implemented include, immediate revegetation of cleared surfaces via seeding, planting of native species, mulching and the installation of biodegradable blankets.

2.6 SITE MANAGEMENT DURING CONSTRUCTION

Inspections of the site by the supervising consultant should be undertaken prior to and during the construction operations to ensure that vegetated areas designated for retention and exclusion zones are adequately marked and that other appropriate protection procedures are being maintained. Construction and landscape works are likely to alter the environment and soil properties surrounding the vegetation retained on site. Therefore, the following management strategies are proposed to minimise damage to native vegetation retained during the construction period.

Exclusion zones
The compaction of soil surrounding retained vegetation is detrimental to root growth by reducing water infiltration and soil oxygenation rates. A vegetation protection zone will be established containing the Riparian Zone and the Buffer Area in accordance with the vegetation protection guidelines (Section 2.7) using post and wire fencing or suitable high visibility marking tape or orange plastic net fencing. This will reduce the effects of soil

compaction by prohibiting vehicle access and the stockpiling of construction material such as soil and woodchips within the vegetation protection zone.

Silt Fencing
Erosion and sediment control measures are to be implemented to minimise adverse effects of increased erosion and sediment loading. These include: the safe disposal of waste products, coordinated work practices aimed at minimising land disturbance, the disposal of 'clean' water off site, the minimisation of vegetation disturbance through the dedication of 'no go areas', routine site inspections of drains, channels, sediment control structures and water quality, identification of potential erosion areas, installation and maintenance of flow control structures and soil stabilising vegetation wherever required.

The minimisation of soil erosion will be achieved through soil stabilisation measures and water control techniques. Suitable soil stabilisation measures to be implemented include the immediate revegetation of cleared surfaces via seeding, planting of native species, mulching or the installation of biodegradable blankets. Suitable water control measures include construction of earth banks, catch drains, detention and sediment ponds (including Gross Pollutant Traps), grassed and armoured waterways, rock earth and sand bag dams and outlet protection systems to prevent scouring.

Mulching
Mulching is an efficient method to impede the establishment of weed species, soil erosion, compaction and desiccation. Woodchip or other suitable mulch is to be placed at a depth of 75-100mm covering any areas of tree replanting or landscape areas. Areas surrounding the stems/trunks of plants are to be kept free from mulch, thereby reducing the incidence of collar rot on retained or planted flora.

2.7 VEGETATION PROTECTION GUIDELINES

The following guidelines are proposed in relation to retained vegetation on the site and the proposed development:

i. Implementation of an adequate ***Vegetation Protection Zone (VPZ)*** will be required surrounding any retained vegetation. This *vegetation protection zone* can generally be provided by preserving an area around the vegetation with a radius of at least 1.25 x the average canopy radius from the trunk (of typical tree forms) or 0.5 x the tree height. *British Standard BS 5837* (1991);
ii. The boundary of the Vegetation Protection Zone is to be established at the outer boundary of the Vegetation Buffer Zone as shown in Figure 1;
iii. Before construction commences vegetation protection zones should be adequately marked and sign posted using star pickets and wire or high visibility tape or plastic net fencing;
iv. All trees not nominated for retention are to be removed prior to any construction activity or bulk earthworks. Approved tree removal operations in the vicinity of retained trees are to be undertaken in a manner that avoids canopy damage and soil compaction. Such works are to be supervised by a qualified Arborist;
v. Stumps are to be ground - not dozed or dug out;
vi. All trenches footings and major earth movement should avoid *vegetation protection zones*;
vii. Stockpiling materials and soils within *vegetation protection zones* is to be avoided;
viii. Machinery is to avoid *vegetation protection zones* during all operations;
ix. Any trenching or construction works undertaken within *vegetation protection zones* should be witnessed, supervised and recorded (photographed and documented) by a qualified Ecologist or Arborist;

x. Post-construction access control can be achieved using bollards, fences or retaining walls to limit pedestrian access and to control unauthorised vehicular access.

2.8 BUSHFIRE PROTECTION MEASURES

The replanted areas within the riparian buffer zone are not proposed to be managed as a bushfire asset protection zone. The required 10 metre wide asset protection zones are to be located outside of this riparian buffer zone and will include areas incorporated into road reserves, stormwater controls, nutrient control grassed swales and building line setbacks. Rainforest type species have been selected for replanting within the riparian buffer zone areas as these species create a lower bushfire risk to future residential developments than eucalypt species.

