

**VALLA AND JAGUN NATURE RESERVES**

**PLAN OF MANAGEMENT**

**National Parks and Wildlife Service**

**Part of the Department of Environment and Climate Change NSW**

**July 2008**

**This plan of management was adopted by the Minister for Climate Change and the Environment on 21<sup>st</sup> July 2008.**

For additional information or enquires about any aspect of the plan, contact the NPWS Coffs Coast Area Office at Marina Drive (PO Box J200), Coffs Harbour NSW 2450 or by phone on (02) 6652 0900.

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## FOREWORD

Valla and Jagun Nature Reserves are located adjacent to the township of Valla Beach on the mid north coast of NSW.

The vegetation communities of both reserves are diverse considering their small size. Valla Nature Reserve has ten mapped vegetation communities and Jagun Nature Reserve has fourteen. Seven threatened species have been recorded in the reserves, and a further 43 threatened species may potentially occur.

The Gumbaynggir people they have indicated that they have a strong connection to the Valla Beach and Oyster Creek areas. The entrance to Oyster Creek is highly significant to the Gumbaynggir people as well as an important spiritual link with Nunguu Mirral Aboriginal Area (Picket Hill).

The New South Wales *National Parks and Wildlife Act 1974* requires that a plan of management be prepared for each nature reserve. A plan of management is a legal document that outlines how an area will be managed in the years ahead.

A draft plan of management for Valla and Jagun Nature Reserves was placed on public exhibition from 15<sup>th</sup> October 2004 until 7<sup>th</sup> February 2005. The submissions received were carefully considered before adopting this plan.

This plan contains a number of actions to achieve “Better environmental outcomes for native vegetation, biodiversity, land, rivers, and coastal waterways” (Priority E4 in the State Plan) including strategies to reduce nutrient inputs and pollutants entering the Oyster and Deep Creek catchments, retention of key habitat and corridors linking the reserves to surrounding bushland, and pest and weed control programs.

This plan of management establishes the scheme of operations for Valla and Jagun Nature Reserves. In accordance with section 73B of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

**Verity Firth**  
**Minister for Climate Change and the Environment**

## 1. MANAGEMENT CONTEXT

### 1.1 LEGISLATIVE AND POLICY CONTEXT

The management of nature reserves in NSW is in the context of the legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). The matters to be considered in the preparation of a plan of management are listed in Section 72AA of the NPW Act. NPWS policies relate to nature conservation, cultural heritage conservation, recreation, commercial use, research and communication.

Other legislation, international agreements and charters may also apply to management of the area. In particular, the *NSW Environmental Planning and Assessment Act 1979* (EPA Act) requires the assessment and mitigation of environmental impacts of any works proposed in this plan.

This plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan, the plan must be carried out and no operations may be undertaken within Valla and Jagun Nature Reserves except in accordance with the plan. The plan will also apply to any future additions to the reserves. Where management strategies or works are proposed for additions that are not consistent with the plan, an amendment to the plan will be required.

### 1.2 MANAGEMENT PURPOSES AND PRINCIPLES

Nature reserves are reserved under the NPW Act to protect and conserve areas containing outstanding, unique or representative ecosystems, species, communities or natural phenomena.

Under the Act, nature reserves are managed to:

- Conserve biodiversity, maintain ecosystem functions, and protect geological and geomorphological features and natural phenomena;
- Conserve places, objects, features and landscapes of cultural value;
- Promote public appreciation, enjoyment and understanding of the reserve's natural and cultural values; and
- Provide for appropriate research and monitoring.

Nature reserves differ from national parks in that they do not have as a management principle to provide for visitor use.

## **2. VALLA AND JAGUN NATURE RESERVES**

### **2.1 LOCATION, GAZETTAL AND REGIONAL SETTING**

Valla and Jagun Nature Reserves (referred to as "the reserves" in this plan) are located adjacent to the township of Valla Beach (30°35.4'S, 153°0.6'E) on the mid north coast of NSW (see map), within the Nambucca and Bellingen local government areas.

Valla Nature Reserve was gazetted in 1999 as part of the Lower North East NSW Regional Forest Agreement and, following additions in 2005, comprises five areas totaling 47 hectares. The reserve is bisected by Ocean View Drive.

Jagun Nature Reserve was purchased under the Coastal Lands Protection Scheme and gazetted in 1999. The reserve covers 100 hectares and is approximately one kilometre north of Valla Nature Reserve. The creek bed of Oyster Creek forms the north-western boundary of the reserve. Part of the inlet to Oyster Creek also lies within the reserve. The corridor of the North Coast Railway Line forms the south-western boundary. The eastern boundary of the reserve runs along the mean high water mark of North Valla Beach.

The reserves, along with the nearby Nunguu Mirral Aboriginal Area (Picket Hill) and Yarriabini National Park, are the only coastal lands of the NPWS estate between the Bellingen and Macleay rivers. The reserves fall within the area of the Gumbaynggirr Aboriginal people.

### **2.2. LANDSCAPE**

Natural and cultural heritage and on going use are strongly inter-related and together form the landscape of an area. Much of the Australian environment has been influenced by past Aboriginal and non-Aboriginal land use practices, and the activities of modern day Australians continue to influence the environment through recreational use, cultural practices, and the presence of introduced plants and animals.

The geology, landform, climate and plant and animal communities of the reserves, plus their location, have determined how it has been used by humans. In the past Aboriginal people lived and hunted in the area. When Europeans arrived they cleared the land and competed with Aboriginal people for food and resources, eventually displacing them.

Both Aboriginal and non-Aboriginal people place cultural values on natural areas, including aesthetic, social, spiritual, recreational and other values. Cultural values may be attached to the landscape as a whole or to individual components, for example to places used by Aboriginal and/or non-Aboriginal people. This plan of management aims to conserve both natural and cultural values. For reasons of clarity and document usefulness natural and cultural heritage, non-human threats and on-going use are dealt with individually, but their inter-relationships are recognised.

## 2.3 NATURAL AND CULTURAL HERITAGE

### Geology, Landform, Soils and Hydrology

Jagun Nature Reserve is relatively flat and ranges in elevation from sea level to 30 metres above sea level, with the majority of the reserve being less than 3 metres above sea level. Valla Nature Reserve is undulating and ranges between 10-30 metres above sea level.

The reserves lie within the geological formation known as the Nambucca Block, which extends from Coffs Harbour to Kempsey along the coast and to Armidale in the west. A brief description of the soil landscapes and the soil types characteristic of each landscape type in the reserves are provided in Appendix 1.

Soils in Jagun Nature Reserve are generally sandy with clay substrates, and highly erodible. In Valla Nature Reserve soils generally comprise finer soil types which are more stable, though still subject to moderate to high erosion. Soils in Valla Nature Reserve tend to remain moister when compared with the soils in the more open woodland of Jagun Nature Reserve. These micro-climatic differences are also reflected in the vegetation associations of the reserves (refer Native Plants).

