FNQROC DEVELOPMENT MANUAL

OPERATIONAL WORKS

SPECIFICATION

S9

NATURAL AREA RESTORATION

Under review

Issue Date – 11-05

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GENERAL

S8.01 SCOPE

1. These specifications detail all requirements pertaining to materials, site preparation, planting and maintenance associated with permanent and temporary revegetation works associated with the restoration of natural areas.

2. Where there is any conflict determined between the requirements specified herein and the requirements of any referenced Australian Standard, Statutory Authority Standards or otherwise, the requirements specified herein shall apply.

S8.02 REFERENCE DOCUMENTS

Australian Standards

- AS 2507 The storage and handling of pesticides.
- AS 4419 Soils for landscaping and garden use
- AS 4454 Composts, soil conditioners and mulches.

All Australian Standards referenced in this specification shall be the current edition.

Other Reference Documents

Goosem, S. & N.I.J. Tucker. (1995) *Repairing the Rainforest. Theory and practice of rainforest re-establishment in North Queensland's Wet Tropics.* Wet Tropics Management Authority. .

Tracey, J.G. (1982) The Vegetation of the Humid Tropical Region of North Queensland. Division of Plant Industry, CSIRO, Indooroopilly, Qld.

Gleed, S (2001) Revegetation Guidelines - for streams in Cardwell Shire (River Improvement Trust Works). North Queensland Afforestation Association Inc. Cairns.

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MATERIALS

S8.03 PLANT STOCK

1. All plant species shall be as detailed on the approved Revegetation Plan. There shall be no substitution of any species without approval from appropriate Council technical staff.

2. All plant stock shall be sourced from the appropriate local **provenance** and vegetation community applicable to the project unless unavailable and prior approval is given by Council.

3. Lists of specialised plant species required for different revegetation projects referred to in the design guidelines (FNQ ROC Development Manual - Operational Works Design Guidelines. D_ Natural Area Restoration; sections D9.06-D9.11) are provided in the Appendix of this document..

4. The root system of each plant shall be conducive to successful transplantation, all specimens shall be free from pests and disease, especially Phytopthera, sooty mould and scale, and all containers shall be free from insidious weeds.

5. All plants to be used in the project should be;

   - sun hardened for a minimum of 6 weeks prior to planting;
   - well formed,
   - free from disease or insect pests; and,
   - free of physiological disease symptoms (yellowing, wilting etc).

6. The majority of rainforest plant species grown for revegetation projects should be grown in 560ml Supa Native pots. This allows plants to develop an adequate root system that enables them to better cope with extended dry periods post planting. **Pioneer** species and **sclerophyll** species such as *Eucalyptus* and *Callistemon* can be grown in 250ml forestry tubes. Other species suitable to be grown in the 250ml forestry tubes are listed below..

Acacia sp.
Alphitonia sp.
Callistemon sp.
Eucalyptus sp
Ficus sp.
Gahnia sp.
Homalanthus novo-guineensis
Lomandra sp
Macaranga sp.

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7. All plants should comply with the minimum and maximum plant size requirements listed in the table below. Note that the size of the plants used will affect the maintenance schedule required. For example smaller plant stock will require more regular weed maintenance.

Pot size/plant type	**Minimum size (mm)**	**Maximum size (mm)**	**Optimum size (mm)**
250ml capacity pots (ie. forestry tubes)	300	500	400
560ml Supa Native	400	800	600
Pioneers	300	500	400

8. Plants shall be watered before transportation to the planting site, and shall be delivered to the site in a covered container. During loading and unloading damage in handling shall be avoided.

9. Species identified in the following are prohibited from use:

- Land Protection (Pest and Stock Route Management) Act 2002, and the associated
- Land Protection (Pest and Stock Route Management) Regulation 2003
- Species identified in the Local governments Pest Management Plans, and
- "Weed Pocket Guide. Agricultural and Environmental Weeds – Far North Queensland" Department of Natural Resources and Mines, Qld Government 2001 or similar weed pocket guide issued by local government.

S8.04 SOIL MIX

1. Specification for the potting mix are as follows:
   - It shall be friable and not contain any clay;
   - The pH shall be between 5.5 and 7.0;
   - It shall be free from contaminants such as the seed of declared weeds, rocks sticks and salts;
   - It shall contain both long-term (12-14 mths) and short-term (4-6mths) slow release fertilisers; and,
   - It shall have a porosity of approximately 20%.

S8.05 FERTILISER

1. Fertiliser used for native plants should contain Nitrogen(N), Phosphorous(P) and Potassium(K) within the following ranges;
   N = 15 to 25
   P = 1 to 2.2
   K = 5 to 18

   Examples include Robust (4-6mths) NPK = 17.3:1.4:12.2 and Osmocote (12-14ths) = 18:2.2:9.3

S8.06 MULCH

1. Materials suitable for use as mulch in revegetation projects includes;
   - Mulch hay;
   - aged hardwood woodchip, stockpiled for a minimum of 6 weeks; and,
   - Peanut shell.
2. Tea-tree mulch is prone to combustion and shall not be used unless permission is obtained from Council.
3. Bagasse poses a health hazard to the people spreading the mulch and should be avoided if possible.
4. Mulch should be free from weeds, rocks, non-biodegradable and toxic material.

S8.07 EROSION CONTROL MEASURES

1. Erosion control measures include mulching and/or mats such as geotextiles and jute matting. These measures can be used to protect exposed surfaces from the erosive effects of wind, rainwater impact and storm water run-off and should be considered for use when revegetating steep slopes. Site specific details such as soil type, drainage of rainwater run-off and annual rainfall will help determine the necessity of such measures. Blanket spraying should be avoided during the planting establishment phase on point

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bars and the toe (bottom of slope adjacent to waters edge) of the bank for waterways that are subject to annual large flood events. This will help to reduce erosion.

2. Mulching can be applied to mild slopes to limit run-off turbidity caused by raindrop impact. Suitable mulching material for revegetation works includes straw, well-aged wood-chip (although this may lock up available nitrogen in the soil) and gravel.

3. Mulch applied to slopes greater than 20% usually requires reinforcing with netting.

4. Mulch is not suitable for areas subject to concentrated flow unless suitable sized gravel mulch is used.

5. There are four general requirements for effective protection against erosion with erosion control mats. These are good contact with the ground, removal of surface irregularities, good anchorage and the discouragement of seepage flow.

6. Biodegradable erosion control mats are preferable to non-biodegradable ones because they pose less threat to small ground dwelling fauna that can become entangled in netting.

7. Erosion control mats should be inspected on a regular basis and after each storm event that produces run-off.

S8.08 SEDIMENT CONTROL MEASURES

1. Sediment control measures include sediment fences, straw bale barriers and stiff grass barriers.

2. Sediment fences must be placed along the contour but should not be located across areas of concentrated flow. These have little impact on fine silts (<0.02mm) and are limited to flows of around 40 litres per second in areas of concentrated flows. Examples of sediment fence design and layout are provided in the Appendix.

3. Sediment fences have a service life of approximately 6 months and are generally more efficient than straw bales.

4. Fenced areas should be maintained at appropriate intervals. Maintenance includes;
   - removal of sediment
   - checking fence stability
   - checking the fence still functions appropriately

5. Non-woven sediment fence material should be used where the catchment area is small and woven material in areas with a large catchment and therefore a higher flow rate.

6. The sediment fence should be buried in a trench 200mm deep and have stakes at 2m intervals without wire mesh or at 3m intervals with wire mesh. The middle of the sediment fence should be lower than the sides to enable overflow in extreme rainfall events.

7. The maximum catchment area should be 0.6 hectare per 100m of sediment fence.

8. The maximum parallel spacing of sediment fences down long slopes should typically be:

   $$= 90 - 48 [\log (\% \text{ slope})] \text{ metres.}$$

   Where: **H** is the horizontal slope component defined by **H**(H):1(V) and **(% slope)** = (100/**H**)

9. Straw bales are generally only suitable for catchment areas < 0.4 hectares where they will not be subject to concentrated flows.

10. Stiff grass plants can be placed along or just off the contour to control sheet flow and to act as filter strips to capture some sediment run-off. Exotic species such as *Vetiveria spp.* should not be used. Suitable local species to be used include *Lomandra spp*. and *Gahnia spp.*. Typically plants should be placed at intervals of 1-2 metres.

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11. Grass filter strips generally only trap coarse sediments and may also be ineffective during periods of very heavy rain. Note that a significant sediment build-up on filter strips may indicate inefficient on-site erosion controls.

SITE PREPARATION

S8.09 WEED REMOVAL

1. Prior to planting all weeds shall be killed by spraying a suitable glyphosate based herbicide or other herbicide with an appropriate label of off-label permit.

2. Site preparation should involve two applications of herbicide commencing approximately two months prior to planting. The second herbicide application (approximately one month after the first) ensures that any areas missed in the first application are treated.

3. In extremely sensitive sites where it is undesirable to use herbicide, slashing and blanket mulching of weeds can be applied to control weed growth (following the removal of woody weeds). Depending on the material used the mulch will need to be re-applied several times in the first 2-3 years or until canopy closure has been achieved. This may not be very practical or cost effective on large sites (ie > 0.3 hectare).

4. For **point bars** in waterways prone to large floods (coastal lowlands), areas to be planted should be spot sprayed to a diameter of 1 metre at the point where the trees will be planted.

5. Similarly, do not blanket spray the toe of the bank in flood prone waterways (coastal lowlands). A 1 metre strip of Para Grass (*Brachiaria mutica)* should be retained at the toe. Grasses and sedges should be retained for some stability with spot spraying to a diameter of 1 metre where the trees are to be planted.

S8.10 EXCLUSION FENCING

1. Where stock have access to the revegetation site suitable exclusion fences will need to be erected. Feral animals such as pigs, cattle and deer.

2. Exclusion fences for most stock need to be four strands of wire. The bottom three strands are barbed wire and the top is plain wire. Using barbed wire on the top strand poses a great threat to wildlife such as birds and bats.

3. More substantial fencing should be used if the purpose is to exclude domestic animals eg. Dog mesh, chicken wire.

S8.11 RIPPING

1. If the area to be revegetated has been heavily compacted (such as an old quarry or road) then it will need to be deep ripped to a depth of 200-300mm following the contour.

2. Ripping should only be carried out where required because the disturbance of the soil upturns the soil seed bank which usually contains a diverse array of undesirable weed species.

3. Steep slopes, river and creek flats should not be ripped.

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S8.12 EROSION & SEDIMENT CONTROL

1. Factors causing erosion and sedimentation should be controlled during site preparation and prior to planting. This may involve measures to divert, control and reduce the flow velocity of water and run-off. Such measures have been discussed in more detail in S8.07 and S8.08.

2. If working on a site that is prone to erosion (eg.riverbank) consider leaving some cover in the form of grass strips if it is unlikely that the grass will not further infest the planting site.

S8.13 BENCHING/CONTOUR BANKING

1. Benching of extremely steep riverbanks (usually greater than 6m high) can be used to make them more suitable for establishing vegetation and to help reduce sediment run-off. The bench is approximately 3m wide and at a height that is above the *3-year return period flood height.*

2. In greatly modified hardened sites (eg. Quarries, mining areas, roads etc) **swales** should be established to direct seed and direct plant into to help slow down the water flow and increase the amount of water penetration. The swales should follow the contour banks and zig-zag down the slope at a gradient of 1:1.

3. Where swales have been established diversion drains are required to divert excess water away from the swales that have been seeded or planted.

S8.14 HOLE DIGGING

1. In most cases holes should be dug to a depth of 400mm (or approximately twice the depth of the pot) and to a width of 200 mm.

