BUNDANON LIVING LANDSCAPE

FACT SHEET 4

Landcare Australia

FLORA

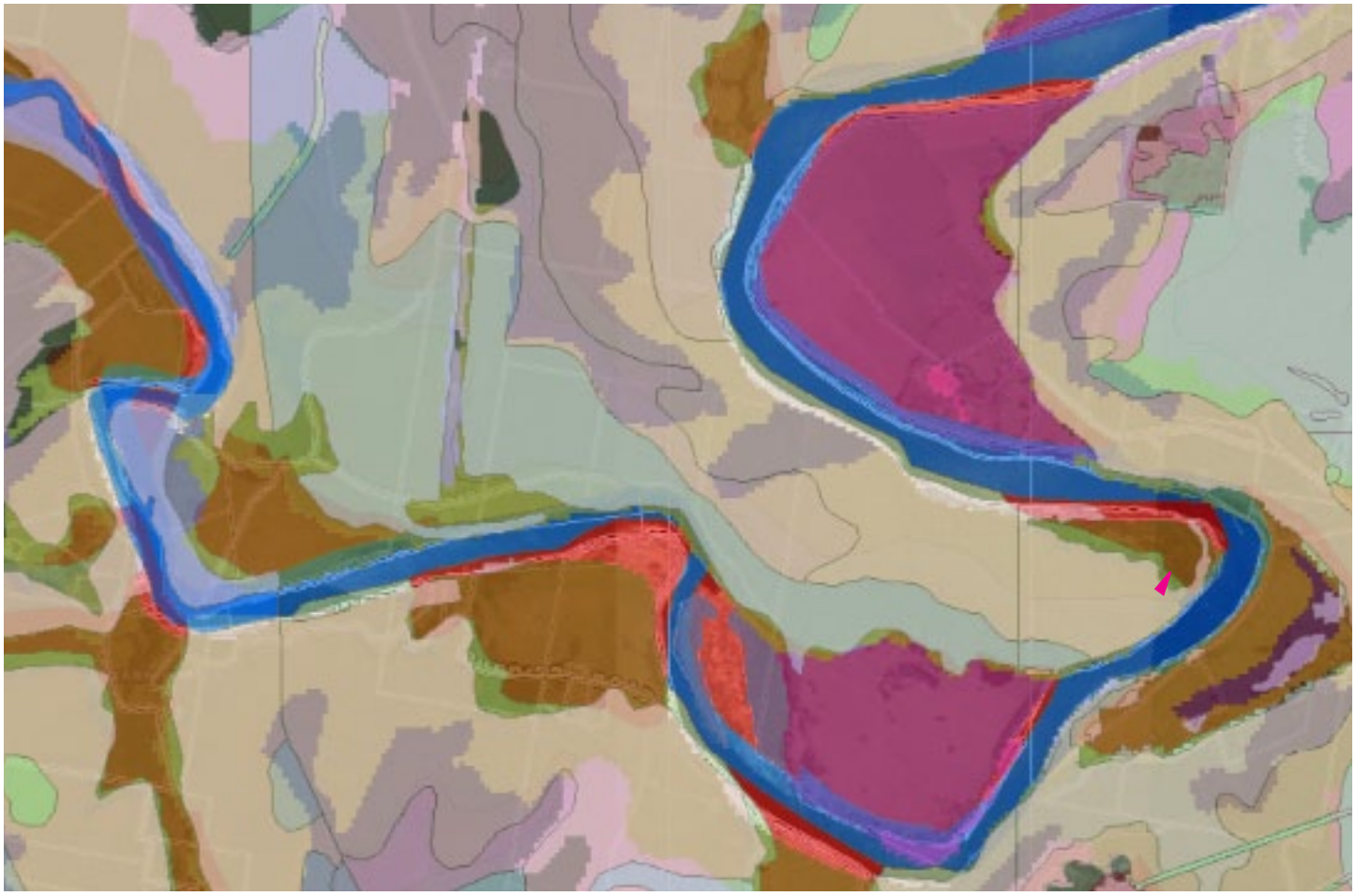
The Bundanon Trust properties are mapped by the NSW National Vegetation Survey as supporting over 14 different vegetation communities. The Living Landscape project incorporates many of these communities.