Jagun Nature Reserve has a number of small drainage lines which flow into Oyster Creek, and freshwater also seeps through the soils of Jagun Nature Reserve directly into Oyster Creek. Oyster Creek intermittently opens and closes to the ocean (known as an ICOL). ICOLs are characterised by having a small catchment area, a short distance of transition between marine and freshwater vegetation, and variations in salinity dependant upon contact with the ocean. The seaward boundary of Jagun Nature Reserve is dynamic. Large sea surges in the early 1960s severely eroded the frontal dunes and almost broke through to the swales behind (B. Sharman, pers.comm.).

Valla Nature Reserve lies within part of the larger catchment of Deep Creek. The western section of the reserve drains into an adjoining coastal wetland listed under State Environment Protection Policy 14 (Coastal Wetlands), and then into Deep Creek. The eastern section of the reserve has several minor drainage lines which flow into Deep Creek within 100 metres of its mouth.

### Native Plants

The vegetation communities of both reserves are diverse considering their small size and, in Jagun Nature Reserve, generally uniform topography. Valla Nature Reserve has ten mapped vegetation communities and Jagun Nature Reserve has 14.

Jagun Nature Reserve contains a complex mosaic of vegetation communities due to the variations in exposure to salt spray, soil parent material, soil fertility, drainage and fire regime. The interactions of these factors result in vegetation communities including spinifex grasslands, acacia and banksia shrublands, woodlands, dry open forests, moist open forests, swamp forests and aquatic vegetation.

Eight species of eucalypts and six other canopy species occur within Jagun Nature Reserve. The most extensive forest communities occur on the older flatter dunes behind

the beach ridges and are dominated by pink bloodwood (*Corymbia intermedia*), which is more tolerant of poor soils (such as occur on younger sand deposits) and exposure to salt spray than other eucalypt trees. Pink bloodwood dominates vegetation 50-100 metres inland from the frontal dune. Less exposed areas of this community typically have an understorey of black oak (*Allocasuarina littoralis*) where the fire regime permits. More exposed areas have an understorey of coastal banksia (*Banksia integrifolia*) which is more tolerant of exposure to salt spray, and extends to the foredune.

Further inland depositional action associated with Oyster Creek has resulted in a more fertile soil with a higher proportion of silt and organic matter than in the younger dune zone. Here pink bloodwood is joined by coastal blackbutt (*Eucalyptus pilularis*), and occasional stands of tallowwood (*E. microcorys*). Swamp mahogany (*E. robusta*) occupies areas of impeded drainage.

Heavier and more fertile clay soils developed on bedrock support blackbutt and ironbark (*E. siderophloia*) where drainage is adequate. Forest red gum (*E. tereticornis*) occupies areas with impeded drainage, and broadleaved paperbark (*Melaleuca quinquenervia*) occupies areas subjected to seasonal inundation. It is replaced by swamp oak (*Casuarina glauca*) and then mangroves (*Avicennia marina*) with increasing salinity along Oyster Creek.

The natural sand dune/swale structure within Jagun Nature Reserve and low incidence of bitou bush (*Chrysanthemoides monilifera*) indicates that vegetation communities have remained relatively undisturbed and have not been sand mined in the past. The efforts of volunteers together with weed management programs have also controlled the extent of bitou bush. Thus, vegetation communities within this reserve serve as an important reference point for neighbouring areas (Scotts, 1999).

The crests and upper slopes of Valla Nature Reserve are dominated by old growth coastal blackbutt (*E. pilularis*), and are one of the best examples of old growth blackbutt in an urban setting on the north coast. The 2005 addition to Valla Nature Reserve includes a headland on which a rare tract of Brush Box Littoral Rainforest occurs. This rainforest is protected under State Environmental Planning Policy 26 (Littoral Rainforest).

On the less well drained midslopes, ironbark (*E. siderophloia*) is associated with coastal blackbutt. Moist open forests of brush box (*Lophostemon confertus*) together with pink bloodwood and red mahogany (*E. resinifera* ssp. *hemilampra*) dominate the lower slopes and water courses, with several stands of flooded gum (*Eucalyptus grandis*) and occasional turpentine (*Syncarpia glomulifera*) and willow bottlebrush (*Calistemon salignus*). Small patches of rainforest occur in protected areas of the lower slopes and gullies (Elks, 2004).

Some of the vegetation communities in Jagun Nature Reserve are listed as endangered ecological communities (EECs) under the TSC Act. These are subtropical coastal floodplain forest, swamp sclereophyll forest on coastal floodplains, swamp oak floodplain forest and coastal saltmarsh. Each is represented as small patches and often adjoin and intergrade, making it difficult to clearly define boundaries. Valla Nature Reserve contains two endangered ecological communities, these being littoral rainforest and subtropical coastal floodplain forest. The objects of the TSC Act in relation to EECs are to prevent their extinction and promote their recovery, to eliminate or manage

certain processes that threaten their survival or evolutionary development, and to ensure that the impact of any action affecting EECs is properly assessed.

A flora survey undertaken in Valla Nature Reserve in 2004 (Elks) identified a population of the threatened species, clear milkvine (*Marsdenia longiloba*), listed as Endangered in the TSC Act. A draft recovery plan for *Marsdenia longiloba* is currently being prepared. Potential habitat for a further 12 threatened flora species occurs within the reserves (see Appendix 2). Recovery plans are in preparation for *Acronychia littoralis* and *Thesium australe*, both of which may be present in the reserve as noted in Appendix 2.

### **Native Animals**

Although only small, Valla Nature Reserve supports an abundance of wildlife due to the diverse range and age of canopy trees and large hollows in the old growth blackbutt forest.

The NPWS *Discovery* Program runs occasional spotlight tours within the reserve. On each occasion unusually high numbers of arboreal mammals have been recorded along a 150 metre section of the track. This has included recordings of 11 greater gliders (*Petauroides volans*), 3 sugar gliders (*Petaurus breviceps*) and 2 common brushtail possums (*Trichosurus vulpecula*) on a single night.

Whilst greater gliders are common, their density in such a small, low soil fertility area on the coast is unusual (Turbill, 2003, Scotts 2004, and Kendall, 2004 pers. com.). High numbers of greater gliders are normally restricted on the coast to more fertile forests such as Pine Creek, within Bongil Bongil National Park, approximately 30 kilometres to the north.

During 1998 the calls of yellow-bellied gliders (*Petaurus australis*) were regularly heard in Valla Nature Reserve (Lyn Orrego & Geoff Wilson, 2004 pers. com.) but they have not been recorded since. This may be attributed to recent and extensive land clearing adjacent to and near the reserve impacting on the glider's home range. The yellow-bellied glider's required home range of between 20 and 85 hectares has been reduced by land clearing to such an extent that it is possible that the remaining habitat in the local area is insufficient for its survival and it may be absent from the reserve.

