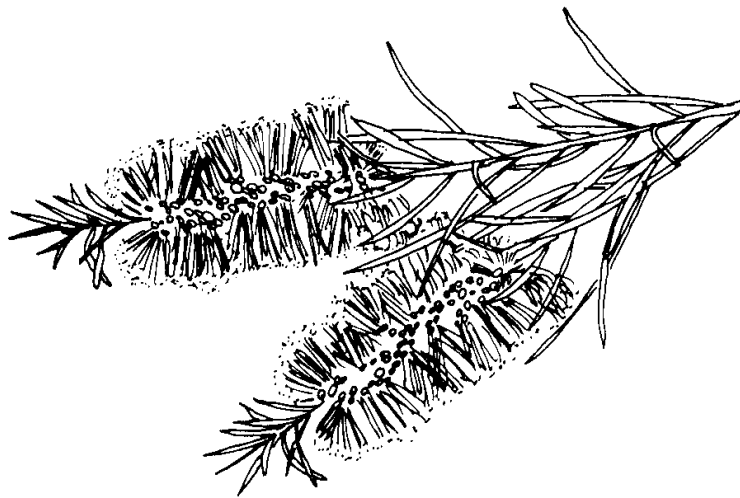


Urban Bushland Inventory and Action Plan



Volume 2 Central Ward Reserves



Pittwater Council

Natural Resource Unit
June 1998

Landuse Planning Table (Adopted for this plan by Council 12/2/2001)

Permissible Uses Exempt (these may be subject to approval under Part 5 of the EPA Act 1979)	Permissible Uses Requiring Development Consent	Prohibited Uses
Bush regeneration, habitat restoration and weed control	Utility installations and similar	Extractive industries and agriculture
Fire hazard reduction activities	Buildings ancillary or incidental to the reserve	Sporting facilities
Ecological burns	Major public drainage works	Permanent private access across a reserve
Multi-use tracks other than motor vehicle	Major rock / soil stabilization works and earthworks	Commercial signage
Boardwalks and minor bridges	Major facilities (not buildings) being viewing platforms, bridges, educational facilities and the like	Dumping of refuse (including building materials, soil, fill, household wastes, etc.)
Temporary activities or developments requiring a lease or licence under the Local Government Act (1993)	Commercial Eco-tourism Activities	Vegetation removal not in accordance with Council's Tree Preservation and Management Order
Appropriate sustainable low impact recreation activities and facilities (other than buildings)	Vehicle access (emergency access, fire breaks and service trails).	Private alienation or encroachment
Minor public drainage and stormwater works		Introduction of exotic flora and fauna
Minor fences		Playground facilities
Compliance, directional, interpretive, identification and safety signs		Flood structures (damming and reduction of environmental flows)
Environmental education activities		Removal of habitat features such as soil, leaf litter, rocks, stones, pebbles and the like
Any use as permitted under Council's Tree Preservation and Management Order		Recreational motor sports (including 4 wheel driving, motorbike riding, etc.)
Minor rock works and earthworks associated with soil stabilization and erosion control		Domestic drainage outlets
Any activity as defined in Management Plans consistent with the core objectives and management objectives		Horse riding facilities
Feral animal control and eradication.		Unleashed dog exercise areas
Biodiversity recovery and enhancement		Water extraction

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Loquat Valley/Pindari Reserve, Bayview

Reserve Number: 0098.

Street Address: 22A and 25 Loquat Valley Road, Bayview.

1.0 Description & Category

1.1 Location and Description

Loquat Valley/Pindari Reserve is located in Bayview extending across Loquat Valley Road. It is bounded by residences in Loquat Valley Road and Pindari Crescent and Pamela Crescent Reserve. It is 1.49 hectares in size and features a creekline running from ridgetop to gully bottom through the centre of the Reserve.

1.2 Land Tenure and Property Description

The Reserve is owned by Council, includes Lot 29A and Lot 53A in DP 30648 and is zoned 6(a) Open Space - Existing Recreation.

1.3 Category of Land

The Reserve is community land under the Local Government Act 1993. It is categorised as a natural area and further categorised as bushland and watercourse. It meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2.0 Natural & Cultural Heritage

2.1 Topography, Geology and Soils

Loquat Valley/Pindari Reserve is on a north facing slope from the crest to the valley floor with a creekline running through it.

The upper slopes are characterised by geology of the Newport Formation of the Narrabeen Group. The steep colluvial side slopes, occasional sandstone boulders and benches are characteristic landforms associated with finer grained shale and lithic quartz sandstone. The soils derived vary, on sandstone they are shallow and sandy, and on shales they are moderately

deep podsols. The soils have been mapped as the Watagan soil landscape.

The geology of the lower slopes is of the Terrigal Formation of the Narrabeen Group and consists of sandstone and siltstone. The slopes are moderately inclined with rounded valleys. The deep sandy clays to yellow earth soils have been mapped as the Erina soil landscape.

A possible dyke has been identified along a section of the creekline. This requires further investigation.

2.2 Hydrology

Loquat Valley is a small, steep catchment of Pittwater. This Reserve extends from near the top of the catchment and follows a creekline that receives water from several natural and man-made drainage lines. Adjoining properties and discharge from the roadway gutters have increased the amount of water that flows through the creekline.

2.3 Vegetation

The Reserve supports Spotted Gum (*Corymbia maculata*) Forest with emergent Grey Gum (*E. punctata*) and Turpentine (*Syncarpia glomulifera*) trees also present. The microclimate affects the plant community whereby upslope the tall shrub layer and ground layer are dominated by Forest Oak (*Allocasuarina torulosa*) and grasses, which are replaced by Cheese Tree (*Glochidion ferdinandii*) and False Bracken (*Calochlaena dubia*) in the moist gullies.

A Closed-forest community, dominated by Lillypilly (*Acmena smithii*), Red Ash (*Alphitonia excelsa*) and Water Wine (*Cissus hypoglauca*), occurs in the lower section of the Reserve.

2.4 Fauna

Tree removal in the upper part of the Reserve has resulted in the thick growth of Forest Oak. The threatened Glossy Black-cockatoo, which feeds almost exclusively on fruits of the Casaurinaceae family, has a local population ranging from West Head which would forage in the Reserve. Whip Birds are resident in the forested areas.

It is likely that insectivorous bats hunt above and below the tree canopy during the warmer months when insects are abundant and that flying foxes frequent the Reserve when the spotted gums and turpentine are flowering. Recent arboreal mammal scratch marks and possible bandicoot diggings were noted.

Frog habitat is present in the creek, although likely to be adversely affected by urban run-off. The presence of tree frogs suggests that snakes such as the Green Tree Snake may be present.

Council's Habitat and Wildlife Corridor Conservation Strategy maps the Reserve as "Corridor - CO1" which indicates corridor or habitat areas though disturbed are likely to be of good value due to good crown cover and/or understorey.

2.5 Aboriginal and Non-aboriginal Sites

There are no recorded Aboriginal sites within the Reserve. There is potential for Aboriginal sites such as axe grinding grooves and engravings to occur in the area. There are no known European Heritage sites in the Reserve.

3.0 Significance and Objectives

3.1 Statement of Significance

Loquat Valley/Pindari Reserve is significant because:

- ❖ it provides a continuous transect of bushland from ridge top to valley floor;

- ❖ it includes provides a small sample of Spotted Gum Forest considered to be of nature conservation significance at State level and provides habitat for the threatened Glossy Black-cockatoo;
- ❖ it provides habitat for birds, frogs, mammals and reptiles and acts as a stepping stone between larger areas of habitat due to its diversity;
- ❖ it contributes to the scenic quality by maintaining ridgetop vegetation in Bayview;
- ❖ it provides a record of the original landscape and the changes wrought by urban development;
- ❖ it has been a focus for the community to work together regenerating the bush and encouraging recreational and educational pursuits.

3.2 Management Objectives

The management objectives for Loquat Valley/Pindari Reserve are:

- ❖ to protect the Reserve's natural features in particular the Spotted Gum Forest and Forest Oak habitat for the threatened Glossy Black-cockatoo;
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve;
- ❖ to encourage community involvement in bushland management of the Reserve;
- ❖ to re-establish the informal walking track;
- ❖ to reinstate a bush regeneration program with community volunteers to follow on from past achievements;
- ❖ to enforce against damage to the Reserve, lopping of trees, encroachments and illegal dumpings.

4.0 Management Issues

4.1 Weed Invasion and Bush Regeneration

Light weed infestation at the top of the Reserve, related to disturbances from road batters, edge effects and a drainage line, needs to be addressed to limit the downward spread.

The area of the Reserve between Loquat Valley Road and Pamela Crescent Reserve has been the focus of a previous Volunteer Bush Regeneration Program. This area has an indigenous canopy but understorey and ground cover weeds such as Lantana, Cape Ivy, Blackeyed Suzan and Wandering Jew are still present.

Regeneration work undertaken extends from regenerating the creekline and slopes to track construction. Future bush regeneration should begin on the slopes to prevent reinfestation. Lantana over the creek should be addressed using bush regeneration techniques, in conjunction with a program to stabilise the creekline and prevent further erosion. Although numerous attempts have been made to suppress Wandering Jew along the valley floor, this task should only be attempted once the other issues have been addressed. Re-establishment of the informal bush track will assist in regeneration work.

4.2 Stormwater Drainage

Urban stormwater from residential development and kerbed roads in the catchment causes increased runoff and is likely to affect water quality in the Reserve.

At stormwater pipe outlets bank degradation has occurred. This can be addressed by rock lining the channel and installing energy dissipation basins in conjunction with bank re-vegetation.

4.3 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in

accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction. Following a burn within the Reserve, a weed control program will be undertaken. The closed forest community should not be burnt.

4.4 Management of Native Fauna and Introduced Predators

Loquat Valley/Pindari Reserve provides good habitat for fauna with a variety of habitat components. The winter flowering Spotted Gums and rainforest plants encourage diversity and provide year-round food availability.

A Pittwater-wide public awareness campaign will need to address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. Compliance and interpretive signs would assist. Feral cat and fox predation can be addressed through a Pittwater-wide feral animal control strategy.

4.5 Access, Walking Tracks and Recreation

There are informal tracks from Loquat Valley Road to Pamela Crescent which provide general neighbourhood access and an informal loop track which allows recreational bush walking. The bush tracks require maintenance; vegetation has overgrown, tracks need relining and timber work on the ramp needs to be addressed. There are no tracks in the upper areas of the Reserve.

4.6 Boundaries and Neighbours

There are minor encroachments which a public awareness and education campaign hazard to all neighbours of the Reserve may address, through linking the effects of dumping of vegetation, with subsequent weed infestation and fire hazard.

Some residents of Lentara Road have been clearing trees within the Reserve to enhance their private views of Pittwater. Their illegal actions need to be apprehended to stop further degradation of the ridgetop community which is now almost devoid of mature trees.

5.0 Performance

Management Objectives	Performance Targets (Actions)	Responsibility	Target Date	Capital Cost estimate	Recurrent Cost estimate	Performance Measures
Weed Control & Bush Regeneration	Letterbox drop to re-establish volunteer group	Natural Resources	When community demand	Staff time	\$1 400pa supervision & materials	Group commenced
Stormwater control & drainage	Install erosion control structure	Natural Resources & Engineers	When funding available	Seek detailed design & costings	Integrate into works & maintenance programs	Bank stabilised & better water quality
Management of native fauna & introduced predators	Public awareness & feral animal program	Natural Resources & Compliance	Feral animal control when funds available	Seek detailed costings	Costed within a Pittwater wide feral animal control program	Fauna populations extant
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff time	Fire regime protects property & biodiversity
Access & walking tracks	Track maintenance	Natural Resources	When funds available	Seek detailed costs	Maintenance costs and staff time	Public use
Boundaries & neighbours	Awareness campaign, regain encroachments & prevent clearing	Natural Resources & Compliance	Ongoing		Staff time	Good boundary & bushland interface

Bimbimbie Reserve, Bayview

Reserve Number: 0458

Street Address: 23 Utingu Place, Bayview.

1.0 Description & Category

1.1 Location and Description

Bimbimbie Reserve is a bushland reserve covering 0.43 hectares. Bimbimbie Place and Utingu Place border the Reserve on the north with residential properties on the south.

1.2 Land Tenure and Property Description

The Reserve is owned by the Council, includes Lot 30 DP 248062 and is zoned 6(a) Open Space - Existing Recreation A.

1.3 Category of Land

Bimbimbie Place is community land under the Local Government Act, 1993. The land is categorised as natural area and also bushland and watercourse. It meets the definition of bushland described in State Environmental Planning Policy No. 19 - Bushland in Urban Areas.

2.0 Natural and Cultural Heritage

2.1 Topography, Geology and Soils

The Reserve is located on a south-east facing slope and contains a natural drainage line. The parent geology is interbedded laminate of shale and quartz sandstone of the Newport Formation in the Narrabeen Group.

The undulating to rolling rises of the local area are characteristic of the Erina Soil Landscape and contain fine-grained sandstones and claystones. Moderately deep Red Podzolic soils occur towards the top of the Reserve with deep Yellow Podzolic Soils on the lower slopes. Seasonal waterlogging of the footslopes is an element of this soil type.

2.2 Hydrology

The Reserve's catchment is within an urban area and as such has an altered drainage regime. The drainage line has been modified and flows as a result of urban runoff.

2.3 Vegetation

The Reserve supports Spotted Gum Forest (*Corymbia maculata*). The small tree and tall shrub layer features rainforest species and includes Lilly Pilly (*Acmena smithii*), Cabbage-tree Palm (*Livistona australis*), Turpentine (*Syncarpia glomulifera*) and Bolwarra (*Eupomatia laurina*). Although more associated with drier areas, Forest Oak (*Allocasuarina torulosa*) and Breynia (*Breynia oblongifolia*) also occur.

The ground covers include Rasp Fern (*Doodia aspera*), Wiry Panic (*Entolasia spp.*), *Poa affinis* and vines such as Water Vine (*Cissus hypoglauca*) cover plants at various levels.

2.4 Fauna

Although small, the habitat features of Bimbimbie Reserve provide for a range of native fauna. Due to the presence of Spotted Gums and Cabbage-tree Palms a number of bird species are likely to use the Reserve. These include seasonal visitors such as the Topknot Pigeon and Channel-billed Cuckoo and species resident in the surrounding area which include many parrots. Tree hollows in the Spotted Gums are a resource for arboreal mammals, insectivorous bats and parrots.

The small creek running through Bimbimbie Reserve provides potential habitat for a variety of small reptiles and frogs.

Council's Habitat and Wildlife Corridor Conservation Strategy maps the Reserve as "Corridor-CO1" which indicates corridors or habitat areas though disturbed are likely to be of good value due to good crown cover and understorey.

2.5 Aboriginal Sites

There are no recorded Aboriginal sites within the Reserve. There is potential for Aboriginal sites such as axe grinding grooves and engravings to occur in the area.

2.6 Non-Aboriginal Sites

The Reserve was created in the mid 1970's by the subdivision of the Halstrom Estate. The Estate contained numerous areas and included a wildlife park, large areas of landscaped bush and exotic gardens. Paths and other structural elements are still apparent and exotic plantings now well established within the Reserve.

3.0 Significance and Objectives

3.1 Statement of Significance

Bimbimbie Place Reserve is significant because:

- ❖ it protects an example of the bushland of Bayview that contains the Spotted Gum Forest, which is significant at State level;
- ❖ it is a record of a part of the Halstrom Estate and is culturally significant;
- ❖ it acts as part of a stepping stone to aid faunal movement throughout the Bayview/Ingleside area;
- ❖ it contributes to the landscape quality of Bayview and provides a record of the original landscape and the changes wrought by urban development;
- ❖ it is an educational resource and a contact point with nature for residents;
- ❖ it allows urban residents to undertake informal recreational pursuits in a bushland setting.