Image: Bloodwood trees in blossom at Riversdale, February 2015

VEGETATION COMMUNITIES SUMMARY

Groups of native plants that grow in association with each other on a specific soil type, being described as distinct “floristic assemblages”. These floristic assemblages provide an equally distinctive suite of native fauna species with their preferred habitat; when combined the flora, fauna and soil are considered to be an Ecological Community. Floristic assemblages are the framework around which Ecological Communities are defined. These assemblages are described with reference to the dominant plant species, usually trees, and the other vegetation strata which might include mid-storey, shrub, vine, groundcover and forb layers. Comprehensive floristic descriptions might also include fungi, mosses, and lichens; however, these are not presently considered in the “scientific determinations” or legal descriptions of the Ecological Communities made by the Department of Environment and Climate Change Scientific Committee.

The floristic assemblages were mapped on site by the NSW Department of Environment and Conservation and the NSW Department of Natural Resources. This report, Native Vegetation of Southeast NSW (NVSNSW), was based on the South Coast - Illawarra Vegetation Integration (SCIVI) Project, which aimed to integrate many previous vegetation classification and mapping works to produce a single regional classification and map plus information on regional conservation status of vegetation types. Survey work for the Land Management Plan generally supported the overall pattern of distribution within study area of the community distribution as mapped by NVSNSW. This mapping was first ground-truthed by Mr Gary Leonard without the aid of Geographical Positioning Technology.



Map showing NSW Vegetation Communities combining various Office of Envrionment and Heritage biometric data

KEY

- Farmland
- Riverbank Forest
- Illawarra Gully Wet Forest
- Shoalhaven Sandstone Forest
- Yalwal Shale Sandstone Transition Forest
- Southern Turpentine Forest
- Southern Lowland Wet Forest
- Coastal Warm Temperate Rainforest
- Currumbene Bateman’s Lowland Forest
- Morton Mallee Heath

WARM TEMPERATE LAYERED FOREST

Clerodendrum tomentosum in fruit along Bundanon Road

This vegetation community is a tall eucalypt forest characterised by an open eucalypt canopy, a dense small tree sub-canopy and a moist shrubby understorey. Warm Temperate Layered Forest occurs predominantly south from the Hacking River along the Illawarra scarp, to Nowra and throughout the Kangaroo Valley. Within this area it is found below 400m on sheltered slopes in gullies and on escarpments with loamy soils where mean annual rainfall exceeds 1000mm. Warm Temperate Layered Forest frequently adjoins Subtropical and Warm Temperate rainforest map units, and contains several rainforest taxa below its eucalypt canopy.

Floristic Summary:
Trees: *Acmena smithii, Livistona australis, Synoum glandulosum, Pittosporum undulatum, Cryptocarya glaucescens, Eucalyptus salignaXbotryoides, E. quadrangulata.*
Shrubs: *Notelaea venosa, Clerodendrum tomentosum, Eupomatia laurina.*
Climbers: *Eustrephus latifolius, Smilax australis, Pandorea pandorana, Geitonoplesium cymosum, Morinda jasminoides, Marsdenia rostrata, Tylophora barbata, Stephania japonica.*
Groundcover: *Doodia aspera, Pseuderanthemum variabile, Oplismenus imbecillis, Gymnostachys anceps, Blechnum cartilagineum.*

Distribution Pattern on the Bundanon Property as mapped by NVSNSW: Below southern facing ridge of western valley.

