

WATAGAN FLORA RESERVES (BAR, OLNEY AND WARRAWOLONG N^o. 83, 186 AND 80) SITE SPECIFIC WORKING PLAN



Mount Warrawolong, Watagan Flora Reserve. Photo: Stephen Bell

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The NSW Department of Planning and Environment (DPE) Secretary has been appointed as land manager of Bar Flora Reserve (FR) No. 83, Olney FR No. 186 and Warrawolong FR No. 80 (Appendix 1) by the Minister responsible for the Forestry Act 2012 under section 57(3) of the Act. The flora reserves are collectively referred to as 'Watagan Flora Reserve'. Under section 146(3) of the National Parks and Wildlife Act 1974, nearby or adjoining land to existing reserves can be managed by NPWS.

This site-specific working plan describes the important values of an individual Flora Reserve and identifies site-specific priorities for management. The plan is to be read in conjunction with the General Working Plan for Flora Reserves Managed by NPWS document which identifies NSW National Parks and Wildlife Service's broad objectives and strategies for managing flora reserves (Appendix 2). These two documents together form the flora reserve working plan in line with the requirements of section 25 of the *Forestry Act 2012*.

1. DETAILS OF THE RESERVE

1.1 LOCATION

Watagan FR sits along the northern edge of Olney SF and western edge of Watagan SF, approximately 45 kilometres south-west of Newcastle. Watagans National Park (NP) is located one kilometre east of the reserve and Yengo NP is eight kilometres to the south-west/west. The reserve consists of two irregularly shaped parcels separated by approximately 1.5-3.5 kilometres of Watagan State Forest (SF) at the narrowest and widest points. Warrawolong FR and the Bar FR, largely contained in compartments 13-14 of Watagan SF and compartments 22-23 of Olney SF, respectively, were previously gazetted in 1986.

Most of the reserve is located within the Hunter River catchment. However, Bar FR and the southern edge of Warrawolong are located within the catchment of Lake Macquarie and Tuggerah Lakes.

Warrawolong and Bar FRs can be accessed from the west via Laguna along Watagan Creek Road or from the south/south-east via Watagan Forest Road, Wollombi Forest Road and Walkers Ridge Forest Road. Warrawolong Fire Trail forms part of the eastern boundary of the Warrawolong FR and leads northward to Mount Warrawolong. Forestry trails including Bar Trail and Turner Road provide access within the FR.

The Warrawolong FR receives a moderate amount of recreational usage. NPWS will review the forestry trails within the reserve for management and public access suitability.

Walkers Ridge Forest Road leads westwards to Murray's Forest Road and provides public access to the Olney FR from the south/south-east. Tiger Cat Trail and Lynches Paddock Fire Trail provide internal access. The Olney FR cannot be accessed from the west.

The Great North Walk, a popular 250-kilometre walking route from central Sydney to Newcastle, traverses 4.8km the Warrawolong FR.

See Locality Map in Appendix 1.

1.2 KEY ATTRIBUTES OF THE RESERVE

Watagan FR forms part of a regionally significant ecological north-south corridor which connects the coastal ranges from the Hunter River estuary in the north to the Hawkesbury River estuary in the south.

Specific values that are to be protected in the reserve include:

- » regionally significant vegetation
- » high conservation mature age forest
- » catchment protection and water quality

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- » identified as an area of regional koala significance (ARKS) of high resilience
- » a large number of threatened fauna species
- » threatened flora
- » Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions endangered ecological community
- » part of traditional Country for Darkinjung and Awabakal People

These values are described in more detail in the following sections.

1.3 GENERAL DESCRIPTION

Area

The reserve has a total area of 1494 hectares, consisting of the Warrawolong FR (615 hectares), Bar FR (78 hectares) and Olney FR (802 hectares).

The access road to the top of Mount Warrawolong (20 metres wide) and the fire tower (excluded by 40 metre radius) are excluded from NPWS management.

There is an inholding in the north of Olney FR, approximately 92 hectares in area, accessed via Lynches Paddock Trail.

Topography

Watagan FR is remotely located in the steep, rugged country of the Watagan Mountains which form part of the Great Dividing Range. The reserve is on the watershed divide between the Hunter River catchment and the catchment of Lake Macquarie / Tuggerah Lakes. The reserve lies within the NSW Sydney Basin Bioregion.

Olney FR exhibits dissected upland ridge and plateau terrain typical of the western edge of the Sydney Basin. Elevation in this FR varies from a maximum of 440 metres ASL along the central inverted-Y ridgeline to 140 metres ASL in the south western corner along Olney Arm Creek. Slopes in the north eastern part of the FR are not as steep.

The terrain of Warrawolong FR is noticeably different, being shaped by volcanic activity of the Tertiary period. At 642 metres ASL, Mount Warrawolong, a volcanic neck, easily dominates the landscape, and forms steep-sided dome-shaped hills on weathered basalt which contrast with the blocky, more angular sandstone features elsewhere in the reserve. Elevation falls more steeply where eroded Hawkesbury Sandstone is exposed, to 140 metres ASL along the bed of Watagan Creek towards the north-east boundary of the reserve.

Several minor watercourses drain the reserve: Back Arm and Olney Arm in the Olney FR, and a tributary of Watagan Creek in the Warrawolong FR.

Apart from some clearing along Watagan Creek, Watagan FR is adjoined to the north and west by vegetated land, held in private tenure.