2. Post hole diggers are suitable for digging holes on most sites. Post hole diggers may be unsuitable for use on sites that have soils with a high clay content because the auger blade can create hard polished walls inside the hole, which will make root penetration more difficult. If polished walls do occur, they can be scraped or scoured with a crow-bar or spade to break up the polished surface.

PLANTING DESIGN

S8.15 GENERAL

1. The planting design used will depend on the type of revegetation project being implemented and the vegetation structure and ecology of the local vegetation community.

S8.16 RAINFOREST PLANTING DESIGN

2. In wet tropics rainforest revegetation projects trees should be planted at random spacings 1.5 – 2.0m apart.

3. Most rainforest revegetation projects should incorporate a mix of the *framework species method* (including **pioneers**) and the *maximum diversity method* (Goosem & Tucker) to create a forest that will be the building blocks of a particular vegetation community.

4. The *framework method* uses species that are part of the pioneer and mid-**successional** stages of plant community development. Trees in this category generally produce a fruit crop in a much shorter time period than those mature phase species and they have seeds that are commonly dispersed by birds. This facilitates the recruitment of additional plant species that are bird dispersed. The *maximum diversity method* attempts to re-create the pre-clearing diversity by using a higher proportion of **mature phase** species which are much slower growing, take a long time to reach maturity and seed, and are generally less tolerant of high light intensities and wind exposure. If too many mature phase species are used the intensive maintenance period is increased.

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5. Using this combined planting design approximately 70% of the total number of trees to be planted in a project should be framework species. No more than 10% of the total number of trees should be true pioneer species. Planting too many pioneer species may result in the planting becoming 'stagnant'. After several years the canopy leaves of pioneers such as *Homalanthus novo-guineensis and Alphitonia petriei*, become smaller and the canopy architecture becomes more open, allowing more light to reach the canopy floor. This then provides a suitable environment for weed species to recolonise, especially grasses. The weeds and grasses then out compete the recruited seedlings. This stagnation often prevents the planting from evolving into a more mature/advanced vegetation community. The remaining 20% of species to be planted includes **mature phase** species from the *maximum diversity method*.

S8.17 SCLEROPHYLL PLANTING DESIGN

1. **Sclerophyll** dominated revegetation projects require a different approach because of the different characteristics of the vegetation communities. Careful consideration needs to be given to the primary objective of the sclerophyll community being established.

2. Consideration must be given to the vegetation structure of the vegetation community targeted to re-establish/restore. Determine if the canopy is purely sclerophyll (eg. Rose Gum, *Eucalyptus grandis)* or should it have rainforest components as well.

3. Similarly, consideration needs to be given to species planted that belong to the mid canopy and understorey layers in a wet tropics sclerophyll revegetation project. For example, if you were designing a wet sclerophyll revegetation project to provide a corridor and habitat for the Yellow-bellied Glider it would be inappropriate to incorporate rainforest plants that are going to grow up into the *Eucalyptus grandis* canopy, out compete the Eucalypt species and develop into a rainforest community. The area planted would then not be a viable Yellow-bellied Glider corridor.

4. The planting design for sclerophyll revegetation projects should be determined by observing the tree spacing and species mix in the local sclerophyll vegetation community for that site.

S8.18 RIPARIAN REVEGETATION DESIGN

1. The crucial element of planting design for **riparian** revegetation projects is the selection of species for the different vertical positions on the banks of the watercourse. Different species have different tolerance levels to the mechanical impacts of floodwaters and the period of inundation. Appropriate riparian species and their planting positions in the riparian zone are provided in the Appendix.

2. The following elements help determine the design and species selection for riparian revegetation projects;

    - slope,
    - vegetation community,
    - presence of rock and/or sand,
    - distance from the waters edge,
    - location of watercourse in catchment, and,
    - size of the watercourse.

3. Careful consideration should be given prior to planting **point bars (**sand bars). These areas are part of an ever-changing watercourse. Given the right conditions the sand bars will be recolonised by an 'ephemeral' riparian community that will persist until the next major flood event. Species that play such a role includes; *Callistemon viminalis, Ficus congesta, Nauclea orientalis, Syzygium tierneyanum, Tristaniopsis exiliflora and Melaleuca leucadendron* – depending on the catchment and the natural species assemblage. If these areas are to be planted the tree species should be planted at 6 – 8m spacings to allow free movement of flood waters.

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S8.19 BEACH STRAND PLANTING DESIGN

1. There are distinct vegetation zones in beach strand communities that relate to the position along the dune and the successional stage of the vegetation. These include the;
   - beach foredune – containing sand colonising species that can tolerate exposed conditions and salty winds;
   - beach mid-dune – this occurs on the landward side of the foredune and often contains shrubby species or trees that will have branches that reach down to the sand; and,
   - beach scrub – this usually occurs in the lee of the mid-dune and tends to be more stable.
2. The plants used in the revegetation of beach strand areas should be closely aligned with the plant species that naturally occur in the beach zone being planted. Beach strand vegetation communities vary according to the richness of the substrate, the rainfall received and the proximity to other vegetation communities. The Appendix lists appropriate beach strand species to plant in relation to the associated vegetation community of the project site.

S8.20 WETLAND PLANTING DESIGN

1. The design of a wetland revegetation/rehabilitation project will be determined by the hydrology of the wetland system and the area to be planted within the wetland. To be most effective wetland projects should use a combination of vegetation types; floating species, emergent species and submerged plants. This helps maximise water quality improvement and aquatic biodiversity.

2. The hydroperiod (ie duration and frequency of inundation) has a significant impact on the establishment, growth and survival of wetland vegetation. This information is crucial for designing a successful wetland revegetation project.

3. Aquatic plants should be planted according to their preference for water depth and degree of water flow.

4. The best uptake of nutrients in wetland systems occurs where the water has a low flow rate.

5. Sedge species should be planted in clusters 5 – 10m apart with individual plants in a cluster spaced 1m apart. This will assist in rapid colonisation.

6. Terrestrial species to be planted around the wetland edge should be planted at densities similar to that particular type of wetland vegetation community. For example, a Featherpalm Swamp (*Archontophoenix alexandrae)* would have trees planted at random spacings of 1.5 – 2.0m similar to rainforest revegetation projects. A *Melaleuca quinquinervia* swamp is classified as a medium open forest and should have Melaleuca's planted wider apart (>2.0) with the ground layer planted out with sedges such as *Thoracostachyum sumatranum* and *Lepironia articulata*. Some appropriate species for wetland plantings are provided in the Appendix.

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PLANTING

S8.21 GENERAL

1. All plantings should be carried out at the time of year when the likelihood or rainfall is greatest and when the threats to planting success are a minimum. The table below provides guidelines to the most suitable planting times for different areas.

2. Please note that the most suitable planting periods given below are a guideline only. Each site has its own individual soil moisture and rainfall characteristics. Details such as average rainfall and months with the most reliable amount of rainfall must be identified for each individual site.

Altitude	Location Description	Threat	Most Suitable Planting Period
Coastal lowlands / foothills	Low rainfall areas	No follow-up rain	Jan – March
	Riparian	Flooding	April-May or June-July (with irrigation if required)
	Beach strand	Drying out	Mar-June (depending on length of wet season)
	Wetland	Flooding	Nov-Dec (irrigation required) or April-July (depending on area of wetland being planted)
	Areas with no wet weather access	No access in wet season	Dec-Feb or April- June (irrigation may be required)
	Other areas	Lack of follow-up rain	Year round with irrigation
Tableland areas	Riparian	Flooding	April-June or Nov-Jan (with irrigation)
	Mabi forest	Drying out/frost	Nov-Dec (irrigation required) or Jan - Mar
	Wetland	Flooding	Jan – Mar (depending on area of wetland being planted)
	Areas with no wet weather access	No access during the wet	Nov-Dec (with irrigation) or Jan – Feb
	Frost-prone areas	Frost	Nov-Dec (irrigation required) or Feb – Mar
	Other areas	Lack of follow-up rain	Year round with irrigation

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3. Planting should be carried out as soon after plant delivery to the site as possible. All containers, unless fully biodegradable, shall be removed at the latest point before planting.

4. All plants should be obtained from a nursery located in an area having a similar climate to the site of the works.

S8.22 PLANTING

1. Fertiliser is placed in the bottom of the hole and cover with some dirt prior to planting. This prevents tree roots coming into direct contact with the fertiliser which may cause roots to burn.

2. Trees must be planted correctly. Check the depth of the hole. The top soil surface in the pot should be at ground level when the tree is planted in the ground.

3. Squeeze the pot firmly and gently remove the tree from the pot. Place the tree in the hole and carefully backfill the hole with soil.

4. During backfilling around the plants the soil should be firmed to ensure intimate contact with the roots, but with large material successive layers of soil will need to be firmed as backfilling proceeds.

5. Ensure the plants are held securely by the soil but do not compact the soil too much so that moisture penetration is restricted.

6. Form a small saucer (ie an indented area) around the stem to capture water and allow for greater penetration.

7. After planting, trees should not be staked as this can lead to weak stems.

8. Plants should be watered directly after planting prior to spreading of mulch. A minimum of 10 litres of water should be given to each tree immediately after planting. This watering helps to settle the roots against the soil and get rid of any air pockets. If planting coincides with natural rainfall then the need for ongoing watering is alleviated.

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IRRIGATION & MULCHING

S8.23 WATERING IN

1. All plants should be watered in after planting at the rate of 10 litres per plant.

2. If no follow up rainfall is received the revegetated area should be watered once a week (at a minimum rate of 10 litres of water per plant) until substantial amounts of rain fall.

S8.24 MULCHING

1. Mulching helps to reduce the growth of weeds, keeps soil temperatures more constant and helps to retain soil moisture levels. Mulching is more beneficial if it covers the entire area rather than just circles around individual trees.

2. Mulch shall be installed to a depth of 150mm and should be left just clear of the plant stem.

3. Particle masks should always be used when spreading hay or bagasse to avoid breathing in mould spores or fibres.

4. Note that mulches will not be suitable for use in areas subject to concentrated water flow unless covered by netting or suitably sized gravel mulch is used.

5. Mulch should not be used in fire prone areas or where natural regeneration is being encouraged.

MAINTENANCE

S8.25 WEED CONTROL

1. A maintenance program is to be implemented immediately following planting. This involves the use of Glyphosate based herbicide (using the manufacturers recommended rates) to eradicate weeds and grasses that grow within the revegetated area.
2. Bioactive is to be used in sites adjacent to waterways and wetlands.
3. Maintenance visits should occur at 2 – 3 monthly intervals on average. During the dry and wet, warmer months of September to March the favourable growing conditions may result in the requirement of more frequent maintenance events (every 6 – 8 weeks).
4. Contact of the herbicide with the new plants shall be avoided. If greater than 1% of the total number of trees planted die as a result of any one herbicide application, the dead trees should be replaced.
5. Glyphosate shall not be applied under the following weather conditions at the site:
    - when winds exceed 15 km/hr;
    - where the surface is too wet; or,
    - during rain periods or when rain appears imminent.

S8.26 IRRIGATION

1. Irrigating should only be necessary in the first 3 – 4 months after planting if insufficient rainfall is received or in the following dry season if the plants become water stressed.
2. The contractor will be responsible for sourcing the irrigation equipment necessary to water the revegetated site if required.
3. When irrigating the planting it is more beneficial to the trees if they are given a good deep soaking less frequently rather than frequent shallow waterings. Plantings should be irrigated to the extent that water reaches a depth of at least 15-20cm below the ground surface.
4. Irrigating should not be necessary more than once per week during dry periods unless the plants still show signs of water stress.