The bushfire protection measures to be utilised for future residential development will be specified in the Bushfire Assessment Report prepared in accordance with Planning for Bushfire Protection (RFS, 2006).

2.9 OPERATION OF THE COMMUNITY ASSOCIATION

The site is proposed to be developed as a Community Title subdivision under the NSW Community Land Development Act. Accordingly all open space throughout the site, inclusive of the Riparian Corridors will be designated 'Common Property' (Lot 1).

In accordance with the Act, the Community Association has the power to levy each owner within the Community Scheme, a regular (usually quarterly) fee to manage the Community Association Property (Lot 1 Land) in accordance with the management plans which are registered with the Community Management Statement.

Additionally the Community Association also has the power to levy a fee (if identified from the start of the scheme) to manage any other land within the Community Scheme to which it directs within its management plans as "Special Facilities".

In this instance the Riparian Corridors within the site will form (Lot 1) within the scheme, whilst the private conservation areas will be managed by the community scheme.

As such, the Community Association will (by contract with an external contractor) carry out the actions contained within the vegetation management plan which relate to the Riparian Corridor, both on the site and upon the adjacent site, at it's own expense. The funding for this scheme will be raised in advance by levying the owners within the subdivision a regular budgeted fee. This arrangement will exist in perpetuity upon the formation of the Community Scheme.

SECTION 3

WORKS PROGRAM

3.1 WORKS PROGRAM

A proposed works program is outlined in Table 3.1.

TABLE 3.1
PROPOSED WORKS PROGRAM

Action	Responsibility	Funded By
Pre-construction		
• Collection of seed/plant propagation.	- Contract grower	Developer
• Identification (flagging) of vegetated areas to be retained (VPZ).	- Project Supervisor	Developer
• Erection of erosion control fencing.	- Contractor with advice of Project Supervisor	Developer
• Installation of protective fencing and signs around adjacent bushland (VPZ).	- Contractor with advice of Project Supervisor	Developer
• Commencement of weeding / regeneration within retained vegetation.	- Contractor / suitably qualified Bushland Regenerator	Developer
• Preparation of a landscape/tree planting program if required.	- Contractor / Project Supervisor	Developer
Construction		
• Commencement of weeding / regeneration within retained vegetation.	- Contractor / suitably qualified Bushland Regenerator	Developer
•		
• Monitor erosion control fencing (weekly – and after rain) and replace if required.	- Contractor with advice of Project Manager	Developer
• Monitor vegetation protection fencing and signs and replace if required.	- Contractor with advice of Project Supervisor	Developer
• Implementation of tree/shrub planting program	- Contract landscaper/bush regenerator	Developer

TABLE 3.1 PROPOSED WORKS PROGRAM		
Action	**Responsibility**	**Funded By**
Post-construction		
• Plant new landscape trees recognised within landscape plan.	- Contractor engaged by Community Association	Community Association
• Remove vegetation protection fencing and signs.	- Contractor engaged by Community Association	Community Association
• Continuation of weeding / regeneration within retained vegetation.	- Contractor / suitably qualified Bushland Regenerator engaged by Community Association	Community Association
• Monitoring of retained vegetation *at 3, 6, 9, 12 months, and annually thereafter for 2 years* – conduct maintenance if required.	- Project Supervisor engaged by Community Association	Community Association
• A yearly report on the status of the bushland including photographs shall be sent to Council.	- Project Supervisor engaged by Community Association	Community Association