Yengo NP lies approximately 8 kilometres south-west of the Olney FR. Watagans NP and Jilliby State Conservation Area (SCA) are 1 kilometre to the east of the Warrawolong FR. Warrawolong Nature Reserve (NR), with an area of approximately 100 hectares, directly adjoins the north-western edge of the Warrawolong FR. This land is currently held under Part 11 of the *National Parks and Wildlife Act 1974*.

The reserve forms part of a state significant habitat linkage between the Watagans and Stockton. This is an important connection between the southern sandstone ranges and the coastal heaths and wetlands of Port Stephens. It's also a regionally significant ecological north-south corridor between the coastal ranges from the Hunter River estuary in the north to the Hawkesbury River estuary in the south. These reserves complement the expansive reserves of the Greater Blue Mountains World Heritage Area to the west, as well as Popran and Brisbane Water National Parks to the south (DECCW 2010).

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Geology and soils

Watagan FR is largely underlain by Mesozoic era sedimentary sandstone, siltstone and claystones of the Narrabeen Group. Areas of Hawkesbury Sandstone also occur throughout.

The soils of the flora reserve vary predictably with the geology. The basalt-derived soils are deeper and of higher fertility than the shallow, highly erodible sandstone-derived soils. Rock outcrop over Hawkesbury Sandstone in the Watagan Mountains is not as conspicuous as some parts of the Sydney Basin and appears to be more deeply weathered (Murphy & Tille 1993).

Climate

Watagan FR lies predominantly within the Hunter climatic region with only the southern extent of the Warrawolong FR falling within the Central Coast climatic region (OEH 2014a, OEH 2014b).

Nearby weather station rainfall records are available from Wyong (Olney State Forest), located approximately 6 kilometres east of the Warrawolong FR, where average annual rainfall is 1161 millimetres, and Watagan Central, located approximately 2 kilometres west of the Olney FR, where average annual rainfall is 910 millimetres.

Annual rainfall distribution is seasonal at each of these sites. Rainfall predominantly occurs over summer with peaks January to March. Winter periods are drier.

Annual rainfall is also influenced by topography. Annual rainfall is approximately 1195 millimetres at the highest points in the Warrawolong FR (640 m ASL) and is forecast to decline to 900 millimetres on the lower parts (160 m ASL) of the two northern parcels (BioClim 2009).

Average annual temperatures vary with elevation, slope and aspect, which impacts on the amount of solar insolation received.

Climate change predictions suggest that in the near future (2030), minimum and maximum temperatures in the Hunter and Central Coast climatic region are expected to increase by 0.4 – 1.0°C or 0.3 – 1.0°C respectively and the number of hot days (over 35°C) will increase. Average rainfall is projected to decrease in spring and winter for both regions. Average fire weather is expected to increase in summer, spring and winter in the Hunter and in summer and spring in the Central Coast region (OEH 2014a, OEH 2014b).

Vegetation / flora and fauna

Vegetation types

Six Plant Community Types (PCTs) were mapped in the Reserve (Table 1) (Eco Logical Australia 2022). Two PCTs accounted for more than 65% of the total area, namely Central Coast Escarpment Moist Forest (PCT 3230: 36%) and Lower North Ranges Turpentine Moist Forest (PCT 3242: 29%). PCT 3041 Sydney Sandstone Coachwood-Grey Myrtle Rainforest and PCT 3592 Sydney Coastal Enriched Sandstone Forest both comprise large areas of the Reserve, albeit significantly less area than the above two communities, at 14% and 19% respectively. The most restricted PCTs comprise approximately 2.2% of the Reserve, with PCT 3047 Sydney Montane Basalt Rainforest and PCT 3258 Sydney Basin Creekflat Blue Gum-Apple Forest comprising 15.6 ha and 17.3 ha respectively.

PCT 3258 is considered equivalent to the Endangered Ecological Community River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions under the *Biodiversity Conservation Act 2016* and the Critically Endangered Ecological Community River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. This PCT comprises a relatively small proportion of the Reserve. Based on the landscape position, being alluvial flats at an elevation below 250m, field observations of the condition of this PCT and analysis of plot data collected it is considered that this PCT conforms to the final determination (Eco Logical Australia 2022).

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Table 1: Plant Community Types (PCTs) identified within Watagan Flora Reserve (Eco Logical Australia 2022)

PCT ID	PCT Name	Class	Formation
3041	Sydney Sandstone Coachwood-Grey Myrtle Rainforest	Northern Warm Temperate Rainforests	Rainforests
3047	Sydney Montane Basalt Rainforest	Southern Warm Temperate Rainforests	Rainforests
3230	Central Coast Escarpment Moist Forest	Northern Hinterland Wet Sclerophyll Forests	Wet Sclerophyll Forests (Grassy sub-formation)
3242	Lower North Rangers Turpentine Moist Forest	Northern Hinterland Wet Sclerophyll Forests	Wet Sclerophyll Forests (Grassy sub-formation)
3258	Sydney Basin Creekflat Blue Gum-Apple Forest	Northern Hinterland Wet Sclerophyll Forests	Wet Sclerophyll Forests (Grassy sub-formation)
3592	Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)

Flora

One threatened flora species, Scrub Turpentine (*Rhodamnia rubescens*), was recorded within Watagan FR (Eco Logical Australia 2022). Rainforest cassia (*Senna acclinis*) was recorded within Warrawolong NR, less than one kilometre of Watagan FR (DPIE 2018a). A total of nine threatened plant species have been recorded in Olney SF (Appendix 4).