The NPWS Key Habitats and Corridors Project (Scotts 2003) identifies Valla and Jagun Nature Reserves as forming a critical part of a regional habitat corridor known as the Oyster Creek Urunga Corridor. This corridor links large areas of coastal vegetation from Deep Creek in the south to the Bellinger River in the north, providing potential key linkages for threatened forest fauna.

The diversity of forest communities within and adjacent to the reserves provide habitat for a wide range of threatened species. The NPWS Wildlife Atlas identifies seven threatened species in the reserves. A further 43 threatened species may potentially occur in the reserves (see Appendix 3). In 2004, a small-scale fauna survey was commissioned, which confirmed the presence of 48 native animal species in the reserves. Systematic fauna surveys may identify additional species.



Under the provisions of the TSC Act, recovery plans may be prepared for threatened species. Of the threatened species listed in Table 2, a recovery plan is in place for the yellow-bellied glider (NPWS 2003a) and the regent honeyeater (Menkhorst et al. 1999). Draft recovery plans have been prepared for the koala (NPWS 2003b), for the barking owl (NPWS 2003c) and for the large forest owls, including the masked owl and powerful owl (DEC 2005). Recovery plans and recovery actions listed in the Priorities Action Statement (currently available in draft form) will be used to guide management of threatened species in the reserves.

Considering the small size of the reserves and the range of threatened species known and predicted to occur, the retention of neighbouring vegetated areas (including large hollow bearing trees) is important to maintain habitat corridors linking the reserves to other tracts of native vegetation and to maintain biodiversity in the region.

### **Cultural Heritage**

The reserves are located within the country of the Gumbaynggir Aboriginal people and within the boundaries of the Nambucca Heads and Coffs Harbour Local Aboriginal Land Councils (LALC). There is some conjecture as to whether the name Valla is of European or Aboriginal derivation. The Gumbaynggir translate the name Valla to 'Janingbirriny', which means 'wattle tree gum-bridge' (Morelli, 1999). Other accounts on the history of the area note that "the Aborigines' name for the locality was 'Valla Valla' (Thurtell & Smith n.d.). Jagun is Gumbaynggir for homeland, country or birthplace (Morelli, 1999).

Aboriginal communities have an association and connection to the land. The land and water diversity values within a landscape are central to Aboriginal spirituality and contribute to Aboriginal identity. Aboriginal communities associate natural resources with the use and enjoyment of foods and medicines, caring for the land, passing on cultural knowledge and strengthening social bonds. Aboriginal heritage and nature are inseparable from each other and need to be managed in an integrated manner across the landscape.

During consultation with the Gumbaynggir people they have indicated that they have a strong connection to the Valla Beach and Oyster Creek areas. The entrance to Oyster Creek is highly significant to the Gumbaynggir people as well as an important spiritual link with Nunguu Mirral Aboriginal Area (Picket Hill):

*"The ocean and waterways, the mountains, the land and its environment are all connected to our culture, heritage and traditions in life. The foods of the ocean such as pipis and fish, were used and continue to be used as traditional food sources."*  
(Gumbaynggir Aboriginal Elders, 2003).

A registered native title claim (NC 98/15) includes the extreme north of Jagun Nature Reserve, as well as the mouth of Oyster Creek and Crown lands to the north of the reserve. The Aboriginal heritage sites within the area surrounding the reserves are diverse and range from Aboriginal men's and women's places to middens and scarred and ceremonial trees and many other areas of cultural significance. A cultural heritage assessment and survey of the area may identify other values in the reserves.

The Nambucca Valley was first visited by cedar cutters and loggers in the 1830s, although there are stories of escaped convicts surviving shipwrecks and living in the area before this time (Townsend, 1993).

There have been no European cultural heritage surveys undertaken in the reserves, however, Jagun Nature Reserve is known to have been used for grazing bullocks in the 1800s and for general cattle grazing up until the 1970s. There is evidence of past logging including large tree stumps. Small dams are present in both reserves. The southern part of the existing nature reserve was previously owned and farmed by the Sharman family from the 1950s to 1980 when it was purchased under the Coastal Lands Protection Scheme. The family undertook various market garden and grazing enterprises during this time. Subsequently, when the place was a Crown reserve, there was some revegetation of previous clearings by both native species and weeds.

Valla Nature Reserve was leased for many years for cattle and pig farming. The only known evidence of these activities is a small number of stumps, remnant fencing, concrete pads, dams and iron water tanks.

## **2.4 VISITOR USE AND EDUCATION**

The reserves are valued by the adjacent Valla Beach community in particular for their natural, cultural and landscape values. Jagun Nature Reserve is accessed from Valla Beach Road, Birugun Close and Cockburn Street. Valla Nature Reserve is accessed from Valla Beach Road, Ocean View Drive and Tuna Street. There is no public vehicle access within the reserves.

Bushwalking and bird watching are the principal uses of the reserves. There are no formal walking tracks or other visitor facilities in the reserves, however the management trails in both reserves provide opportunities for walking.

A walking track and 4WD vehicle track accessed off Cockburn Street within the Public Recreation Reserve to the south of Jagun Nature Reserve provides public access to North Valla Beach. Picnic shelters are located along the walking track. The Public Recreation Reserve is managed by Department of Lands and 4WD access is restricted to vehicles with a permit obtained through Nambucca Shire Council.

Fishing, canoeing and kayaking are regularly undertaken along Oyster Creek within Jagun Nature Reserve. Access to Oyster Creek is off the Pacific Highway through Oyster Creek Reserve to the north west of the reserve and is managed by Bellingen Shire Council.

Valla Nature Reserve provides one of the best areas for spotlighting native animals in the mid north coast (refer 2.2 Native Animals). The NPWS's *Discovery* Program runs occasional spotlight tours in the reserves. These tours provide information to visitors about the natural environment, the history of the reserves and the cultural heritage significance of the area.

Opportunities for a range of recreation activities including camping, horse riding, and water sports are available outside the reserves within the local region.

## 2.5 THREATS TO RESERVE VALUES

### Visitor impacts

The provision of recreation opportunities is not a primary management objective for nature reserves under the NPW Act. The reserves currently receive low levels of use for appropriate passive recreation such as bush walking, nature study and bird watching (refer 2.4 Visitor Use and Education). The area below high water mark at North Valla Beach is outside Jagun Nature Reserve and managed by Nambucca Shire Council. Council allows 4WD beach driving along this section of the beach under a permit system. Dogs and horses are also permitted within this area of the beach. There is some “spill over” into Jagun Nature Reserve, with vehicles and domestic animals entering the reserve from the beach either intentionally or accidentally.

The sand dunes, and the native vegetation on them, are fragile and susceptible to damage from motor vehicles and trampling by horses. Vehicles, horses and dogs also have the potential to disturb native wildlife if they enter the reserves. The walking of dogs in both reserves is an ongoing problem. These activities are not consistent with the study of nature and natural environments are generally considered inappropriate uses of a nature reserve.

The periodic dumping of rubbish and garden refuse, and unauthorised clearing and use of the reserves adjacent to residential areas, also threatens values.