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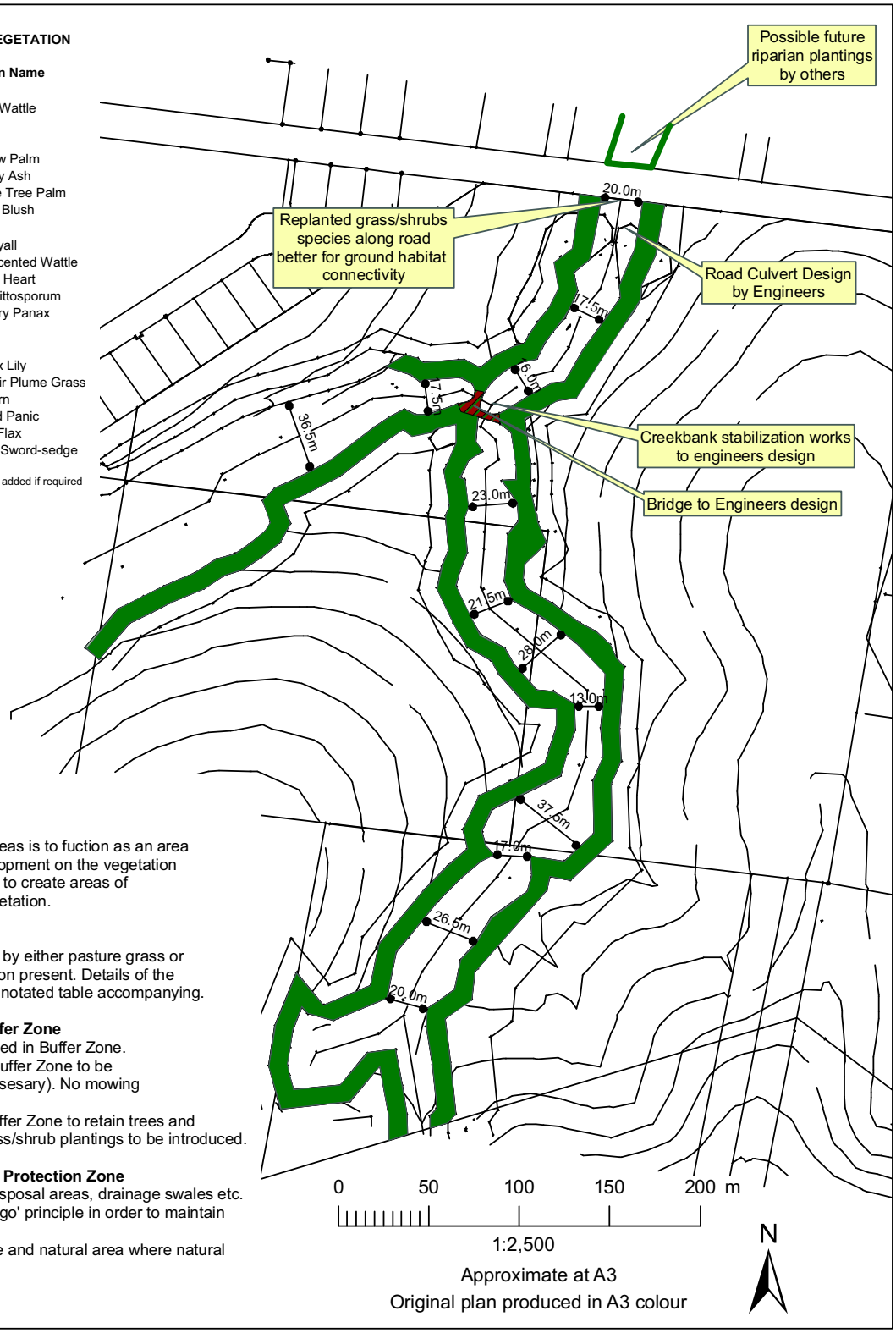
Wright, P. (1991) *Bush Regenerators Handbook*, The National Trust of Australia (NSW)

RECCOMMENDED SPECIES FOR RE-VEGETATION WITHIN BUFFER AREA

Scientific Name	Common Name
Trees	
Acacia prominens	Gosford Wattle
Acmena smithii	Lillypilly
Alphitonia excelsa	Red Ash
Archontophoenix cunninghamiana	Bangalow Palm
Elaeocarpus reticulatus	Blueberry Ash
Livistona australis	Cabbage Tree Palm
Sloanea australis	Maidens Blush
Shrubs	
Acacia binervia	Coast Myall
Acacia suaveolens	Sweet Scented Wattle
Omalanthus populifolius	Bleeding Heart
Pittosporum revolutum	Yellow Pittosporum
Polyscias sambucifolia	Elderberry Panax
Wilkiea heugeliana	Wilkiea
Groundcovers	
Dianella caerulea var. *producta*	Blue Flax Lily
Dichelachne micrantha	Short-hair Plume Grass
Doodia aspera	Rasp Fern
Entolasia marginata	Bordered Panic
Gymnostachys anceps	Settlers Flax
Lepidosperma laterale	Variable Sword-sedge

Note: Other native species present within the site can be added if required



10m Buffer Zone Works

Function

The 10m Buffer Zone to the riparian areas is to fuction as an area to buffer the impacts of adjacent development on the vegetation and habitats of the Riparian Zone, and to create areas of additional vegetation from existing vegetation.