Blechnum cartilagineum Gristle fern

Eucalyptus salignaXbottryoides Bangalay Southern Blue Gum hybrid

Synoum glandulosum Scentless Rosewood

SOUTHERN TURPENTINE FOREST

Image Southern Turpentine Forest

This vegetation community is a rather dense eucalypt forest with an open shrubby understorey, found between Bundanoon and the Upper Clyde River area on loamy soils derived from Permian Shoalhaven group sediments. Within its distribution Southern Turpentine Forest typically occurs on sheltered slopes below 600 m ASL with an annual rainfall between 950 and 1300mm. Southern Turpentine Forest belongs to the Southern Lowland Wet Sclerophyll Forests vegetation class (Keith 2004).

Floristic Summary:
Trees: *Syncarpia glomulifera, Corymbia gummifera, Eucalyptus piperita, E. scias.*
Shrubs: *Persoonia linearis, Leucopogon lanceolatus, Acacia obtusifolia, Tetratheca thymifolia, Elaeocarpus reticulatus, Banksia spinulosa*
Climbers: *Billardiera scandens. Groundcover: Dianella caerulea, Entolasia stricta, Pteridium esculentum, Lepidosperma urophorum.*

Distribution Pattern on the Bundanon Property as mapped by NVSNSW: Mainly highest parts along central ridge.

Elaeocarpus reticulates Blueberry Ash

Persoonia linearis Narrow-leaf geebung

Leucopogon lanceolatus Lance-leaf beard heath

TEMPERATE DRY RAINFOREST

Image: Lilly Pilly Gully View

This vegetation community is a simple closed forest characterised by a dense tree canopy, lianes, a mesic shrub stratum and a sparse patchy groundcover. This dry rainforest has a widespread distribution as small occurrences in gullies and on lower slopes of gorges and foothills below 400m. Within this distribution Temperate Dry Rainforest typically occupies dry shale gullies with an annual rainfall from 850 – 1250mm. Temperate Dry Rainforest is within the Dry Rainforests vegetation class (Keith 2004). It is highly sensitive to fire, and remnants on private lands are likely to be subject to grazing and weed invasion.

Floristic Summary:
Trees: *Backhousia myrtifolia, Acmena smithii, Pittosporum undulatum.*
Shrubs: *Pittosporum revolutum, Breynia oblongifolia, Ficus coronata, Notelaea venosa, Rapanea howittiana.*
Climbers: *Morinda jasminoides, Cissus hypoglauca, Eustrephus latifolius,*
Pandorea pandorana, Smilax australis, Marsdenia rostrata, Geitonoplesium cymosum, Parsonsia straminea.
Groundcover: *Doodia aspera, Pseuderanthemum variabile, Oplismenus imbecillis .*

Distribution Pattern on the Bundanon Property as mapped by NVSNSW: At the mouth of the western valley.

Ficus coronate Sandpaper fig

Doodia aspera Prickly Rasp Fern

Backhousia myrtifolia Grey Myrtle

CURRAMBENE-BATEMANS LOWLANDS FOREST

Image: Currambene-Batemans Lowlands Forest View

This vegetation community is a eucalypt forest with an open shrub layer and a dense grassy groundcover, found on coastal lowlands on sandstones and shales below 100m ASL. Its distribution is primarily between Bomaderry and Cudmirrah, with the largest stands around Currambene State Forest between Nowra and Culburra. Small woodlots and remnant trees suggest the distribution may have extended northward along the extensively cleared footslopes between Bomaderry and Berry and on the lower slopes of Kangaroo Valley. High frequency fires and grazing pose threats to some stands. Currambene Lowlands Forest are transitional between Southern Lowlands Wet Sclerophyll Forests and South East Dry Sclerophyll Forests (Keith 2004).

Floristic Summary:
Trees: Allocasuarina littoralis, Corymbia gummifera, C. maculata, Eucalyptus pilularis. Shrubs: Pimelea linifolia, Banksia spinulosa, Persoonia linearis, Lomatia ilicifolia.
Climbers: Billardiera scandens, Hardenbergia violacea.
Groundcover: Entolasia stricta, Lomandra longifolia, Dianella caerulea, Lepidosperma laterale, Pteridium esculentum, Imperata cylindrica, Themeda australis, Lomandra multiflora, L. obliqua.