S8.27 REPLANTING

1. The contractor shall be responsible for replacing dead trees if greater than 5% of the total number of trees die within the follow-up maintenance period (2-3 years as agreed to) as a direct result of herbicide application or lack of watering.
2. Replacement plants shall be of similar size and quality and of identical species and variety to the plants being replaced.
3. The contractor shall not be held responsible for dead trees that result from **extreme** natural climatic events such as cyclone, floods, frost and/or fire within a given time period as agreed to by the council and the contractor in the planning process.

S8.28 MONITORING

1. Regular monitoring of the project site is crucial to keep track of the overall project progress. There are three main areas to be monitored in a revegetation project. These are;
    - weed growth;
    - watering requirements; and,
    - general plant condition.

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2. Progress of project implementation should also be monitored. This includes recording planting dates, number of trees planted each day and details of maintenance visits (weed control, irrigation and mulching).

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APPENDIX

APPENDIX I – GLOSSARY

Mature phase = refers to those species that appear later in the successional process. These species are light intolerant, usually slow growing relative to pioneer species, and, produce seed much less frequently.

Pioneer = a fast growing plant species that is shade intolerant, produces vast numbers of seeds regularly and has a rapid biomass turnover which assists in changing soil conditions.

Point bar = a build up of alluvial material deposited in the water channel and usually extending out into the waterway itself.

Provenance = (in revegetation context) generally refers to the site or area from which a seed has been collected in a natural population. Local provenance is not defined merely by distance but by similarities in soil type, topography, climate, vegetation communities and the means of pollination and dispersal. Local provenance varies for different species depending on the above-mentioned factors.

Riparian = of or on the riverbank

Sclerophyll = plants which have hard leaves to reduce moisture loss. Examples include Eucalypts and Melaleucas.

Succession = a process of change whereby ecological communities become established and mature. Succession in vegetation communities involves species replacements, shifts in population structure and changes in the availability of resources such as light, moisture and soil nutrients.

Swale = a bank positioned on a contour with the purpose of slowing water run-off to increase the amount of water penetration into the soil. These are usually constructed by mounding soil.

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APPENDIX II – HABITAT PLANTINGS

(a) Cassowary Food Trees

Scientific Name	Common Name	Size (m)	Comments
1) trees			
Acmena graveolens	Cassowary satinash	30	Attractive new growth/fruit
Acronychia acidula	Lemon aspen	15	Attractive foliage, edible fruit
Alphitonia whitei	Red Ash	20	Fast growing. Nectar sought after by bees
Barringtonia calyptrata	Cassowary Pine	15	Good for wet sites, atttractive flowers.
Cananga odorata	Ylang ylang	10	Highly performed flowers
Canarium muelleri	Scrub Turpentine	8	Suited to poorer soils
Castanospora alphandii	Brown tamarind	15	Produces abundant seed crops, widespread.
Cerbera floribunda	Cassowary plum	10	Attractive flowers/fruit
Chionanthus ramiflorus	Northrn olive	8	Very hardy adaptable species
Cryptocarya mackinnoniana	Mackinnon's laurel	15	Hardy species. Attractive new growth
Cryptocarya oblata	Tarzali silkwood	15	Attractive new growth/fruit
Cryptocarya triplinervis	Brown Laurel	8	Hardy widespread species
Elaeocarpus grandis	Blue quandong	30	Fast grower. Attractive flowers/fruit
Elaeocarpus eumundii	Eumundii quandong	20	Attractive flowers
Endiandra hypotephra	Rose Walnut	15	Adaptable fast growing species
Endiandra sankeyana	Sankey's walnut	5	Adaptable widespread species
Ficus congesta	Red leaf fig	20	Good for wet sites
Ficus racemosa	Cluster Fig	15	Fast growing, suitable for river banks
Litsea leefeana	Brown bollywood	15	Abundant seed crop. Adaptable species
Myristica insipida	Native nutmeg	30	Fruit attractive to many birds. Sheltered sites
Nauclea orientalis	Leichardt tree	10	Semi-deciduous,prefers wet sites & riverbanks
Neolitsea dealbata	Grey bollywood	10	Adaptable species, widespread
Pleiogynium timorense	Burdekin plum	10	Very hardy species. Suitable for poorer soils
Prunus turneriana	Almondbark	10	Adaptable species. Produced good seed crop
Scolopia braunii	Brown birch	10	Very adaptable species. Attracts butterflies
Syzygium alliiligneum	Onionwood	30	Colourful flowers, fruit, new growth. Widespread
Syzygium cormiflorum	Bumpy satinash	30	Hardy, widespread, attractive to many mammals/birds.
Syzygium kuranda	Kuranda satinash	30	Widespread hardy species. Attractive flowers
Syzygium tierneyanum	River cherry	30	Excellent species for stream & riverbanks
Terminalia sericocarpa	Damsen plum	30	Excellent species for stream and riverbanks.
2) palms & pandans			
Archontophoenix alexandrae	Alexander palm		Widespread. Excellent species for wet sites
Pandanus monticola	Pandanus		Widespread rainforest pandan
Ptychosperma elegans	Solitaire palm		Good species for wet sites
3) shrubs & herbs			
Alpinia caerulea	Common ginger		Widespread, sheltered sites
Cordyline petiolaris	Palm lily		Widespread. Prefers sheltered sites
Polyscias australianum	Ivory basswood		Widespread, fast growing
4) vines			
Faradaya splendida	Potato vine		Widespread, attractive flowers/fruit
Melodorum leichardtii	Zig-zag vine		
5) cover trees			
Homolanthus novo-guineensis	Bleeding heart		Widespread, adaptable. Fragrant fruit

Under review

Macaranga tanarius	Blush macaranga		Adaptable fast growing
Macaranga involucrata	Macaranga		Adaptable fast growing
Polyscias elegans	Celerywood		Fast growing, attracts a variety of frugivorous birds

(b) Tree-kangaroo Food Trees

Food Tree Species of Lumholtz's tree-kangaroo, *Dendrolagus lumholtzi* (on the Atherton Tablelands)

The tree species listed below may not be suitable for all planting sites. Technical advice should be sought prior to selecting species.

L = leaf Fl = flower Fr = fruit

Family Consumed	Species	Common Name	Plant Part
Anacardiaceae	*Euroschinus* falcata	Pink Poplar	L
Apocynaceae	*Alstonia scholaris*	Milky Pine	L
Apocynaceae	*Cerbera inflata*	Cassowary Plum	L
Apocynaceae	*Neisosperma poweri*	Milkbush	L
Araliaceae	*Polyscias australiana*	Ivory Basswood	L
Araliaceae	*Polyscias elegans*	Celerywood	L
Araliaceae	*Polyscias murrayi*	White basswood	L
Araliaceae	*Schefflera actinophylla*	Umbrella Tree	L, Fl
Araucariaceae	*Agathis microstachya*	Bull Kauri	L
Balanopaceae	*Balanops australiana*	Pimply Ash	L
Cyatheaceae	*Cyathea cooperi*	Tree Fern	L
Elaeocarpaceae	*Aceratium doggrellii*	Buff Carabeen	L
Elaeocarpaceae	*Elaeocarpus grandis*	*Blue* Quandong	L, Fl, Fr
Elaeocarpaceae	*Sloanea australis ssp. parviflora*	Blush Alder	L
Elaeocarpaceae	*Sloanea langii*	White Carabeen	L
Euphorbiaceae	*Glochidion hylandii*	*H*yland's buttonwood	L
Euphorbiaceae	*Rockinghamia angustifolia*	Kamala	L
Fabaceae	*Castanospermum australe*	Black Bean	L
Icacinaceae	*Citronella smythii*	Silky Beech	L
Icacinaceae	*Irvingbaileya* australis	Wax Berry	L
Lamiaceae	*Viticipremna queenslandica*	*V*itex	L
Lauraceae	*Beilschmiedia bancroftii*	Yellow walnut	L
Lauraceae	*Beilschmiedia collina*	Mountain Blush Walnut	L
Lauraceae	*Beilschmiedia tooram*	Tooram walnut	L
Lauraceae	*Cryptocarya angulata*	Ivory Laurel	L
Lauraceae	*Cryptocarya corrugata*	Corduroy Laurel	L
Lauraceae	*Cryptocarya hypospodia*	*Northern* Laurel	L, Fl.
Lauraceae	*Cryptocarya mackinnoniana*	*Rusty* Laurel	L
Lauraceae	*Cryptocarya melanocarpa*	Laurel	L
Lauraceae	*Cryptocarya murrayi*	Murray's Laurel	L
Lauraceae	*Cryptocarya triplinervis*	Brown Laurel	L
Lauraceae	*Endiandra insignis*	*Hairy* Walnut	L
Lauraceae	*Endiandra monothyra v*ar *monothyra*	Rose Walnut	L
Lauraceae	*Endiandra sankeyana*	*S*ankey's Walnut	L
Lauraceae	*Endiandra wolfei*	Rose Walnut	L
Lauraceae	*Litsea connorsii*	Laurel	L
Lauraceae	*Litsea leefeana*	Bollywood	L, Fr, P
Lauraceae	*Neolitsea dealbata*	*Grey* Bollywood	L
Meliaceae	*Anthocarapa nitidula*	Incensewood	L
Meliaceae	*Dysoxylum pettigrewianum*	Spur Mahogany	L
Monimiaceae	*Doryphora aromatica*	Sassafras	L
Monimiaceae	*Tetrasynandra laxiflora*	Tetra Beech	L
Moraceae	*Ficus benjamina*	*Weeping* Fig	L

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Moraceae	*Ficus obliqua*	*Small-leaved* Fig	L
Moraceae	*Ficus superba var henneana*	*Superb* Fig	L
Myristicaceae	*Myristica globosa subsp. muelleri*	Native Nutmeg	L
Myrtaceae	*Syzygium gustavioides*	Watergum	L
Myrtaceae	*Syzygium johnsonii*	Rose Satinash	L
Myrtaceae	*Xanthostemon chrysanthus*	Golden Penda	L
Myrtaceae	*Xanthostemon whitei*	Red Penda	L
Oleaceae	*Chionanthus ramiflora*	Northern Olive	L
Oleaceae	*Olea paniculata*	Native Olive	L
Pittosporaceae	*Hymenosporum flavum*	Native Frangipani	L
Proteaceae	*Alloxylon flammeum*	Pink Silky Oak	L
Proteaceae	*Athertonia diversifolia*	Atherton Oak	L, Fl
Proteaceae	*Cardwellia sublimes*	Bull Oak	L
Proteaceae	*Helicia nortoniana*	Norton's Oak	Fr
Rhamnaceae	*Alphitonia petriei*	Sarsaparilla	L, Fl
Rhamnaceae	*Alphitonia whitei*	Sarsaparilla	L
Rosaceae	*Prunus turneriana*	Almondbark	L
Rutaceae	*Acronychia acidula*	Lemon Aspen	L, Fr
Rutaceae	*Flindersia acuminata*	Silver Silkwood	L
Rutaceae	*Flindersia bourjotiana*	Silver Ash	L, Fl
Rutaceae	*Flindersia brayleyana*	Queensland Maple	L, Fl
Rutaceae	*Flindersia pimenteliana*	Maple Silkwood	Fl
Rutaceae	*Melicope elleryana*	Evodia	L
Sapindaceae	*Arytera divaricata*	Rose Tamarind	L
Sapindaceae	*Arytera pauciflora*	Small leaved Tamarind	L
Sapindaceae	*Castanospora alphandii*	Brown Tamarind	L
Sapindaceae	*Cnesmocarpon dasyantha*	Fern-leaved tamarind	L
Sapindaceae	*Cupaniopsis flagelliformis ssp. flagelliformis*	Brown Tuckeroo	L, Fr
Sapindaceae	*Diploglottis diphyllostegia*	Northern Tamarind	L
Sapindaceae	*Guioa lasioneura*	Silky Tamarind	L
Sapindaceae	*Jagera pseudorhus var integerrima*	Pink Tamarind	L, Fr
Sapindaceae	*Mischocarpus lachnocarpus*	Woolly Pear Tamarind	L, Fr, P
Sapindaceae	*Sarcopteryx martyana*	-	L
Sapotaceae	*Pouteria myrsinodendron*	Yellow Boxwood	L
Sterculiaceae	*Argyrodendron peralatum*	Tulip Oak	L
Sterculiaceae	*Franciscodendron laurifolium*	Cabbage Crowsfoot	L
Symplocaceae	*Symplocos cochinchinensis var. pilosiuscula*	White Hazelwood	L
Urticaceae	*Dendrocnide photinophylla*	Shining leaved Stinging tree	L
Xanthophyllaceae	*Xanthophyllum octandrum*	Macintyres Boxwood	L