Taxonomists are also working on a revision of the *Prostanthera cineolifera-ovalifolia-lanceolata* complex (*Lamiaceae*) and have identified a probable new species currently known only from the Bar Lookout area, approximately two kilometres from the southern boundary of Warrawolong (R. Palsson, personal communication).

A limited number of occurrences of the species *Eucalyptus hypostomatica* (Pokolbin box) were recorded in the north-eastern areas of the eastern portion of the FR (Eco Logical Australia 2022). This species has a conservation status of Rare (but with no current identifiable threat) and is considered to have a range of greater than 100km, however, occurs in small populations.

A draft working plan prepared for the Bar-Warrawolong FR identified an isolated stand of brown barrel (*Eucalyptus fastigata*) on Mount Warrawolong and noted that the presence of this species is unusual, being some 80 kilometres distant from the nearest other occurrences (DPI Forests NSW n.d.).

Vertebrate Fauna

Olney SF as a whole supports a rich fauna assemblage, particularly arboreal mammals, birds and frogs. Based on the density of undisturbed forest, rock and variety of habitat available, Watagan FR is expected to support a similarly rich assemblage. Several patches of high conservation mature age forest have been identified in Olney FR, as determined by Northern and Southern Comprehensive Regional Assessments from 1999 and 2000.

A total of 57 threatened native animal species have been recorded in or within 1 kilometre of Watagan FR including 25 birds, 23 mammals, 6 amphibians and 3 reptiles (Appendix 5). Among these are brush-tailed

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rock wallabies, koalas, greater gliders and a high number of other arboreal mammals, and ground-dwelling mammals, including spotted-tailed quolls.

Koalas

NSW BioNet Atlas contains 28 records of koalas in or within 1 kilometre of Watagan FR, recorded between 1974 and 2005 (DPIE 2018a). Dan Lunney's Community Wildlife Survey in the period 2004-2006 recorded 6 sightings, OEH and Forestry Corporation surveys in the period 1992-1998 recorded 11 records, and a further 10 records were registered by Forestry Corporation in the period 2002- 2005. A koala was sighted as recently as April 2022 during a drone survey for the species.

Watagan FR is within the Central Coast Koala Management Area (KMA) (OEH 2018). The tree species known to be used by koalas in North Coast KMA that occur within the vegetation communities of Watagan FR include:

- » turpentine (*Syncarpia glomulifera*)
- » smooth-barked apple (*Angophora costata*)
- » broad-leaved white mahogany (*E. umbra*)
- » grey gum (*E. punctata*)
- » blue-leaved stringybark (*E. agglomerata*)
- » grey box (*E. moluccana*)
- » Sydney blue gum (*E. saligna*)
- » lilly pilly (*Acmena smithii*)
- » rough-barked apple (*A. floribunda*)
- » forest oak (*Allocasuarina tortulosa*)
- » white mahogany (*E. acmenoides*)
- » blackbutt (*E. pilularis*)
- » mountain blue gum (*E. deanei*)
- » "rainforest species".

Watagan FR is in an area of regional koala significance (ARKS) of high 'resilience', as identified by the Koala Prioritisation Project NSW (DPIE 2018b). ARKS mapping provides focus for koala strategy, providing profiling and analysis of the landscape values and threats acting on koala populations in New South Wales (DPIE 2018b).

Watagan FR forms part of the NSW Koala Strategy 2018-2021 (NSW Government 2018) and management of the reserve will support the actions and strategies of the NSW Koala Strategy 2022.

1.4 HISTORY

Aboriginal history and heritage

The Watagan Mountains are in the traditional Country of the Awabakal People – which extends coastwards, and of the Darkinjung People - which extends westward beyond the Great Dividing Range. Watagan FR itself falls within the boundaries of three different local Aboriginal land councils (LALCs):

- almost all of Olney FR is within the Metropolitan LALC area
- almost all of Warrawolong FR is within the Biraban LALC area, together with a small portion on the north-east edge of the Olney FR
- Bar FR falls within the Darkinjung LALC area.

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The Watagan Range and surrounding land provided a rich range of food and other resources for Aboriginal people (2010). Mount Warrawolong is understood to have been of ceremonial significance for Aboriginal people. This area is of great importance to both Darkinjung and Awabakal people.

The Hawkesbury Sandstone areas of the Sydney Basin are particularly rich in Aboriginal heritage. No sites were recorded within Watagan FR prior to its gazettal as land managed by NPWS, however Aboriginal sites and artefacts were recorded during an archeological survey of the FR undertaken in 2021.

Shared heritage

In the early days of the colony, settlement progressed quickly along well-watered, accessible valleys but the rugged and heavily timbered country of the Watagan Range acted as a physical barrier to exploration and development west of Lake Macquarie and Tuggerah Lakes by European settlers.

European settlement began around the Watagan Range area in the 1820s (Lake Macquarie Libraries n.d.). Timber getters came to the area from about the 1830s, originally targeting red cedar (*Toona ciliata*). Most of the cedar was shipped to England to supply a market hungry for softwood and stands were virtually exhausted by the 1890s (DECCW 2010). Demand for pit props for coal mining and later railway sleepers shifted the focus to hardwood timbers.