Distribution Pattern on the Bundanon Property as mapped by NVSNSW: Mainly surrounding the Bundanon property and on slopes downstream on east of study area.

Elaeocarpus kirtinii Pigeonberry ash

Entolasia stricta Wiry panic

Clematis Aristata Travellers joy

COASTAL WARM TEMPERATE RAINFOREST

Image: *Ficus coronata* at Riversdale Creek

This vegetation community is a closed forest with a dense tree canopy, a subcanopy of small trees, lianes, an open layer of mesic shrubs and a fern-dominated groundcover. This rainforest is widely distributed across the study area in small patches, with local concentrations along the Illawarra scarp north from Cambewarra. It is found in moist sheltered gullies and on sheltered escarpment slopes on loam to clay loam soils from 0 - 400m ASL with a mean annual rainfall greater than 900mm. Coastal Warm Temperate Rainforest belongs to the Northern Warm Temperate Rainforests vegetation class (Keith 2004). Much of its original distribution remains extant and it is represented within several large conservation reserves. Repeated fires may pose a threat to some stands.

Floristic Summary:
Trees: Acmena smithii, Livistona australis, Ceratopetalum apetalum, Cryptocarya glaucescens, Synoum glandulosum.
Small Trees: Tasmannia insipida, Eupomatia laurina, Ficus coronata, Psychotria loniceroides.
Shrubs: Cyathea australis.
Climbers: Morinda jasminoides, Smilax australis, Microsorum scandens, Marsdenia rostrata, Palmeria scandens, Pandorea pandorana, Parsonsia straminea, Cissus hypoglauca, Pyrrosia rupestris, Arthropteris tenella, Eustrephus latifolius.
Groundcover: Lastreopsis microsora, Blechnum cartilagineum, B. patersonii, Asplenium australasicum, Doodia aspera.

Distribution Pattern on the Bundanon Property as mapped by NVSNSW: Between mouth of western valley and bottom of valley slopes.

Morinda jasminoides Sweet Morinda

Eupomatia laurina Bolwarra- detail

Livistonia australis Cabbage Tree Palm

YALWAL SHALE-SANDSTONE TRANSITION FOREST

Images Above, *Eucalyptus punctata*, below, *Patersonia sericea*

This vegetation community has a wide distribution in the valleys of the lower Shoalhaven River and its tributaries. Within this distribution Yalwal Shale-Sandstone Transition Forest occurs on ridges and slopes between 100-250m elevation, primarily on loamy soils derived from Conjola conglomerate and Wandrawandian siltstone. Yalwal Shale-Sandstone Transition Forest belongs to the Sydney Hinterland Dry Sclerophyll Forests vegetation class (Keith 2004).

Floristic Summary:
Trees: Corymbia gummifera, Eucalyptus punctata, Syncarpia glomulifera.
Shrubs: Persoonia linearis, Lomandra obliqua, Macrozamia communis, Podolobium ilicifolium. Climbers: Glycine clandestina, Hardenbergia violacea.
Groundcover: Entolasia stricta, Pomax umbellata, Patersonia sericea, Lepidosperma laterale, Lomandra multiflora, Phyllanthus hirtellus, Dianella revoluta, Goodenia hederacea, Panicum simile, Lomandra confertifolia ssp rubiginosa.

Distribution Pattern on the Bundanon Property as mapped by NVSN-SW: Mainly on slopes on west of property.

Images: Right, *Corrymbia gummifera* Blossom details; Below, details of *Macrozamia communis*, Burrawang

RIVERBANK FOREST

Image: View across to the island from Bundanon Road

Riverbank Forest is a distinctive tall River Oak forest with an open shrub layer and a dense or patchy groundcover of grasses and forbs. It is found on sand/gravel alluvium strewn with cobbles along swift flowing reaches of streams, at elevations from 20-800m ASL. Riverbank Forest is part of the Eastern Riverine Forests vegetation class (Keith 2004). Its riparian habitat is susceptible to weed invasion and degradation where livestock are unconstrained.