### Fire

The NPWS regards fire as a natural phenomenon and one of the continuing physical factors influencing the Australian environment. Inappropriate fire regimes have been identified as a key threatening process affecting the biological diversity of NSW. Fire could also damage cultural features and threaten neighbouring land.

Both reserves have been subject to frequent unauthorised fires for many years. Large areas of both reserves were burnt in a series of wild fires over the spring and summer of 2001/2002. During this time one large fire burnt approximately 60% of Jagun Nature Reserve.

The intensity, interval and season of fire in the reserves is thought to have resulted in the proliferation of blady grass (*Imperata cylindrica*) and a sparse and simplified midstratum vegetation, especially on sand substrates in Jagun Nature Reserve. Extensive blady grass cover is associated with the general absence of mature coastal banksias (*Banksia integrifolia*) and black oaks (*Allocasuarina littoralis*) from otherwise suitable habitat suggesting that the frequent fires have impacted on these species.

In contrast, ground layer vegetation dominated by kangaroo grass (*Themeda australis*) in Valla Nature Reserve and the southern end of Jagun Nature Reserve suggests that fire regimes have had less of an impact on understorey vegetation in these areas, and that past grazing practices within the reserves were of low intensity.

Those areas of the reserves with well-developed midstratum vegetation appear to have had either infrequent low intensity fires, or no fires, for at least 15 years. These areas either have some topographic protection from fire and support midstratum vegetation

dominated by hardy rainforest species, or have no apparent protection but have nonetheless avoided fire and support mature sclerophyll vegetation such as coastal banksia or black oak (Elks, 2004).

A recent review of fire management planning throughout the NPWS has resulted in a modified approach to fire planning based on the level of complexity involved. In regard to these reserves, the NPWS has prepared a fire management strategy for the reserves covering these complex issues.

The fire management strategy for the reserves involves a description of the reserves, the bush fire environment, fire management, fire trails and plan administration. The strategy identifies strategies to protect adjacent properties from fire emanating from the reserves, as well as incorporating ecological burning principles. Due to their relatively small size, the reserves have been considered together with adjacent areas of bushland for fire management planning purposes by the Nambucca Bushfire Management Committee.

Asset Protection Zones have been identified to protect residences on the southern boundary of Jagun Nature Reserve and on the northern boundary of Valla Nature Reserve. Asset Protection Zones have been prepared in consultation with the Rural Fire Service and Nambucca Shire Council and comply with the Rural Fire Service's guide, 'Planning for Bushfire Protection', (Rural Fire Services and Planning NSW 2001).

A Strategic Fire Management Zone has been identified in the southern end of Valla Nature Reserve adjoining Tuna Street and will be managed according to fuel loads to protect adjoining properties.

Heritage Management Zones have been identified to ensure that these areas are managed for the conservation of biodiversity and that fire frequency is managed according to predetermined fire thresholds for each vegetation community.

## **Introduced Plants and Animals**

The North Coast Region Pest Management Strategy (NPWS 2002) broadly identifies the introduced plant and animal issues for the reserves. Both reserves have low to moderate infestations of introduced species.

The majority of Valla Nature Reserve contains a relatively low weed density, however the spread of weeds from dumping of garden refuse, garden escapees or nutrient enrichment is a concern where the reserve abuts residential areas. Dumping of garden refuse behind the water tower on Valla Beach Road is also a known source of weeds in the reserve. The main noxious weed species of concern in the reserve are lantana (*Lantana camara*), crofton weed (*Ageratina adenophora*) and mistflower (*Ageratina riparia*).

Jagun Nature Reserve has low to moderate populations of bitou bush (*Chrysanthemoides monilifera* subsp. *rotundata*) along the length of the foredune. The spread of bitou bush has been controlled, largely due to the efforts of Bushcare volunteers who operated in the area from 1985 until recently. Weed management programs together with strong support from community members through Valla Beach

Dunecare Group are making substantial progress in controlling bitou bush and other environmental weeds. A threat abatement plan for bitou bush has been approved (DEC 2006).

Patches of groundsel bush (*Baccharis halimifolia*) and crofton weed occur in moist areas and lantana is scattered throughout the southern end of Jagun Nature Reserve. Some occurrences of the invasive glory lily (*Gloriosa superba*) have also been found in the northern tip of the reserve. The railway corridor to the west of Jagun Nature Reserve is also a source of weeds, in particular groundsel bush, which has spread into the reserve.

Foxes and feral cats have been recorded in both reserves. A Threat Abatement Plan has been prepared for the red fox and is in preparation for feral cats. Domestic dogs and cats from neighbouring properties are also known to wander into the reserves.

The presence of the introduced honey bee (*Apis mellifera*) has been observed in several tree hollows within Valla Nature Reserve. Competition from feral honeybees (*Apis mellifera*) is listed as a Key Threatening Process under the TSC Act. Honeybees impact on biodiversity in two broad ways: via competition for tree hollows and via competition for floral resources, such as pollen and nectar. As there are now fewer hollows in the landscape due to clearing and logging of old growth forest, and as hollows are often vital to many native birds and mammals for breeding and shelter, competition for tree hollows is of particular concern.

### **Stormwater and catchment runoff**

The Oyster Creek and Deep Creek catchments are under considerable pressure from urban development. The majority of urban stormwater run-off from Valla Beach is discharged into a tributary of Oyster Creek north of Valla Beach Road (Luffman, 1999). The Deep Creek catchment collects urban stormwater run-off south of Valla Beach Road.

The entrance to Oyster Creek is closed for long periods (Luffman, 1999). The closed entrance means that the creek is poorly flushed and therefore catchment run-off and groundwater have a major impact on the volume and quality of water. Any significant discharge into the tributary creeks draining into the Oyster Creek catchment may affect water quality and potentially impact on the ecology of the creek.

Run-off from residential areas has the potential to introduce pollutants such as soil, fertilisers, pesticides, pathogens, grass, plastics, litter, oil, grease and metal particles, as well as a range of other compounds and weed propagules. Weed invasion along some of the drainage lines into the reserves is potentially significant.

The former Valla Gold Mine is located outside the reserve within the Oyster Creek catchment. Remediation works were undertaken between 1981 and 1983 to ensure run-off and sediment from the site did not contaminate Oyster Creek. Recent water quality and aquatic fauna sampling in Oyster Creek have found no significant contamination. Further remediation works are planned in the near future (NSW Department Mineral Resources, 2001). The NPWS is a member of the Technical

Working Party with the Department of Minerals and Energy, Bellingen Shire Council and other agencies undertaking this work.