3.2 Management Objectives

The management objectives for Bimbimbie Place Reserve are:

- ❖ to protect the natural and cultural features of the Reserve;
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve that relates to the Spotted Gum Open Forest;
- ❖ to adequately manage the bushland in relation to encroachments and weed invasion;
- ❖ to protect life and property from wildfire and to maintain ecological processes by seeking to maintain a near-natural fire regime in those parts of the Reserve with exception to the closed forest area to conserve native flora and fauna in the Reserve;
- ❖ to control introduced animals in the Reserve;
- ❖ to provide low impact recreational and educational use of the Reserve consistent with the other objectives, and
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion and Bush Regeneration

In the old landscaped area, the creekline and path have various exotic species such as Strelitzia, Creeping fig and Pine Trees, which can be invasive. On the Reserve boundaries, fill and vegetative rubbish have contributed to the weeds, which are infesting the Reserve. Weeds include Paddy's Lucerne, Erharta, Crofton, Asparagus Fern, Honeysuckle, Cape Ivy and Lantana.

The Reserve has a range of native plant species, assisted by previous bush regeneration work. The plant community has a number of rainforest understorey species expected due to lack of fire. Increased water and nutrients following

development would further contribute to this trend.

Any future bush regeneration program will involve:

1. Weeding of the Spotted Gum forest on the southern side part of the reserve. This should be combined with manual fuel reduction to provide areas of bare earth for eucalypt germination;
2. The creekline and old landscaped area requires primary weeding, targeting *Ficus plumeria* along creek, which is strangling native plants;
3. The part of the reserve adjoining Bimbimbie Place requires weeding, followed by general weeding throughout the Reserve;
4. The old Radiata Pines and Spotted Gums should be assessed for risk management. Deadwood may have to be removed from the older trees.
5. Whilst not currently invasive, the Radiata Pines should be monitored.

4.2 Management of Significant Plant Communities and Fire Regime :

The Spotted Gum Forest has suffered as a result of changes to the environment such as a lack of fire, increasing soil moisture content, and ground water quality and quantity following the subdivision of the estate for residential development. Initially, the manual removal of leaf litter for fuel management should assist in allowing germination of eucalypts.

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction. Areas with rainforest understorey should generally not be burnt. Following a burn within the Reserve, a

follow up weed control program will be implemented.

4.3 Management of Native Fauna and Introduced Predators

Bimbimbie Place Reserve provides good habitat for fauna with a variety of habitat components. The winter flowering Spotted Gums and rainforest plants encourage diversity and year-round food availability.

A Pittwater wide public awareness campaign will address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. Compliance and interpretive signs can assist in this. Feral cat and fox predation is an issue that needs to be addressed through a Pittwater-wide control strategy.

4.4 Access, Signage and Recreation

Rationalisation of the many small informal tracks throughout the Reserve is needed and so there can be one main informal track.

A sign should be installed naming the Reserve.

There is potential for a picnic table/sitting area to be placed within the cleared area on the north – east of the reserve in conjunction with landscaping of the bush edge with indigenous plants.

4.5 Cultural Heritage

The management of cultural heritage will be undertaken in accordance with the Burra Charter. The former Estate's landscaped paths and mature Radiata Pines will be retained to provide a link to the history of the area. The invasive fig species that is strangling native plants will be removed according to bush regeneration principles.

Interpretive signage should be prepared outlining the history of the Estate and the significance of the Reserve.

4.6 Boundaries and Neighbours

The many indigenous plants adjacent to the Reserve within private properties contribute to the Reserve's viability and significance. Neighbours should be encouraged to actively plant local plant species and prevent domestic animals from roaming in the Reserve.

5.0 Performance

Management objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration	Formation of a volunteer bush regeneration group	Natural Resources	As public demand requires	Staff resources	\$1000pa \$ 400 approx materials	Volunteers commence work in the Reserve
Management of significant plant sp. & communities	Manual fuel removal	Natural Resources	Volunteer Group target	Staff resources		Spotted Gum regeneration
Management of native fauna & introduced predators	Public awareness & feral animal control	Natural Resources & Compliance	Sign 1998/99 Pittwater wide program as resources available	Sign \$500	Staff time	Increased fauna extant within Reserve
Fire Management	Maintain appropriate fire regime	Natural Resources & Fire Control	Ongoing		Staff time	Fire regime protects property & biodiversity
Access, signs, & recreation	Install interpretive signs & picnic table. Rationalise unnecessary walking tracks	Natural Resources	As resources available	Seek detailed costings		Public appreciation of Reserve
Cultural Heritage	Install interpretive signs	Natural Resources	As resources available	Seek detailed costings		Public appreciation of Reserve
Boundaries & neighbours	Public awareness	Natural Resources	As resources available			Public appreciation to achieve viable bushland

Ilya Avenue Reserve, Bayview

Reserve Number: 0102

Street Address: 19A Ilya Avenue, Bayview.

1.0 Description & Category

1.1 Location and Description

Ilya Avenue Reserve is located on the northern side of the cul-de-sac of Ilya Avenue and extends north between two properties to an escarpment. The Reserve covers an area of 0.33ha.

1.2 Land Tenure and Property Description

The Reserve is owned by Council and described as a Public Reserve in DP 28379. The land is zoned 6(a) Open Space - Existing Recreation.

1.3 Classification of Land

The Reserve is community land under the Local Government Act, 1993 and is categorised as a natural area which is further categorised as bushland, watercourse and escarpment. It meets the definition of bushland described in State Environmental Planning Policy No. 19 - Bushland in Urban Areas.

2.0 Natural & Cultural Heritage

2.1 Topography, Geology and Soils

Ilya Avenue Reserve is situated on a north facing slope. The lower section of the Reserve gently slopes towards an escarpment. A creekline runs through the Reserve across a sandstone bench towards the escarpment.

The parent geology is Hawkesbury sandstone characterised by medium to coarse grained quartz sandstone with minor shale and laminite lenses. The geology gives rise to shallow coarsely grained loose sandy loams, clayey sand and sandy clay loam characteristic of the GyMEA Soil Landscape.

2.2 Hydrology

The shallow soils over rock benches give rise to water seepage. One drainage line results from stormwater discharge mid-way into the Reserve, and drains into a natural creekline. Impeded drainage occurs in a large area in the lower part of the Reserve. The catchment above the Reserve has residential and rural development often with unkerbed roads.

2.3 Vegetation

Above the escarpment, Ilya Avenue Reserve supports Hawkesbury Sandstone Open-Forest dominated by Sydney Peppermint (*E. piperita*) and Sydney Red Gum (*Angophora costata*). Associated trees include Grey Gum (*E. punctata*). The shrub layer includes *Pultenaea stipularis* and River Rose (*Bauera rubioides*). A Coachwood Closed-forest occurs along the main creek line, dominated by Coachwood (*Ceratopetalum apetalum*) and Turpentine (*Syncarpia glomulifera*). At the top of the escarpment groups of rock orchids (*Dendrobium* sp.) are present

2.4 Fauna

Although the presence of surrounding residential properties has diminished some of this Reserve's faunal habitat value, it is still likely to support a range of species. The range of canopy species present means that blossom is often available for birds and mammals. The thick ground cover, rock outcrops and the creek favour reptiles and frogs. This creek is lined with saw sedge, which provides good refuge for frogs such as the leaf green tree frog.

The threatened Glossy Black-cockatoo may occasionally feed in the Reserve due to the presence of Black She-oak.

Council's Habitat and Wildlife Corridor Conservation Strategy maps Ilya Avenue as "Corridor - Co1" which indicates corridors or habitat areas though disturbed are likely to be of good value due to good crown cover and/or understorey.

2.5 Aboriginal and Non-aboriginal sites

There are no recorded Aboriginal sites within the Reserve, although there is potential for Aboriginal sites such as axe grinding grooves and engravings to occur within the area.

There are no noted European heritage sites within the Reserve

3.0 Classification, Significance And Objectives

3.1 Statement of Significance

Ilya Avenue Reserve is significant because :

- ❖ it contains a perched stand of Coachwood which is considered a regionally significant plant community;
- ❖ it maintains a continuity of vegetation on the Escarpment with high scenic value to Pittwater;
- ❖ it protects an example of the bushland of Bayview in a similar condition to that which occurred when the area was first visited by Europeans;
- ❖ it acts as a stepping stone to aid faunal movement throughout the Bayview/Ingleside bushland;
- ❖ it is an educational resource and a contact point with nature for residents;

3.2 Management Objectives

The management objectives for Ilya Avenue Reserve are:

- ❖ to protect the natural features of the Reserve;
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve;
- ❖ to adequately manage the bushland in relation to encroachments and weed invasion;
- ❖ to protect life and property from wildfire and to maintain ecological processes by seeking to maintain a near-natural fire regime in those parts of the Reserve with the exception of the closed forest area to conserve native flora and fauna in the Reserve;
- ❖ to control introduced animals in the Reserve;
- ❖ to provide low impact recreational and educational use of the Reserve consistent with the other objectives, and
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion and Bush Regeneration

The main areas of weed infestation are at the creekline near the cliff face due to urban runoff, and adjacent to the road due to edge disturbance. Weeds include African Olive, Ochna, Camphor laurel, *Pyracantha angustifolia*, Asparagus fern, Lantana, Fishbone Fern, Small-leaved Privet and Cobbler's Pegs. Garden escapes such as Buttercup and Balsam have infested areas along the creekline.

The roadside edge should be addressed by working across the embankment, once the creekline and escarpment edges have been addressed.

4.2 Stormwater Management

Large concentrations of filamentous green algae were noted along the gutter on part of the Reserve adjacent to a lawn area indicating excess nutrients. This should be addressed through a public education campaign.

The informal grassed edges in the upper catchment assists with addressing problems associated with water quantity and quality, and should be retained.

4.3 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve presents itself as a low risk as it is a small Reserve; it is surrounded by residential properties and has an area containing rainforest trees.

Following regular monitoring a combination of manual and/or fire fuel reduction can be used on fuel loadings in accordance with The Draft Fuel Management Plan. Variability in fire regime is recommended and the closed forest should not be burnt. Council environmental staff will assess ecological considerations. A weed control program will be initiated after fire in the Reserve, and soil erosion issues considered.

4.4 Management of Native Fauna and Introduced Predators

The Reserve provides good habitat and is enhanced by the adjoining residential allotments that have retained significant portions of bush with a variety of habitat components.

A Pittwater wide public awareness campaign will address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam into the bushland.

4.5 Access and Recreation

There are no formal tracks within the Reserve. Informal access will be allowed to take advantage of the bushland setting and the panoramic views.

4.6 Public Awareness

There is a need to distribute "bush friendly" brochures and literature to educate adjoining residents about the problems for the Reserve associated with excessive use of garden fertiliser, domestic animals, dumping garden clippings, and threats to the Reserve's viability.

5.0 Performance

Management Objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration <input type="checkbox"/>	Formation of a volunteer Bush Regeneration Group <input type="checkbox"/>	Natural Resources <input type="checkbox"/>	As public demand requires <input type="checkbox"/>	Staff resources <input type="checkbox"/>	\$1000pa \$400 approx. materials	Volunteers commence work in the Reserve
Stormwater Management <input type="checkbox"/>	Retain informal grass edges Public information	Engineers		Staff time		Improved creek health
Management of native fauna & introduced predators	Public awareness campaign for responsible pet ownership & feral animal program	Natural Resources & Compliance	When funds available as well as ongoing programs	Ongoing	Costed within a Pittwater wide feral animal control program	An increase in native fauna in the Reserve
Fire Management <input type="checkbox"/>	Maintain appropriate fire regime <input type="checkbox"/>	Bushfire Services & Natural Resources <input type="checkbox"/>	Ongoing <input type="checkbox"/>	<input type="checkbox"/>	Staff time <input type="checkbox"/>	Safe fuel levels & conservation <input type="checkbox"/>
Public Awareness & Signage <input type="checkbox"/>	Bush friendly information distributed & sign installed	Natural Resources	1998/99	\$150 \$500		Sympathetic public behaviour

Kennedy Place Reserve, Bayview

Reserve Number: 0456

Street Address: 3A Kennedy Place, Bayview.

1. Description & Category

1.1 Location and Description

Kennedy Place Reserve is located on the south side of Kennedy Place and west of Jacqueline Close. Three boundaries adjoin residential properties. The Reserve is 0.13ha in size.

1.2 Land Tenure and Property Description

Kennedy Place Reserve is described as Lot 55 in DP 216125, and is owned by Pittwater Council subject to caveat K200000P. The land is zoned 6 (a) Open Space - Existing Recreation.

1.3 Category of Land

The Reserve is community land and under the Local Government Act, 1993 is categorised as a natural area which is further categorised as bushland and watercourse. It meets the definition of bushland described in State Environmental Planning Policy No. 19 - Bushland in Urban Areas.

2. Natural And Cultural Heritage

2.1 Topography, Geology and Soils

Kennedy Place Reserve is on a steep to moderate upper slope of a ridge with a south-facing aspect featuring some rocky outcrops and boulders.

The parent geology is Hawkesbury Sandstone which is characterised by medium to coarse grained quartz sandstone with very minor shale and laminate lenses.

2.2 Hydrology

The Reserve is in the upper section of a small catchment above McCarrs Creek and receives stormwater from a roadside gutter outlet at the top of the Reserve. There are no permanent creeks through the Reserve.

2.3 Vegetation

The upper slope of Kennedy Place Reserve supports Hawkesbury Sandstone Open Forest dominated by Sydney Peppermint (*Eucalyptus piperita*) and Bastard Mahogany (*E. umbra*). There is a sparse understorey of low trees, where Black She-oak (*Allocasuarina littoralis*) is common.

The lower part of the Reserve is wetter and Turpentine (*Syncarpia glomulifera*) occurs. Here understorey plants include New South Wales Christmas Bush (*Ceratopetalum gummiferum*) and Tree Ferns.

2.4 Fauna

This small Reserve has habitat features which favour native fauna but its size and proximity to residences decrease fauna diversity. Black She-oak in the Reserve is a food source and may be used by the threatened Glossy Black-cockatoo. The Reserve would be used as a 'stepping stone' to larger Reserves, Ku-ring-gai Chase and Garigal National Parks.

Council's Habitat and Wildlife Corridor Conservation Strategy, maps the Reserve as "Corridor Co1" which indicates corridor or habitat areas though disturbed are likely to be of good value due to good crown cover and understorey.

2.5 Aboriginal and Non-aboriginal sites

There are no recorded Aboriginal sites within the Reserve. There is potential for Aboriginal sites such as axe grinding grooves and engravings to occur in the area. There are no known European Heritage sites in the Reserve

3. Significance And Objectives

3.1 Statement of Significance

Kennedy Place Reserve is significant because:

- ❖ it protects a small example of the bushland overlooking McCarrs Creek in a similar condition to that which occurred when the area was first visited by Europeans;
- ❖ it provides visual protection of the escarpment;
- ❖ it provides habitat suitable for the threatened Glossy Black-cockatoo;
- ❖ it acts a stepping stone to aid faunal movement throughout the Bayview/Church Point area to the larger bushland areas of the National Parks;
- ❖ it is an educational resource and a contact point with nature for residents;

3.2 Management Objectives

The management objectives for Kennedy Place Reserve are:

- ❖ to protect the natural features of the Reserve;
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve;
- ❖ to adequately manage the bushland in relation to encroachments and weed invasion;

- ❖ to protect life and property from wildfire and to maintain ecological processes by seeking to maintain a near-natural fire regime in those parts of the Reserve to conserve native flora and fauna in the Reserve;
- ❖ to control introduced animals in the Reserve;
- ❖ to provide low impact recreational and educational use of the Reserve consistent with the other objectives, and
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4. Management Issues

4.1 Weed Invasion & Bush Regeneration

The main areas of weed infestation are along the drainage line and near residential boundaries resulting in pockets of moderate to low infestation. Weeds include Lantana, Senna, Crofton, Asparagus Fern, Ginger, Fleabane, and Fish-bone fern.

Any bush regeneration program should commence in the upper areas, working down the slope in a manner that does not allow reinfestation once clearing has taken place.

Most weeding is required in the lower section of the Reserve due to seepage from a rock bench.

4.2 Stormwater Drains

The road above the Reserve impacts directly feeding stormwater runoff into an unformed channel in the Reserve. At present the understorey and leaf litter protect the ground adequately, however this should be monitored.

4.3 Fire regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. Fire has been absent for a number of years in this small and narrow Reserve.

The Reserve will be regularly monitored for fuel loading and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan. Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction. Following a burn within the Reserve, a weed control program will be undertaken.