Floristic Summary:
Trees: Casuarina cunninghamiana.
Shrubs: Hymenanthera dentata, Urtica incisa.
Climbers: Stephania japonica, Pandorea pandorana.
Groundcover: Microlaena stipoides, Lomandra longifolia, Oplismenus aemulus, Dichondra repens.

Distribution Pattern on the Bundanon Property as mapped by NVSNSW: At water's edge, particularly along Eearie Park and The Island.

River Oaks, Bundanon

SOUTHERN LOWLAND WET FOREST

image: Southern Lowland Wet Forest view

This vegetation community is a rather dense eucalypt forest with an understorey of shrubs and grasses, and is distributed from Conjola to Batemans Bay, predominantly east of the Clyde River, with northern outliers at Tapitallee. Within this distribution Southern Lowland Wet Forest occurs below 250m ASL on open hill slopes and gullies with loamy soils where mean annual rainfall ranges from 1000 to 1300mm. Southern Lowland Wet Forest belongs to Southern Lowland Wet Sclerophyll Forests vegetation class (Keith 2004). Most of its original distribution is currently included within state forests and conservation reserves.

Floristic Summary:
Trees: *Corymbia maculata, Eucalyptus pilularis, E. paniculata.*
Shrubs: *Elaeocarpus reticulatus, Persoonia linearis, Leucopogon lanceolatus, Macrozamia communis, Breynia oblongifolia, Notelaea longifolia, Hibbertia aspera, Synoum glandulosum.*
Climbers: Cissus hypoglauca, Eustrephus latifolius, Tylophora barbata, Pandorea pandorana.
Groundcover: *Dianella caerulea, Entolasia stricta, Lomandra longifolia, Pteridium esculentum, Schelhammera undulata, Lepidosperma urophorum.*

Distribution Pattern on the Bundanon Property as mapped by NVSNSW: At the base of cliffs in western valley.

Tylophora barbata Bearded Tylophora

Notelaea longifolia Large Mock-Olive

Notelaea longifolia Large Mock-Olive

ILLAWARRA GULLY WET FOREST

Image: Birds Nest Ferns Bundanon, off Cedar Walk

This vegetation community is a tall eucalypt forest with a moist open understorey, primarily distributed from the Hacking River catchment along the Illawarra scarp south to Mt Keira, on coastal lowlands near Berry and scattered through coastal foothills and lowlands from Nowra south to Batemans Bay. Within this distribution Illawarra Wet Gully Forest occurs on sheltered slopes and gullies with loamy soils with an annual rainfall in the range of 1000-1700mm. With increasing soil fertility Illawarra Wet Gully Forest grades into Warm Temperate Layered Forest and may be replaced by rainforest units in areas long protected from fire. Illawarra Wet Gully Forest is related to Central Coast Wet Forest, but lacks several taxa restricted to the north coast forests. More than a third of its original range has been cleared, mainly in the Illawarra lowlands. Illawarra Wet Gully Forest is included within the North Coast Wet Sclerophyll Forests vegetation class (Keith 2004). This community was mapped during the Bio Blitz 2014.

Floristic Summary:
Trees: *Livistona australis, Syncarpia glomulifera, Eucalyptus pilularis, E. paniculata. Shrubs: Synoum glandulosum, Breynia oblongifolia, Notelaea longifolia.*
Climbers: *Eustrephus latifolius, Tylophora barbata, Hibbertia scandens, Glycine clandestina, Hibbertia dentata, Geitonoplesium cymosum.*
Groundcover: *Lomandra longifolia, Pteridium esculentum, Dianella caerulea, Entolasia stricta, Oplismenus imbecillis, Imperata cylindrica, Pseuderanthemum variabile.*

Distribution Pattern on the Bundanon Property as mapped by NVSNSW: Small area east of the Bundanon property off Cedar Walk

Phil Craven from NWPS assesses this vegetation community during the 2014 Bio Blitz. Photo Heidrun Lohr.