### **Isolation and habitat fragmentation**

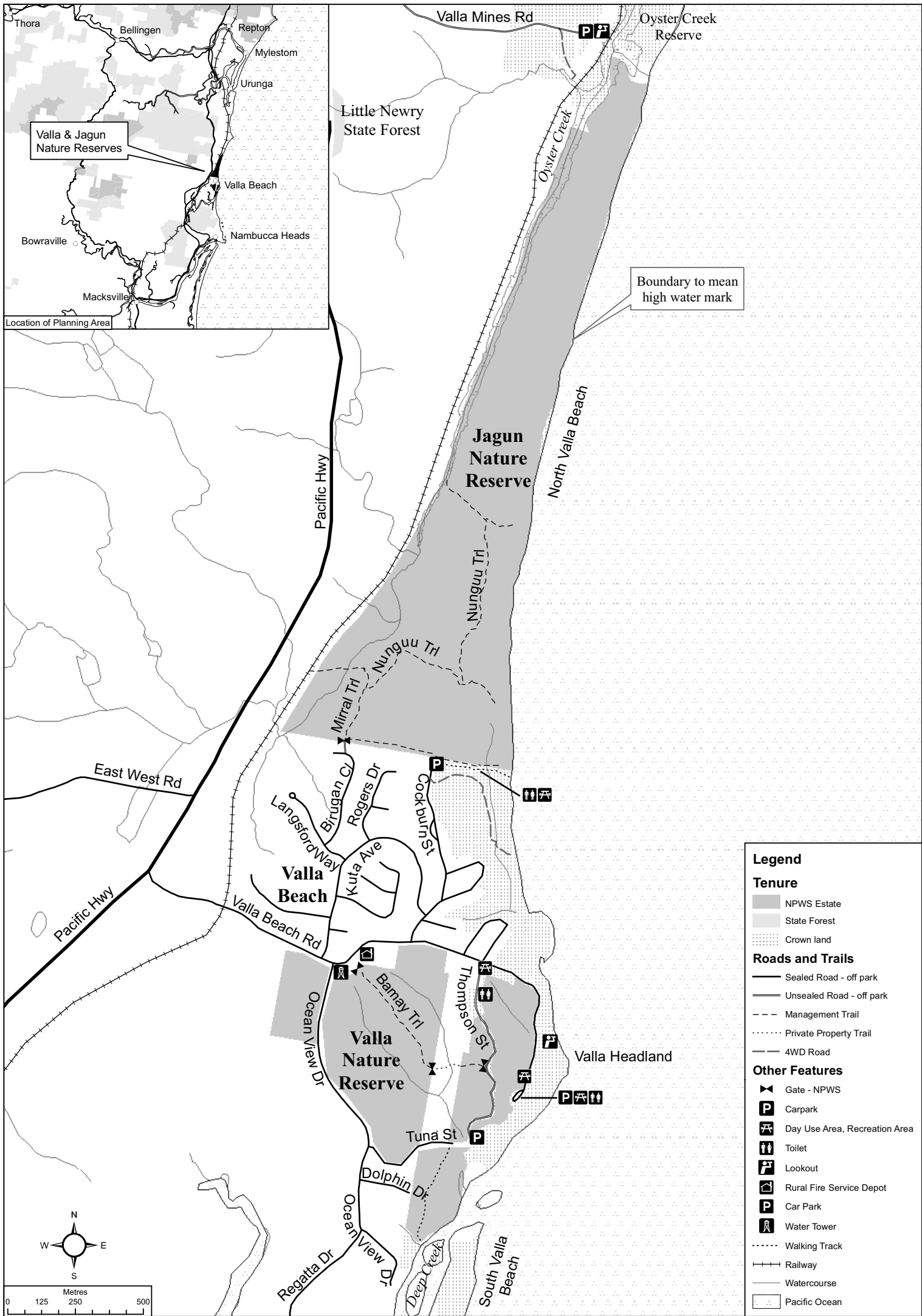
The reserves are identified as forming a critical part of the Oyster Creek Urunga Corridor providing key habitat for threatened species (refer section 2.3 Native Animals).

As the reserves are relatively small in size, it is important to consider the reserves in the context of surrounding remnant vegetation. Nearby vegetated areas consolidate the habitat values of the reserve however, the corridor values of remaining bushland are under threat from clearing and urban development. Clearing of vegetation within the area has resulted in fragmentation of habitat. Long term conservation of biodiversity within the bio-region and the reserves depends upon the protection, enhancement and connection of remaining habitat across the landscape, involving vegetation remnants on both public and private lands.

This is especially the case given the likely consequences of climate change in the region. Anthropogenic climate change has been listed as a key threatening process under the TSC Act due to its anticipated impacts on biodiversity, through changes in the geographical extent of habitats and ecosystems, and subsequent changes in population size and distribution of species.

Sea-level rise is one of the projected outcomes of climate change, with a sea-level rise of between 18 and 59 centimetres by 2100 expected (IPCC 2007). This will result in: increased intensity and frequency of storm surges; increased shore erosion; impacts on coastal ecosystems (including the loss of important coastal wetlands and mangroves); and impacts on human settlements and infrastructure (CSIRO 2004). These impacts will be exacerbated by the expected increased frequency of extreme storm events.

While the potential impact of climate change for the reserves is difficult to predict with any accuracy (since it depends on the compounding effects of other pressures), the most immediate impacts are likely to be felt in Jagun Nature Reserve which would suffer a loss of freshwater coastal wetlands, including swamp forests, affecting the whole vegetation complex of the reserve. These wetland communities are already under threat from a range of pressures and are listed as endangered ecological communities under the TSC Act.



Valla & Jagun Nature Reserves

Boundary to mean high water mark

**Legend**

**Tenure**

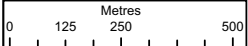
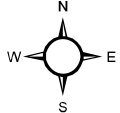
- NPWS Estate
- State Forest
- Crown land

**Roads and Trails**

- Sealed Road - off park
- Unsealed Road - off park
- Management Trail
- Private Property Trail
- 4WD Road

**Other Features**

- Gate - NPWS
- Carpark
- Day Use Area, Recreation Area
- Toilet
- Lookout
- Rural Fire Service Depot
- Car Park
- Water Tower
- Walking Track
- Railway
- Watercourse
- Pacific Ocean



#### 4. MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcomes	Strategies	Priority
<p><b>Soils, Landforms and Hydrology</b></p> <p>Soils in the reserves have a moderate to high erosion hazard.</p> <p>The reserves are part of the Oyster and Deep Creek catchments. The ocean entrance to Oyster Creek is closed for long periods and poorly flushed. Urban stormwater run-off from Valla Beach has the potential to introduce pollutants and weeds into the reserves.</p> <p>The former Valla Gold Mine is subject to ongoing works to ensure run-off and sediment do not contaminate Oyster Creek. NPWS participates on a Technical Working Party undertaking this work.</p>	<ul style="list-style-type: none"> <li>• Soil disturbance and erosion are minimised.</li> <li>• Pollutants and weeds entering the reserve from urban run-off are minimised.</li> <li>• Run-off and sediment from the former Valla Mine does not significantly impact on water quality of Oyster Creek.</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake all works in a manner that minimises erosion and water pollution.</li> <li>• Liaise with Nambucca Shire Council to encourage and implement storm water management controls that minimise pollutants carried in stormwater from entering the reserves.</li> <li>• Liaise with Nambucca Shire Council and the EPA about encouraging the community to reduce nutrient inputs and pollutants entering the Oyster and Deep Creek catchments.</li> <li>• Work with the Northern Rivers Catchment Management Authority to improve the level of weed control, the integrity of riparian vegetation and water quality in Deep Creek and Oyster Creek catchments.</li> <li>• Continue participation on the Technical Working Group undertaking remediation works at Valla Gold Mine and environmental monitoring in Oyster Creek.</li> </ul>	<p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>Ongoing</p>