The *Forestry Act 1916* was introduced to protect timber reserves. Olney SF was dedicated in several stages between 1914 and 1951. The portions of Olney SF where the Olney FR is located, was dedicated in 1951. The majority of the Warrawolong FR was dedicated as state forest in 1914 but the 35-hectare area around Mount Warrawolong was dedicated in 1980. Non-harvest areas and exclusion zones were previously identified by Forestry Corporation to protect sensitive environmental features and habitats in Olney SF.

The following information was sourced from the draft Working Plan for Bar-Warrawolong FR (DPI – Forests n.d.):

“Light selective logging for hardwood and rainforest species occurred within accessible areas of the reserve but due to the poor access, were limited. This was particularly the case around the Bar where the Walkers Ridge Road was a dead end up until the 1950s.

Harvesting activities were generally light and with the Bar targeted for rainforest as well as hardwood species. There are accounts of Red Cedar (*Toona ciliata*) being harvested from the southern parts of the reserve before being excluded. Limited harvesting was undertaken on the slopes of Mt Warrawolong due to access issues and areas of Brown Barrel were excluded from harvesting due to the unique nature of this community with in the Watagans.

The summit of Mt Warrawolong was cleared by Surveyor General Sir Thomas Mitchell in July 1829 to enable production of the first map of New South Wales. The clearing was conducted to preserve the line of sight for 360° around the summit. Periodic re-brushing and burning has largely preserved this site with a trig station established for reference by the Department of Lands.

The Bar Flora Preserve was dedicated in 1965 and the Warrawolong Flora Preserve was dedicated in 1966 in recognition of the conservation values present. With subsequent review and extension, the Bar and Warrawolong flora reserves were gazetted in 1986.

In 1997 the original plan for Warrawolong FR was amended to allow construction of an access road and 15-metre fire tower on Mount Warrawolong, replacing the Bar Fire Tower to the south which had become unsafe.

The area between the Bar and Warrawolong flora reserves had been managed as a connection corridor for flora and fauna values. During the Comprehensive Regional Assessment of the Forests of North East NSW, the connecting area was reclassified as Forest Management Zone 1 with the intent of amalgamating the reserves.”

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With a decline in farming, and population growth on the Central Coast, the rugged land in the dry sandstone plateau country was recognized as important for catchment protection. The first conservation area gazetted in this area was Dharug NP in 1967. Watagan NP was created as the result of the Lower North East Regional Forest Agreement in 1999. Jilliby SCA was gazetted in 2003 from three former state forest plantations.

Fire history

Recent fire history indicates that sizeable portions of the Olney FR burnt by wildfire fairly regularly in the past including in 1968-69, 1976-77, 1984-85, 1997-98, and 2016-2017.

Wildfire events in the more mesic vegetation of the Warrawolong FR have been much smaller. They include fires in 1964-65, 1977-78, 1981-82, 1985-86, 1986-87 and 2001-02.

No prescribed burns have been undertaken in either FR.

NPWS manages wildfire, fuel loads and response capabilities in accordance with a Reserve Fire Management Strategy, in conjunction with the local bushfire committee and in collaboration with NPWS wildlife ecologists and neighbours, including Forestry Corporation. When preparing burn plans, NPWS considers the biodiversity thresholds for the target vegetation types and the fuel loading of the area.

1.5 CURRENT USAGE

Mount Warrawolong is a significant regional vantage point that supports a fire tower, which is also used for communications, a lookout and a trig station. The Great North Walk also passes through Warrawolong FR, skirting the lower slopes of Mount Warrawolong and exiting the reserve to the north via Cedar Brush Path. Other recreational activities in Watagan FR include trail bike riding and 4WD touring. Overall, Warrawolong FR receives a moderate amount of recreational usage, mostly bushwalkers. A logbook was kept at the summit of Mount Warrawolong for many years.

It is not known what level of visitor use occurs in Olney FR, but it is expected to be much lower than Warrawolong FR.

There are no visitor facilities in Watagan FR. Other than the Great North Walk, the focus for visitors is in the east of Olney SF, where serviced campgrounds, walking tracks and other facilities have been provided by Forestry Corporation, namely the Basin Camping Area (located nine kilometres south of the reserve) and Olney Forest HQ's Camping Area (located eight kilometres east of Warrawolong FR). The Hunter Mountain Bike Association also has a permit to manage a mountain bike track in Olney SF.

There is some evidence of illegal entry beyond locked gates and vandalism at Mount Warrawolong, as well as the use of trails by unregistered trailbikes.

Olney, Warrawolong and Bar Flora Reserves form part of public land (Olney State Forest) that has been declared for the purposes of recreational hunting under the *Game and Feral Animal Control Act 2002*. The area contained within these Flora Reserves is currently listed as a hunting exclusion zone which means that hunting is not permitted. This may be revised should the circumstances around the exclusion change.

Whilst there are no apiary sites currently licensed in Watagan FR, bee foraging occurs within the FR from apiary sites outside the reserve. New set-down sites will not be approved.

2. SYSTEM OF MANAGEMENT

2.1 OBJECTIVES OF MANAGEMENT

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General objectives for the management of all flora reserves managed by NPWS are set out in Section 1.1 of the General Working Plan for NPWS-Managed Flora Reserves (Appendix 2). This includes objectives from applying local NPWS operational plans and strategies including those for fire, pests and weeds.