Current Condition

The Buffer Zone is currently vegetated by either pasture grass or large trees with some riparian vegetation present. Details of the vegetation present are provided the annotated table accompanying.

Works within the 10m Vegetation Buffer Zone

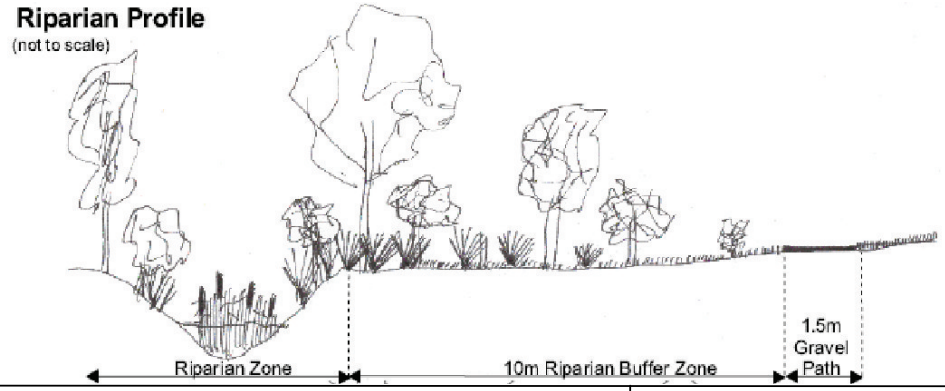
- Existing natural vegetation to be retained in Buffer Zone.
- Grassed areas within the Vegetation Buffer Zone to be regenerated and replanted (where nessesary). No mowing or slashing to be permitted.
- Existing vegetated areas within the Buffer Zone to retain trees and natural vegetation, supplementary grass/shrub plantings to be introduced.

Works within the 10m Bushfire Asset Protection Zone

- Nutrient control measures - grassed disposal areas, drainage swales etc. may be permitted only on an 'ingo' 'outgo' principle in order to maintain an APZ width of 10.0m.
  Supplementary plantings to Landscape and natural area where natural regeneration is ocurring.
- Weed removal to be undertaken.

Riparian Profile

(not to scale)



**Subject Site boundary subject to final survey*

Plan for indicative purposes only. Not for detailed measurement.
Map based on survey by Cahill.

Legend

Riparian Buffer Zone (10M Wide)

conacher environmental group

ABN: 62 274 841 042
PO Box 4033
78 York Street
East Gosford NSW 2250
Ph: (02) 4324 7888
Fax: (02) 4324 7899
cegconsult@bigpond.com