Current Situation	Desired Outcomes	Strategies	Priority
<p><b>Native Plants and Animals</b></p> <p>The old growth coastal black butt forest in Valla Nature Reserve supports an abundance of wildlife including a large number of arboreal mammals.</p> <p><i>M. longiloba</i> is present in Valla Nature Reserve and is listed as threatened under the TSC Act. Both reserves contain predicted habitat for many threatened plant and animal species.</p> <p>Urban development surrounding the reserves has impacted on the available habitat for native species and is of particular concern to arboreal mammals in Valla Nature Reserve.</p> <p>Long term conservation of the reserves' natural values would be enhanced by the retention of remaining vegetation on neighbouring lands.</p>	<ul style="list-style-type: none"> <li>• The diversity of existing native flora and fauna is maintained.</li> <li>• Threatened species populations do not decline.</li> <li>• There is increased understanding and knowledge of the reserves flora and fauna and their ecological needs.</li> <li>• The conservation and corridor values of the reserves are enhanced by retention of vegetated areas on adjacent private and public land.</li> </ul>	<ul style="list-style-type: none"> <li>• Implement recovery plans, priority actions and threat abatement plans for threatened species as they are prepared.</li> <li>• Undertake or encourage flora and fauna surveys especially for those listed as threatened under the TSC Act.</li> <li>• Exclude fire from fire sensitive communities and areas (refer Fire Management).</li> <li>• Liaise with Nambucca Shire Council and relevant landholders to encourage the retention of key habitat and corridors in the vicinity of the reserves and to identify potential wildlife /habitat corridors to link to other remnant areas.</li> <li>• Encourage and assist the development of voluntary conservation agreements for the protection of conservation values on surrounding properties.</li> <li>• Monitor arboreal mammal populations in Valla Nature Reserve, to determine any decline in populations.</li> </ul>	<p>High</p> <p>Medium</p> <p>High</p> <p>High</p> <p>High</p> <p>Ongoing</p>

<p><b>Cultural Heritage</b></p> <p>Aboriginal people have a strong relationship with the area.</p> <p>Jagun Nature Reserve has a history of logging and grazing. Valla Nature Reserve was leased for cattle and pig farming.</p> <p>The only known remnants of past use of the reserves are large stumps from logging in Jagun Nature Reserve, and stumps, dilapidated fencing, iron sheeting and concrete pads associated with cattle and pig farming in Valla Nature Reserve. Small dams are also present in both reserves.</p> <p>No comprehensive surveys of Aboriginal or non-Aboriginal cultural values have been undertaken.</p>	<ul style="list-style-type: none"> <li>• The cultural heritage of the reserves are identified, conserved and managed in accordance with their significance.</li> <li>• Aboriginal cultural heritage values are protected in partnership with the local Aboriginal community.</li> </ul>	<ul style="list-style-type: none"> <li>• Precede all ground disturbance work with a check for cultural features.</li> <li>• Encourage studies into the reserves' Aboriginal cultural heritage in consultation with the Gumbaynggir Aboriginal people, Nambucca Heads and Coffs Harbour LALC's and other relevant people.</li> <li>• Liaise with the Gumbaynggir Aboriginal people, Native Title claimants, Nambucca Heads and Coffs Harbour LALCs and other relevant people about management and interpretation of the Aboriginal heritage of the reserves.</li> <li>• Work with the local community to identify the non-indigenous cultural heritage of the reserves.</li> <li>• Allow stumps to naturally deteriorate. Remove fencing and iron sheeting where necessary to protect animals or visitors. Assess the significance of the concrete pads and appropriateness of removal. Maintain the dams for habitat values.</li> </ul>	<p>High</p> <p>High</p> <p>High</p> <p>Medium</p> <p>Low</p>
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		<p>at major access points to the reserves.</p> <ul style="list-style-type: none"> <li>• Install reserve identification and regulatory signs at the entrance to the reserves. Maintain signs at strategic locations along the dunes and Oyster Creek within Jagun Nature Reserve prohibiting dogs, horses, camping, fires, motor bikes and other vehicles.</li> <li>• Promote community understanding and appreciation of the conservation values of the reserves through contact with neighbours, community organisations and media releases as needed.</li> <li>• Conduct ongoing ranger patrols in areas adjoining residential areas to promote compliance with NPWS regulations.</li> <li>• Gate management trails (with short sections of fence, if required) to prevent unauthorised vehicular access within the reserves.</li> </ul>	<p>Ongoing</p> <p>Ongoing</p> <p>High</p> <p>High</p>
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<p><b>Introduced Species</b></p> <p>The main weed species in Valla Nature Reserve are bitou bush, crofton weed, mistflower and lantana. In Jagun Nature Reserve the main species are bitou bush, groundsel, crofton weed and lantana.</p> <p>Garden escapees from adjacent residential areas and dumping behind the water tower at Valla Nature Reserve are a threat to the reserves. Groundsel bush has spread into the reserve from the railway corridor west of Jagun Nature Reserve.</p> <p>A Regional Pest Management Strategy addressing some of the introduced species in the reserves has been prepared by NPWS. Weed management programs are in place to control bitou bush, groundsel bush, lantana and other environmental weeds in the reserves.</p> <p>Weed control programs, together with strong community support from the Valla Beach Bushcare Group, are making a major impact in controlling environmental weeds in Jagun Nature Reserve.</p> <p>Domestic dogs and cats enter the reserves from neighbouring properties and off North Valla Beach.</p> <p>Foxes and feral cats have been recorded in both reserves.</p> <p>Feral hives of the European honey bee occur in Valla Nature Reserve. Further survey work is required to determine the extent and impact these bees have on native species within the</p>	<ul style="list-style-type: none"> <li>• Introduced species are controlled and where possible eradicated.</li> <li>• The local community continues its support for bush regeneration and weed control works in the reserves.</li> <li>• Threats to the reserves' values from introduced species are minimised.</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake pest control programs and regeneration works in accordance with the Regional Pest Management Strategy.</li> <li>• Continue control programs for bitou bush, groundsel bush, lantana and other environmental weeds in the reserves.</li> <li>• Monitor the occurrence of weeds following fire and undertake weed control as necessary.</li> <li>• Promote, support and encourage volunteer bush regeneration activities.</li> <li>• Work cooperatively with Nambucca Shire Council and neighbours to control weeds within the reserves and in catchments that may impact on the reserves' values.</li> <li>• Monitor introduced animal species, and implement control programs as required.</li> <li>• Liaise with Kempsey Rural Lands Protection Board to determine any opportunities for co-operative feral animal control programs.</li> <li>• Conduct education programs with neighbours and the local community about the impacts on the reserves from garden escapes, dumping of garden refuse, and pets wandering into the reserves.</li> </ul>	<p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>Medium</p> <p>Low</p> <p>Low</p>
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<p>reserve. No licensed apiary sites occur within the reserves.</p>		<ul style="list-style-type: none"> <li>• Install regulatory signs prohibiting domestic animals and promoting the values of the reserve (refer Visitor Use and Education).</li> <li>• Conduct regular patrols in areas adjoining residential areas to promote compliance with NPWS regulations.</li> <li>• Fence sections of the reserves if the impacts of urban development are deemed to have detrimental impacts.</li> <li>• Liaise with State Rail about methods to control the spread of weeds from the railway corridor into the reserve.</li> <li>• Locate and either remove or exterminate feral beehives located in the reserve.</li> </ul>	<p>Ongoing</p> <p>High</p> <p>High</p> <p>Ongoing</p> <p>Medium</p>
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<p><b>Fire Management</b></p> <p>Both reserves have been subject to frequent unauthorised fires for many years. Large areas of both reserves were burnt in a series of wild fires over the spring and summer of 2001/2002.</p> <p>The high fire frequency in the reserves has promoted highly combustible species, and a sparse and simplified understorey in some areas. Hazard reduction burning is required in other areas where there have been no fires for more than 15 years and the vegetation stratum has simplified.</p> <p>There are no built assets in the reserves that require protection from fire, however a high priority is given to adjacent residential areas.</p> <p>A Fire Management Strategy has been prepared for both reserves, which identifies Asset Protection Zones to protect residences on the southern boundary of Jagun Nature Reserve and on the northern boundary of Valla Nature Reserve. Properties adjacent to Valla Nature Reserve in Tuna Street and Dolphin Place have varying levels of protection from the risk of bushfire. The Asset Protection Zone in this area is incomplete and not consistent with current requirements.</p> <p>Heritage Management Zones have been identified together with fire history to ensure that these areas are managed for the conservation of biodiversity and that fire frequency is managed according to predetermined vegetation thresholds.</p>	<ul style="list-style-type: none"> <li>• Life, property, natural and cultural values in and adjacent to the reserves are protected from fire.</li> <li>• Fire frequencies and regimes are appropriate for conservation of native flora and fauna communities.</li> <li>• Unauthorised fires no longer occur in the reserves.</li> </ul>	<ul style="list-style-type: none"> <li>• Implement the Fire Management Strategy and update to incorporate new additions and as required at the start of each fire season in consultation with the RFS.</li> <li>• Manage fire regimes to protect biodiversity as well as maintenance of Asset Protection Zones to protect adjoining properties.</li> <li>• Manage fire sensitive communities according to appropriate fire intervals and regimes. Monitor the impacts of fire on ecosystems in the reserves.</li> <li>• Liaise with relevant authorities and neighbours to reduce the incidence of unauthorised fires.</li> <li>• Encourage neighbours to report occurrences of unauthorised fires.</li> <li>• Continue to participate in the Nambucca Bush Fire Management Committee. Maintain coordinated and cooperative arrangements with the Rural Fire Service, Nambucca Shire Council and neighbours in regard to fuel management and fire suppression.</li> <li>• Liaise with Nambucca Shire Council to ensure all new residential developments consider fire management issues relevant to the reserves and are in accordance with the Rural Fire Service's guide, 'Planning for Bushfire Protection'.</li> </ul>	<p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p>
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<p>Management trails within the reserves provide access for fire and pest management purposes.</p> <p>Sections of the fire management trail network require upgrading and widening to ensure safe and sustainable vehicle access. This includes the Oyster Creek crossing.</p>		<ul style="list-style-type: none"> <li>• Maintain, upgrade and/or rehabilitate sections of the Asset Protection Zone behind Tuna Street and Dolphin Place to secure adequate protection to private property assets.</li> <li>• Maintain and upgrade all management trails (see map) to a standard suitable for fire management purposes.</li> <li>• Allow natural regeneration of trails no longer required for management purposes.</li> </ul>	<p>High</p> <p>High</p> <p>Low</p>
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**High** priority activities are those imperative to achievement of the objectives and desired outcomes. They must be undertaken in the near future to avoid significant deterioration in natural, cultural or management resources.