MORTON MALLEE-HEATH

Image: Eearie Park Morton Mallee Heath

Morton Mallee-Heath has an open to dense shrub canopy with emergent mallees and a thick groundcover of sedges and forbs. This unit occurs on damp shallow sandy loams on sandstone, at elevations from 10m to 750m, where mean annual rainfall varies from 900-1400mm. Morton Mallee-Heath is transitional between the Sydney Montane Dry Sclerophyll Forests and Sydney Montane Heaths vegetation classes (Keith 2004). Much of the original distribution is within conservation reserves, where altered fire regimes and unauthorised use of off-road vehicles pose the main threats.

Floristic Summary:
Trees: *Eucalyptus sclerophylla, Corymbia gummifera.*
Shrubs: *Leptospermum trinervium, Hakea teretifolia, Banksia ericifolia, B. spinulosa, Epacris microphylla, Hakea laevipes, Banksia paludosa, Isopogon anemonifolius, Lambertia formosa, Persoonia mollis ssp leptophylla.*
Groundcover: *Lepyrodia scariosa, Patersonia sericea, Lindsaea linearis, Gonocarpus tetragynus, Goodenia bellidifolia, Ptilothrix deusta.*

Distribution Pattern on the Bundanon Property as mapped by NVSNSW: On slopes behind Eearie Park.

Image: Morton Mallee Heath forest view, *Banksia spinulosa*, Hairpin Banksia; Club Moss.

SHOALHAVEN SANDSTONE FOREST

image: View from West escarpment, Eearie Park 2

Shoalhaven Sandstone Forest is an open eucalypt forest or woodland with an abundant sclerophyll shrub stratum and a groundcover dominated by sedges. This unit occurs on sandstone plateaux up to 700m ASL in the lower Shoalhaven district. Within this distribution Shoalhaven Sandstone Forest occurs on sandy loam soils derived primarily from Hawkesbury or Nowra sandstone. Shoalhaven Sandstone Forest belongs to the Sydney Coastal Dry Sclerophyll Forests vegetation class (Keith 2004).

Floristic Summary:
Trees: *Corymbia gummifera, Eucalyptus sclerophylla, E. sieberi.*
Shrubs: *Lambertia formosa, Persoonia levis, Banksia spinulosa, Petrophile pedunculata, Leptospermum trinervium, Lomatia ilicifolia, Bossiaea heterophylla, Hakea laevipes, Platysace linearifolia, Pimelea linifolia, Tetratheca thymifolia.*
Groundcover: Lomandra obliqua, Patersonia sericea, Entolasia stricta, Caustis flexuosa, Cyathochaeta diandra.

Distribution Pattern on the Bundanon Property as mapped by NVSNSW: below Southern Turpentine Forest on highest parts of eastern access road and above Riversdale.

Images: Narrow Leafed Geebung, Scribbly Gum details

OTHER VEGETATION COMMUNITIES

A sea-grass bed which is a breeding ground for native fish has been located and mapped in the river bed off the Eearie Park Island. The river and the sea grass beds are not owned by the Trust however management activities on Bundanon Trust properties might impact on the sea-grasses.

Garry Daly's report *Fauna Surveys at Haunted Point, Bundanon, 2013* also includes the following specific vegetation communities:

- Lilly Pilly-Sassafras-Stinging Tree subtropical rainforest, remnants in small areas of Haunted Point
- Sydney Peppermint-Spotted Gum-Lilly Pilly wet forest- along south facing slopes of Haunted Point Ridge.
- Sydney Peppermint-Spotted Gum-Lilly Pilly wet forest widespread along the south facing slopes of Haunted Point Ridge
- Red Bloodwood-Blackbutt-Spotted Gum shrubby open forest
- Spotted Gum-Blackbutt shrubby open forest
- River Oak Open forest- a small remnant on the banks of the river

FLORA SPECIES AND SURVEYS

512 species of plants were recorded by Gary Leonard during surveys undertaken in 1995 and 1996 and were recorded in a joint report Flora and Fauna of Bundanon, May 1996 co-authored by Garry Daly. This report was loosely based on past surveys by Daly (1995) and Mills (1985). One of these plants, Nowra Heath Myrtle *Triplarina nowariensis*, is a protected species listed as endangered under the TSC Act and endangered nationally under the EPBC Act. No Endangered Ecological Communities occur on site.