In addition to that general guidance, the objectives for Watagan FR will be to:

- » integrate management of the flora reserve with management of Watagans NP in accordance with the *Watagans National Park and Jiliby State Conservation Area Plan of Management* and Warrawolong NR
- » improve knowledge of use of the reserve by koalas and other threatened species and develop and implement appropriate management strategies
- » ensure visitor use of the reserve is environmentally sustainable
- » work with neighbours to enhance conservation outcomes.

2.2 MANAGEMENT STRATEGIES

Stewardship activities within the reserve are enabled by this working plan as informed by the *Watagans National Park and Jiliby State Conservation Area Plan of Management*, and the general requirements of the NPWS Parks Management Framework.

General management strategies (policies) for the management of all flora reserves managed by NPWS are set out in Section 1.2 of the General Working Plan for NPWS Managed Flora Reserves (Appendix 2). This includes policies applying from local NPWS operational plans and strategies including those for fire, pests and weeds.

In addition to that general guidance, management objectives will be met through the management strategies (policies) identified below and the adaptable works program at Appendix 3.

Biodiversity management and ecological knowledge

- NPWS will seek to work with Forestry Corporation to develop and implement actions for the conservation of threatened species within the reserve.
- Relevant actions in the Koala Strategy and the Saving Our Species Iconic Koala Project will be implemented.

Cultural Heritage

- Opportunities for Aboriginal community involvement in the Flora Reserve will be promoted.

Pest and weed management

- As per the General Working Plan (Appendix 2) and any actions in the adaptable works program (Appendix 3).

Fire

- A fire management strategy will be developed for the reserve in consultation with the Lower Hunter and Central Coast bushfire management committees.
- Fire planning and operations will be managed and conducted in collaboration with Forestry Corporation, the relevant Bushfire Management Committee and other adjoining landowners.

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- Designation under the Fire Access and Fire Trail (FAFT) for named fire trails and roads in or near the Watagan Flora Reserve are presented in Appendix 6.

Roads and infrastructure

- The access road to the fire tower (20 metres wide) and the fire tower itself (excluded by 40 metre radius) are excluded from NPWS management and will continue to be managed and maintained by Forestry Corporation.
- Walkers Ridge Road will continue to be maintained to a 4WD all-weather standard by Forestry Corporation. Murrays Forest Road will continue to be managed and maintained by Forestry Corporation.
- Roads and trails within the reserve which provide public vehicle access will be maintained by NPWS.
- A review of internal forestry trails will be undertaken to determine those appropriate for public access and management purposes. Trails that have little or no use or come with unacceptable environmental or other impacts will be closed and rehabilitated.

Visitor opportunity and management

- Mount Warrawolong and The Great North Walk is open to bushwalkers only
- Apart from driving on public roads and trails, visitor use in this reserve will be restricted to bushwalking and other self-reliant nature-based activities such as bird watching
- Horse riding and mountain biking are permitted on publicly accessible roads and trails within the reserve.

Community engagement

- As per the General Working Plan (Appendix 2) and any actions in the adaptable works program (Appendix 3).

Licences and other third-party agreements

- As per the General Working Plan (Appendix 2) and any actions in the adaptable works program (Appendix 3).

2.3 ACTIVITY PERMISSIBILITY

Activities permitted without approval or conditions

- All actions consistent with the management strategies identified in the general working plan for NPWS managed flora reserves (at the time of writing this included weeds, pest, fire, infrastructure and visitation management)
- use of registered motor vehicles operated by licenced drivers on publicly accessible roads and trails
- nature-based activities such as bushwalking, bird watching and photography
- recreational cycling on reserve roads and management trails
- Aboriginal cultural activities not requiring a permit

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- activities allowed by a continuing valid permit, e.g., scientific licence.

Activities permitted with conditions

No activities specific to Watagan FR are listed as requiring permission. Activities general to all flora reserves that require permitting are listed in the general working plan of NPWS managed flora reserves (Appendix 2).

Activities requiring permission will generally be subject to assessment and, if permitted, have conditions applied by the land manager (NPWS) consistent with the *Forestry Act* and applying policies and guidelines. Permits can only be issued for activities within flora reserves following approval by the DPE Secretary under section 61(1) of the *Forestry Act*.

Activities not permitted

The following activities will not be permitted in the Watagan Flora Reserve:

- timber harvesting
- removal of forest products and materials, with the exception of Aboriginal use of forest products (Appendix 2)
- grazing by domestic stock
- gravel or hard rock quarrying
- mineral and petroleum exploration and mining
- lighting of campfires and any other unauthorized fires
- camping
- entering with domestic dogs
- new permits for bee keeping
- mineral fossicking
- hunting.

Mining

There are no gazetted exemptions from provisions of the *Mining Act 1992* for this flora reserve.

2.4 MANAGEMENT RESPONSIBILITY

The Secretary of the Department of Planning and Environment (DPE) has been appointed as land manager of Watagan FR by the Minister for Regional NSW under section 57(3) of the *Forestry Act*. This will enable NPWS to manage the land in accordance with this working plan. Under section 146(3) of the *National Parks and Wildlife Act 1974* nearby or adjoining land to existing reserves can be managed by NPWS.