Taken from: Coombes, K., Simmons, T. and R. Jensen (2006) *Tree use by Lumholtz's tree-kangaroo*, *Dendrolagus lumholtzi, on the Atherton Tablelands.*

Under review

(c) Possum Food Trees

Records from Seawright, Goudberg, Procter-Gray, Laurance , Cooper, Winter (Compiled by J.Winter)

BOTANICAL NAME	Green Ringtail	Coppery Brushtail	Herbert R Ringtail	Lemuroid Ringtail	Striped Possum
Acacia celsa		Y			
Acacia melanoxylon		Y			
Acacia sp		Y			
Acmena resa			Y	Y	
Acronychia crassipetala		Y	Y	Y	
Aglaia ferruginea		Y			
Aglaia sapindina				Y	
Alectryon coriaceus		Y			

BOTANICAL NAME	Green Ringtail	Coppery Brushtail	Herbert R Ringtail	Lemuroid Ringtail	Striped Possum
Aleurites rnoluccana	Y	Y	Y		
Alloxylon wickhamii	Y				
Alphitonia petriei		Y	Y	Y	
Alphitonia whitei				Y	
Antirhea tenuiflora			Y		
Archidendrani vaillantii			Y		
Argyrodendron peralatum	Y	Y			
Argyrodendron polyandrum	Y				
Argyrodendron sp	Y				
Argyrodendron sp code 576	Y				
Arytera lautererana			Y	Y	
Arytera sp			Y		
Austromyrtus sp			Y		
Beilschmedia bancrofti				Y	
Beilschmeidia sp aff B.obtusifolia		Y		Y	
Beilschmiedia tooram			Y	Y	
Brachychiton acerifolius	Y				
Brackenridgea nitida			Y		
Breynia stipitata		Y			
Brombya platynema			Y		
Caldcluvia australiensis				Y	
Canarium baileyanum			Y		
Cardwellia sublimis				Y	
Carnarvonia araliifolia				Y	
Carnarvonia sp			Y		
Carnarvonia sp code 231	Y				
Castanospermum australe		Y			
Castanospora alphandii		Y	Y	Y	
Cephalaralia cephalobotrys			Y	Y	
Ceratopetalum succirubrum				Y	
Chrysophyllum sp code 128			Y		
Cinnamomum camphora	Y	Y			
Cinnamomum laubatii	Y				
Cryptocarya angulata				Y	
Cryptocarya corrugata				Y	
Cryptocarya hypoglauca				Y	
Cryptocarya rigida			Y	Y	
Cupaniopsis ferruginea	Y				
Daphnandra repandula		Y		Y	
Darlingia darlingiana			Y		
Darlingia ferruginea				Y	
Dendrocnide photinophylla	Y				
Dipiogiottis diphyllostegia	Y	Y			
Diploglottis bracteata			Y	Y	
Doryphora aromatica		Y			
Drypetes australasica			Y		
Dysoxylum pettigrewianum		Y			
Dysoxylum rufum		Y			
Elaeocarpus arnhemicus				Y	
Elaeocarpus coorongooloo		Y			
Elaeocarpus eumundi			Y		
Elaeocarpus ferruginiflorus			Y		
Elaeocarpus foveolatus			Y		
Elaeocarpus grandis			Y		
Elaeocarpus largiflorens			Y	Y	
Elaeocarpus ruminatus		Y	Y	Y	
Elaeocarpus sp.			Y		
Eleagnus latifolia			Y		
Endiandra muelleri				Y	
Endiandra palmerstonii		Y		Y	
Endiandra sankeyana	Y				

Under review

BOTANICAL NAME	Green Ringtail	Coppery Brushtail	Herbert R Ringtail	Lemuroid Ringtail	Striped Possum
Endiandra sp				Y	
Endiandra sp aff E. hypotephra				Y	
Endiandra sp aff E. muelleri			Y	Y	
Endiandra sp code 15				Y	
Endiandra sp code 62	Y	Y		Y	
Eucalyptus intermedia			Y		
Eucalyptus tereticornis		Y			
Eucalyptus torelliana			Y		
Euodia sp code 305		Y	Y		
Euroschinus falcata	Y	Y	Y		
Ficus copiosa	Y				
Ficus crassipes	Y				
Ficus destruens	Y				
Ficus fraseri	Y	Y			
Ficus leptoclada	Y				
Ficus obiiqua var obliqua	Y				
Ficus pleurocarpa	Y				
Ficus sp	Y	Y			
Ficus superba	Y	Y			
Ficus watkinsiana	Y		Y		
Flindersia bourjotiana		Y		Y	
Flindersia brayleyana		Y		Y	
Flindersia pimenteliana		Y		Y	
Flindersia schottiana		Y			
Franciscodendron laurifolia	Y				
Franciscodendron laurifolium	Y				
Geissois biagiana				Y	
Glochidion hylandii			Y		
Glochidion sp.			Y		
Guioa lasioneura		Y	Y		
Helicia lamingtoniana				Y	
Helicia nortoniana			Y		
Homalanthus novo-guineensis		Y	Y		
Litsea glutinosa	Y				
Litsea leefeana	Y	Y		Y	
Litsea sp				Y	
Lomatia fraxinifolia			Y		
Macaranga inamoena			Y		
Macaranga subdentata			Y		
Mallotus moilissimus		Y			
Mallotus philippensis		Y			
Mallotus polyadenos		Y			
Melia azederach		Y			
Melicope fareana				Y	
Mischocarpus lachnocarpus	Y				
Myristica insipida					
Neisosperma poweri					
Neolitsea dealbata		Y	Y	Y	
Niemeyera prunifera	Y				
Pipturus argenteus	Y				
Pittosporum sp		Y			
Planchonelia brownlessiana			Y		
Planchonella macrocarpa			Y		
Planchonella obovoidea		Y			
Planchonella sp			Y		
Planchonella xerocarpa			Y		
Polyosma rhy.tophloia		Y	Y	Y	
Polyscias murrayi			Y		
Polyscias sp		Y	Y		
Pouteria castanosperma			Y		
Premna acuminata					

Under review

BOTANICAL NAME	Green Ringtail	Coppery Brushtail	Herbert R Ringtail	Lemuroid Ringtail	Striped Possum
Prunus tumeriana			Y	Y	
Pseudocarapa nitidula		Y			
Pullea stutzeri				Y	
Rhodamnia costata			Y		
Rhodamnia sp				Y	
Rhodomyrtus pervagata		Y			
Rhodomyrtus trineura		Y	Y		
Rhysotoechia robertsonii		Y			
Rockinghamia angustifolia			Y		
Schefflera actinophylla					Y
Sloanea australis			Y		
Sloanea langii	Y		Y	Y	
Sloanea macbrydei			Y	Y	
Solanum mauritianum		Y			
Sphenostemon lobosporus			Y		
Stenocarpus sinuatus		Y	Y		
Synima cordierum		Y	Y		
Syzygium cormiflorum			Y	Y	
Syzygium endophloium				Y	
Syzygium gustavioides				Y	
Syzygium papyraceum			Y		
Syzygium trachyphloium			Y		
Syzygium wesa			Y		
Syzygium wilsoni ssp. cryptophlebium			Y		
Terminalia sericocarpa		Y			
Tetrasynandra laxiflora				Y	
Tetrasynandra sp			Y		
Timonius singularis			Y		
Toona australis		Y			
Trichosanthes sp.			Y		
Zanthoxylum veneficum		Y		Y	

Under review

(d) Flying Fox Food Trees

This list was made by Cathy Eggert for a Masters thesis, October to March at Zillie Falls colony and other locations in 1993-4. Seed identification performed by Nigel Tucker + Greg Richards 1990 (probably all year round sampling).

NATIVE BLOSSOM

Celastraceae	Euonymus australiana
Elaeocarpaceae	Elaeocarpus grandis
Fabaceae	Castanospermum australe
Lauraceae	Neolitsea dealbata
Myrtaceae	Eucalyptus cloeziana, Corymbia citriodora, Corymbia intermedia, Corymbia polycarpa, Eucalyptus teretecornis
	Syzygium forte
	Syncarpia glomulifera

NATIVE FRUITS

Annonaceae	Polyalthia michaelii
Apocynaceae	Melodinus australia
Araliaceae	Schefflera actinophylla
	Polyscias sp
Arecaceae	Archontophoenix alexandrae
Burseraceae	Canarium muelleri
Chrysobalanaceae	Parinari nonda

Combretaceae	Terminalia arenicola, T. catappa, T.sericocarpa
Elaeocarpacae	Elaeocarpus grandis, E. bancrofti, E. eumundi
Elaeagnaceae	Eleagnus triflora
Euphorbiaceae	Drypetes sp ,
Meliaceae	Melia azedarach var. australasica
Moraceae	Ficus fraseri, F.pleurocarpa, F.triradiata, F.watkinsiana, F. obliqua var.obliqua, F. crassipes, F. adenosperma, F. virens subsp. virens, F. virens var. sublanceolata, F.septica, F. virgata, F. congesta, F. copiosa, F.variegata
Myrtaceae	Decaspermum humile Syzygium spp Syzygium cryptophlebium, S.forte, S. kuranda, S.wesa
Rubiaceae	Nauclea orientalis, Canthium attenuatum
Rutaceae	Acronychia acidula
Sapotaceae	Manilkara kauki Planchonella obovoidea
Urticaceae	Pipterus argentea
Verbenaceae	Faradaya splendida

(e) Mahogany Glider Habitat Trees (*Petaurus gracilis)*

Family	**Species**	**Habit**	**Common Name**
Burseraceae	*Canarium australianum*	tree	
Hibbertiaceae	*Dillenia alata*	tree	Red Beech
Mimosaceae	*Acacia celsa*	Tree	Brown Salwood
	Acacia mangium	Tree	Brown Salwood
Moraceae	*Ficus congesta*	Tree	Red-leaf Fig
Myrtaceae	*Corymbia intermedia*	Tree	Pink Bloodwood
	Corymbia tessellaris	Tree	Carbeen
	Eucalyptus pellita	Tree	Red Stringybark
	Eucalyptus tereticornis	Tree	Blue Gum
	Lophostemon suaveolens	Tree	Swamp mahogany
	Melaleuca dealbata	Tree	Paperbark
	Melaleuca leucadendra	Tree	Broad leaved Paperbark
	Melaleuca quinquinervia	tree	Paperbark
	Melaleuca viridiflora	Tree	Paperbark
Rubiaceae	*Nauclea orientalis*	Tree	Leichhardt Tree
Rutaceae	*Melicope elleryana*	Tree	Evodia
Sapindaceae	*Guoia acutifolia*	Tree	Glossy Tamarind

Under review

(f) Yellow-bellied Glider Habitat Trees (*Petaurus australis)*

Species are taken from the wet sclerophyll vegetation types 14b, 56 (Tracey, 1982) and 61 and 64 from Stanton and Stanton.

