

Conceptual Rehabilitation Plan

This Conceptual Rehabilitation Plan (CRP) has been prepared on behalf of Petrac Pty Ltd in relation to the proposed rehabilitation of degraded native vegetation on approximately 6.3ha of land situated within Lot 2 on DP1070446, Lennox Head NSW ("the site"). This 6.3ha is to function as an offset to the displacement of threatened species habitat and freshwater wetlands resulting from the development of the adjoining Pacific Pines Estate. The overall intent of rehabilitation works on the site is to:

- preserve and enhance existing populations of the threatened plant species Hairy Joint Grass (*Arthraxon hispidus*); and
- enhance biodiversity values in the locality by re-instating the floristic and structural elements of degraded Endangered Ecological Communities within the site.

Additional and more detailed rehabilitation and revegetation plans are to prepared and submitted to Ballina Shire Council and the Department of Environment and Climate Change prior to the commencement of any rehabilitation works.

Rehabilitation Area A - Littoral Rainforest

Community description:
Littoral rainforest is a closed ecological community (i.e. >70% canopy cover) that generally occurs less than 2km from the coastline. The structural components of this community range from low thickets in wind exposed areas to tall forests in more protected areas. Species are predominantly moist, evergreen, leathery leaves and there are generally vines within the canopy. Although the community is dominated by rainforest species, sclerophyllous species, such as Queensland blue gum (*Eucalyptus tereticornis*), Coastal banksia (*Banksia integrifolia*) and Smooth-barked apple (*Angophora costata*) may also be present.

- Ecological Values:**
The ecological values associated with restoration of this community on the site are:
- Littoral rainforest is recognised as an Endangered Ecological Community pursuant to the NSW *Threatened Species Conservation Act 1995* ("TSC Act");
 - increased connectivity to similar vegetation to the north of the site and significant wetland vegetation contained within the Ballina Nature Reserve to the south of the site;
 - improved fauna movement opportunities and increased biodiversity; and
 - Littoral rainforest provides habitat for a range of threatened flora and fauna species.

Species suitable for supplementary planting include: Tuckeroo (*Cupaniopsis anacardioides*), Guioa (*Guioa semiglauc*a), Bunya pine (*Araucaria bidwillii*), Lilly pilly (*Acmena smithii*), Green bolly gum (*Neolitsea australiensis*), Coastal banksia (*Banksia integrifolia*), Red kamala (*Mallotus philippensis*), Cheese tree (*Glochidion ferdinandi*), Black teak (*Pentaceras australis*) and Jackwood (*Cryptocarya glaucescens*).

Notes: Where populations of Hairy Joint Grass occur within this Rehabilitation Area, it may be necessary to provide a disjunct canopy,if shading is found to reduce the survivorship of individuals

Rehabilitation Area B - Freshwater Wetland

Community description:
Freshwater wetlands are an ecological community associated with coastal areas that are subject to periodic flooding and in which standing fresh water persists for at least part of the year in most years. The structure and composition of the community varies both spatially and temporally depending on the level of water inundation. Meadows of grasses, sedges and rushes occur where submersion is not prolonged, while aquatic herbs dominant where semi-permanent or permanent standing water is present. The composition and structure of the vegetation found within freshwater wetlands is greatly influenced by grazing history, changes to draining regime and soil salinity, and catchment runoff and disturbance.

- Ecological values:**
The ecological values associated with restoration of this community on the site are:
- Freshwater wetlands on coastal floodplains are recognised as an Endangered Ecological Community pursuant to the *TSC Act*;
 - increased availability of good quality habitat for the threatened flora species Hairy joint grass and Square-stemmed spike-rush (*Eleocharis tetraquetra*) that are known to occur within the locality; and
 - increased biodiversity and connectivity.