**Medium** priority activities are those that are necessary to achieve the objectives and desired outcomes but are not urgent.

**Low** priority activities are desirable to achieve management objectives and desired outcomes but can wait until resources become available.





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**APPENDIX 1:  
Soil Landscapes of Valla and Jagun Nature Reserves**

<b>Jagun Nature Reserve</b>		
<b>Soil Landscape</b>	<b>Description</b>	<b>Erodibility</b>
Beach		
Goolawa (go)	Coastal beaches, foredunes and hind dunes on outer barrier sands with elevation less than 3 metres. Soils are rapidly drained Shelly Rudosols (Siliceous Sands) on beaches, weakly developed Aeric Podsoles on stable dunes and Arenic Rudosols on devegetated dunes.	Very high erodibility, extreme wind erosion hazard
Goolawa landscape variant (goc)	Gently undulating plains with elevation of 1-3m. Located landward of foredune of coastal beaches, often terminating at an interbarrier swamp. Soils are as for Goolawa (go).	Very high erodibility, extreme wind erosion hazard
Estuarine		
Macleay Arm (ma)	Narrow flats of coastal interbarrier streams, which are occasionally tidally inundated. Soils are moderately deep and poorly drained with peats (Hemic and Sapric Organosols) overlying saturated sands (Oxyaquic and Extratidal Hydrosols). The soils also have acid sulphate potential.	The peat soils generally found on the surface are very stable unless burnt, However, once disturbed by fire, powerboat wash or other means, these soils are highly erodible.
Erosional/Residual		
Newry (ne)	Undulating rises and hills on metasediments of the Nambucca Beds. Soils are deep moderately well drained Red and Brown Kurosols with gravelly Brown Kurosols on headlands and silty-textured Brown or Red Krosols on footslopes.	Moderate to high erosion risk due to moderate erodibility, high rainfall erosivity and moderate slopes.
<b>Valla Nature Reserve</b>		
<b>Soil Landscape</b>	<b>Description</b>	<b>Erodibility</b>
Erosional/Residual		
Newry (ne)	Undulating rises and hills on metasediments of the Nambucca Beds. Soils are deep moderately well drained Red and Brown Kurosols with gravelly Brown Kurosols on headlands and silty-textured Brown or Red Krosols on footslopes.	Moderate to high erosion risk due to moderate erodibility, high rainfall erosivity and moderate slopes.