Watagan FR is gazetted over state forest land. Timber harvesting has been excluded from this area since its dedication. The reserve will be managed by NPWS for conservation purposes as guided by the principles and objectives of the *National Parks and Wildlife Act 1974*. Watagan FR will be managed by NPWS in accordance with the principles, objectives and legislative framework of the *Forestry Act* and the *Agreement for the Management of Flora Reserves between the Minister for Lands and Forestry and the Minister for the Environment* (OEH 2018). NPWS will draw on its own management frameworks to achieve this.

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The management of Watagan FR will be integrated into the management of other NPWS managed land. However, this working plan will stand alone in terms of its role in ensuring the original purpose of the Flora Reserve dedication is upheld.

The plan seeks to apply an adaptive management approach, to ensure that the application of flexible and sound land management practices can be applied to protect the specific values of Watagan FR. This adaptive management approach ensures the integration of natural variability and environmental changes across the broader landscape into decisions and actions delivered.

2.5 MONITORING, REPORTING AND REVIEW

Observation, reporting and review will be undertaken in accordance with section 3 of the *General Working Plan for Flora Reserves Managed by NPWS* in Appendix 2.

Reviews of this Working Plan will be linked with reviews of the *Watagans National Park and Jilliby State Conservation Area Plan of Management*. Further or refined review may be undertaken via the adaptable actions in Appendix 3.

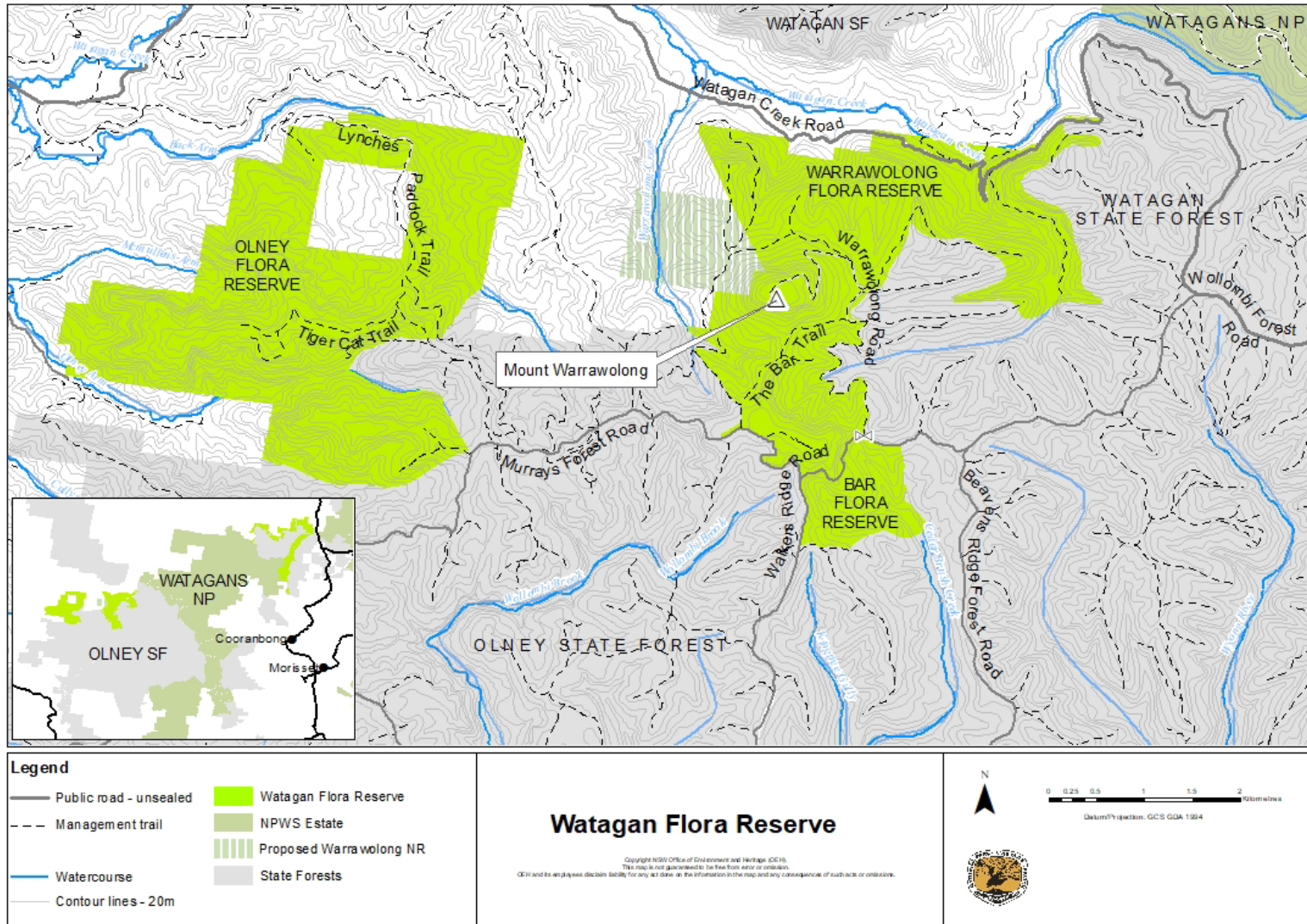
3. LIST OF APPENDICES

- » Appendix 1 – Locality Map
- » Appendix 2 – General Working Plan for flora reserves managed by NPWS
- » Appendix 3 – Adaptable works program
- » Appendix 4 – Threatened Flora Species List
- » Appendix 5 – Threatened Fauna Species List
- » Appendix 6 – Roads and Trails
- » Appendix 7 – References
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APPENDIX 1 – LOCALITY MAP



APPENDIX 2 – GENERAL WORKING PLAN FOR FLORA RESERVES MANAGED BY NPWS

[Forestry Corporation link to general working plan.](#)

APPENDIX 3 – ADAPTABLE WORKS PROGRAM

This list of actions has been developed from discussions with local staff referencing the objectives in Section 2.1 and the strategies/policies in Section 2.2.