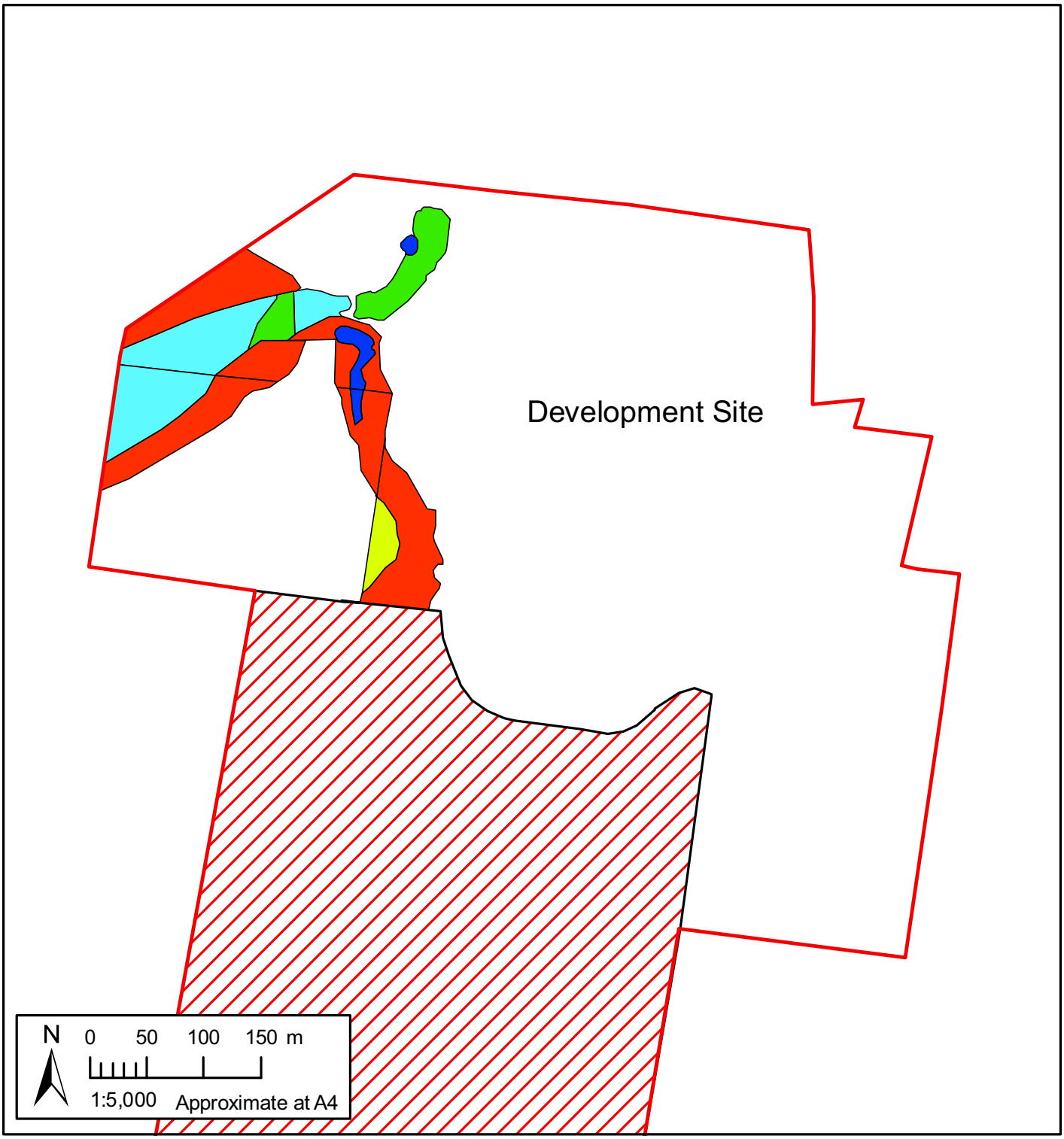
Figure 1 -

Buffer Zone Management Plan

Parkside, Terrigal

Ver.FX By. JM
13/05/10
Ref.No.CE24

Source: Aerial © Department of Lands (2007)



Flora and fauna survey locations are approximate and have not been fixed by land survey. *Subject Site boundary subject to final survey
Plan for indicative purposes only. Not for detailed measurement

Legend

- Subject Site Boundary
- **Low Intensity Works** Reasonably intact vegetation with low levels of weed invasion. Targeted weed removal required with encouragement of natural bushland regeneration. Occasional works undertaken on a part-time programmed basis, works to be identified in Community Plan and sourced form Community funding.
- Dam (community land)
- **Medium Intensity Works** Partially intact vegetation with moderate levels of weed invasion. Ongoing weed removal targeting specific weeds (e.g. Lantana, Blackberry and Privet). Some areas requiring replanting with assisted natural regeneration, works to be identified in Community Plan.
- **High Intensity Works** Disturbed and extensively weed infested areas. Significant weed removal, assisted regeneration and replanting. Long-term commitment to weeding / regeneration programs required. Enrichment of fauna habitat recources required. Detailed works and funding program needed to establish procedures / costings / timing etc as identified in Community Plan.
- Private Conservation Land
- Area to be Dedicated to Council

Original plan produced in A4 colour

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Figure 2 (a)

Weed Removal and Riparian Bushland Regeneration Works

Kings Avenue, Terrigal

By:JMDC
19/11/10
Ref.No.10050

Source: Aerial © Department of Lands (2010)

APPENDIX I

WEED MANAGEMENT TECHNIQUES

WEED MANAGEMENT TECHNIQUES
FOR USE IN AREAS OF VEGETATION RETENTION

Employing the Bradley Method for regeneration requires the removal of weeds in phases. Stages of weed removal can be broken into three components:

Primary Weeding
Primary weeding is the initial weeding. It is recommended that primary weeding should be carried out on the subject land to remove the majority of dominant weeds. This involves removal of weeds through herbicide use and hand removal. It is important to note primary weeding usually initiates new growth of both weeds and native species. Primary weeding of the site may take up to four weeks and it is recommended that this work either be carried out by a licensed bushland regeneration company or by the owners under the direction of a qualified Bushland Regenerator.