Family	Species	Habit	Common Name
Rhamnaceae	*Pomaderris argyrophylla*	shrub	Pomaderris
Casuarinaceae	*Allocasuarina torulsa*	Tree	Forest Oak
Cyperaceae	*Gahnia aspera*	Sedge	Large-seeded Gahnia
	Gahnia sieberiana	sedge	Saw Sedge
Epacridaceae	*Acrotriche aggregata*	shrub	Ground Berry
Euphorbiaceae	*Breynia cernua*	shrub	Coffee Bush/Fart Bush
Mimosaceae	*Acacia falcata*	shrub	
	Acacia flavescens	shrub	Red Wattle
	Acacia whitei	shrub	
Myrtaceae	*Corymbia clarksoniana*	Tree	Clarkson's Bloodwood
	Eucalyptus acmenoides	tree	Mountain Stringybark
	Eucalyptus grandis	Tree	Flooded/Rose Gum
	Eucalyptus resinifera	Tree	Red Stringybark
	Syncarpia glomulifera	Tree	Turpentine
Pittosporaceae	*Bursaria tenuifolia*	Tree	Slender Bursaria
Poaceae	*Themeda triandra*	Grass	Kangaroo Grass
Thymeliaceae	*Pimelea linifolia*	herb	Rice Flower
Zingerbaceae	*Alpinia caerulea*	Ginger	Common Ginger

Under review

APPENDIX III – RIPARIAN PLANTINGS

The table below lists species that commonly grow along watercourses in the Wet Tropics Bioregion. Please note that this list does not include all species suitable for the revegetation of stream banks, it is a guideline only. Existing floristic data and/or appropriate technical advice should be sought for further suitable species. Planting positions are given for each species however, it is recognised that for smaller order streams and tributaries that are subject to few floods or low impact floods a more diverse range of species can be planted. The riparian positions indicated in the table are displayed in the creek profile diagrams that follow the table.

KEY TO SITE POSITIONING

Altitude
AA = all areas
CL = coastal lowlands (< 40m)
FH = foothills (40 – 400m)
U = uplands (400 – 800m)
H = highlands (800 – 1600m)

Riparian Position
C = bank toe
PB = point bar (in creek)
L = lower bank
M = mid-bank and creek flat area
R = riparian (flat at top of creek slope)
W = wet areas
AA = all positions

SPECIES	COMMON NAME	ALTITUDE	RIPARIAN POSITION	NOTES
Acacia celsa (syn A. aulacocarpa ssp aulacocarpa)	Brown Salwood	AA	R	Banks and floodplains, frost resistant, pioneer species.
Acacia mangium	Sally Wattle	CL, FH	R	Common pioneer in the lowlands
Acacia oraria	Coastal wattle	CL, FH	R	Rheophyte along creeks in drier communities, also along beaches
Acmena hemilampra ssp hemilampra	Blush Satinash	CL, FH, U	M, R	High banks, swampy and sandy areas, frost tolerant, beaches
Acmena smithii	Lilli-pilli	FH, H, U	C, L	Water's edge commonly through wet sclerophyll, frost tolerant
Antidesma bunius	Herbert River Cherry	CL, FH, U	L, M	Grows in drier types of rainforests and on rainforest margins.
Archontophoenix alexandrae	Alexandra palm	CL, FH	M, W	Grows well in any moist situation, frost sensitive
Atractocarpus fitzalanii ssp fitzalanii	Brown Gardenia	CL, FH, U	M, R, W	Fruit eaten by cassowaries.
Barringtonia acutangula ssp acutangula	Barringtonia	CL, FH	L,M	Any moist situation
Barringtonia calyptrata	Barringtonia	CL, FH	L, M, R, W	Prefers permanently moist areas
Beilschmiedia obtusifolia	Blush Walnut	AA	L, M, R, W	Banks, floodplains, swampy areas
Buchanania arborecens	Buchanania	CL, U, FH	M, R	Highbanks, floodplains
Caldcluvia australiensis	Pink Alder	U,H	L, M	Smaller stream orders in well developed rainforest
Callistemon viminalis	Weeping Bottlebrush	FH, U	C, L	Water's edge, frost tolerant, widespread
Carallia brachiata	Corkwood	CL, FH	L, M, R	Banks, floodplains, good frugivore attractant
Cardwellia sublimis	Northern Silky Oak	AA	M, R	Widespread throughout the area, endemic to NEQ.
Castanospermum australe	Black Bean	CL, FH	M, R	High banks, floodplains
Casuarina cunninghamiana	River She-Oak	FH, U	C, L	Water's edge species, frost resistant
Chionanthus ramiflora	Northern Olive	CL , FH, U	M, R	Banks, floodplains, good frugivore attractant
Claoxylon tenerifolium	Qld Brittlewood	AA	L, M	Favoured by disturbance.
Cleistanthus apodus	Weeping Cleistanthus	CL, FH	L, M	Attractive habit and new leaf flush
Cryptocarya hypospodia	Northern Laurel	AA	M, L, R	Banks, floodplains, adaptable
Cryptocarya murrayi	Murray's Laurel	CL, FH	L, M, R	Banks, floodplains

Under review

SPECIES	COMMON NAME	ALTITUDE	RIPARIAN POSITION	NOTES
Cryptocarya triplinervis	Brown Laurel	AA	L, M, R	Banks, floodplains, bird attractant
Cyathea cooperi	Cooper's tree-fern	U, FH	C, L, M	Grows in any moist situation, shoots back after frost
Dillenia alata	Red Beech	CL, FH	R, M W	Banks, floodplains, sandy/swampy areas
Dysoxylum gaudichaudianum	Ivory Mahogany	CL, FH, U	L, M, R	Banks, floodplains
Elaeocarpus grandis (syn. E. angustifolius)	Blue Quandong	AA	L, M, R	Higher banks, floodplains, fast growing, frost sensitive
Ficus congesta	Red-leaf Fig	AA	AA	Water's edge species. Adaptable, widespread
Ficus destruens	Rusty Fig	AA	L, M, R	Fruit eaten by many bird species.
Ficus pleurocarpa	Banana Fig	AA	M, R	
Ficus racemosa	Cluster Fig	CL, FH, U	M, R	Banks, floodplains, fast growing
Ficus septica	Septic Fig	AA	L, M, R	Grows in any moist situation
Ficus variegata	Variegated Fig	CL, FH, U	L, M, R, W	Fruit eaten by cassowaries, Double-eyed Fig Parrots and Spectacled Flying Foxes.
Ficus virens	White Fig	AA	L, M, R	Grows in any moist situation, important wildlife resource
Ganopyllum falcatum	Scaly Ash	CL, FH	M, R	Banks, floodplains
Glochidion benthamianum	Pin Flower Tree	CL, FH	M, R, W	Banks, floodplains, bird attractant, fast growing
Glochidion harveyanum	Buttonwood	AA	L, M, R	Widespread, banks, floodplains, frost tolerant
Glochidion phillippicum	Buttonwood	CL, FH	R	Banks, floodplains
Glochidion sumatranum	Buttonwood	AA	L, M, R, W	Banks, floodplains
Gmelina dalrympleana	Grey Teak	CL, FH, U	L, M, R, W	Fruit eaten by fruit doves and cassowaries.
Gmelina fasciculiflora	White Beech	AA	M, R	Banks, floodplains, frost tolerant
Guioa acutifolia	Glossy Tamarind	AA	L, M, U	Common in rainforest and wet sclerophyll forest
Homolanthus novo-guineensis	Bleeding Heart	AA	L, M, R	Banks, floodplains, pioneer species
Intsia bijuga	Kwila	CL	L, W	At low elevations close to the sea, often in beach forest
Lindsaomyrtus racemoides	Daintree Penda	CL, FH	M, R	Banks, floodplains
Litsea fawcettiana	Brown Bollygum	AA	M, R	Banks.
Litsea leefeana	Brown Bollywood	AA	M, R	Fruit eaten by many bird species
Lomandra hystrix	Matrush	AA	C, PB, L, W	Water's edge
Lomandra longifolia	Matrush	AA	C, PB, L, W	Water's edge
Lophostemon grandiflorus ssp riparius	Northern Swamp Box	AA	C, L, M	Often as a rheophyte along watercourses more commonly through open forest
Lophostemon suaveolens	Swamp Mahogany	AA	M, R, W	Common through swampy open forest
Macaranga tanarius	Macaranga	CL, FH, U	L, M, R, W	Pioneer species common in regrowth on the coastal lowlands.
Melaleuca dealbata	Grey Paperbark	CL, FH, U	C, L, W	Water's edge, floodplains, swampy areas
Melaleuca leucadendra	Weeping Paperbark	CL, FH, U	C, L, W	Water's edge, floodplains, swampy areas
Melicope elleryana	Butterfly Tree	AA	L, M, R, W	Banks, floodplains, moist situations
Millettia sp. (McIlwraith)	-	CL, FH, U	L, M, W	Banks, floodplains
Nauclea orientalis	Leichhardt tree	CL, FH, U	PB, L, M, R, W	Grows well ina ny moist situation
Polyscias elegans	Celerywood	AA	M, R	Pioneer, banks, floodplains
Pouteria obovoidea	Boxwood	AA	M, R	Banks, floodplains
Pouteria sericea	Mongo	CL, FH, U	L, M, R	Along watercourses through open forest
Rhysotoechia robertsonii	Robert's Tamarind	CL, FH, U	L, M, R	Fruit eaten by cassowaries.
Schefflera actinophylla	Umbrella tree	AA	L, M, R, W	Common on smaller stream orders often as a rheophyte
Scolopia braunii	Brown Birch	AA	L, M,R	Fruit eaten by lots of birds.
Syzygium angophoroides	Yarrabah Satinash	CL, FH, U	L, M, R, W	Grows in any moist situation
Syzygium australe	Creek Cherry	AA	C, L, M, W	Water's edge.

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SPECIES	COMMON NAME	ALTITUDE	RIPARIAN POSITION	NOTES
Syzygium gustavoides	Watergum	AA	L, M, R, W	Banks, floodplains
Syzygium oleosum	Scented Satinash	AA	L, M	More common in uplands as riparian species through wet sclerophyll forest
Syzygium papyraceum	Paperbark Satinash	U, H	L, M, R	Banks, floodplains
Syzygium sayeri	Pink Satinash	CL, FH, U	M, R	Banks, floodplains, frost tolerant
Syzygium tierneyanum	River Cherry	CL, FH, U	M, L	Water's edge, frost sensitive
Terminalia sericocarpa	Damsen Plum	CL, FH, U	L, M, R	Banks, floodplains, good frugivore attractant
Tristaniopsis exiliflora	Kanuka Box	AA	C, L, W	Water's edge, prefers granite/metamorphic derived soils
Waterhousia hedraiophylla	Red Satinash	CL, FH	L, M, R	Banks and floodplains
Waterhousia mulgraveana		CL, FH, U	L, M, R	Banks and floodplains
Xanthostemon chrysanthus	Golden Penda	AA	C, L	Mostly along waterways as a rheophyte.

The species data is sourced from;

Cooper, W and W.T Cooper (2004) Fruits of the Australian Tropical Rainforest. Nokomis Editions Pty Ltd, Melbourne, Australia.

Gleed, S (2001) Revegetation Guidelines - for streams in Cardwell Shire (River Improvement Trust Works). North Queensland Afforestation Association Inc. Cairns.

Goosem, S.G. and N.I.J. Tucker (1995) Repairing the Rainforest. Theory and practice of rainforest re-establishment in North Queensland's Wet Tropics. WTMA & QDEH, Cassowary Publication.