4.4 Management of Native Fauna and Introduced Predators

Future planting and bush regeneration programs need to consider the habitat value of the Reserve. Signs at Reserve entrances need to be installed to indicate that removal of bush rock, bark and dead wood is prohibited as they form important microhabitats.

A public awareness campaign to adjoining properties will need to address the value of the bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the

Reserve. Fox predation is an issue which needs to be addressed through a well designed feral animal control strategy.

4.5 Signage, Access and Recreation

A sign naming the Reserve, compliance and/ or interpretive signage on habitat value should be installed.

Access to the Reserve is poor and due to the steepness of the site would not be encouraged other than on an informal basis. This, however, enhances the habitat potential of the bush.

4.6 Boundaries and Neighbours

Some clearing has taken place along residential boundaries. Educational information on weed eradication and the benefits and values of the bushland is required for the neighbouring properties.

5.0 Performance

Management Objectives	Performance Targets (Actions)	Responsibility	Completion Date	Capital Cost	Recurrent Cost	Performance Measure
Weed control & bush regeneration	Public appreciation & formation of a volunteer bush regeneration group	Natural Resources	As public demand requires	Staff resources	\$1400 pa direct supervision & materials costs	Group commenced
Fire Management	Ensure appropriate fire regime	Natural Resources & Fire Control	Ongoing		Staff time	Fuel management protects property & biodiversity
Management of native fauna & introduced predators	Public awareness campaign for responsible pet ownership, feral animal program & install signage	Natural Resources & Compliance	1998/99	\$500 sign Seek funds for animal programs	Costed within a Pittwater wide feral animal control program	Extant fauna populations
Signage	Reserve sign	Natural Resources & Building Services	1998/99	\$500		Sign installed
Boundaries & neighbours	Regain encroachments & awareness campaign	Natural Resources & Compliance	When resources available	Within an overall reserve regeneration program	Staff time	No encroachments & improved public appreciation of reserve

Minkara Reserve, Bayview

Reserve Number: 0103

Street Address: 13A Narla Road and 22 Minkara Road, Bayview.

1.0 Description & Category

1.1 Location and Description

Minkara Reserve is located on the south-eastern corner of Narla and Minkara Roads, Bayview. It is a 2.6 hectare bushland reserve. The Reserve is situated on a ridge and as such is not subject to the pressure of urban run-off.

It is bordered on two sides by sealed road; the southern side is directly adjacent to privately owned bushland. A Sydney Water-owned blue metal access road cuts through the centre of the Reserve to the ridgetop where their water tank is situated.

1.2 Land Tenure and Property Description

Minkara Reserve is described as Lot 1 DP 581802 and Lot 51 DP 731366, and is zoned 6(a) Open Space - existing recreation.

1.3 Category of Land

Minkara Reserve is community land, is categorised as a natural area and further categorised as bushland under the Local Government Act, 1993. It meets the definition of bushland described in State Environmental Planning Policy No.19 - Bushland in Urban Areas.

2.0 Natural and Cultural Heritage

2.1 Topography, Geology and Soils

Minkara Reserve is situated on a crest, at a height of 145 metres above sea level, and is therefore one of the highest points in Bayview. The Reserve gently slopes to the northern boundary, with a moderate slope into a gully on the south-western boundary.

The parent geology of is Hawkesbury Sandstone, with sandstone and very minor shale and laminate lenses. The soils are characteristic of the Gynea Soil Landscape, where the soil depth is generally shallow, sandy, stony and porous. Soil depth increases towards the south-western corner of the Reserve.

2.2 Hydrology

The Reserve straddles the ridge; one side flowing north to Pittwater, the other south towards Cahill Creek and Winnereremy Bay.

Water drains from the topographic high where the water tank is situated, down all sides of the Reserve. A gully drains the south-western side. A stormwater pipe occurs at the south-west corner of the Reserve, draining from the road through the Reserve and into the gully.

An area of impeded drainage occurs in the north-eastern portion of the Reserve on a long sandstone bench.

2.3 Vegetation

Minkara Reserve supports Hawkesbury Sandstone Open-forest, dominated by Smooth-barked Apple (*Angophora costata*), Sydney Peppermint (*Eucalyptus piperita*) and Red Bloodwood (*Corymbia gummifera*), and Sandstone Ridgetop Woodland dominated by Scribbly Gum (*E. haemastoma*).

In more sheltered areas there is a low density small tree and shrub layer. Common shrub species include Sunshine Wattle (*Acacia terminalis*), Flaky-barked Tea-tree, Sydney Boronia (*Boronia ledifolia*), Black She-oak (*Allocasuarina littoralis*) and Prickly Moses (*A. ulicifolia*). Ground layer plants include the sedge *Cyathochaeta diandra*, Oat Speargrass (*Anisopogon avenaceus*), *Xanthorrhoea latifolia* and Bracken Fern (*Pteridium esculentum*).

2.4 Fauna

Minkara Reserve is important as it is one of the few Council owned parcels of land within the major bushland corridor that links Bayview and the peninsula with Ku-ring-gai Chase National Park. This connectivity to adjacent areas of quality habitat has resulted in Minkara and surrounding habitat supporting a diverse faunal assemblage.

The abundant rocky outcrops of the Reserve are an important habitat feature providing niches for a range of reptiles. The protection provided by the deep crevices would have been of particular importance during the January 1994 bushfires which swept through the valley.

Minkara has a good stand of Scribbly Gums, a noted koala food tree. Koala scratch marks have been located on private bushland to the south of the Reserve and the species could possibly use the Reserve when dispersing from core habitats such as West Head. The Scribbly Gums have a number of tree hollows which are used by mammals and birds such as Brush-tailed Possums and Rainbow Lorikeets.

Ring-tailed Possums and Long-nosed Bandicoots occur in the Reserve. Their presence along with the likely occurrence of Sugar Gliders make it probable that the Reserve and adjoining bushland is important foraging territory for the threatened Powerful Owl. The presence of Black She-oak and Forest Oak would also attract the endangered Glossy Black-cockatoo to the Reserve.

The ephemeral creek that drains Minkara Reserve would provide breeding habitat for a range of frogs and may possibly harbour the endangered Red-crowned Toadlet.

Minkara Reserve is marked as a Major Habitat Area in the Pittwater Council Habitat and Wildlife Corridor Conservation Strategy. This is defined as having a higher degree of biodiversity, with a wide diversity of habitat types and faunal species. This Reserve is also important due to its close proximity to the National Park, providing an important link for the majority of Pittwater Reserves.

2.5 Aboriginal Sites

There are no recorded Aboriginal sites, although there is a high potential for engraving and axe grinding groove sites to occur, since Hawkesbury Sandstone outcrops occur in the Reserve and the general Ingleside area is prolific with identified sites.

2.6 Non-Aboriginal Sites

There are no known European heritage sites within the Reserve.

3.0 Significance & Objectives

3.1 Statement of Significance

Minkara Reserve is significant as:

- ❖ it protects a large example of relatively undisturbed bushland in Bayview and is continuous with other naturally vegetated land on the escarpment;
- ❖ it contains the Sydney Sandstone Ridgetop Woodland which has local conservation significance;
- ❖ it is classified as a major habitat area in Council's Habitat and Wildlife Corridors Conservation Strategy, with a high degree of biodiversity, provides potential habitat for endangered fauna and acts as a major link for other Council reserves to the National Park;
- ❖ the Reserve is located at the top of the catchment and therefore does not suffer extreme pressures from urbanisation, and is an important local reference site;
- ❖ it contributes to the landscape quality of Bayview, has expansive views of Pittwater, and provides an important natural escarpment as a visual backdrop to the coast as a record of the original landscape;
- ❖ it allows post-fire vegetation studies;
- ❖ it provides an example of bushland in a similar condition to that which occurred when the area was first visited by Europeans;

- ❖ it is an educational resource, and a contact point with nature for residents; and
- ❖ it allows urban residents to undertake informal recreational pursuits in a bushland setting;

3.2 Management Objectives

The management objectives for Minkara Reserve are:

- ❖ to protect the natural features of the Reserve, in particular the Sydney Sandstone Ridgetop Woodland which has local conservation significance and potential habitat for endangered fauna;
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve;
- ❖ to adequately manage the bushland in relation to weed invasion, stormwater and fire management and illegal clearing;
- ❖ to reduce the number of tracks and reduce erosion in the Reserve;
- ❖ to ensure that recreational use does not compromise the other values of the Reserve;
- ❖ to restore the area near the Sydney Water access road and water tank
- ❖ to control introduced animals in the Reserve;
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion and Bush regeneration

The main areas of weed infestation occur around the boundaries and walking tracks of the Reserve. These include Pampas Grass, Lantana, Blackberry and Bitou Bush.

The Sydney Water access road and the bus turning circle are surfaced with blue metal, which is favouring weed growth through the leaching of nutrients. The main weed problem along Narla Road is Whiskey Grass. As there are native grasses growing amongst these, hand removal is recommended.

The carpark/turning area on Narla Road shows signs of landscaping, suggesting the fill area extended further. The landscaped edge has been only partially successful; restricting vehicle access, and revegetation with non local plants. The soil compaction and weed cover in the north-west corner have inhibited native plant regeneration. Weeds include Whiskey Grass, Paspalum, Couch and *Acacia saligna*. This area, of approximately 10 x 20m, could be treated by laying a sandstone mulch and planting with species indigenous to the reserve.

The weed edge along Minkara Road towards the drainage line includes Small-leaved Privet, Bitou Bush, Lantana, Fennel, Crofton Weed and Coreopsis. Weeds extend a further 20-30m along the drainage line and include Wild Tobacco, Crofton Weed and Lantana.

4.2 Stormwater Management

Minkara Reserve is located at the top of the catchment and is therefore not subject to urban run-off to the same extent as other urban reserves.

A stormwater drain is located in the southwest corner of the Reserve, which directs water from Minkara Road into the Reserve. The water runoff from the road also affects the road edge and allows weeds to establish due to sediments and other water borne pollution.

4.3 Fire Management

It is estimated that Minkara Reserve has experienced fire activity five times over the past 30 years, within different areas of the Reserve. This regime may be more frequent than is desirable.

The first known fire occurred in the 1960's in the area adjacent to Minkara and Narla Roads. The second appears to have taken place about 20 years ago in the western portion, adjacent to Minkara Reserve. The third, about 15 years ago in an unknown area, the fourth 10 years ago burning the woodland area in the north-eastern area. The fifth was in January 1994. This fire burned the majority of the Reserve although the southern gully was largely untouched.

Management of the fire regime in the Reserve is undertaken by the Warringah Pittwater Bushfire Management Committee in accordance with Circular C10 - Planning for Bush fire Prone Areas. The Reserve will be regularly monitored for fuel loadings by Warringah Pittwater Bushfire Services and any hazard reductions required will be undertaken in accordance with the draft Fuel Management Plan. Ecological considerations will be assessed by Council's Environmental Staff to determine methods of hazard reduction. Following a burn within the Reserve, a weed control program will be undertaken.

4.4 Management of Native Fauna and Introduced Predators

A public awareness campaign for adjoining properties will need to address the value of the bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. The removal of bush rock, bark, and deadwood is prohibited as they form important microhabitat and may be brought to the attention of residents through the campaign or through interpretive signs.

Fox predation is an issue which needs to be addressed through a well designed Feral animal control strategy.

4.5 Access, Walking Tracks and Recreation

The main access point into Minkara Reserve is located in Narla Road, 50m from the junction of Minkara and Narla Roads. Two informal bush tracks lead from this point; one track runs parallel with Narla Road with a 10-20m bushland strip between the track and the road. The track is approximately two metres wide and is compacted. The other track runs south into the Reserve and branches off into two directions; one track exiting at Minkara Road, the other adjacent to the sandstone outcrops in the Reserve. These are of about one metre wide, with a sandy, gravel surface.

There is no formal track leading to the vantage point.

Horse riding and bike riding are having an adverse impact on the soil, causing accelerated compaction and erosion. Horses and bike riding are to be prohibited in this Reserve, and explanatory signs erected. It is recommended that the track running parallel to Narla Road be brush matted or planted out, and no formal tracks created.

4.6 Boundaries and Neighbours

Weeds are the main boundary issue. The bus turning circle is encroaching into the Reserve and the blue metal surface creates further weed growth. This blue metal should be replaced with a more sympathetic material such as crushed sandstone.

Areas adjoining private property appear to be relatively weed free bushland and should be encouraged to remain this way.

Illegal clearing has occurred at the eastern end of the Reserve to maximise a view for a resident when looking North to Pittwater. Rangers should be notified of residents activity and the owner advised to amend the action.

5.0 Performance

Management objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
<i>Weed Control & Bush Regeneration</i> □	Formation of a volunteer bush regeneration group□	Natural Resources□	As public demand requires□	Staff resources□	\$1000pa & \$400 approx materials□	Volunteers commence work in the Reserve
<i>Stormwater Management</i> □	Weed drainage areas and monitor□	Natural Resources□	Ongoing□	Staff resources	Within a regeneration program	Native plants filter runoff
<i>Management of native fauna & introduced predators</i> □	Public awareness campaign. Pittwater wide feral animal control program	Natural Resources	On-going and when funds available	Seek detailed costings	Costed within a Pittwater wide feral animal control strategy	Fauna populations extant. Public understanding & responsible pet ownership
<i>Fire Management</i> □	Maintain appropriate fire regime□	Bushfire Services & Natural Resources	Ongoing□	□	Staff time□	Safe fuel levels & biodiversity conservation
<i>Access and walking tracks</i> □	Regenerate unnecessary tracks & prohibit horse riding	Natural Resources & Compliance	Sign 1998/99 Track when resources available		\$500 for sign Obtain detailed costing for track	
<i>Boundaries & neighbours</i> □	Encourage community awareness & address turning circle issue	Natural Resources & Compliance	Ongoing		Staff time	Good boundary & bushland interface

Kennedy Park, Bayview

Reserve Number: 0108

Street Address: 19A Kennedy Place, Bayview

1.0 RESERVE DESCRIPTION

1.1 Location and Description

Kennedy Park is located between the residential areas of McCarrs Creek Road and Kennedy Place with access handles connecting from both roads. The Reserve occupies 0.85ha.

1.2 Land Tenure and Property Description

The Reserve is owned by Pittwater Council being subject to caveat K 200000 P and a right of carriageway and includes Lot 54 in DP 216125.

1.3 Category of Land

Kennedy Park is community land and under the Local Government Act is categorised as a natural area which is further categorised as bushland. It meets the definition of bushland described in State Environmental Planning Policy No. 19 – Bushland in Urban Areas.

2.0 Natural And Cultural Heritage

2.1 Topography, Geology and Soils

The Reserve is located on a very steep to moderate slope with a north-westerly aspect. Rock outcrops are prevalent on the upper slopes of the Reserve.

At the top of the Reserve, the parent geology is Hawkesbury Sandstone. Soils derived are shallow to moderately deep yellow earths and podzols with low soil fertility characteristic of the Gynea soil landscape.

In the majority of the Reserve, the underlying geology is the shales and fine grained sandstones of the Newport Formation of the Narrabeen Group. The Watagan soil landscape

is associated with the deeper soils in this part of the Reserve.

2.2 Hydrology

The Reserve is located in the McCarrs Creek catchment with no permanent drainage lines.

2.3 Vegetation

Kennedy Park supports Grey Gum (*E. punctata*) and Grey Ironbark (*E. paniculata*) open forest on the Narrabeen shales and has been mapped as PC01 Spotted Gum Forest. The top of the Reserve is Hawkesbury Sandstone Open-Forest dominated by Smooth-barked Apple (*Angophora costata*) and Sydney Peppermint (*E. piperita*) on the Hawkesbury Sandstone. The small tree and low shrub layer includes Grass Tree (*Xanthorrhoea sp.*), Geebung (*Persoonia levis*) and Forest Oak *Allocasuarina torulosa*. The ground layer is mainly composed of Kangaroo grass (*Themeda australis*). The southern end of the Reserve has a more sheltered aspect resulting slight change in understorey with Bracken (*Pteridium esculentum*).

2.4 Fauna

The many good habitat trees provide shelter and nesting hollows for many resident birds and arboreal mammals, including 'micro-bats', as well as a movement corridor to the National park and nearby bushland. The Reserve provides important habitat for Swamp Wallabies and long nosed Bandicoot.