Secondary or Follow-up Weeding
Secondary or follow-up weeding involves intensive weeding in areas that have already received primary work to remove weed regrowth or overlooked weeds. It is recommended that secondary weeding be conducted 3-6 months after primary weeding. Secondary weeding of the site may take up to two weeks and should be carried out by either a licensed bushland regeneration company or by the owners under the direction of a qualified Bushland Regenerator.

Maintenance Weeding
After primary and secondary weeding and natural regeneration of the bushland, the area should be able to resist most weeds. However, weeds will re-establish on the site from birds, wind and water transporting seed and other propagules into the site. Maintenance weeding should be undertaken once or twice a year until such time as the resistance of the bushland to weeds increases, then only requiring hand-weeding every two to three years. Maintenance weeding of the site may take up to one week and should be carried out by either a licensed bushland regeneration company or by the owners under the direction of a qualified Bushland Regenerator.

Natural regeneration of the dominant native plant species is expected to occur over time provided ongoing management works are maintained.

Weed removal should be undertaken using small tools such as spades, mattocks, garden forks and saws to reduce soil disturbance and minimise damage to nearby plants. In addition to hand removal of weeds in some situations where weeds are abundant, such as for many of the grass species and when native plants will not be affected by spray drift, the use of Glyphosate herbicide is recommended in accordance with the manufacturers specifications. Herbicides should not be applied prior to rain occurring as this reduces the herbicides' effectiveness and increases the potential to enter creeks and drainage lines in runoff.

Weeds are to be progressively removed in accordance with the following techniques recommended by the National Trust, NSW National Parks and Wildlife Service and Australian Association of Bush Regenerators.

Woody Weeds Removal Techniques:

Cut and Paint (Woody weeds to 10 cm basal diameter)
- Make a horizontal cut close to the ground using secateurs, loppers or a bush saw; and
- Immediately apply herbicide to the exposed flat stump surface.

Considerations:
- Cuts should be horizontal to prevent herbicide from running off the stump, sharp angle cuts are hazardous;
- Herbicide must be applied immediately before the plant cells close (within 30 seconds) and translocation of herbicide ceases;
- If plants resprout cut and paint the shoots after sufficient regrowth has occurred; and
- Stem scraping can be more effective on some woody weeds.

Stem Injection
- At the base of the tree drill holes at a 45 degree angle into the sapwood;
- Fill each hole with herbicide immediately; and
- Repeat the process at 5 cm intervals around the tree.

Frilling or Chipping
- At the base of the tree make a cut into the sapwood with a chisel or axe;
- Fill each cut with herbicide immediately; and
- Repeat the process at 5 cm intervals around the tree.

Considerations:
- Plants should be actively growing and in good health;
- Deciduous plants should be treated in spring and autumn when leaves are fully formed;
- For multi-stemmed plants, inject or chip below the lowest branch or treat each stem individually; and
- Herbicides must be injected immediately before plant cells close (within 30 seconds) and translocation of herbicide ceases.

Small Hand-Pullable Plants Removal Techniques:

Hand Removal
- Remove any seeds or fruits and carefully place into a bag;
- Grasp stem at ground level, rock plant backwards and forwards to loosen roots and pull out; and
- Tap the roots to dislodge any soil, replace disturbed soil and pat down.

Considerations:
- Leave weeds so roots are not in contact with the soil eg. hang in a tree, remove from site or leave on a rock.

Vines and Scramblers Removal Techniques:

Hand Removal
- Take hold of one runner and pull towards yourself;
- Check points of resistance where fibrous roots grow from the nodes;
- Cut roots with a knife or dig out with a trowel and continue to follow the runner;
- The major root systems need to be removed manually or scrape/cut and painted with herbicide; and
- Any reproductive parts need to be bagged.

Stem Scraping

- Scrape 15 to 30 cm of the stem with a knife to reach the layer below the bark/outer layer; and
- Immediately apply herbicide along the length of the scrape.

Considerations:

- A maximum of half the stem diameter should be scraped. Do not ringbark;
- Larger stems should have two scrapes opposite each other; and
- Vines can be left hanging in trees after treatment.

Weeds with Underground Reproductive Structures Removal Techniques:

Hand Removal of Plants with a Taproot

- Remove and bag seeds or fruits;
- Push a narrow trowel or knife into the ground beside the tap root, carefully loosen the soil and repeat this step around the taproot;
- Grasp the stem at ground level, rock plant backwards and forwards and gently pull removing the plant; and
- Tap the roots to dislodge soil, replace disturbed soil and pat down.