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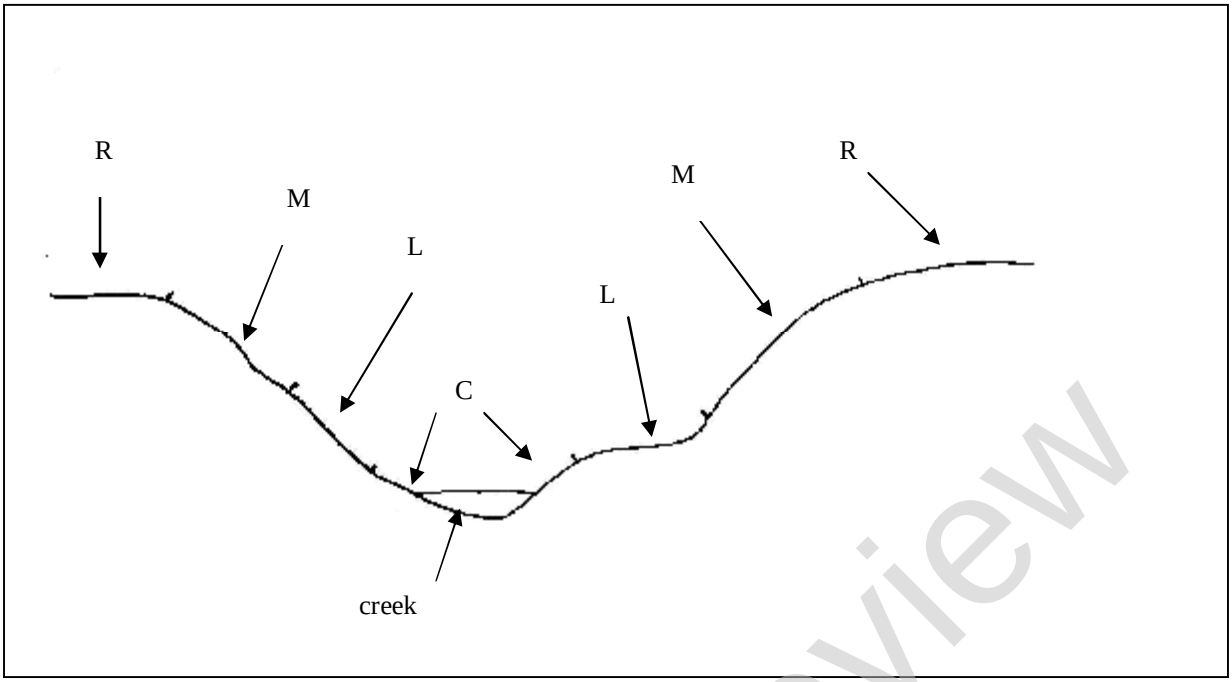
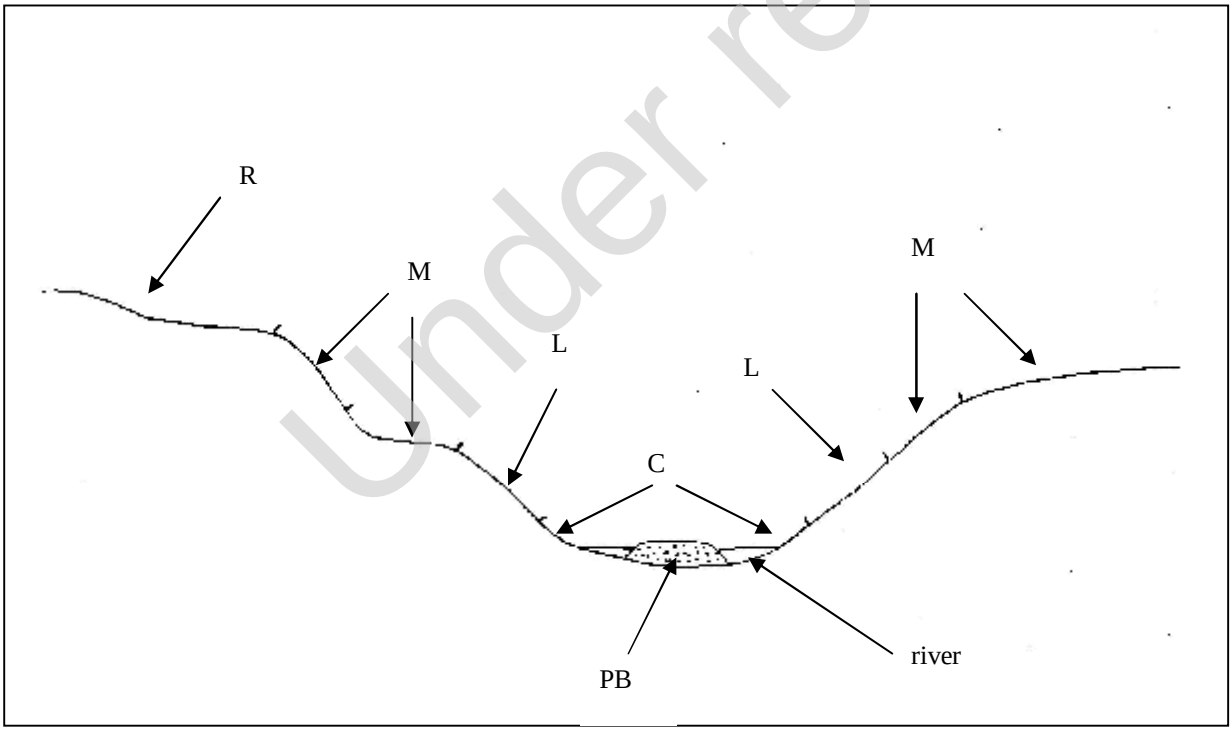
Creek Profile Diagrams

a) Foothills, uplands and highlands





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APPENDIX IV – BEACH STRAND SPECIES

Zone Position

F = *Beach fore dune*; contains sand colonising species that tolerate exposed conditions and salty winds
M = *Beach mid-dune*; this occurs on the landward side of the foredune and often contains shrubby species or trees that will have branches that reach down to the sand
S = *Beach scrub*; this usually occurs in the lee of the mid-dune and tends to be more stable

Geographical Location

2b – enriched soils
CP = Cape Tribulation
TB = Town Beach, Cape Tribulation
MC = Myall Creek, Cape Tribulation
K = Kurramine Beach
NC = Noah creek
EB = Ella Bay, Innisfail
MB = Mission Beach

2b – poor soils
C = Cowley Beach, Innisfail
TH = Tully Heads, Tully
RH = Rockingham Bay
CA = Cardwell

7b
W = Wangettii
RC = Red Cliff Point
CI = Cairns Inlet
YP = Yule Point

SPECIES	VEG TYPE	HABIT	ZONE	GEOGRAPHICAL LOCATIONS	NOTES
Acacia crassicarpa	2b, 7b	tree	M, S	K, C, RC, CI	Usually indicates early stage of rainforest development
Acacia mangium	2b	tree	S	TH, CI, K	The presence of numerous trees of this species indicates poorly developed 2b rainforest
Acacia oraria	7b	tree	M, S	YP, W, RC.	Restricted to 7b
Acacia polystachya	2b, 7b	tree	M, S	CP, W, RC, CI	
Acmena hemilampra ssp hemilampra	2b	tree	M, S	CP, MC, TH, CA, K, EB	Characteristic of higher rainfall areas
Acmenospermum claviflorum	2b	tree	S	CP, MC, K, MB	
Acronychia acronychioides	2b	tree	S	TH, K	
Acronychia imperforata	2b	tree	S	RH	Uncommon
Aglaia australiensis	2b	tree	S	CP	
Aglaia elaeagnoidea	2b	tree	M, S	RH, CI	
Aglaia meridionalis	2b	tree	S	CP, MC	
Aglaia sapindina	2b	tree	S	NC, K	
Aidia racemosa	7b	tree	M, S	YP, W, RC	Common mid-dune species in 7b
Aidia sp. (Gap Creek)	2b	tree	M, S	C	Uncommon
Alchornea thozetiana var. longifolia	7b	tree	M, S	W, RC	Restricted to 7b
Alectryon tomentosus	2b, 7b	tree	S	RH, W	
Alphitonia excelsa	2b, 7b	tree	M, S	RH, CA, W, RC, CI, K	Beach scrub
Alyxia spicata	2b, 7b	vine	M, S	CP, TB, MC, NC, C, TH, RH, CA, YP, W, RC	Common species in beach strand plantings.
Anthocarapa nitidula	2b	tree	S	CP, NC	
Antidesma bunius	2b	tree	S	C, K	
Archidendron grandiflorum	2b, 7b	tree	S	RH, W, CI	
Archidendron hendersonii	7b	tree	S	W	
Archidendron lucyi	2b	tree	M, S	NC, MB	
Archontophoenix alexandrae	2b	palm	M, S	NC, MB	
Arenga australasica	2b	palm	M, S	K, RH	
Argyrodendron polyandrum	7b	tree	S	W	
Arytera bifoliolata	7b	tree	S	RC, W	

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SPECIES	VEG TYPE	HABIT	ZONE	GEOGRAPHICAL LOCATIONS	NOTES
Arytera pauciflora	2b	tree	S	MC	
Atractocarpus fitzalani	2b, 7b	tree	M, S	CP, TB, NC, TH, YP, K	
Atractocarpus sessilis	2b	tree	M, S	MC	
Austromyrtus minutiflora	2b	tree	M, S	MC, MB	
Barringtonia calyptrata	2b	tree	S	K	
Beilschmiedia obtusifolia	2b	tree	M, S	CP, NC, K , CA	
Breynia cernua	2b	shrub	M, S	CP, TH, RC, K	
Breynia oblongifolia	7b	shrub	M, S	W, RC	
Bridelia penangiana	7b	shrub	M, S	RC	
Brucea javanica	7b	tree	S	YP, W, RC	Restricted to 7b
Buchanania arborecens	2b	tree	M, S	CP, TB, RH, CA, K	
Calophyllum calaba	2b	tree	S	CP, K	
Calophyllum inophyllum	2b	tree	F	NC, MB,	
Calophyllum sil	2b	tree	M, S	TB, MC, NC , K	Common in 2b where the soils are enriched from soils in adjacent communities (veg types 1a, 2a)
Canarium australianum	2b, 7b	tree	M, S	C, RH, CA, W, RC, CI	Common species in 7b and poorer soils in 2b
Canarium vitiense	2b, 7b	tree	S	YP, NC	
Canavalia rosea	2b	vine	F	C	Beach foredune
Canthium coprosmoides	2b, 7b	tree	M, S	CP, TB, RH, YP, W, K	
Carallia brachiata	2b	tree	M, S	CP, TB, MC, NC	Common in 2b where the soils are enriched from soils in adjacent communities (veg types 1a, 2a)
Cassine melanocarpa	2b, 7B	tree	M, S	CP, CI, CA, YP, W, RC	More common in 7b
Casuarina equisitifolia ssp incana	2b	tree	F	K, C	Foredune coloniser
Celtis paniculata	2b, 7b	tree	M	TB, K, RH, YP, W, RC	Common in beach rainforest
Cerbera manghus	2b	tree	F, M, S	CP	
Chionanthus ramiflorus	2b, 7b	tree	M, S	CP, TB, MC, NC, K, TH, RH, CA, YP, W, RC	Very common in beach rainforest
Claoxylon tenerifolium	2b	tree	M, S	K	
Cleistanthus apodus	2b	tree	S	NC, K	
Clerodendron longiflorum	2b	tree	M, S	RH	
Clerodendrum inerme	2b, 7b	shrub	F, M	TH, CA, YP	Beach foredune
Commersonia bartramia	2b	tree	M, S	TB, CA, K	
Cordyline cannifolia	2b	palm-lily	S	CP, K	
Corymbia tessellaris	2b, 7b	tree	M, S	TH, RH, RC	The presence of numerous trees of this species indicates poorly developed 2b rainforest.
Crinum pedunculatum	2b	lily	F, M	CP, NC, RH, MB, EB	
Cryptocara triplinervis	2b	tree	M, S	RB, RC	
Cryptocarya clarksoniana	2b, 7b	tree	S	MC, K, W, RC	
Cryptocarya cunninghamii	2b, 7b	tree	S	CP, TB, MC, NC, K, W	Common in 2b where the soils are enriched from soils in adjacent communities (veg types 1a, 2a)
Cryptocarya exfoliata	7b	tree	S	W, RC	
Cryptocarya hypospodia	2b	tree	M, S	CP, NC, K, TH, RH	Common in 2b
Cryptocarya laevigata	2b	tree	M, S	CP	
Cryptocarya murrayi	2b	tree	S	TB	
Cryptocarya vulgaris	2b	tree	S	CP, TB, MC, TH	
Cupaniopsis anacardioides	2b, 7b	tree	M, S	YP, W, RC, CI	Restricted to 7b
Cupaniopsis flagelliformis	2b	tree	S	TB	
Cupaniopsis foveolata	2b	tree	S	CP, K, RH	
Darlingia darlingiana	2b	tree	S	CP, MC	
Decaspermum humile	2b	tree	M, S	CP	
Deplanchea tetraphylla	2b	tree	M, S	TB, MC	
Dianella caerulea	2b, 7b	herb	M, S	MC, K, C, TH, RH, W	