The endangered Glossy Black-cockatoo is expected to occasionally visit the Reserve to feed on the Black She-oak.

Council's Habitat and Wildlife Corridor Conservation Strategy maps Kennedy Park as "Corridor – CO1" which indicates corridors or habitat areas though disturbed are likely to be of good value due to good crown cover and/or understorey.

2.5 Aboriginal and Non-Aboriginal sites

There are no recorded Aboriginal sites within Kennedy Park. There is potential for Aboriginal sites such as engravings and middens to occur as indicated by other sites in the area which have been noted on National Parks and Wildlife Service's Sit Register.

There are no recorded sites of European or cultural significance.

3.0 Significance And Objectives

3.1 Statement of Significance

Kennedy Park is significant because:

- ❖ it provides a wildlife corridor and habitat for fauna between the National Park, the escarpment and Inglewood Park.
- ❖ it provides potential habitat for endangered and significant species including the Glossy Black-cockatoo, Squirrel Glider and Long Nosed Bandicoot.
- ❖ it provides a diverse example of urban bushland, a record of pre-European landscape.
- ❖ it provides an example of Spotted Gum Forest, a plant community of State conservation significance.
- ❖ it contributes to the scenic and landscape quality of McCarrs Creek, and area of estuarine bushland.
- ❖ it provides habitat trees and other niches for a range of native fauna including Swamp Wallabies and insectivorous bats.

3.2 Management Objectives

The management objectives for Kennedy Park Reserve are:

- ❖ to protect the natural features of the Reserve;

- ❖ to conserve and manage the significant vegetation and fauna in the Reserve;
- ❖ to adequately manage the bushland in relation to weed invasion and encroachments;
- ❖ to utilise fire to maintain the diversity of native plants in the Reserve to conserve native flora and fauna;
- ❖ to control introduced animals in the Reserve; and
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion

Dumping and garden escapes has led to weed infestation around the perimeter. Disturbance related to a Water Board pipeline from Kennedy Place, across the middle of the Reserve has also influenced the spread of weeds. Bitou Bush may have arrived in bird droppings on their return to the National Park.

Weeds include Bitou Bush, Lantana, Ochna, Paspalum, Senna, Bamboo and Potato Vine.

4.2 Bush Regeneration

The perimeter of the Reserve should be targeted with the top of Reserve given high priority. The bulk of the Reserve has light to medium density weed so that only one or two sweeps would be required. This weeding could include the service line.

The weeds have not overly impacted on the resilience of the native community. Once the understorey is restored the weeds are unlikely to re-establish.

Directing residential stormwater would be identified as an issue during this work and those owners asked to remedy the improper practice.

4.3 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 – Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan. Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction.

Following burn within the Reserve a weed control program needs to be initiated. The ground layer has a medium layer of leaf litter and fire does not appear to have occurred recently.

4.4 Management of Native Fauna and Introduced Predators

Kennedy Park provides good habitat for fauna with a variety of habitat components. The fauna activity is evident from diggings, scratch marks

and droppings throughout the Reserve. Where weeds are common in the understorey, their replacement with native shrubs would enhance the habitat value of the Reserve.

A Pittwater wide public awareness campaign will address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve.

Feral cat and fox predation is an issue that needs to be addressed through a Pittwater-wide control strategy.

4.5 Access and Neighbours

There are no formal tracks within the Reserve and access is limited. There are access issues related to a right of carriageway that requires resolution.

5.0 Performance

Management Objectives	Performance Targets (Actions)	Responsibility	Completion Date	Capital Cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration	Formation of volunteer bush regeneration group	Natural Resources	When community demand	Staff time	\$100pa + \$400 approx materials	Group commenced
Habitat Improvement	Habitat included in bush regeneration program	Natural Resources	When volunteer group established		Staff time	Improved faunal habitat
Management of native fauna & introduced predators	Public awareness campaign for responsible pet ownership & feral animal program	Natural Resources & Compliance	When funds available as well as ongoing programs	Ongoing	Costed within a Pittwater wide feral animal control program	An increase in native fauna in the Reserve
Fire Management	Ensure appropriate fire regime	Natural Resources & Fire Control	Ongoing		Staff time	Fire regime protects property & biodiversity
Boundaries & neighbours	Bush friendly information distributed	Natural Resources	1998/99	\$150		Sympathetic public behaviour
	Notify residents of encroachments Access issues addressed.		Negotiations commenced 1997/98			Encroachments regained. Access issues resolved.

Walana Crescent Reserve, Mona Vale

Reserve Number: 0116

Street Address: 1, 3, 5 & 7 Walana Crescent, Mona Vale.

1. Description & Category

1.1 Location and Description

Walana Crescent Reserve is located on Mona Vale Road, west of Mona Vale Cemetery. The narrow reserve occupies 0.46 hectares between Walana Crescent and Mona Vale Road.

1.2 Land Tenure and Property Description

Walana Crescent Reserve is owned by Council and is described as Lots 1, 2, 3 and 4 in DP 350940. The land is zoned 6(a) Open Space - Existing Recreation A.

1.3 Category of Land

Walana Crescent Reserve is community land under the Local Government Act 1993. It is categorised as a natural area and further categorised as bushland. It meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2. Natural And Cultural Heritage

2.1 Topography, Geology and Soils

Walana Crescent Reserve is at the base of a north south escarpment and has an easterly aspect.

The slope is characterised by geology of the Terrigal Formation of the Narrabeen Group. On the lower slopes, moderately deep to deep yellow podzolic soils have been derived from fine-grained sandstone and claystones. Colluvial influence of Hawkesbury Sandstone is present.

These soils have a very high soil erosion hazard.

2.2 Hydrology

The reserve is located mid catchment, below Ingleside and Katandra Bushland Sanctuary. There are no permanent natural drainage lines. Seasonal waterlogging is expected to occur as the Reserve is situated on a footslope.

2.3 Vegetation

At Walana Crescent Reserve, the dominant indigenous canopy species indicate that the area lies at an interface between shale and sandstone geology. Colluvial sands from the areas of Hawkesbury Sandstone geology higher up the slopes overly shales of the Narrabeen Group. Native tree species present include Sydney Peppermint (*Eucalyptus piperita*), Turpentine (*Syncarpia glomulifera*), Smooth-barked Apple (*Angophora costata*), Grey Ironbark (*E. paniculata*) and Broad-leaved White Mahogany (*E. umbra*).

The understorey is severely disturbed through much of the area. In the more intact areas the understorey includes small trees of rainforest associated species such as Cheese Tree (*Glochidion ferdinandi*), Hard Corkwood (*Endiandra sieberi*), Blueberry Ash (*Elaeocarpus reticulatis*) and Bastard Rosewood (*Synoum glandulosum*).

Shrubs include Breynia (*Breynia oblongifolia*), Muttonwood (*Rapanea variabilis*), White Spider Flower (*Grevillea linearifolia*), Acacia longissima, Hairy Clerodendrum (*Clerodendrum tomentosum*), Mock Olive (*Notelaea longifolia*) and Common Hop Bush (*Dodonaea triquetra*).

Vines include Old Man's Beard (*Clematis aristata*) and Water Vine (*Cissus hypoglauca*), and ground covers (*Lomandra multiflora*), Blady Grass (*Imperata cylindrica*), Kangaroo Grass (*Themeda australis*) and Blue Flax Lily (*Dianella caerulea*).

2.4 Fauna

Due to the adjacent roads, weed invasion and dumping, fauna habitat has been devalued at Walana Crescent. Some canopy trees remain providing habitat for a variety of birds. Bandicoot digging activity has been noted.

Council's Habitat and Wildlife Corridor Conservation Strategy maps the reserve as "Major Habitat - MH " which indicates major habitat areas. This signifies a high degree of diversity within the Reserve in both habitat types and species presently using it.

The reserve is on the edge of extensive bushland areas, mainly private, and association adds to the Reserve's significance.

2.5 Aboriginal and Non-Aboriginal Sites

There are no recorded Aboriginal sites within the Reserve, although there is potential for Aboriginal sites such as axe grinding grooves and engravings to occur in the area.

There are no known European Heritage sites in the Reserve.

3.0 Significance and Objectives

3.1 Statement of Significance

Walana Crescent Reserve is significant because:

- ❖ it protects an example of bushland which provides an interface between vegetation characteristic of Hawkesbury Sandstone and Narrabeen shales;
- ❖ it is adjacent to an area of major habitat and aids faunal movement throughout the Bayview/ Ingleside area with habitat trees;
- ❖ it contributes to the landscape quality of Mona Vale and provides a record of the original landscape and the changes wrought by urban development;
- ❖ it acts as a gateway portion of bushland to Mona Vale.

3.2 Management Objectives

The management objectives for Walana Crescent Reserve are:

- ❖ to protect the natural features of the Reserve;
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve;
- ❖ to adequately manage the bushland in relation to encroachments, weed invasion and fire management;
- ❖ to protect life and property from wildfire and to maintain ecological processes by seeking to maintain a near-natural fire regime to conserve native flora and fauna in the Reserve;
- ❖ to control introduced animals in the Reserve;
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion and Bush Regeneration

The boundaries of the Reserve have been affected by road construction works and road runoff. A number of terraces have been constructed in the lower two-thirds of the Reserve.

The least weed infested bushland is located at the top of the Reserve, becoming progressively more weed infested in the lower two-thirds. The most common weeds are Lantana, Cassia and Bamboo. Other weed species present include Cotoneaster, Oleander, Camphor Laurel, Crofton Weed, Fishbone Fern and Morning Glory.

Bush regeneration is needed to improve the viability of the remnant native vegetation and should follow these principles and priorities:

- 1) work from intact good bush, towards the weedier sections downslope.

- 2) weed control followed by planting indigenous species and mulching the areas along road verges in the lower areas.

4.2 Eucalypt dieback

A number of trees have been affected by roadworks and disturbances to soil levels and water. This is particularly evident along Mona Vale Road.

4.3 Stormwater Management

Roadside runoff affects the southern boundary of the Reserve and accumulates in the eastern corner depositing sediment.

4.4 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction. Rainforest species present should not be burnt.

4.5 Management of Native Fauna and Introduced Predators

Walana Crescent Reserve is adjacent to a significant and large area of bushland and contributes with its diverse plant community and a variety of habitat components. The mature trees with hollows, fibrous bark and mixed understorey encourage diversity of fauna and food availability.

If bush regeneration is initiated, maintaining weed piles to create pockets of habitat would aid the fauna that may occupy the reserve.

A Pittwater-wide public awareness campaign would address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. Compliance signs would assist.

Feral cat and fox predation are issues that need to be addressed through a Pittwater-wide control strategy.

4.6 Access, walking tracks and recreation

The Reserve provides a screen and begins the bushland character of Mona Vale Road as the road leaves Warriewood valley. The Reserve has the potential to become an example to the public of the 'green' attitudes the Pittwater area encourages. This may translate to regeneration of the Reserve as a gateway or display section of bushland. A seating area in the Reserve could be added for visitor use.

5.0 PERFORMANCE

Management Objectives	Performance Targets (Actions)	Responsibility	Target Date	Capital Cost estimate	Recurrent Cost estimate	Performance Measures
Weed Control & Bush Regeneration	Letterbox drop to re-establish volunteer group	Natural Resources	When community demand	Staff time	\$1 400pa supervision & materials	Group commenced
Management of native fauna & introduced predators	Public awareness & feral animal program	Natural Resources & Compliance	Feral animal control when funds available	Seek detailed costings	Costed within a Pittwater wide feral animal control program	Fauna populations extant
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff time	Fire regime protects property & biodiversity
Access & Use	Establish seating area	Natural Resources	When funds available	\$500		Public use

Fauna Species List Bayview

Key

Record

UBS - urban bushland survey summer; UBW - urban bushland survey winyer

PA P. Antcliff pers comm; AES - survey of Nangana Road

Status

R=resident F=frequent visitor

W=winter migrant

L=likely to occur

O=occasional or uncommon visitor S=summer migrant

Bold = regionally significant sp

Bold Italic =Threatened sp

Common Name	Scientific Name	Record	Status
Birds			
Brown Goshawk	Accipiter fasciatus	L	F
Little Eagle	Hieraaetus morphnoides	UBS	O
Spotted Turtle-dove	Streptopelia chinensis	UBS	R
Brown Cuckoo-Dove	Macropygia amboinensis	L	R
Common Bronzewing	Phaps chalcoptera	L	F
Sulphur-crested Cockatoo	Cacatua galerita	UBS	F
Galah	Cacatua roseicapilla	UBS	F
Yellow-tailed Black-Cockatoo	Calyptorhynchus funereus	L	F
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	PA 95	O
Australian King-Parrot	Alisterus scapularis	UBS	F
Crimson Rosella	Platycercus elegans	L	F
Eastern Rosella	Platycercus eximius	UBW	O
Scaly-breasted Lorikeet	Trichoglossus chlorolepidotus	L	O
Rainbow Lorikeet	Trichoglossus haematodus	UBS	F
Fan-tailed Cuckoo	Cuculus pyrophanus	UBS	R
Shining Bronze-Cuckoo	Chrysococcyx lucidus	L	S
Common Koel	Eudynamys scolopacea	L	S
Channel-billed Cuckoo	Scythrops novaehollandiae	L	S
Southern Boobook	Ninox novaeseelandiae	UBS	R
Powerful Owl	<i>Ninox strenua</i>	PA 95	F
Tawny Frogmouth	Podargus strigoides	UBS	R
Owlet-nightjar	Aegotheles cristatus	L	R
Spine-tailed Swift	Hirundapus caudacutus	L	S
Kookaburra	Dacelo novaeguinea	UBS	R
Sacred Kingfisher	Halcyon sancta	L	S
Dollarbird	Eurystomus orientalis	L	S
Black-faced Cuckoo-shrike	Coracina novaehollandiae	UBS	R
Cicadabird	Coracina tenuirostris	L	S
Eastern Yellow Robin	Eopsaltria australis	AES 93	R
Rose Robin	Petroica rosea	L	W
Golden Whistler	Pachycephala pectoralis	AES 93	R
Rufous Whistler	Pachycephala rufiventris	L	S
Grey Shrike-thrush	Colluricincla harmonica	UBS	R
Leaden Flycatcher	Myiagra rubecula	L	S
Black-faced Monarch	Monarcha melanopsis	L	S
Grey Fantail	Rhipidura fuliginosa	UBS	R
Rufous Fantail	Rhipidura rufifrons	L	S
Eastern Whipbird	Psophodes olivaceus	UBS	R
Superb Fairy-wren	Malurus cyaneus	UBS	F
Variegated Wren	Malurus lamberti lamberti	L	F
White-browed Scrubwren	Sericornis frontalis	UBS	R
White-throated Warbler	Gerygone olivacea	L	S
Brown Warbler	Gerygone mouki	AES 93	S