In keeping with an adaptive management approach, the actions below may be revised or deleted and new actions may be added by the local NPWS Branch in order to better meet the objectives of the working plan. This may occur after they have been undertaken or attempted, when new information arises or to suit changing circumstances. The priorities applied to these actions may also be revised.

The priority rating in the table below have been agreed with local operational staff and reflect the importance of the list of actions relative to the situation in the reserve.

No.	Adaptable management actions	Priority
1	<p>Biodiversity management and ecological knowledge</p> <p>Complete vegetation mapping for the reserve, including site survey of the unusual occurrence of brown barrel (<i>Eucalyptus fastigata</i>) on Mount Warrawolong as needed.</p> <p>Seek and support additional targeted survey to determine extent of koala populations and use of the reserve by koalas.</p> <p>Share and exchange data on threatened species with Forestry Corporation relevant to Olney SF as the basis of developing a survey program of threatened species in Watagan FR.</p>	1
2	<p>Aboriginal heritage</p> <p>Work with the Aboriginal community to manage (and interpret if relevant) Aboriginal heritage in the reserve.</p>	1
3	<p>Pest and weed management</p> <p>Until the flora reserve is established in the Branch Pest Management Strategy, priority pest/weed control works will include:</p> <ul style="list-style-type: none"> » wild dog and fox baiting » working with other agencies and neighbouring landowners to coordinate control of vertebrate pests as required » control of lantana » monitoring for other weed species and taking action as needed. 	1
4	<p>Fire management</p> <p>Manage the reserve as a Strategic Fire Advantage Zone (SFAZ) and Land Management Zone (LMZ).</p> <p>The objective of an LMZ is to conserve biodiversity and protect cultural heritage and manage fire consistent with published biodiversity thresholds.</p>	1
5	<p>Roads and infrastructure</p> <p>Review any existing access agreements with Forestry Corporation and other adjoining landowners over roads/ trails which traverse private land including: Lynches Paddock Trail. Develop new access agreements as required.</p>	3

	Monitor the impact of 4WD vehicles and other visitor use on trails in the reserve and respond as necessary.	
6	Visitor use Install regulatory and interpretive signage at appropriate entrances to the reserve. Monitor visitor use and impacts in the reserve and respond as required	2
7	Neighbour relations Develop a database of neighbouring landowners for use in pest management, wildfire response and other management activities. Liaise with neighbours regarding management issues as required	1
8	Unauthorised uses Reserve management will prioritise monitoring of unauthorised uses and take action as needed.	3

APPENDIX 4 – THREATENED FLORA SPECIES LIST

The table below lists the threatened native plants found in within 1 kilometre of Watagan Flora Reserve (DPIE 2018a).

Common Name	Scientific Name	NSW Status*	Cwlth status [#]	Watagan Flora Reserve	Warrawolong NR
Rainforest Cassia	<i>Senna acclinis</i>	E		Known	Known
Scrub Turpentine	<i>Rhodamnia rubescens</i>	CE			Known

* Listing NSW Biodiversity Conservation Act 2016

[#] Listing Commonwealth Environment Protection and Biodiversity Conservation Act 1999

E = Endangered, CE = Critically Endangered

@ 'Known' is defined as all records occurring within 1000 metres of the boundary of the reserve

APPENDIX 5 – THREATENED FAUNA SPECIES LIST

The table below lists the threatened native animals found within 1 kilometre of Watagan Flora Reserve (DPIE 2018a).

Common Name	Scientific Name	NSW Status*	Cwlth status [#]	Olney parcel [@]	Warrawolong parcel [@]	Olney State Forest [!]	Watagan State Forest [!]	Warrawolong NR
Mammals								
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V					Present	
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	E	V		Known	Present	Present	
Eastern Bentwing-bat	<i>Miniopterus schreibersii oceanensis</i>	V				Present		Present
Eastern Chestnut Mouse	<i>Pseudomys gracilicaudatus</i>	V				Present		
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	V		Known		Present		
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	V		Known				
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V		Known		Present		
Golden-tipped Bat	<i>Phoniscus papuensis</i>	V			Known	Present	Present	
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	V		Known		Present		
Greater Glider	<i>Petauroides volans</i>		V			Present	Present	
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	V		Known	Present	Present	
Koala	<i>Phascolarctos cinereus</i>	V	V	Known	Known	Present	Present	
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	V	V	Known	Known	Present		Present
Little Bent-	<i>Miniopterus</i>	V				Present		