Source: Adapted from Eddie (2000)

## APPENDIX 2:

### Known and potential habitat of threatened plant species in Valla and Jagun Nature Reserves

Scientific name	Common Name	Status *	Reserve
<b>Known to occur</b> <i>Marsdenia longiloba</i>	clear milkvine	E1#	Valla
<b>Potential habitat</b> <i>Acronychia littoralis</i>	scented acronychia	E1#	Jagun/ Valla
<i>Amorphospermum whitei</i>	rusty plum	V	Valla
<i>Arthraxon hispidus</i>	hairy-joint grass	V#	Jagun/ Valla
<i>Chamaesyce psammogeton</i>	sand spurge	E1	Jagun
<i>Cryptostylis hunteriana</i>	leafless tongue orchid	V#	Jagun
<i>Cynanchum elegans</i>	white-flowered wax plant	E1#	Valla
<i>Glycine clandestina</i>		E2	Valla
<i>Hicksbeachia pinnatifolia</i>	bopple nut	V#	Valla
<i>Hydrocharis dubia</i>	frogbit	#	Valla
<i>Lindaea incisa</i>	slender screw-fern	E1	Jagun/ Valla
<i>Melaleuca groveana</i>	Grove's paperbark	V	Jagun/ Valla
<i>Parsonsia dorrigoensis</i>	milky silkpod	V#	Valla
<i>Pomaderris queenslandica</i>	podaderris	E1	Jagun/ Valla
<i>Senna acclinis</i>	Senna	E1	Jagun/ Valla
<i>Thesium australe</i>	austral toadflax	V#	Jagun/ Valla
<i>Tylophora woollsii</i>	cryptic forest twiner	E1#	Jagun/ Valla

\* Status is given by the schedules of the TSC Act: E1 = endangered species (Part 1 of Schedule 1), E2 = endangered population (Part 2 of Schedule 1), V = vulnerable (Schedule 2).

# Also considered nationally threatened and listed under the C'th *Environment Protection and Biodiversity Conservation Act 1999*.

Source: Elks (2004)

## APPENDIX 3:

### Threatened Animal Species Known or Predicted to Occur in Valla and Jagun Nature Reserves

Scientific name	Common Name	Reserve	Status*
<b>Known occurrences</b>			
<u>Birds</u>			
<i>Calyptorhynchus lathamii</i>	glossy black-cockatoo	Jagun	V
<i>Ephippiorhynchus asiaticus</i>	black-necked stork	Valla	E1
<i>Haematopus longirostris</i>	piebald oystercatcher	Jagun	V
<i>Lophoictinia isura</i>	square-tailed kite	Valla	V
<i>Pandion haliaetus</i>	osprey	Jagun/ Valla	V
<u>Mammals</u>			
<i>Petaurus australis</i>	yellow-bellied glider	Jagun	V
<i>Pteropus poliocephalus</i>	grey-headed flying-fox	Jagun/ Valla	V#
<b>Predicted to occur</b>			
<u>Fish</u>			
<i>Epinephelus daemeli</i>	black cod	Jagun	V^
<u>Frogs</u>			
<i>Crinia tinnula</i>	wallum froglet	Jagun/ Valla	V
<i>Litoria brevipalmata</i>	green-thighed frog	Jagun/ Valla	V
<u>Reptiles</u>			
<i>Caretta caretta</i>	logger-head turtle	Jagun	E1
<i>Chelonia mydas</i>	green turtle	Jagun	V
<i>Coeranoscincus reticulatus</i>	three-toed snake-tooth skink	Jagun/ Valla	V#
<i>Hoplocephalus bitorquatus</i>	pale-headed snake	Jagun/ Valla	V
<i>Hoplocephalus stephensii</i>	Stephens' banded snake	Jagun/ Valla	V
<u>Birds</u>			
<i>Burhinus grallarius</i>	bush stone-curlew	Jagun	E1
<i>Calidris alba</i>	sanderling	Valla	V
<i>Climacteris picumnus</i>	brown tree-creeper	Jagun/ Valla	V
<i>Coracina lineata</i>	barred cuckoo-shrike	Jagun/ Valla	V
<i>Esacus neglectus</i>	beach stone-curlew	Valla	V
<i>Ixobrychos flavicollis</i>	black bittern	Jagun	V
<i>Lathamus discolor</i>	swift parrot	Jagun/ Valla	E1#
<i>Lichenostomus fasciogularis</i>	mangrove honeyeater	Jagun	V
<i>Limosa limosa</i>	black-tailed godwit	Jagun/ Valla	V
<i>Ninox connivens</i>	barking owl	Jagun/ Valla	V
<i>Ninox strenua</i>	powerful owl	Valla	V
<i>Ptilinopus regina</i>	rose-crowned fruit-dove	Jagun/ Valla	V
<i>Pyrrholaemus sagittatus</i>	speckled warbler	Jagun/ Valla	V
<i>Rostratula benghalensis</i>	painted snipe	Jagun/ Valla	V#
<i>Sterna albifrons</i>	little tern	Jagun	E1
<i>Tyto novaehollandiae</i>	masked owl	Jagun/ Valla	V
<i>Xanthomyza phrygia</i>	regent honeyeater	Jagun/ Valla	E1#
<i>Xenus cinereus</i>	Terek sandpiper	Valla	V
<u>Mammals</u>			
<i>Cercatetus nanus</i>	eastern pygmy possum	Jagun/ Valla	V
<i>Chalinolobus nigrogriseus</i>	large pied bat	Jagun/ Valla	V
<i>Dasyurus maculatus</i>	spotted-tailed quoll	Jagun/ Valla	V#
<i>Kerivoula papuensis</i>	golden-tipped bat	Jagun/ Valla	V
<i>Miniopterus australis</i>	little bent-wing bat	Jagun/ Valla	V
<i>Miniopterus schreibersii</i>	eastern bent-wing bat	Jagun/ Valla	V
<i>Mormopterus norfolkensis</i>	eastern freetail bat	Jagun/ Valla	V

Scientific name	Common Name	Reserve	Status*
<i>Myotis adversus</i>	large-footed mouse-eared bat	Jagun/ Valla	V
<i>Nyctophilus bifax</i>	eastern long-eared bat	Jagun/ Valla	V
<i>Petaurus norfolcensis</i>	squirrel glider	Jagun/ Valla	V
<i>Phascogale tapoatafa</i>	brush-tailed phascogale	Jagun/ Valla	V
<i>Phascolarctos cinereus</i>	koala	Jagun/ Valla	V
<i>Planigale maculata</i>	common planigale	Jagun/ Valla	V
<i>Pteropus alecto</i>	black flying-fox	Jagun/ Valla	V
<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat	Jagun/ Valla	V
<i>Scoteanax rueppellii</i>	greater broad-nosed bat	Jagun/ Valla	V
<i>Syconycteris australis</i>	Queensland blossom bat	Jagun/ Valla	V

\* Status given under the TSC Act (E1 = endangered species, V = vulnerable species) except for ^ the black cod which is listed under the *Fisheries Management Act 1994*

# also listed under EPBC Act

Source: adapted from Kendall & Kendall 2003