Striated Thornbill	Acanthiza lineata	L	F
Brown Thornbill	Acanthiza pusilla	UBS	R
White-throated Treecreeper	Climacteris leucophaea	L	R
Eastern Spinebill	Acanthorhynchus tenuirostris	UBS	R
Red Wattlebird	Anthochaera carunculatus	UBS	R
Little Wattlebird	Anthochaera chrysoptera	L	R
Yellow-faced Honeyeater	Lichenostomus chrysops	UBW	W
White-eared Honeyeater	Lichenostomus leucotis	L	F
Noisy Miner	Manorina melanocephala	UBS	R
Lewin's Honeyeater	Meliphaga lewinii	UBS	R
White-naped Honeyeater	Melithreptus lunatus	UBW	W
Noisy Friarbird	Philemon corniculatus	L	R
White-cheeked Honeyeater	Phylidonyris nigra	L	F
New Holland Honeyeater	Phylidonyris novaehollandiae	L	F
Spotted Pardalote	Pardalotus punctatus	UBS	F
Silvereye	Zosterops lateralis	UBS	F
Red-browed Finch	Emblema temporalis	UBS	F
Common Mynah	Acridotheres tristis	UBS	R
Olive-backed Oriole	Oriolus sagittatus	L	S
Spangled Drongo	Dicrurus hottentotus	AES 93	S
Satin Bowerbird	Ptilonorhynchus violaceus	AES 93	R
Australian Magpie Lark	Grallina cyanoleuca	L	R
Grey Butcherbird	Cracticus torquatus	UBS	R
Australian Magpie	Gymnorhina tibicen	UBS	R
Pied Currawong	Strepera graculina	UBS	R
Australian Raven	Corvus coronoides	UBS	R
<u>Mammals</u>			
Short-beaked Echidna	Tachyglossus aculeatus	L	R
Tiger Quoll	Dasyurus maculatus	L	O
Brown Antechinus	Antechinus stuartii	AES 93	R
Swamp Wallaby	Wallabia bicolor	UBS	R
Sugar Glider	Petaurus breviceps	UBS	R
Common Ringtail Possum	Pseudocheirus peregrinus	UBS	R
Common Brushtail Possum	Trichosurus vulpecula	UBS	R
Koala	Phascolarctos cinereus	L	O
Long-nosed Bandicoot	Perameles nasuta	UBS	R
Bush Rat	Rattus fuscipes	AES 93	R
Grey-headed Flying-fox	Pteropus poliocephalus	L	O
Gould's Wattled Bat	Chalinolobus gouldii	AES 93	R
Common Bent-wing Bat	Miniopterus schreibersii	L	F
Fox	Vulpes vulpes	AES 93	R
<u>Reptiles</u>			
Blind Snake	Ramphotyphlops nigrescens	L	R
Green Tree Snake	Dendrelaphis punctulatus	L	R
Red-bellied Black Snake	Pseudechis porphyriacus	L	R
Yellow-faced Whip Snake	Demansia psammophis	L	R
Lace Monitor	Varanus varius	L	R
Bearded Dragon	Pogona barbata	L	R
Eastern Water Dragon	Physignathus leseurii	L	R
Leaf-tailed Gecko	Phyllurus platurus	L	R
Leseur's Velvet Gecko	Oedura leseurii	L	R
Eastern Water Skink	Eulamprus quoyii	UBS	R
Cunninghams Skink	Egernia cunninghamii	L	R
Striped Skink	Ctenotus robustus	L	R
Copper-tailed Skink	Ctenotus taeniolatus	L	R
Grass Skink	Lampropholis delicata	UBS	R
Garden Skink	Lampropholis guichenoti	UBS	R

Weasel Skink	Saproscincus mustelina	L	R
Blue-tongued Lizard	Tiliqua scincoides	L	R
Eastern Long-necked Tortoise	Chelodina longicollis	L	R
<u>Frogs</u>			
Common Eastern Froglet	Crinia signifera	UBS	R
Brown-striped Frog	Limnodynastes peronii	L	R
Red-Crowned Toadlet	Pseudophryne australis	L	R
Green Tree Frog	Litoria caerulea	L	R
Peron's Tree Frog	Litoria peronii	L	R
Leaf Green Tree Frog	Litoria phyllochroa	L	R

East McCarrs Creek Road Reserve, Church Point

Reserve Number: 0110

Street Address: 229 McCarrs Creek Road, Church Point.

1.0 Description & Category

1.1 Location and Description

The East McCarrs Creek Road Reserve is located in Church Point close to the boundary between Ku-ring-gai Chase National Park and McCarrs Creek Road. The Reserve is bounded on the west and north partly by McCarrs Creek Road and undeveloped allotments fronting the road. The southern boundary is the unformed Boundary Road and the eastern boundary is defined by residential allotments from Gilwinga Drive and Barcoola Place. The Reserve is undeveloped bushland situated on a west facing slope and occupies 2.57ha.

1.2 Land Tenure and Property Description

East McCarrs Creek Road Reserve is owned and managed by Council and is described as Reserve for Access in DP 12164, Lots 1 to 5 in DP 20097, Lot 2 in DP 517452 and Lot 1 in DP 520537. The land is zoned 6(a) Open Space - Existing Recreation and 9(d) Arterial Road Reserve.

1.3 Category of Land

East McCarrs Creek Road Reserve is community land under the Local Government Act, 1993. It is categorised as a natural area and further categorised as bushland and watercourse. The Reserve meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2.0 Natural and Cultural Heritage

2.1 Topography, Geology and Soils

The Reserve is situated on a west facing slope from near the crest to midway down the slope. It contains a boulder-lined creekline and occasional floaters.

The Reserve features Hawkesbury Sandstone geology giving rise to the GyMEA soil landscape with steep slopes and occasional sandstone boulders and benches. Lower parts of the reserve feature shales and sandstones of the Newport formation in the Narrabeen Group. These give rise to siliceous sands and moderately deep red, brown and gleyed podzols strongly influenced by the sandstone plateau. These soils have been mapped as a Watagan soil landscape and may lead to mass movement presenting a severe soil erosion hazard.

2.2 Hydrology

The Reserve is located in the mid to lower part of the catchment and is adjacent to Cicada Glen Creek. It contains a permanent watercourse running west down a steeply sloping sandstone boulder-strewn path. The water channel was observed to have green algae growing on the boulders. There is a second perennial drainage line associated with a wetter plant community.

2.3 Vegetation

The uppermost parts of the slope support Hawkesbury Sandstone Open Forest dominated by Smooth-barked Apple (*Angophora costata*) and Red Bloodwood (*Corymbia gummifera*). The understorey includes *Pultenaea daphnoides*, Soft Boronia (*Boronia mollis*) and Sydney Boronia (*B. ledifolia*). Downslope, Sydney Peppermint (*Eucalyptus piperita*) dominates in the majority of the Reserve. Here the small tree and shrub layer includes Forest Oak (*Allocasuarina torulosa*), Pine-leaf Geebung (*Persoonia pinifolia*), Smooth

Geebung (*P. levis*), Woody Pear (*Xylomelum pyriforme*), Common Hop Bush (*Dodonea triquetra*), and Sunshine Wattle (*Acacia terminalis*).

Turpentine (*Syncarpia glomulifera*) and Cabbage-tree Palm (*Livistona australis*) with a Bracken (*Pteridium esculentum*) understory dominate the adjacent moist areas at the bottom slopes of the reserve.

The permanent creekline contains a Coachwood Closed-forest dominated by Coachwood (*Ceratopetalum apetalum*). The small tree and shrub layer includes Water Gum (*Tristaniopsis laurina*), *Tristania nerifolia*, Black Wattle (*Callicoma serratifolia*), Cheese Tree (*Glochidion ferdinandi*), New South Wales Christmas Bush (*Ceratopetalum gummiferum*), Crinkle Bush (*Lomatia silaifolia*), Saw Sedge (*Gahnia sp*) and Gristle Fern (*Blechnum cartilaginum*). Coachwood Closed Forest is considered to be a regionally significant plant community.

2.4 Fauna

The Reserve has a direct connection to the bushland in and around Ku-ring-gai Chase National Park which has resulted in an extensive faunal species list. Its complex vegetation structure, although somewhat disturbed by the 1994 fire, provides cover and food resources for a range of species including the threatened Glossy Black-cockatoo which has been seen feeding in Forest Oak nearby.

During late 1995 a juvenile Powerful Owl was observed in the Reserve. The main prey for Powerful Owls are Sugar Glider and Common Ringtail Possum which occur locally.

Swamp Wallaby tracks and droppings were observed further demonstrating faunal diversity within this Reserve.

Upper parts of the Reserve may provide habitat for Red-crowned Toadlet, Giant Burrowing Frog and Heath Monitor.

Council's Habitat and Wildlife Corridor Strategy maps East McCarrs Creek Road Reserve as 'major habitat MH'. This signifies a high degree of diversity within the Reserve in both habitat types and species present. It provides a vegetated link from the National Park into the urban bushland remnants of Church Point and Pittwater.

2.5 Aboriginal and Non-aboriginal sites

There are no recorded Aboriginal sites within East McCarrs Creek Road Reserve although there is potential for sites such as axe grinding groves, engravings and middens to occur in this area.

There are no known sites of European heritage in the Reserve.

3.0 Significance and Objectives

3.1 Statement of Significance

East McCarrs Creek Road Reserve is significant because:

- ❖ it protects an example of undisturbed bushland of Church Point and is continuous with other naturally vegetated land near Ku-ring-gai Chase National Park;
- ❖ it protects an example of Coachwood Closed Forest, which is significant in the Sydney region;
- ❖ it is classified as a major habitat area in Council's Habitat and Wildlife Corridors Conservation Strategy with a high degree of biodiversity and acts as an important habitat and link to other habitat for faunal species movement;
- ❖ it provides habitat for threatened species of fauna namely Glossy Black-cockatoo, Powerful Owl, Red-crowned Toadlet, Giant Burrowing Frog and Heath Monitor;
- ❖ it allows the study of post fire vegetation response;
- ❖ it contributes to the landscape quality of McCarrs Creek and provides a record of the original landscape and the changes wrought by urban development;
- ❖ it is an educational resource and a contact point with nature for residents; and
- ❖ it allows urban residents to undertake informal recreational pursuits in a bushland setting.

3.2 Management Objectives

The management objectives for East McCarrs Creek Road Reserve are:

- ❖ to protect the natural features of the Reserve particularly populations of significant plant communities and fauna species;
- ❖ to maintain a natural range of structural and floristic diversity of bushland within the Reserve;
- ❖ to protect life and property from wildfire and to maintain ecological processes by seeking to maintain a near-natural fire regime in those parts of the Reserve with exception to the closed forest area to conserve native flora and fauna in the Reserve;
- ❖ to adequately manage the bushland in relation to encroachments and weed invasion;
- ❖ to control introduced animals in the Reserve;
- ❖ to provide low impact recreational and educational use of the Reserve consistent with the other objectives, and
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion & Bush Regeneration

Weed degradation in the Reserve is occurring along the roadside and down the creekline. Along the roadside, weeds are sparse and include Lantana and Cobblers Pegs. The creekline contains Balsam and other moisture-loving weeds. Residential properties above contain numerous weeds, which could potentially establish in the Reserve.

The January 1994 bush fires promoted natural regeneration of the Reserve with optimum conditions for germination of many species. Some areas are now dominated Flannel Leaf (*Astrotricha floccosa*), a pioneer species responding to the fire.

Weed control will include the following:

- ❖ The roadside infestation of Lantana should require only minimal return visits once removed;
- ❖ The creekline requires weeding along its length.

4.2 Stormwater Management

Urban development occupies the upper catchment and water quantity and quality has been affected by the increased urban runoff. This development in the catchment has caused erosion and siltation of the creekline. Signs of excess nutrients on channel boulders indicating fertiliser overuse by the presence of green filamentous algae. The sandy sediment load in the creek results from inadequate sediment and erosion controls on development sites.

4.4 Fire Regime

The wild fires of 1994 allowed regeneration of the bushland but also significantly affected the Closed Forest community by damaging some of the mature trees which has opened the canopy, exposing the ground layer.

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings by Warringah Pittwater Bush Fire Services and any hazard reductions required will be undertaken in accordance with the Fuel Management Plan. Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction especially areas containing rainforest species within closed forest communities.

The Hawkesbury Sandstone Open Forest should not be burnt more often than once in ten years. Variability in the fire regime is recommended in both intensity and season of burn. Following a burn within the Reserve, a weed control program will be initiated.

4.5 Management of Native Fauna and Introduced Predators

The proximity of the Reserve to residential areas and Ku-ring-gai Chase National Park make it susceptible to foxes and feral cats. This should be addressed via a Pittwater wide feral animal control program introduced in conjunction with the National Parks and Wildlife Service.

The value of bushland as habitat for fauna will be the focus of a program directed to neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. The residents will be encouraged to observe and record the fauna movements to assist in the better understanding of the native wildlife.

4.6 Access, Boundaries and Neighbours

Signage for the Reserve is needed. There are currently no formal tracks within the Reserve, although there is access at the roadside culvert near the creekline.

There is a need for a public awareness and education campaign to encourage residents to take a bush sensitive approach to managing their property boundaries. In particular, residents above the Reserve may need guidance regarding the effect landfilling and clearing can have on bushland resulting in accelerated erosion and weed dispersal.

5.0 Performance

Management objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital Cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration	Letterbox drop for volunteer group	Natural Resources	When community demand	Staff time	\$1400pa supervision & materials	Group commenced
Stormwater Management	Ensure soil erosion devices used on building sites Public education about minimising nutrients	Built Environment Natural Resources	Ongoing As part of a bush friendly campaign	Leaflet \$500	Integrate into works & maintenance programs	No further erosion of the creek & better water quality
Management of native fauna & introduced predators	Public awareness campaign for responsible pet ownership & feral animal program	Natural Resources & Compliance	When funds available as well as ongoing programs	Ongoing	Costed within a Pittwater wide feral animal control program	
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff time	Safe fuel levels & conservation
Access, boundaries & neighbours	Signage & community awareness & public participation in the Reserve	Natural Resources	Sign 1998/99 Other when resources available	Sign \$500	Staff time	Public co-operation & appreciation

McCarrs Creek Road Reserve (1), Church Point

Reserve Number: 0106

Street Address: Adjacent to 23 McCarrs Creek Road, Church Point.

1.0 Description & Category

1.1 Location and Description

McCarrs Creek Road Reserve (1) is located in Church Point, south of the Public Wharf, the General Store and Quarter Sessions Road Reserve. The Reserve is located between residential properties and is separated from Pittwater by McCarrs Creek Road. Residential access is via a sealed road through the Reserve. The Reserve is 0.38ha in size.

1.2 Land Tenure and Property Description

McCarrs Creek Road Reserve (1) is owned by Council and is described as a Public Road Reserve and zoned as 6 (a) Open Space - Existing Recreation and 9(d) Arterial Road Reservation.

1.3 Classification of Land

McCarrs Creek Road Reserve (1) is a Public Road and is categorised as a natural area which is further categorised as bushland. It meets the definition of bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2.0 Natural and Cultural Heritage

2.1 Topography, Geology and Soils

McCarrs Creek Road Reserve (1) is on a west-facing colluvial footslope that marks the entrance of McCarrs Creek into Pittwater. The narrow, steeply sloping Reserve has occasional sandstone benches.

The underlying shale and sandstone geology is the Newport Formation of the Narrabeen Group. Soils derived are moderately deep brown, red and gleyed podzols which have been mapped as

the Watagan Soil Landscape. These soils are prone to mass movement and present a severe soil erosion hazard when disturbed.

2.2 Hydrology

The Reserve falls within the McCarrs Creek catchment. It is at the bottom of a steep local catchment and has a minor creekline. The Reserve receives runoff from the ridgeline and crest above where development includes residences and some roads.

2.3 Vegetation

The Reserve supports Spotted Gum Forest dominated by Spotted Gum (*Corymbia maculata*). The low tree layer ranges from wet gully species to a drier more exposed understorey.

In the southern area a stand of Cabbage-tree Palms (*Livistona australis*) forms a closed understorey with Rough-fruit Pittosporum (*Pittosporum revolutum*) and Water Vine (*Cissus hypoglauca*). In the remainder of the Reserve, the small tree and shrub layer includes Black She-oak (*Allocasuarina littoralis*), Narrow-leaved Geebung (*Persoonia linearis*), and Common Hop Bush (*Dodonea triquetra*). Groundlayer species include Scrambling Lilly (*Geitenoplesium cymosum*), Blue Flax Lilly (*Dianella caerulea*), Mat Rush (*Lomandra longifolia*) and Barbed-wire Grass (*Cymbopogon refractus*).

2.4 Fauna

This Reserve can be viewed as a “stepping stone” for faunal movement to areas of the Western Foreshores, Scotland Island and the National Park. The local fauna benefits from the intact indigenous understorey, which although weed infested provides thickets for habitat. There are aboreal mammal scratch marks on numerous trees, and digging holes indicate the presence of Long-nosed Bandicoots.

Council's Habitat and Wildlife Corridor Conservation Strategy maps McCarrs Creek Road Reserve (1) as "Corridor - C01" which indicates corridors or habitat areas though disturbed are likely to be of good value due to a natural and complete crown cover and/or understorey.

2.5 Aboriginal sites

There are no recorded Aboriginal sites within the Reserve. There is potential for Aboriginal sites such as middens, engravings and axe grinding grooves to occur in the area, as other nearby sites have been recorded in the National Parks and Wildlife Services Site Register.