Common Name	Scientific Name	NSW Status*	Cwlth status#	Olney parcel@	Warrawolong parcel@	Olney State Forest ¹	Watagan State Forest ¹	Warrawolong NR
winged Bat	<i>australis</i>							
Long-nosed Potoro	<i>Potorous tridactylus</i>	V	V			Present	Present	
New Holland Mouse	<i>Pseudomys novaehollandiae</i>	P	V			Present		
Parma Wallaby	<i>Macropus parma</i>	V			Known	Present	Present	
Red-legged Pademelon	<i>Thylogale stigmatica</i>	V			Known		Present	
Southern Myotis	<i>Myotis macropus</i>	V				Present		
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	Known			Present	
Squirrel Glider	<i>Petaurus norfolcensis</i>	V				Present		
Yellow-bellied Glider	<i>Petaurus australis</i>	V			Known	Present	Present	
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	V		Known				Present
Birds								
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	V				Present		
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V			Known	Present		
Fork-tailed Swift	<i>Apus pacificus</i>		C,J,K			Present		
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	V		Known	Known	Present	Present	Present
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	V		Known	Known	Present	Present	
Glossy Ibis	<i>Plegadis falcinellus</i>		C			Present		
Grey-crowned Babbler (eastern	<i>Pomatostomus temporalis temporalis</i>	V			Known		Present	

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Common Name	Scientific Name	NSW Status*	Cwlth status#	Olney parcel@	Warrawolong parcel@	Olney State Forest ¹	Watagan State Forest ¹	Warrawolong NR
subspecies)								
Little Eagle	<i>Hieraaetus morphnoides</i>	V	V		Known	Present		
Little Lorikeet	<i>Glossopsitta pusilla</i>	V				Present	Present	
Masked Owl	<i>Tyto novaehollandiae</i>	V				Present		
Olive Whistler	<i>Pachycephala olivacea</i>	V					Present	
Powerful Owl	<i>Ninox strenua</i>	V			Known	Present	Present	Present
Rainbow Bee-eater	<i>Merops ornatus</i>		J			Present		
Regent Honeyeater	<i>Anthochaera phrygia</i>	E	CE		Known	Present	Present	
Rose-crowned Fruit-Dove	<i>Ptilinopus regina</i>	V				Present	Present	
Scarlet Robin	<i>Petroica boodang</i>	V			Known	Present	Present	
Sooty Owl	<i>Tyto tenebricosa</i>	V			Known	Present	Present	Present
Speckled Warbler	<i>Chthonicola sagittata</i>	V				Present		
Turquoise Parrot	<i>Neophema pulchella</i>	V				Present		
Varied Sittella	<i>Daphoenositta chrysoptera</i>	V				Present		
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	V	C			Present		
White-throated Needle-tail	<i>Hirundapus caudacutus</i>		C,J,K			Present		
Amphibians								
Giant Barred Frog	<i>Mixophyes iteratus</i>	E	E			Present		
Giant Burrowing Frog	<i>Heleioporus australiacus</i>	V	V			Present		
Green-thighed Frog	<i>Litoria brevipalmata</i>	V				Present		
Littlejohn's Tree Frog	<i>Litoria littlejohni</i>	V	V		Known	Present	Present	

Common Name	Scientific Name	NSW Status*	Cwlth status#	Olney parcel@	Warrawolong parcel@	Olney State Forest!	Watagan State Forest!	Warrawolong NR
Red-crowned Toadlet	<i>Pseudophryne australis</i>	V				Present		
Stuttering Frog	<i>Mixophyes balbus</i>	E	V		Known	Present		
Reptiles								
Broad-headed Snake	<i>Hoplocephalus bungaroides</i>	E	V			Present		
Rosenberg's Goanna	<i>Varanus rosenbergi</i>	V	-	Known	Known			
Stephens' Banded Snake	<i>Hoplocephalus stephensii</i>	V	-	Known				

* Listing NSW Biodiversity Conservation Act 2016

Listing Commonwealth Environment Protection and Biodiversity Conservation Act 1999

V= Vulnerable, E = Endangered, CE = Critically Endangered, C=CAMBA, J=JAMBA, K=ROKAMBA

@ Known is defined as all records occurring within 1000 metres of the boundary of the reserve

! Present is within the adjoining State Forest

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APPENDIX 6 – NAMED ROADS AND TRAILS

Trail/road name	Designation under FAFT Plan
Bar Trail	-
Cedar Brush Walk	Strategic Cat 1
Great North Walk	Strategic Cat 1
Lynches Paddock Trail	Tactical Cat 7
Murrays Forest Road	-
Tiger Cat Trail	-
Turners Road	Strategic Cat 1
Walkers Ridge Road	Strategic Cat 1
Warrawolong Road	Strategic Cat 1
Watagan Creek Road	Strategic Cat 1
Watagan Shelf Road	-
Wave Rock Road	-
Wombat Point Road	-

APPENDIX 7 – REFERENCES

DECCW 2010, *Watagans National Park and Jilliby State Conservation Area Plan of Management*.

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APPENDIX 8 – APPROVAL AND AMENDMENTS FROM PREVIOUS VERSION

In line with section 25 of the *Forestry Act 2012*, flora reserve working plans and any amendments must be approved by the Minister.

This plan was approved by The Hon. Tara Moriarty MLC, Minister for Agriculture, Minister for Regional New South Wales and Minister for Western New South Wales

Date of approval: 14/9/23

Version	Changes	Approval details
3.0	» Addressed comments by Forestry Corporation.	» The Hon. Tara Moriarty MLC, Minister for Agriculture, Minister for Regional New South Wales and Minister for Western New South Wales, 14/9/23