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SPECIES	VEG TYPE	HABIT	ZONE	GEOGRAPHICAL LOCATIONS	NOTES
Dillenia alata	2b	tree	M, S	TB, NC, C, TH, RH, CA,	Characteristic of higher rainfall areas
Diospyros cupulosa	2b	tree	S	CP, TB, MC, NC	
Diospyros ferrea	2b, 7b	tree	M, S	TH, RH, YP, W, RC, CI	Common species in 7b and poorer soils in 2b
Diospyros hebecarpa	2b	tree	M, S	NC, K,	
Dodonaea viscosa	2b	shrub	F, M	C	
Drypetes lasiogyna	2b	tree	M, S	RH, CA	
Dysoxylum arborescens	2b	tree	S	NC	
Dysoxylum gaudichaudianum	2b	tree	M, S	K	
Dysoxylum mollissimum	2b	tree	S	CP, K	
Dysoxylum opositifolium	2b	tree	S	CP, MC	
Dysoxylum papuanum	2b	tree	S	CP	
Elaeocarpus grandis	2b	tree	S	TB, NC	
Emmenosperma cunninghamii	2b	tree	M, S	TH, RH	
Endiandra hypotephra	2b	tree	M, S	EB, CP, TB, MC, K	Common in 2b where the soils are enriched from soils in adjacent communities (veg types 1a, 2a)
Erythrina indica	2b	tree	M, S	MB	Beach scrub
Eugenia reinwardtiana	2b	shrub	M, S	CP, NC, RH	
Eupomatia laurina	2b	tree	S	C	
Euroschinus falcata	2b	tree	M, S	C, TH, RH, CA, E	
Exocarpus latifolius	2b, 7b	shrub	M, S	YP, W, RC, CI	Common in 7b
Ficus congesta	2b	tree	S	NC	
Ficus microcarpa	2b, 7b	tree	M	NC, RC	
Ficus opposita	2b	shrub	M	RH, CA,	
Ficus pleurocarpa	2b	tree	S	MC	
Ficus racemosa	2b	tree	M, S	MB, K	
Ficus septica	2b	tree	S	CP	
Ficus virens	2b, 7b	tree	M, S	TB, NC, RC	
Ficus virgata	2b	tree	M, S	CP, NC, K	
Ganophyllum falcatum	2b, 7b	tree	M, S	CP, NC, NC, K, TH, RH, W, RC, MB	Common in beach rainforest
Garcinia warrenii	2b	tree	S	CP, TB, NC	
Gardenia actinocarpa	2b	tree	M , S	MC	
Glochidion harveyanum	2b	tree	M, S	NC, C, TH, RH, RC	
Glycosmis trifoliata	2b, 7b	tree	M, S	RH, YP, W, RC	Common in 7b
Gomphandra australiana	2b	tree	S	CP, NC, K	
Grevillea baileyana	2b	tree	S	TB	
Guettardella tenuiflora	2b	tree	M, S	NC, K	
Guioa acutifolia	2b, 7b	tree	M, S	CP, MC, K, C, TH, RH, CA, W	Common in beach rainforest
Haplostichanthus sp (Johnstone River LWJ 471)	2b	tree	M, S	CP	
Harpullia frutescens	2b	shrub	S	K	
Harpullia rhyticarpa	2b	tree	S	CP, TB, MC	
Hedraianthera poryphyropetala	2b	tree	S	MC	
Helicia australasica	2b	tree	S	CP, TB	
Helicia nortoniana	2b	tree	S	K	
Heritiera littoralis	2b	tree	M, S	CP, EB	Often grows in association with mangroves
Hibiscus tiliaceus	2b	tree	F	RH, MB	
Hydriastele wendlandiana	2b	palm	M, S	TB, NC, K	
Intsia bijuga	2b	tree	M, S	CP, NC, MB	
Ipomoea pes-caprae	2b	vine	F	TH, MB	
Ixora biflora	2b	shrub	M, S	TB, MC	

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SPECIES	VEG TYPE	HABIT	ZONE	GEOGRAPHICAL LOCATIONS	NOTES
Ixora klanderiana	2b, 7b	shrub	M, S	CP, TB, MC, NC, RH, YP, W, RC, MB	Common in beach rainforest
Jagera pseudorhus	2b, 7b	tree	M, S	W, CI, K	
Jasmimum simplicifolium	2b, 7b	tree	F,M S	W, RH, CA, YP, RC	Common species in 7b and poorer soils in 2b
Leea indica	2b	shrub	M, S	K	
Lepidereema sericolignis	2b	tree	S	MC	
Lepidozamia hopei	2b	cycad	S	TB	
Licuala ramsayi	2b	fan palm	S	TB, NC	
Linospadix minor	2b	palm shrub	S	MC	
Litsea breviumbellata	2b	tree	S	C	
Litsea fawcettiana	2b	tree	S	TH, RH, CA	
Litsea glutinosa	2b, 7b	tree	S	W, RC	
Litsea leafeana	2b	tree	S	CP, TB	
Lomandra banksii	2b	Mat-rush	M, S	C	
Macaranga inamoena	2b	tree	M, S	MC	
Macaranga involucrata	2b, 7b	tree	M, S	RH, YP	
Macaranga subdentata	2b	tree	M, S	MC	
Macaranga tanarius	2b	tree	M, S	CA	
Mallotus philippensis	2b, 7b	tree	M, S	W	
Maytenus fasciculiflora	2b, 7b	tree	M, S	W	
Medicosma sessiliflora	2b	tree	S	MC	
Melaleuca leucadendra	2b, 7b	tree	M, S	TB, YP	
Melia azederach	2b	tree	M, S	K	
Memecylon pauciflorum	2b	tree	M, S	RH	
Micromelum minutum	2b, 7b	tree	M, S	YP, W, RC, CI	
Miliusa brahei	2b, 7b	tree	S	RH, YP, W	
Mimusops elengi	2b, 7b	tree	F, M	CP, TB, NC, YP, W, RC, CI	Found north of Cairns
Mischocarpus exangulatus	2b	tree	M, S	CP, K, CA	
Mischocarpus lachnocarpus	2b	tree	S	TB, MC, C, K	
Morinda citrifolia	2b	tree	F, M	K,	
Myristica insipida	2b	tree	M, S	CP, TB, NC, K, MB	
Myrtella obtusa	2b	shrub	M, S	C, MB	Usually indicates early stage of rainforest development
Neolitsea brassi	2b	tree	S	CP, TB, NC	
Normanbya normanbyi	2b	palm	S	CP, MC	
Ormosia ormondii	2b	tree	S	MC	
Palaquium galactoxylum	2b	tree	S	CP, NC, K,	
Pandanus monticola	2b	tree	S	NC	
Pandanus soms-laubachii	2b, 7b	tree	M, S	TH, RC	
Pavetta australiensis	7b	shrub	S	W, RC	
Phyllanthus cuscutiflorus	7b	tree	M, S	RC	
Phyllanthus tenellus	7b	shrub	M, S	YP	
Pilidiostigma recurvum	2b	shrub	S	MC	
Pisonia umbellifera	2b	tree	M, S	MB	
Pittosporum rubiginosum	2b	tree	S	CP, TB, NC, MC	
Pittosporum venulosum	2b	tree	M, S	CI	
Pleigynium timorense	2b, 7b	tree	S	RH, CA, YP, W, RC, CI	Common species in 7b and poorer soils in 2b
Pleomele angustifolia	2b	tree	M, S	CP	
Podocarpus grayae	2b	tree	S	CP, TB, NC, K, RH	
Polyalthia nitidissima	2b, 7b	tree	M, S	C, TH, RH, CA, YP, W, RC, CI, K	Common beach rainforest species

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SPECIES	VEG TYPE	HABIT	ZONE	GEOGRAPHICAL LOCATIONS	NOTES
Polyscias australiana	2b	tree	S	CP, TB, MC, NC, K, C, TH, CA	Common in 2b
Polyscias elegans	2b	tree	S	K, TH, RH, CA., CI	
Pongamia pinnata	2b	tree	F, M, S	CP, NC, RH, W, EB, MB, CI	
Pongamia sp (McIlwraith BH3295RFK)	2b	tree	S	CA	
Pouteria brownlessiana	2b	tree	S	CP, TB, MC	
Pouteria chartacea	2b	tree	M, S	CP, TB, MC, NC, TH, RH	Common in 2b
Pouteria obovata	2b	tree	M, S	CP, NC, TH, EB, CI	
Pouteria obovoidea	2b	tree	S	NC, K	
Pouteria pohlmaniana	2b	tree	M, S	TH, CA	
Pouteria sericea	2b, 7b	tree	F, M, S	RH, CA, W, RC	More common in 7b
Premna dallachyana	7b	tree	M, S	W, RC	
Premna serratifolia	2b	tree	M , S	C, EB ,	
Pseuduvaria froggattii	2b	tree	S	CP	
Psychotria dallachiana	2b	shrub	S	CP, TB, MC, NC	Common in 2b where the soils are enriched from soils in adjacent communities (veg types 1a, 2a)
Psychotria nematopoda	2b	shrub	S	CP	
Ptychosperma elegans	2b	palm tree	S	K	
Rapanea porosa	2b	tree	S	K, TH	
Rapanea subsessilis	2b	shrub	S	MC	
Rhodamnia spongiosa	2b	tree	S	MC	
Rhodomyrtus macrocarpa	2b	tree	M, S	CP, TB, MC, NC, K, TH, MB	Common in 2b where the soils are enriched from soils in adjacent communities (veg types 1a, 2a)
Rhysotoechia robertsonii	2b	tree	M, S	CP, K	
Sarcopteryx martyana	2b	tree	S	CP, TB, K	
Scaveola frutescens	2b	shrub	F, M	MB, CA	
Schefflera actinophylla	2b	tree	M, S	CP TB, MC, NC, CA	
Scolopia braunia	2b, 7b	tree	M, S	CP, TB, NC, RH, YP, W, RC, CI	Common in beach rainforest
Semecarpus australiensis	2b, 7b	tree	M, S	CP, NC, K, RC	WARNING: the sap from this species can cause severe blistering of the skin
Sophora tomentosa	2b	shrub	F, M	MB, EB	
Sterculia quadrifida	2b	tree	M, S	CP, NC, K, RC, CI	
Strychnos lucida	2b	tree	M, S	CP, NC	
Synima macrophylla	2b	tree	S	TB	
Syzygium angophoroides	2b	tree	M, S	TB, MC	
Syzygium cormiflorum	2b	tree	S	CP, MC, NC, K	
Syzygium eythrocalyx	2b	tree	S	MC	
Syzygium forte ssp forte	2b	tree	F, M	K, C, TH, RH, CA, EB	Common in 2b
Syzygium sayeri	2b	tree	S	NC	
Tabernaemontana orientalis	2b, 7b	tree	M, S	CP, TB, MC,NC, C, YP, W, RC	Common in beach rainforest
Tabernaemontana pandacqui	2b, 7b	shrub	M, S	CP, TB, MC, NC, C , YP, W, RC	
Tarenna dallachiana	2b, 7b	tree	S	W	
Terminalia arenicola	2b	tree	F, M	TB, TH, RH, CA, CI, K	
Terminalia catappa	2b	tree	F, M, S	C, MB	
Terminalia muelleri	2b, 7b	tree	M, S	CP, C, YP, W, RC, K	Common species in 7b and poorer soils in 2b
Terminalia sericocarpa	2b, 7b	tree	S	MC, YP,	
Tetrasynandra pubescens	2b	tree	S	MC, K	
Thespesia populneoides	2b	tree	F	MB	