3.0 Significance and Objectives

3.1 Statement of Significance

McCarrs Creek Road Reserve (1) is significant because:

- ❖ it contains Spotted Gum Forest which is of conservation significance at a State level;
- ❖ it acts as a stepping stone to aid faunal movement throughout Bayview, Church Point, and the Western Foreshores to the larger bushland areas of the National Park;
- ❖ it provides habitat for regionally significant species of fauna, the Long-nosed Bandicoot
- ❖ it contributes to the landscape quality of the Pittwater foreshore adjacent to a major public wharf;
- ❖ it protects an example of the bushland of Church Point in a similar condition to that which occurred when the area was first visited by Europeans; and
- ❖ it is an educational resource and a contact point with nature for residents.

3.2 Management Objectives

The management objectives for McCarrs Creek Road Reserve (1) are:

- ❖ to monitor the tree canopy and dieback;

- ❖ to protect the natural features of the Reserve, in particular the significant Spotted Gum Forest and Long-nosed Bandicoot habitat;
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve;
- ❖ to adequately manage the bushland in relation to encroachments and weed invasion;
- ❖ to protect life and property from wildfire and to maintain ecological processes by seeking to maintain a near-natural fire regime in those parts of the Reserve with exception of the closed forest area to conserve native flora and fauna in the Reserve;
- ❖ to control introduced animals in the Reserve;
- ❖ to provide low impact recreational and educational use of the Reserve consistent with the other objectives, and
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion & Bush Regeneration

The understorey is infested with weeds due to disturbances which include the roadside cutting and drains off McCarr's Creek Road, the access road, drains, the road embankment and vegetation dumping.

In the southern, moister area weeds include Asparagus Fern, Small-leaved Privet, Lantana, Morning Glory, Resurrection Plant and *Anredera* established in the more exposed areas of the slope. The large edge to area ratio makes weed invasion more prevalent along urban edges as weeds can easily be blown in and reinfestation occur.

Bush regeneration and some tree planting has been carried out around an area of Cheese Trees and is in need of follow-up weeding. The weed cover is greatest near drain outlets and vegetation waste piles.

The drain outlets need improvement to limit the spread of stormwater across the slope and the piles should either be removed or burnt.

4.2 Eucalypt Dieback

The mature Spotted Gums in the Reserve should be monitored as their natural environment has been disturbed by the surrounding suburban development including drains, compaction from road traffic and building work. Natural or assisted regeneration of Spotted Gums, or replanting from a local seed source, should be encouraged.

4.3 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. Due to the very small size of the Reserve and definition by sealed access ways the Reserve is considered a low risk making a fuel reduced zone inappropriate. The Reserve will be regularly monitored for fuel loading by the Warringah Pittwater Bush fire Services and any hazard reductions or regenerative burns will be undertaken in accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council Environmental staff to determine methods of hazard reduction. Following a burn within the Reserve, a weed control program will be undertaken.

An appropriate fire regime needs to be maintained within the Reserve to ensure the survival of the significant Spotted Gum Forest.

4.4 Management of Native Fauna and Introduced predators

The presence of winter flowering Spotted Gums, understorey habitat and a stand of Cabbage-tree Palms adds to the habitat value and should be maintained in future management of the Reserve.

A Pittwater wide public awareness campaign will address the value of the bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. Fox predation is an issue which needs to be addressed through a Pittwater wide control strategy.

4.5 Access and walking tracks

The Reserve is crossed by an access road, a pedestrian path to the bus stop and other minor tracks for dumping garden waste. The small tracks should be rationalised by brush matting where unnecessary.

4.8 Boundaries and neighbours

Residents have been dumping garden refuse in the Reserve, increasing weed infestation, nutrients and fuel loadings. Encroachments threaten the integrity of the Reserve, and include carports and level lawn areas that are used as extensions of gardens. Vegetation has been cleared to allow views of Pittwater. In some places this has been done in conjunction with clearing around powerlines. Along the entrance to the Reserve an old garden has been left neglected and overgrown. The conservation of the bushland requires a community-oriented bushland awareness program to protect it from further weed invasion and lawn encroachments.

5.0 Performance

Management Objectives	Performance Targets (Actions)	Responsibility	Completion Date	Capital Cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration	Re-establish a contract bush regeneration program	Natural Resources	As funds available	Seek detailed cost of contract bush regeneration program		Increased area of Reserve with low weed infestation
Eucalypt Dieback	Monitor mature Spotted Gums & promote regrowth	Natural Resources	Ongoing		Staff Time	
Management of Native Fauna & Flora	Public awareness campaign	Natural Resources	Ongoing		Staff Time	
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		In kind staff time	Safe fuel loads & conservation of bushland flora & fauna
Introduced Predators	Public awareness & feral animal control	Natural Resources & Compliance	Within a Pittwater wide program as resources available		Staff time & resources	
Access and walking tracks	Regenerate unnecessary tracks	Natural Resources			Integrate within staff resources & bush regeneration contract	
Boundaries & Neighbours	Regain any encroachments & bush friendly information distributed	Natural Resources	Ongoing Leaflets 1998/99	Leaflets \$150		Sympathetic public behaviour & boundaries restored

Quarter Sessions Road Reserve, Church Point

Reserve Number: 0105

Street Address: 2199 Pittwater Road, Church Point.

1. Description & Category

1.1 Location and Description

Quarter Sessions Road Reserve is located in Church Point above Pittwater Road; there are residences to the east and south and a pathway on the unformed Quarter Sessions Road and a Uniting Church Cemetery to the west. The Reserve is opposite the Church Point General Store and the Public Wharf. It is 0.06 hectares in size.

1.2 Land Tenure and Property Description

The Reserve is owned by Pittwater Council and is described as Lot 15 & Lot 15A in DP10583. The land is zoned 6(a) Open Space - Existing Recreation and 9(d) Arterial Road Reservation.

1.3 Category of Land

Quarter Sessions Road Reserve is community land under the Local Government Act, 1993 and is categorised as a natural area which is further categorised as bushland. It meets the definition of bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2. Natural And Cultural Heritage

2.1 Topography, Geology and Soils

The Reserve is on the footslope of a spur with a northerly aspect at the junction of McCarrs Creek with Pittwater. The shale and quartz sandstone slope is characterised by geology of the Newport Formation of the Narrabeen Group. The soils derived are moderately deep yellow podzolic soils and some deep yellow earths.

The soils have been mapped as the colluvial Erina soil landscape.

2.2 Hydrology

A pathway running downhill acts as to direct water onto a bench area within the Reserve. An area of soil is characterised by seasonal waterlogging exacerbated due to the water channelled down the path.

2.3 Vegetation

The vegetation in the Reserve is characterised by Spotted Gum Forest with dominant canopy species of Spotted Gum (*Corymbia maculata*) and Grey Ironbark (*Eucalyptus paniculata*). Swamp Oak (*Casuarina glauca*) and shrubs covering the road embankment relate to an ecotone with Swamp Oak Woodland that dominated north of Pittwater Road. Adjacent is the cemetery with a healthy tree canopy and ground layer including Kangaroo Grass (*Themeda australis*), Weeping Grass (*Microlaena stipoides*) and Kidney Weed (*Dichondra repens*).

2.4 Fauna

This Reserve acts as a local refuge for fauna from the surrounding residential area and provides a good source of nectar in winter flowering Spotted Gums. It provides a 'stepping stone' for fauna moving to areas of Ku-ring-gai Chase National Park and Scotland Island.

Council's Habitat and Wildlife Corridor Conservation Strategy maps Quarter Sessions Road Reserve as "Corridor - C01" which indicates corridors or habitat areas though disturbed are likely to be of good value due to good crown cover and/or understorey. The Swamp Oak vegetation community has high habitat value (Australian Museum, 1994), in particular Casuarinas are a food source for the Glossy Black-cockatoo, a vulnerable species in NSW.

2.5 Aboriginal sites

A midden exists in the northeast corner of the historic church cemetery. The midden may also extend into the Reserve. The midden includes mainly cockles, oysters, mud oysters and whelk shell types. The location and content of the midden provides information about the local aboriginal society and the molluscs present in Pittwater prior to European settlement.

2.6 Non-aboriginal sites

The Reserve occupies an old church site as indicated by the cutting at the rear of the Reserve. This relates to the cemetery on the other side of Quarter Sessions Road held in Trust by the Uniting Church.

3. Significance and Objectives

3.1 Statement of Significance:

Quarter Sessions Road Reserve is significant because:

- ❖ it contains a small example of Spotted Gum forest considered significant in NSW;
- ❖ it acts as a stepping-stone Reserve between larger habitats due to its location;
- ❖ it contributes to the scenic landscape character of Church Point;
- ❖ it provides a record of the changes wrought by settlement and development on the original landscape;
- ❖ It protects an Aboriginal site;
- ❖ it provides a natural setting for the adjacent historic cemetery;
- ❖ it is an educational resource in a bushland setting and a contact point with nature for residents.

3.2 Management Objectives

The management objectives for Quarter Sessions Road Reserve are:

- ❖ to control drainage affecting the Reserve;
- ❖ to maintain the natural range of structural and floristic diversity in the Reserve by adequately managing the bushland in relation to encroachments and weed invasion;
- ❖ to protect the natural features of the Reserve;
- ❖ to maintain ecological processes by seeking to maintain a near natural fire regime to conserve native flora and fauna in the Reserve;
- ❖ to control introduced animals in the Reserve;
- ❖ to protect the Aboriginal site;
- ❖ to provide a bushland setting for the historic cemetery;
- ❖ to provide low impact recreational and educational use of the Reserve consistent with the other objectives, and
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4. Management Issues

4.1 Weed Invasion & Bush Regeneration

Exotic grass dominates the site. Lantana and Morning Glory are present on the steep slope of the Reserve.

Any bush regeneration program for the Reserve should include weed control, followed by indigenous plant revegetation. This should be staged so that work progresses from the top of the Reserve in horizontal bands. Replacement of exotic grasses with native grass such as Kangaroo Grass (*Themeda australis*) and Weeping Meadow Grass (*Microlaena stipoides*) is recommended.

4.2 Stormwater Runoff

The unlined drain running down Quarter Sessions Road is causing scouring, siltation and a decline in water quality. It requires lining of the channel and the installation of a series of energy dissipators along its length within the Reserve. In addition, a stilling pond and directional outlet channel are required to carry the stormwater across the Reserve. The introduction of locally occurring riparian plants is recommended.

Once the effects of the drain on the Reserve are mitigated it is expected to see a recovery in the condition of the plant community in particular the mature trees.

4.3 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. Due to the extremely small size and sparse understorey and as it is surrounded by urbanisation, the Reserve is considered low risk. A fuel-reduced zone would be inappropriate.

The Reserve will be regularly monitored for fuel loading by Warringah Pittwater Bush Fire Services and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan. Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction. Following a burn within the Reserve, a weed control program will be undertaken.

4.4 Habitat Improvement

Regeneration and restoration measures need to be undertaken, particularly of the understorey to provide suitable habitat for small birds.

4.5 Access and Recreation

There is potential for picnic facilities in the Reserve, facilitated by the level area and proximity to the public wharf. There are good views of Pittwater from the Reserve. The presence of an aboriginal midden, the old church site and associated cemetery could afford interpretive signage of an educational and historical nature relating the cultural change in the area.

5.0 Performance

Management objectives	Performance Targets (actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration	Letterbox drop for volunteer group	Natural Resources	When community demand	Staff time	\$1 400pa supervision & materials	Group commenced
Stormwater control and drainage	Install erosion control structures	Engineers & Natural Resources	When funding available	Seek detailed design & costings	Integrate into works & maintenance programs	No further bank erosion
Habitat Improvement	Understorey regeneration & restoration program	Natural Resources	When funding available	As part of a regen program	Seek ongoing bushland management program	Viable bushland habitat increased
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff time	Safe fuel levels & conservation
Recreation & Interpretive signs	Picnic table & interpretive signs	Natural Resources	As resources available	\$1000		Public appreciation of Reserve

McCarrs Creek Road Foreshore Reserve, Church Point

Reserve Number: 107

Street Address: Via access points between 10 & 12 McCarrs Creek Road, Church Point.

1.0 DESCRIPTION AND CATEGORY

1.1 Location and Description

McCarrs Creek Road Foreshore Reserve is located in Church Point. Residences along McCarrs Creek Road border to the south and east, the foreshore of McCarrs Creek near the bus turning area form the northern and western borders. It is 0.46 hectares in size and is near to large areas of bushland in the National Park. It also provides access to the foreshore of Pittwater and McCarrs Creek.

1.2 Land Tenure and Property Description

The Reserve is owned and dedicated for public recreation by the Department of Land & Water Conservation under the care and management of Pittwater Council. The Reserve is described as a 100 foot Reservation and identified as R78588/9. The land is zoned 6(a) Open Space – Existing Recreation.

1.3 Category of Land

The Reserve is managed according to the principles of Crown Land Management under the Crown Lands Management Act, 1989, and for consistency can also be managed as community land under the Local Government Act 1993. The land is categorised as a natural area and is further categorised as bushland, foreshore and watercourse. The land meets the definition of bushland described in State Environmental Planning Policy No. 19 – Bushland Urban Areas.

2.0 Natural And Cultural Heritage

2.1 Topography, Geology and Soils

McCarrs Creek Road Foreshore Reserve is situated on the creek's tidal foreshore and extends across a west facing lower slope. The foreshore is rocky with the exception of a small beach. The slope is further shaped by a slight spur and two shallow gullies. The underlying geology is the Newport Formation of the Narrabeen Group. The sandstones and shales have given rise to moderately deep brown, red and greyed colluvial podzols which are prone to mass movement and present a severe soil erosion hazard.

2.2 Hydrology

The Reserve has no permanent water courses. Two swales suggest water flow during rainfall. The reserve is at the bottom of a sub catchment within McCarrs Creek tidal area with Kennedy Park in the upper sections of this catchment.

2.3 Vegetation

The Reserve supports Spotted Gum Forest (*Corymbia maculata*). The small tree and shrub layer contains Forest Oak (*Allocasuarina torulosa*), Rough-fruit Pittosporum (*Pittosporum revolutum*), Blueberry Ash (*Eleaocarpus reticulatus*), and Narrow-leaved Geebung (*Persoonia linearis*). Ground layer species include Burrawang (*Macrozamia communis*), Bracken (*Pteridium esculentum*), Kangaroo Grass (*Themeda australis*).

2.4 Fauna

Although the understorey is disturbed, this Reserve has tall Spotted Gums which are winter flowering and provide habitat niches for arboreal mammals and birds. As well as the higher nutrient foliage level in relation to other habitat types, there are also a number of hollow-bearing trees suitable for birds and mammals. Sprouts in dead trees are also important in this manner. The Reserve is likely to be occasionally used by the Powerful Owl as it forages for arboreal mammals.

Council's Habitat and Wildlife Corridor Conservation Strategy maps in Reserve as 'R'. These smaller reserves are likely to have very modified habitat or are suffering adverse edge effects which can be enhanced by planting program or by reducing mowing in grassed areas and allowing natural regeneration.

2.5 Aboriginal Sites

There are no recorded Aboriginal sites within the Reserve, although there is potential for midden, engraving and axe grinding groove sites to occur in the area.

2.6 Non-Aboriginal Sites

An old pathway comprising dimension sandstone steps runs across the Reserve from the site of an old residence to a foreshore landing.

3.0 Significance And Objectives

3.1 Statement of Significance

McCarrs Creek Foreshore Reserve is significant because:

- ❖ It contains Spotted Gum Forest which is significant at a State level;
- ❖ It combines intertidal rocky shore and sandy beach habitat with Open Forest and acts as a stepping stone Reserve to larger bushland areas in the National Park;
- ❖ It provides foreshore access to McCarrs Creek and Pittwater;
- ❖ It contributes to the landscape quality of Pittwater Foreshore and is used as a picnic and recreational area in a bushland setting;
- ❖ It provides a record of the original landscape and the changes wrought by urban development; and

- ❖ It is an educational reserve and a contact point with nature for residents.