Crowning

- Remove and bag stems with seed or fruit;
- Grasp the leaves or stems together so the base of the plant is visible;
- Insert the knife or lever at an angle close to the crown;
- Cut through all the roots around the crown; and
- Remove and bag the crown.

Herbicide Treatment – Stem Swiping

- Remove any seed or fruit and bag; and
- Using a herbicide applicator, swipe the stems/leaves.

Considerations:

- Further digging may be required for plants with more than one tuber;
- Some bulbs may have small bulbils attached or present in the soil around them which need to be removed;
- It may be quicker and more effective to dig out the weed;
- Protect native plants and seedlings; and
- For bulb and corm species the most effective time to apply herbicide is after flowering and before fruit is set.

Exotic vegetation should be removed and stockpiled in a clear area away from adjoining bushland. This stockpile should be removed from the site at a convenient time. As part of the regular maintenance of the restored area any regrowth of the exotic plant species should be removed and disposed of appropriately.

Use of Herbicides

There are various categories of herbicides currently used (Buchanan, 1989), specifically those that kill on contact (contact herbicides), and those that must move through the tissue of the plant (systematic herbicides). Other herbicides include those that are non-selective and those that are selective. There are also those herbicides that kill all existing plants and those that prevent germination (Buchanan, 1989). The most commonly used biodegradable

herbicides by bush regenerators are those containing glyphosate (ZERO ®, Glyphosate 340 ® and Roundup ®).

An advantage of herbicide use is the low time taken to spray weeds as compared to physically removing them, particularly for large infestations of weeds. Another advantage is that the dead weeds may provide some measure of soil stabilisation for a short period of time.

Herbicides should not be applied prior to rain occurring. This reduces the herbicides effectiveness as well as being transported in runoff to creeklines and waterways.

An advantage of herbicide use is the low time taken to spray weeds as compared to physically removing them, particularly for large infestations of weeds.

Buchanan (1989), recommends that the use of herbicides should be considered when:

1. there are small areas of dense weeds with few or no native plants to protect;
2. there are large areas of weeds;
3. the weeds are growing too rapidly for physical removal; and
4. the weeds are located in areas with a high potential for erosion if vegetation is removed.

The spraying of weeds must only be undertaken by experienced persons. The success of each treatment must be evaluated by the operator after a set period of time according to the labelled effectiveness for each herbicide. Care must be taken when applying herbicides near drainage lines to avoid excess use due to the sensitivity of the wetlands and waterways into which runoff will eventually flow.

APPENDIX II

ESTIMATED COSTINGS

Works Required To Implement The Riparian and Buffer Zone Vegetation Management Plan (Pre-Construction Phase)

Task	Description	Effort / units required	Cost per unit	Total Cost (Estimate)
Pre-construction				
Provenance seed collection, storage and management	Collection of provenance seed for tubestock	4 days	$900 per day	$3,600
Site preparation & weed removal	Labour and herbicides for initial weed control (targeting noxious, woody & problem weeds)	6 days	$950 per day	$5,700
Protective Fencing	Supply & Install	1000LM	$10/LM	$10,000
Sub-total				$19,300.00
GST				$1,930.00
Total				**$21,230.00**

Works Required To Implement The Riparian and Buffer Zone Vegetation Management Plan (Construction Phase)

Task	Description	Effort/units required	Cost per unit	Total Cost (Estimate)
Construction				
Initial revegetation works – including the supply and installation of tree guards and native chip mulch and native indigenous tubestock.	Revegetation with Tree species	11,000m^2 @ 1 plant per 40m^2	$5.00 per tree/shrub installed	$1,375.00
	Revegetation with Sub-Canopy species	11,000m^2 @ 1 plant per 20m^2	$5.00 per tree/shrub installed	$2,750.00
	Revegetation with Shrub species	11,000m^2 @ 1 plant per 10m^2	$5.00 per tree/shrub installed	$5,500.00
	Revegetation with Grass species	3,000m^2 @ 3.5 plants per 1m^2	$2.50 per virocell installed	$7,500.00
	Hydro-mulching	3,000m^2	$1.50 per m^2	$4,500.00
Sub-total				$21,625.00
GST				$2,162.00
Total				**$23,787.00**