Species suitable for supplementary planting include: *Square-stemmed spike-rush (*Eleocharis tetraquetra*), *Hairy joint grass (*Arthraxon hispidus*), Swamp millet (*Isachne globosa*), Swamp rice grass (*Leersia hexandra*), *Schoenoplectus mucronatus*, *Juncus usitatus*, Water primrose (*Ludwigia peploides subsp. montevidensis*), River buttercup (*Ranunculus inundatus*), Common fringe sedge (*Fimbristylis dichotoma*), *Eleocharis equisetina*.

Notes: * indicates species that are recognised as being of formal biodiversity conservation significance pursuant to the *TSC Act*. All relevant Scientific Permits must be obtained prior to conducting any rehabilitation works using these species.

Rehabilitation Area C - Swamp Oak Forest

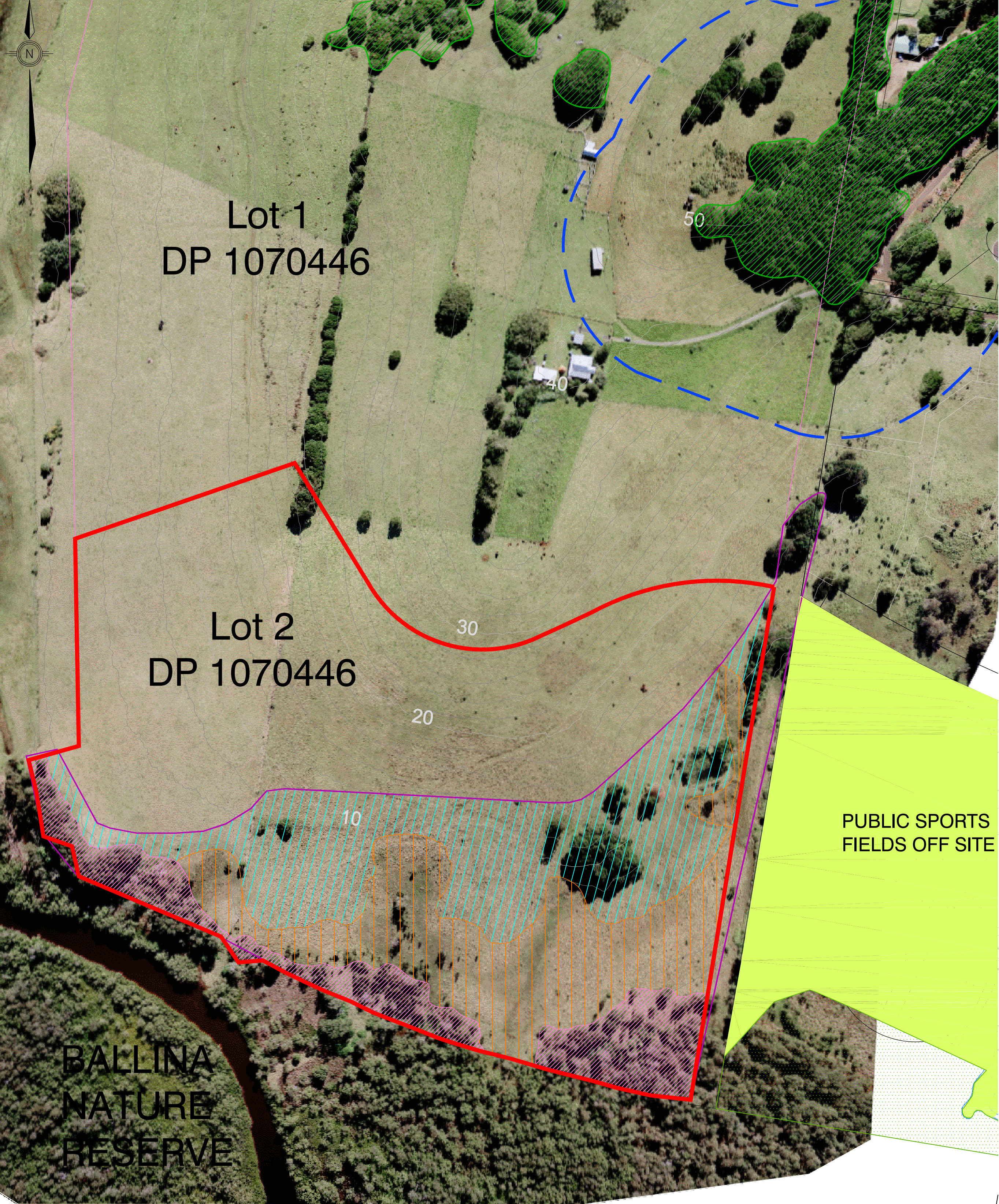
Community description:
Swamp oak forest is found on the coastal floodplains of NSW. It is generally dominated by a dense to sparse canopy of Swamp she-oak (*Casuarina glauca*) and Swamp paperbark (*Melaleuca ericifolia*). The community is found within close proximity of rivers and estuaries and is generally found on saline influenced soils. The composition of species and structure within the community may vary from open forests to low woodlands, scrubs or reedlands with scattered trees depending on the salinity and moisture content of the soil.