3.2 Management Objectives

The management objectives for McCarrs Creek Road Foreshore Reserve are:

- ❖ To protect and maintain the natural range of structural and floristic diversity of bushland in Reserve;
- ❖ To conserve the significant Spotted Gum Forest;
- ❖ To protect the intertidal foreshore zone of the Reserve;
- ❖ To adequately manage the bushland in relation to boat storage, foreshore access, encroachments and access tracks;
- ❖ To protect life and property from wildlife and to maintain ecological processes by seeking to maintain a near-natural fire regime to conserve native flora and fauna in the Reserve;
- ❖ To control introduced animals in the Reserve;
- ❖ To provide low impact recreational and educational use of the Reserve consistent with other objectives, and
- ❖ To encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion

Lawn encroachments and vegetation dumping have led to weed infestation in the Reserve. The lawn areas provide access to the foreshore and have made a larger area useable for ever-increasing boat storage.

Two accessways into the Reserve from McCarrs Creek Road are blocked by heavy infestation of Clumping Bamboo, Brazilian Pepper Tree and Morning Glory.

Weeds have invaded from lot boundaries at the northern end of the Reserve and are established downslope in undisturbed bush. Species include Banana, Lantana, Honeysuckle, and Morning Glory.

4.2 Bush Regeneration

Bush regeneration is needed to improve the viability of the remnant plant community and should follow these principles and priorities:

- ❖ Working from the intact bush to the more weed infested edges;
- ❖ Working from top to bottom, weed control then planting indigenous species; and mulching the areas below the path and bus turning area;
- ❖ Restricting access into bush areas adjacent to a formalised boat storage area and reducing the extent of the mowing practice;
- ❖ Weed maintenance and erosion control along path;
- ❖ Discussion with residents adjacent to blocked accessways regarding removal of weeds prior to any action.

4.3 Stormwater Management

The mown terrace is a result of slope slumping. The resulting terrace has a network of agricultural drains attempting to reduce the extent of impeded drainage. These areas can be revegetated with indigenous water tolerant plants.

Grant funding has been approved for \$17,500 in regard to the proposed seawall extension. The project, to be commenced in the near future, aims to reconstruct the seawall from the southern Reserve boundary to the beach area. The wall will retain slumping earth of the terrace from further movement into the estuary.

4.4 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Bush Fire

Management Committee in accordance with Circular C10 – Planning for Bush Fire Prone Areas. Due to the small size of the Reserve and location of path, a fuel reduced zone is not considered necessary. The Reserve will be regularly monitored for fuel loadings by Warringah Pittwater Bush Fire Services and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council environmental staff to determine methods of hazard reduction.

Following a burn within the Reserve a weed control program is to be initiated.

4.5 Management of Native Flora and Fauna

The conservation of the bushland requires protection from further weed invasion and mown encroachments, and a bush regeneration program. An appropriate fire regime needs to be maintained within the Reserve to ensure the continued survival of the Spotted Gum forest. The survival of this plant community is further at issue as the Reserve contains only several mature trees with sparse understorey, and recruitment of Spotted Gums is not occurring.

4.6 Introduced Predators

A Pittwater wide public awareness campaign will address the value of the bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve.

Fox predation is an issue which needs to be addressed through a Pittwater wide control strategy.

4.7 Access, Tracks and Recreation

There needs to be a sign naming the Reserve. Both accessways are blocked by dense weed growth. Access is from the bus turning area to the north of the Reserve which has become a well defined path. The informal track needs regular attention, especially on the slope.

5.0 Performance (put correct one in here)

Management objectives	Performance Targets (actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration	Seek funds for contract regeneration as part of reserve upgrade	Natural Resources	When funding available	Obtain detailed costs		Bushland actively regenerated
Stormwater control and drainage	Address foreshore erosion by constructing seawall	Reserves	1997/98	\$17,500		No further bank erosion
Habitat Improvement	Within regeneration program	Natural Resources	When funding available	As part of a regen program	Seek ongoing bushland management program	Viable bushland habitat increased
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff time	Safe fuel levels & conservation
Recreation & Interpretive signs	Resolve dinghy storage, track and potential picnic area signage	Natural Resources	As resources available	Seek detailed costs Sign \$500		Public appreciation of Reserve

McCarrs Creek Road Reserve(4), Church Point

Reserve Number: 0244

Street Address: McCarrs Creek Road, Church Point (adjacent to Ku-ring-gai National Park).

1.0 Description & Category

1.1 Location and Description

McCarrs Creek Road Reserve(4) also known as McCarrs Creek Reserve is located at the junction of McCarrs Creek and Cicada Creek in Church Point. Ku-ring-gai Chase National Park is adjacent and residential development is well removed from the Reserve. The Reserve occupies approximately 5 hectares.

1.2 Land Tenure and Property Description

The land is a Crown Reserve No. R 91656 dedicated as a Public Reserve in 1979. It is owned by the Department of Land and Water Conservation and is under the care, control and management of Council. The land is zoned 6(a) Open Space - Existing Recreation A.

1.3 Category of Land

The Reserve is community land under the Local Government Act 1993. It is categorised as a natural area and further categorised as bushland, foreshore and wetland. It meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas. This plan is prepared under the provisions of the Local Government Act, 1993, but is designed to meet the principles of Crown land management under the Crown Land Management Act, 1989.

2.0 Natural and Cultural Heritage

2.1 Topography, Geology and Soils

The Reserve is a filled wetland area and has a maximum relief of less than 3.5m.

Prior to disturbance, soils may have mainly related to the Mangrove Creek estuarine soil

landscape. Valley slopes adjacent to the Reserve along the southern boundary suggest that the original soils may have included soils ranging from the organic sandy loams to organic silty loams associated with Narrabeen Group parent geology.

Imported landfill and dredging spoil overlies the majority of the Reserve following work in the early to mid 1970's. The area was landscaped in 1984/86.

2.2 Vegetation

Vegetation in the Reserve ranges from Mangroves and Saltmarsh on the shoreline, planted Swamp Oak and a small remnant strip of Narrabeen slopes forest along the edge of the Road Reserve.

The planted Swamp Oak Woodland features *Casuarina glauca*. A Bracken fern (*Pteridium esculentum*) understorey occupies an area on the southeastern part of the reserve.

The western end of the bushland strip is Narrabeen slopes forest featuring Rough-barked Apple (*Angophora floribunda*), Turpentine (*Syncarpia glomulifera*), Coastal Banksia (*Banksia integrifolia*), Cabbage-tree Palm (*Livistona australis*), Water Vine (*Cissus hypoglauca*), Sword Sedge (*Gahnia sp.*), Blady Grass (*Imperata cylindrica*), and Scrambling Lily (*Geitonoplesium cymosum*).

Grey Mangroves (*Avicennia marina* var. *australasica*) are regenerating along the foreshores. The mangrove community also incorporates a saltmarsh and rush community in the far western corner of the Reserve.

The middle of the Reserve is now dominated by numerous well established landscape Eucalypt and She-oak plantings.

2.3 Fauna

The growing Casuarina forest provides a food resource and habitat for Glossy Black-cockatoos. Numerous holes are present on the ground indicating Long-nosed Bandicoot activity. Swamp Wallabies would frequent the area. The remnant Mangrove community provides estuarine habitat for fish and invertebrates.

2.4 Aboriginal sites

There are no recorded Aboriginal sites within the Reserve, although there is potential for Aboriginal sites such as axe grinding grooves and engravings to occur in the area.

The National Park's Aboriginal Site Register indicates that a large midden occurs on the north side of McCarrs Creek, near the Reserve.

2.5 Non-aboriginal sites

In the early to mid 1970's spoil from sand dredging activities within McCarrs Creek occupied the site. The majority of the Reserve was covered by at least 1-2m of spoil that was restored to a landscaped park during 1984-86.

3.0 Classification, Significance and Objectives

3.1 Statement of Significance

McCarrs Creek Road Reserve (4) is significant because :

- ❖ it provides habitat for fauna due to its location adjacent to Ku-ring-gai Chase National Park;
- ❖ it contributes to the scenic quality of the estuary, along the roadside and the foreshore of the creekline;
- ❖ it contains a Mangrove community that improves intertidal habitat and minimises creekbank erosion;
- ❖ it provides a vegetated area in an estuarine location;

- ❖ it acts as a stepping stone to aid faunal movement throughout Bayview and Ingleside to the National Park;
- ❖ it is an educational resource and a contact point with nature for residents;
- ❖ it provides public access to the waterway for boat users and picnickers;
- ❖ it allows urban residents to undertake informal recreational pursuits in a bushland setting.

3.2 Management Objectives

The management objectives for McCarrs Creek Road Reserve (4) are :

- ❖ to protect the natural features of the Reserve and improve the habitat features within the parkland;
- ❖ to maintain the structural and floristic diversity of the small amount of remnant bushland in the Reserve;
- ❖ to adequately manage the Reserve in relation to encroachments and weed invasion;
- ❖ to maintain an appropriate fire regime to protect life and property from wildfire and to native flora and fauna in the Reserve;
- ❖ to control introduced animals in the Reserve;
- ❖ to provide low impact recreational and educational use of the Reserve consistent with the other objectives, and
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion and Regeneration

Weeds dominate the perimeter of the Reserve between the filled and landscaped area and McCarrs Creek Road. Vines such as Morning Glory, Lantana, Honeysuckle and Turkey Rhubarb engulfed existing vegetation. The intertidal zone is well maintained.

The initial use of a spider or mechanical device to clear weeds along McCarr's Creek Road is recommended in a staged manner to conserve Long-nosed Bandicoot habitat. Follow-up hand weeding action would be essential to enable successful bush regeneration. The landscaped areas of the Reserve are maturing and require indigenous understorey plantings to improve habitat values.

The intertidal zone is being stabilised by the dominance of mangroves. Further revegetation of the bank using divided tussocks of *Juncus* and other rushes and grasses will help to further stabilise it.

4.2 Stormwater Management

The weed infested drainage swale requires weed removal and introduction of indigenous tussock-forming plantings in the swale to further improve the water quality entering the tidal creek. The current mowing practice has solved the problem of weeds at the Reserve entry.

4.3 Fire Regime

During the 1994 bush fire the lack of native understorey and cover of weeds allowed vigorous weed regrowth.

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in

accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction. Following a burn within the Reserve, a weed control program should be initiated.

4.4 Habitat Improvement

The further regeneration of the Mangrove community is to be encouraged to increase estuarine habitat, improving the health of the creek and native faunal populations.

Further planting of indigenous shrubs and groundcovers in the landscaped area will provide structural diversity under the maturing planted and native canopy. This will provide more diverse plant communities and improve habitat.

4.5 Management of Native Fauna and Introduced Predators

Arboreal animal scratchings and bandicoot diggings are present, however the lack of cover in the majority of the Reserve increases vulnerability to predator attack. Proximity to the larger bushland areas of the National Park highlights fox and feral cat control as an issue that needs to be addressed through a Pittwater wide control strategy.

The dog exercise area is a potential conflict with native fauna habitat and water quality and should be monitored.

4.6 Access and Recreation

The large parking area allows users to arrive by car. The Reserve is regularly used for picnicking, dog exercise and boating.

A proposal exists for a jetty and pontoon close to the dingy storage area together with an extension of the seawall and provision of a ramp for dinghy access. These works aim to improve the amenity of the Reserve for the community.

5.0 Performance

Management objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration <input type="checkbox"/>	Mechanical weed clearance & follow up bush regeneration <input type="checkbox"/>	Natural Resources <input type="checkbox"/>	When funds available <input type="checkbox"/>	Seek detailed costing	As required	Restoration program commenced
Stormwater Management <input type="checkbox"/>	Restoration program <input type="checkbox"/>	Natural Resources Works Services <input type="checkbox"/> &	When funds secured <input type="checkbox"/>	Seek detailed costings <input type="checkbox"/>	Integrate into maint. programs <input type="checkbox"/>	Improved water quality & habitat <input type="checkbox"/>
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff time	Fire regime that caters for safe fuel levels & conservation of plant & animal communities
Habitat Improvement <input type="checkbox"/>	Indigenous understorey restoration included in regen program	Natural Resources	When funds secured	Seek detailed costings	Staff time	Understorey and habitat improved
Management of native fauna & introduced predators <input type="checkbox"/>	Pittwater wide animal control program <input type="checkbox"/>	Natural Resources <input type="checkbox"/>	When funds available	Seek detailed costings of feral animal control	Staff time & resources	
Fire Management <input type="checkbox"/>	Maintain appropriate fire regime <input type="checkbox"/>	Bushfire Services & Natural Resources <input type="checkbox"/>	Ongoing <input type="checkbox"/>	<input type="checkbox"/>	Staff time <input type="checkbox"/>	Fire regime that caters for safe fuel levels & conservation of plant & animal communities
Access and recreation <input type="checkbox"/>	Seawall extension, jetty & pontoon <input type="checkbox"/>	Reserves <input type="checkbox"/>	1997/98 <input type="checkbox"/>	\$50,000 <input type="checkbox"/>	Integrate into maint. programs <input type="checkbox"/>	<input type="checkbox"/>

Fauna Species List Church Point

R-resident; S-summer migrant; W-winter migrant; O-occasional visitor;

F-frequent visitor **Bold Italic** - Threatened Species;

Bold - regionally significant species: C - confirmed in or near reserves

Common name	Scientific name	Record	Status
Brown Goshawk	Accipiter fasciatus	L	F
Whistling Kite	Haliastur sphenurus	UBS	F
Little Eagle	Hieraaetus morphnoides	UBS	F
Topknot Pigeon	Lopholaimus antarcticus	L	S
Brown Cuckoo-Dove	Macropygia amboinensis	L	R
Common Bronzewing	Phaps chalcoptera	L	R
Sulphur-crested Cockatoo	Cacatua galerita	UBS	F
Galah	Cacatua roseicapilla	UBS	F
Yellow-tailed Black-Cockatoo	Calyptorhynchus funereus	UBS	F
Glossy Black-Cockatoo	Calyptorhynchus lathami	UBS	F
Australian King-Parrot	Alisterus scapularis	UBS	F
Crimson Rosella	Platycercus elegans	L	F
Eastern Rosella	Platycercus eximius	L	O
Scaly-breasted Lorikeet	Trichoglossus chlorolepidotus	L	F
Rainbow Lorikeet	Trichoglossus haematodus	UBS	R
Fan-tailed Cuckoo	Cuculus pyrophanus	UBS	R
Shining Bronze-Cuckoo	Chrysococcyx lucidus	L	S
Common Koel	Eudynamys scolopacea	L	S
Channel-billed Cuckoo	Scythrops novaehollandiae	L	S
Pheasant Coucal	Centropus phasianus	L	R
Southern Boobook	Ninox novaeseelandiae	UBS	R
Powerful Owl	Ninox strenua	UBS	F
Tawny Frogmouth	Podargus strigoides	UBS	R
Owlet-nightjar	Aegotheles cristatus	L	R
Spine-tailed Swift	Hirundapus caudacutus	UBS	S
Kookaburra	Dacelo novaeguinea	UBS	R
Sacred Kingfisher	Halcyon sancta	UBS	S
Dollarbird	Eurystomus orientalis	L	S
Superb Lyrebird	Menura superba	UBS	R
Black-faced Cuckoo-shrike	Coracina novaehollandiae	UBS	R
Cicadabird	Coracina tenuirostris	L	S
Eastern Yellow Robin	Eopsaltria australis	UBS	R
Rose Robin	Petroica rosea	L	W
Golden Whistler	Pachycephala pectoralis	UBS	R
Rufous Whistler	Pachycephala rufiventris	L	S
Grey Shrike-thrush	Colluricincla harmonica	UBS	R
Leaden Flycatcher	Myiagra rubecula	L	S
Black-faced Monarch	Monarcha melanopsis	L	S
Grey Fantail	Rhipidura fuliginosa	UBS	R
Rufous Fantail	Rhipidura rufifrons	L	S
Eastern Whipbird	Psophodes olivaceus	UBS	R
Superb Fairy-wren	Malurus cyaneus	UBS	R
Variegated Wren	Malurus lamberti lamberti	L	F
Origma	Origma solitaria	L	R
White-browed Scrubwren	Sericornis frontalis	UBS	R
White-throated Warbler	Gerygone olivacea	UBS	S
Brown Warbler	Gerygone mouki	L	S
Striated Thornbill	Acanthiza lineata	L	F
Yellow Thornbill	Acanthiza nana	L	F
Brown Thornbill	Acanthiza pusilla	UBS	R
Sitella	Neositta chrysoptera	L	F
White-throated Treecreeper	Climacteris leucophaea	UBS	R