Regionally and locally significant flora species as determined by Mills (1995) as referenced in Leonard 1996 that occur on site include:

- *Leptospermum sejunctum* (no common name)
- Net-veined Wattle *Acacia subtilinervis*
- Broad-leaf Hop-bush *Dodonaea rhombifolia*
- Red Cedar *Toona ciliata*
- Downy Zieria *Zieria cytisoides*

Regionally and locally significant flora species as determined by Mills (1995) as referenced in Leonard 1996 that may occur on site include:

- Native Hydrangea *Abrophyllum ornans*
- Hairy-leaved Doughwood *Melicope micrococca*
- Cheese Tree *Glochidion ferdinandi var pubens*
- Yellow Bloodwood *Corymbia eximia*
- Dogwood *Jacksonia scoparia*
- Australian Tree Fern/Cooper's Tree Fern *Cyathea cooperi*
- Weeping Boobialla *Myoporum floribundum*

Garry Daly also identified in 2013

- Snow Wood *Pararchidendron pruinosim*– within 1km of the southern limit of its distribution

The majority of the unfarmed bushland areas on site are free of weeds, while the bushland (marginal) areas that have been grazed have a reduced native plant cover and an elevated number and density of exotic plant species. Cleared grazing land is almost entirely covered in exotic, but desirable, agricultural species. Some weed species have been classified as noxious due to their impact on agricultural productivity and others because they are threatening to native ecosystems. The density of weeds found on site has been mapped and closely correlates to the bushland resilience mapping.

TREE LINES TRACK

Commissioned by Bundanon Trust in 2014, and conceived by artist Janet Laurence, *Tree Lines Track* is a passage of trees, planted in the style of a linear arboretum. This three kilometre walking track connects the natural bushland to the farmland and homestead garden and on to the new regeneration zone at Bundanon, weaving a connection between old and new concepts of landscape.

Tree Lines Track tells stories and celebrates trees. The walking path reveals the different ways trees exist between the natural world, settler culture and the contemporary environmental approach to landscape. Stones placed with trees along the track will create stopping points. They are scripted with varying texts, fragments of poems and prose written either at Bundanon or about its landscape.

Beginning at the ruin of the original farmhouse and winding down through the old forest the path follows along the edge of the lagoon and then swoops across an open paddock towards the Bundanon Homestead. The walk will then reveal the dramatic transformation of lower river flats resulting from the Trust's Living Landscape bush regeration project. The walk continues along a ridge, down to the shores of the Shoalhaven River and back up past the wattles before ending back at the main house. A temporary, interpretive, installation by the artist will be on show in the Single Mans' Hut in late 2014.

Tree Lines Track has been created in partnership with Landcare Australia and is a legacy project to mark the transformation of Bundanon by the Living Landscape initiative which to date has seen over 209 acres of Lantana removed and around 42,000 trees planted. Bundanon is particularly indebted to Dr Shane Norrish, Farming and Major Projects Director, Landcare Australia, for his expertise and commitment to this project. *Tree Lines Track* is dedicated to the memory of Yvonne Boyd (1920-2013)

Over twenty-five years, Janet Laurence's practice has extended to painting, sculpture, installation, photography, architectural and landscape interventions. The major themes that have emerged in the work include: the relationship between the museum, the natural world, and notions of preservation; the exploration of hybrid landscapes that involve a fusion of natural and urban elements; alchemy and the transformation of elements from one state to another.

Image: Artist Janet Laurence leads participants in Siteworks 2014 on a walk of *Tree Lines Track*, a passage of trees, planted in the style of a linear aboretum. This three kilometer walking track connects the natural bushland to the Homestead garden and new regeneration zone at Bundanon.