- Ecological Values:**
The ecological values associated with restoration of this community on the site are:
- Swamp oak forest is recognised as an Endangered Ecological Community pursuant to the *TSC Act*;
 - increased biodiversity and connectivity in the area;
 - this community provides habitat resources for threatened flora and fauna species known to occur within the locality.

Species suitable for supplementary planting include: Swamp she-oak (*Casuarina glauca*), Black wattle (*Acacia melanoxylon*), Red ash (*Alphitonia excelsa*), Swamp turpentine (*Lophostemon suaveolens*), Prickly-leaved tea tree (*Melaleuca styphelioides*), Broad-leaved paperbark (*Melaleuca quinquenervia*), Lilly pilly (*Acmena smithii*), Cheese tree (*Glochidion ferdinandi*), Umbrella cheese tree (*Glochidion sumatranum*) and Narrow-leaved paperbark (*Melaleuca alternifolia*).

Performance Criteria

- Rehabilitation works within the site will be focused on establishing self-sustaining communities that require minimal management intervention in the long-term. In order to achieve this, Petrac are committed to a minimum monitoring and maintenance period of four years during which the following Performance Criteria are to be achieved:
1. no inappropriate plant species (i.e. non-endemic, exotic or weed species) are to be used in the revegetation program;
 2. planting densities and mixtures established in each community are to correspond to the species lists provided for each Rehabilitation Area;
 3. an 80% survival rate of plant stock is to be maintained within each Rehabilitation Area for a period of four years;
 4. a minimum 80% native ground cover is to be maintained for the four-year maintenance period; and
 5. Rehabilitation Areas are to be maintained such that:
 - a.native species comprise at least 90% of the species composition within each plot; and
 - b.native species comprise at least 90% of the biomass and/or cover within each plot.



LEGEND

	Site Boundary		Rehabilitation Area A - Littoral Rainforest
	100m SEPP 26 Buffer		Rehabilitation Area B - Freshwater Wetland
	Extent of off site reserve		Rehabilitation Area C - Swamp Oak forest
	Remnant Rainforest		Off-site conservation zone

Note: The off-site conservation zone will also be subjected to rehabilitation and revegetation works to provide an offset for the displacement of threatened species on the Pacific Pines Estate

DESIGNED: DMC	A1	Vertical Datum
DRAWN: JM		A.H.D.
CHECKED: KJD		
Horizontal Datum	Projection	
*****	*****	
CAD FILE: I:\7296-21\Acad\Conceptual Rehab Plan\729621-CRP-01_v2.dwg		
XREF's: 6501-HairyJointGrass-Revised-080305; X-Ref-Conts		

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PETRAC		DATE: 29-05-08	Rv.
CONCEPTUAL REHABILITATION PLAN		PLAN No:	
729621-CRP-01			0