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SPECIES	VEG TYPE	HABIT	ZONE	GEOGRAPHICAL LOCATIONS	NOTES
Vitex rotundifolia	2b	vine	F, M	C	
Wedelia biflora	2b	herb	F, M	C	
Wikstroemia indica	2b	shrub	S	C	
Wrightia laevis	2b	tree	S	K	
Xylopia maccreae	2b	tree	S	CP, TB, MC, K	Common in 2b where the soils are enriched from soils in adjacent communities (veg types 1a, 2a)

NB. VEG TYPE follows the vegetation descriptions as described by Tracey, J.G (1982) The Vegetation of the Humid Tropical Region of Queensland.

Data sourced from;

Hopkins, M.S. A. W. Graham and R.K. Hewett (1999) The Distribution and Floristic Composition of Rainforests on Coastal Sands in the Wet Tropics Region.

Freebody, K. (1992-1999) Seed Collecting Diaries (unpublished).

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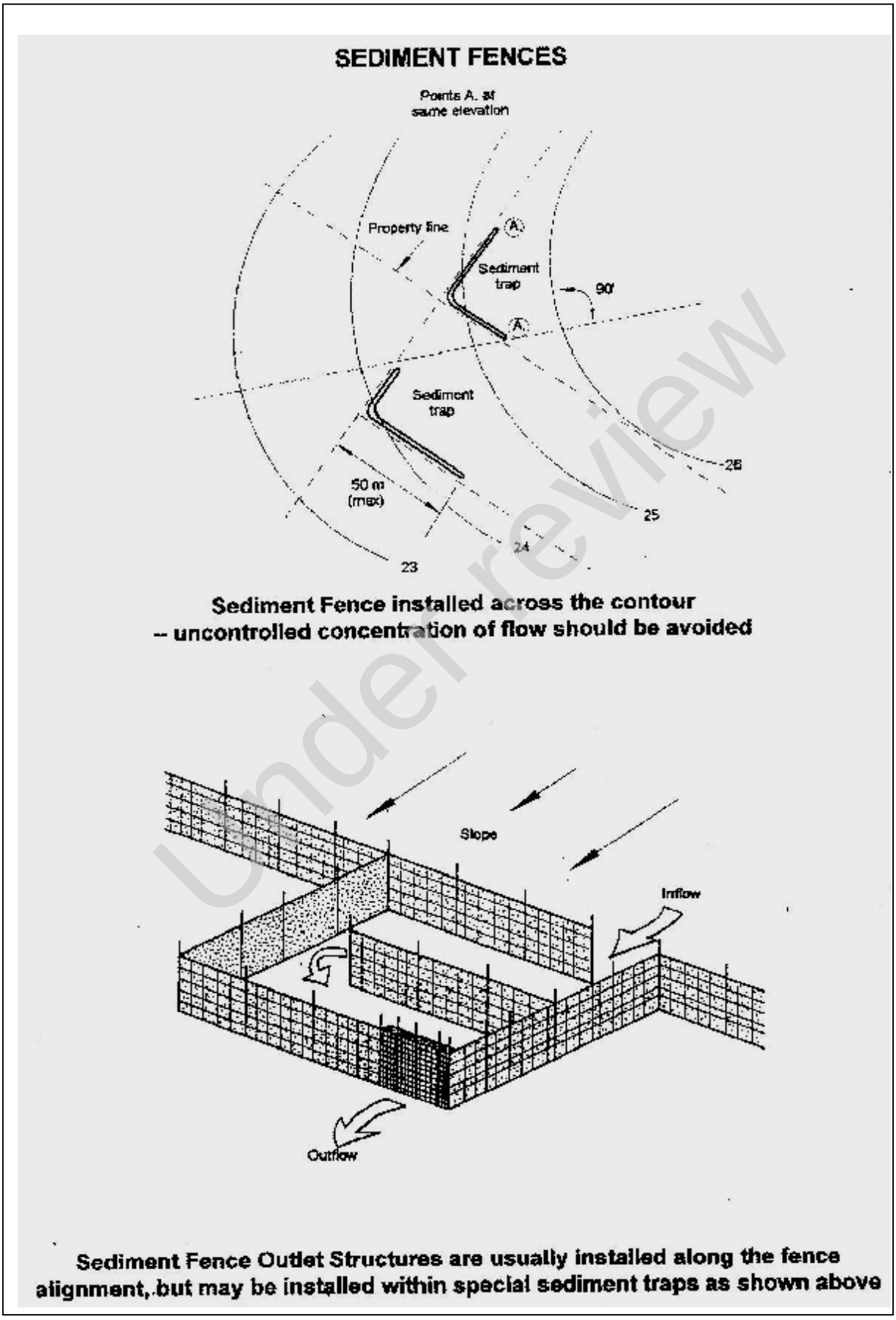
APPENDIX V – WETLAND SPECIES

VEGETATION COMMUNITY	SPECIES	HABIT
Saline/freshwater ***Melaleuca quinquinervia*** swamp community (occurs where permanent freshwater seepage meets tidal influence)	*Melaleuca quinquinervia*	Tree
	Heritiera littoralis	Mangrove tree
	Excoecaria agallocha	Mangrove tree
	Cynometra iripa	Mangrove tree
Melaleuca quinquinervia & ***Dillenia alata*** swamp community (these 2 species co-dominate and no tidal influence. Occurs on red soils and organic swampy soils (peat). Many rainforest species* occur in the mid-canopy)	*Melaleuca quinquinervia*	Tree
	Dillenia alata	Tree
	Pandanus tectorius	Pandan
	Lepironia articulata	Sedge
	Thoracostachyum sumatranum	Sedge
	Bolboschoenus sp.	Sedge
	Cyperus exaltus.	Sedge
	Stenochlaena palustris	Climbing Fern
	Philydrum lanuginosum	Frogsmouth
	Elaeocharis equisetina	Sedge
	Scleria ciliaris	sedge
	Barringtonia calyptrata *	tree
	*Nauclea orientalis**	tree
	*Atractocarpus fitzalani**	Small tree
	*Dillenia alata**	tree
	*Ficus congesta**	Small tree
	Gahnia sieberiana	Sedge
Alexandra Palm Forest swamp (the canopy is dominated by *Archontophoenix alexandrae* with a mid-canopy of mixed rainforest species & ground layer of sedges)	*Archontophoenix alexandrae*	Palm
	Gahnia sieberiana	Sedge
	Cyperus sp.	Sedge
	Thoracostachyum sumatranum	Sedge
	Rhynchospora corymbosa	Sedge
	Scirpodendron ghaeri	Sedge
	Fimbristylis sp.	Sedge
	Scleria sumatrensis	Sedge
	Hypolytrum nemorum	Sedge
Melaleuca dealbata & Dillenia *allata* *dominated swamps (peat soils)*	*Melaleuca dealbata*	Sedge
	Dillenia allata	Sedge
	Lepironia articulate	Sedge
	Gahnia sieberiana	Sedge
Melaleuca swamp forest (well-drained sandy swales with long periods of inundation)	*Melaleuca quinquinervia*	Tree
	Melaleuca catjuputi	Tree
	Scleris ssp.	Sedge
	Gahnia sieberiana	Sedge
	Lepironia articulata	Sedge
	Schoenus sparteus	Sedge
	Thoracostachyum sumatranum	Sedge
	Stenochlaena palustris	Climbing Fern

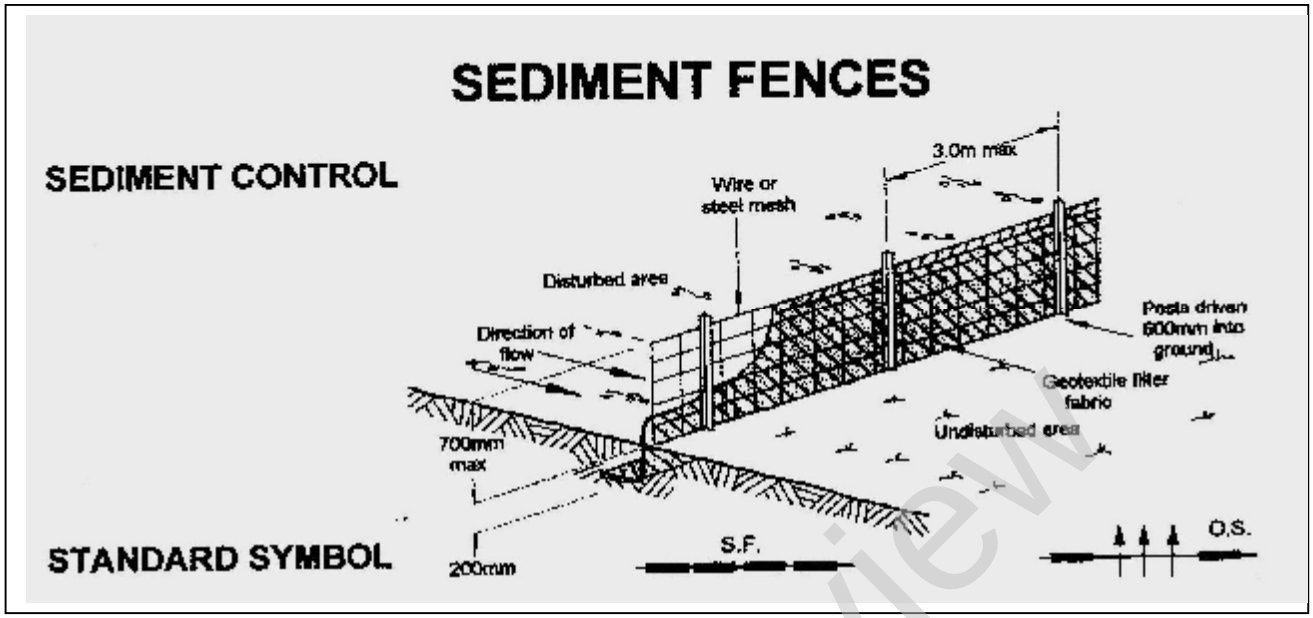
Under Review

APPENDIX VI – SEDIMENT FENCES

Diagram taken from; Institute of Engineers Australia (Qld), ESC Guidelines. 2006



Under review



Under review