Eastern Spinebill	Acanthorhynchus tenuirostris	L	R
Red Wattlebird	Anthochaera carunculatus	L	R
Little Wattlebird	Anthochaera chrysoptera	UBS	R
Yellow-faced Honeyeater	Lichenostomus chrysops	L	W
White-eared Honeyeater	Lichenostomus leucotis	L	W
Scarlet Honeyeater	Myzomela sanguinolenta	L	O
Noisy Miner	Manorina melanocephala	UBS	R
Lewin's Honeyeater	Meliphaga lewinii	UBS	R
White-naped Honeyeater	Melithreptus lunatus	L	W
Noisy Friarbird	Philemon corniculatus	L	R
White-cheeked Honeyeater	Phylidonyris nigra	L	R
New Holland Honeyeater	Phylidonyris novaehollandiae	L	F
Mistletoebird	Dicaeum hirundinaceum	L	R
Spotted Pardalote	Pardalotus punctatus	UBS	R
Silvereye	Zosterops lateralis	UBS	R
Red-browed Finch	Emblema temporalis	UBS	R
Olive-backed Oriole	Oriolus sagittatus	L	S
Spangled Drongo	Dicrurus hottentotus	L	S
Satin Bowerbird	Ptilonorhynchus violaceus	L	R
Grey Butcherbird	Cracticus torquatus	UBS	R
Australian Magpie	Gymnorhina tibicen	UBS	R
Pied Currawong	Strepera graculina	UBS	R
Australian Raven	Corvus coronoides	UBS	R
<u>Mammals</u>			
Short-beaked Echidna	Tachyglossus aculeatus	L	R
Tiger Quoll	Dasyurus maculatus	L	O
Brown Antechinus	Antechinus stuartii	L	R
Swamp Wallaby	Wallabia bicolor	UBS	R
Sugar Glider	Petaurus breviceps	UBS	R
Common Ringtail Possum	Pseudocheirus peregrinus	UBS	R
Common Brushtail Possum	Trichosurus vulpecula	UBS	R
Koala	Phascolarctos cinereus	L	O
Long-nosed Bandicoot	Perameles nasuta	UBS	R
Bush Rat	Rattus fuscipes	L	R
Grey-headed Flying-fox	Pteropus poliocephalus	L	O
Chocolate Wattled bat	Chalinolobus morio	L	R
Gould's Wattled Bat	Chalinolobus gouldii	L	R
Freetail bat	Mormopterus sp (loriae)	L	R
Common Bent-wing Bat	Miniopterus schreibersii	L	F
Greater Broad-nosed bat	Scoteanax ruepelli	L	F
Pale Eptesicus	Vespadelus vulturnus	L	R
Fox	Vulpes vulpes	UBS	F
<u>Reptiles</u>			
Blind Snake	Ramphotyphlops nigrescens	L	R
Green Tree Snake	Dendrelaphis punctulatus	L	R
Golden-crowned Snake	Cacophis squamulosus	L	R
Red-bellied Black Snake	Pseudechis porphyriacus	L	R
Yellow-faced Whip Snake	Demansia psammophis	L	R
Brown Snake	Pseudonaja textilis	L	R
Lace Monitor	Varanus varius	L	R
Bearded Dragon	Pogona barbata	L	R
Jacky Lizard	Amphibolurus muricatus	L	R
Leaf-tailed Gecko	Phyllurus platurus	L	R
Stone Gecko	Diplodactylus vittatus	L	R
Thick-tailed Gecko	Underwoodisaurus milii	L	R
Leseur's Velvet Gecko	Oedura leseurii	L	R
Eastern Water Skink	Eulamprus quoyii	L	R

Red-throated Skink	Eulepis platynota	L	R
White's Skink	Egernia whitei	L	R
Cunninghams Skink	Egernia cunninghamii	L	R
Striped Skink	Ctenotus robustus	L	R
Copper-tailed Skink	Ctenotus taeniolatus	L	R
Grass Skink	Lampropholis delicata	L	R
Weasel Skink	Saproscincus mustelina	L	R
Blue-tongued Lizard	Tiliqua scincoides	L	R
<u>Frogs</u>			
Common Eastern Froglet	Crinia signifera	L	R
Green Tree Frog	Litoria caerulea	L	R
Peron's Tree Frog	Litoria peronii	UBS	R
Leaf Green Tree Frog	Litoria phyllochroa	L	R

Salt Pan Cove Reserve, Newport

Reserve Number: 0075

Street Address: 146A Prince Alfred Parade, Newport.

1.0 Description & Category

1.1 Location and Description

Salt Pan Cove Reserve is located on the eastern foreshores of Pittwater in Newport. This narrow Reserve occupies 1.214ha to Prince Alfred Parade and is bounded by residences, roads and Salt Pan Cove.

1.2 Land Tenure and Property Description

The Reserve is owned by Council, being described as Lot 10 in DP204399. The land is zoned 6(a) Open Space - Existing Recreation.

1.3 Category of Land

The Reserve is community land under the Local Government Act 1993. It is categorised as a natural area and further categorised as bushland, watercourse and foreshore. It meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2.0 Natural and Cultural Heritage

2.1 Topography, Geology and Soils

Salt Pan Cove Reserve is situated on Pittwater's eastern tidal foreshore and extends from a mudflat cove along a south facing slope. The grade of the slope diminishes towards the west as a spur extends into Pittwater to form the cove. The foreshore is rocky with the exception of the mudflat at the eastern end of the Reserve.

The parent geology is made up of the shales and sandstones of the Newport Formation of the Narrabeen Group. The derived soils are the moderately deep brown, red and gleyed colluvial podzols of the Watagan soil landscape. These soils are prone to mass movement and present a severe soil erosion hazard when disturbed.

2.2 Hydrology

The Reserve is at the bottom of the catchment which features residential development on Bilgola Plateau and steep slopes adjacent to the Reserve. The eastern end contains a boulder-lined creekline that discharges through mangroves and mudflats into Pittwater. The remainder of the Reserve contains no defined natural drainage lines.

2.3 Vegetation

On the slopes, Salt Pan Cove Reserve is dominated by Spotted Gum (*Corymbia maculata*) Forest. On the north facing slope the Spotted Gum is associated with Grey Ironbark (*Eucalyptus paniculata*) and Rough-barked Apple (*Angophora floribunda*). Common species in the understorey include Forest Oak (*Allocasuarina torulosa*), Common Hop Bush (*Dodonaea triquetra*) and Burrawang (*Macrozamia communis*).

Cabbage-tree Forest dominated by Cabbage-tree Palm (*Livistona australis*) and Coachwood (*Ceratopetalum apetalum*) occurs along the creekline. Beneath the canopy the dense low tree layer of rainforest species includes Smooth Mock Olive (*Notelaea venosa*), Sandpaper Fig (*Ficus coronata*) and Mutton Wood (*Rapanea variabilis*). Groundlayer species present include Rasp Fern (*Doodia aspera*), Maidenhair Fern (*Adiantum formosum*), Tender Brake (*Pteris tremula*) and Water Vine (*Cissus hypoglauca*).

On the mudflats, remnant Swamp Oak (*Casuarina glauca*) Woodland dominates and a

mangrove community of Grey Mangrove (*Avicennia marina var australasica*) occur. In the past, both these communities would have continued further along the foreshore.

2.4 Fauna

Although weed invasion has badly degraded fauna habitat in this Reserve, a few habitat trees such as Spotted Gum, Cabbage-tree Palm, Swamp Oak, Forest Oak and Blueberry Ash remain. Squirrel gliders, a threatened species in NSW and an endangered population in Pittwater, have been recorded nearby. Regeneration of fauna habitat would assist the gliders and other species as usable trees are too far apart.

Council's Habitat and Wildlife Corridor Conservation Strategy maps the Reserve as "Corridor - Co1 " which indicates corridors or habitat areas though disturbed are likely to be of value due to good crown cover and/or understorey.

2.5 Aboriginal and Non-aboriginal sites

Several sites exist in this Reserve:

- ❖ an open midden located above South Beach consists mainly of oyster shell.
- ❖ an open midden located to the north of the Reserve, consists of 70% shells. The shell types include oyster, mussel, cockle and mud oyster.
- ❖ an open midden severely eroded by wave action, consisting of oyster, mud oyster, mussels and cockle shell types.
- ❖ an open midden, similar to the above site, severely eroded by wave action. Oyster, mud oyster, periwinkle and mussel shell types make up 50% of the midden contents.

There is potential for further Aboriginal sites such as axe grinding grooves and engravings to occur in the area.

There are no known European Heritage sites in the Reserve.

3.0 Significance And Objectives

3.1 Statement of Significance

Salt Pan Cove Reserve is significant as:

- ❖ It provides a small sample of Spotted Gum Forest, a plant community considered significant in NSW;
- ❖ It provides intertidal habitats of rocky shores, mudflats, Grey mangrove (*Avicennia marina var australasica*) and Swamp Oak (*Casuarina glauca*) Woodland;
- ❖ It provides potential habitat for Squirrel gliders, a threatened species in NSW and an endangered population in Pittwater;
- ❖ it acts as a stepping stone to aid faunal movement throughout the peninsula;
- ❖ it contributes to the landscape quality of Newport and the eastern foreshore of Pittwater while providing a record of the original landscape and the changes wrought by urban development;
- ❖ it provides a number of Aboriginal sites on the foreshore indicative of food resources used by the original inhabitants of the area;
- ❖ it is an educational resource and a contact point with nature for residents; and
- ❖ it allows urban residents to undertake informal recreational pursuits in a bushland and foreshore setting.

3.2 Management Objectives

The management objectives for Salt Pan Cove are:

- ❖ to protect the natural features of the Reserve;
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve;
- ❖ to protect the significant plant communities, namely Spotted Gum forest, and habitats, namely potential habitat for Squirrel Glider,

and intertidal habitats including rocky shore, mudflats, mangroves and remnant Swamp Oak forest;

- ❖ to protect the natural features of the Reserve;
- ❖ to adequately manage the bushland in relation to encroachments and weed invasion;
- ❖ to protect life and property from wildfire and to maintain ecological processes by seeking to maintain a near-natural fire regime in those parts of the Reserve with the exception of the closed forest area to conserve native flora and fauna in the Reserve;
- ❖ to control introduced animals in the Reserve;
- ❖ to provide low impact recreational and educational use of the Reserve consistent with the other objectives, and
- ❖ to encourage community appreciation and neighbourhood participation in the bushland management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion

Along the narrow western arm of the Reserve, Lantana and Honeysuckle have established as a result of dumping. Soil and vegetative dumping from the road have also contributed to weed infestation in the Reserve. The gully area is generally dominated by Lantana and occasionally by Morning glory.

4.2 Bush regeneration

A regeneration program previously undertaken, defined an informal access track from Prince Alfred Parade and included some weeding of the adjacent bush, needs to be followed up. As the Closed Forest area is least weed infested, the slope above this area should be seen as a priority. It should be then progressively weeded out from the areas of good bush, gradually expanding in an east and westerly direction to the limits of the Reserve.

4.3 Eucalypt dieback

The condition of Eucalypts in the gully section of the Reserve have been affected by urban runoff, changes to water quality and landfill associated with road construction and stormwater lines.

4.4 Stormwater Management

The steep catchment piped into the Reserve via an outlet at Prince Alfred Parade is contaminated by residential and road runoff resulting in a decline in water quality. The change along the creekline should be monitored and the stormwater outlet lined with rocks to dissipate water velocity if scouring becomes a problem.

4.5 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan.

Several species present, particularly rainforest species, are fire sensitive and therefore fire is not desirable in this area. Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction. Following a burn within the Reserve, a weed control program will be undertaken.

4.6 Management of Native Fauna and Introduced Predators

Salt Pan Cove Reserve provides good habitat for fauna with a variety of habitat components. The winter-flowering Spotted Gums, Mangroves, Swamp Oak and Closed Forest species encourage diversity and year-round food availability.

A Pittwater wide public awareness campaign will address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. Compliance and interpretive signs can assist this.

Feral cat and fox predation is an issue that needs to be addressed through a Pittwater-wide control strategy.

4.7 Access, walking tracks and neighbours

There is an informal track from Prince Alfred Parade leading south down to the creek and cove via log timber steps. It provides access to a sandy beach where some dinghies are located. The rest of the Reserve allows adjacent residents to pass through the Reserve to jetties and the foreshore.

There is a history of garden refuse dumping, as well as understorey clearing generally to provide views. Notably some mangroves have been cleared to provide boat access to some residents and improve views. There is a need to educate residents about living near bushland and issues including control of domestic animals, dumping, bush rock removal and appropriate bushfire hazard reduction practices.

5.0 Performance

Management objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration	Formation of a volunteer bush regeneration group	Natural Resources	As public demand requires	Staff resources	\$1000pa & \$ 400 approx materials	Volunteers commence work in the Reserve
Eucalypt dieback	Monitor mature trees	Reserves & Natural Resources	Ongoing monitoring		In kind staff time	
Stormwater Management	Monitoring stormwater issues & if necessary rock line outlet	Urban Infrastructure/ Natural Resources	When funds available		In kind staff time	Stormwater issues managed
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		In kind staff time	Safe fuel loads & conservation of bushland flora & fauna
Management of native fauna & Introduced Predators	Public awareness campaign for responsible pet ownership & feral animal program	Natural Resources & Compliance	When funds available as well as ongoing programs	Ongoing	Costed within a Pittwater wide feral animal control program	An increase in native fauna in the Reserve
Access, walking tracks & neighbours	Awareness campaign re dumping in the Reserve Compliance/ interpretive sign Regain encroachments	Natural Resources & Compliance	Sign 1997/98 Other when resources available	Sign \$400 Encroachments \$	Staff time & resources	Public appreciation & co-operation to achieve more viable bushland for fauna & flora

Bushrangers Hill Reserve, Newport

Reserve Number: 0452

Street Address: 13 & 15 Bungan Head Road, 26 Karloo Parade, Newport.

1.0 Description & Category

1.1 Location and Description

Bushranger's Hill Reserve occupies 0.29ha and is located above Bungan Beach, between Barrenjoey Road, Bungan Head Road and Karloo Parade. The coastal ridgeline reaches a dominating peak within the Reserve, affording magnificent views of the coastline. The Reserve was a previous Koala habitat.

1.2 Land Tenure and Property Description

The Reserve is owned by Council, being described as Lot 3 in DP 619416 being subject to a Right of Carriageway for adjoining property, Lots 1 and 3 in DP 600462 and Lot 1 in DP 600462. The land is zoned 6(a) Open Space - Existing Recreation A and part of the Reserve is Foreshore Scenic Protection - Slip Zone.

1.3 Category of Land

The Reserve is community land under the Local Government Act 1993. It is categorised as a natural area and further categorised as bushland. It meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2.0 Natural & Cultural Heritage

2.1 Topography, Geology and Soils

Bushranger's Hill Reserve is a peak in a coastal ridgeline that divides the peninsula. It drops very steeply to Bungan Beach and all other sides. The north-south ridgeline is narrow and sandstone floaters occur across the eastern slope.

The hill is capped by Hawkesbury sandstone which overlies shales and sandstones of the Newport formation in the Narrabeen Group.

The soils, shallow earthy sands on the crest and red and brown podzols on the slopes, mainly relate to the Watagan soil landscape of the Newport Formation. These soils are prone to mass movement and susceptible to an extreme soil erosion hazard.

2.2 Hydrology

The Reserve lies at the top of three catchments: Bungan Beach, Newport Beach and Yachtsmans Paradise in Pittwater. There are no creeklines, though the strata of the underlying geology gives rise to seepage areas. There are no developments within the Reserve to affect the water quality or the volume of flow.

2.3 Vegetation

The vegetation features Coastal Scrub, Closed Heath and Low Open Woodland communities.

A large Rusty Fig (*Ficus rubiginosa*) dominates the peak.

Below the crest Coastal Scrub to 3.5m tall covers the south-eastern slope. Swamp She-oak (*Casuarina glauca*), Coastal Rosemary (*Westringia fruticosa*) and Coastal Tea-tree (*Leptospermum laevigatum*) dominate to the north-east, whilst Scrub She-oak, Coastal Banksia (*Banksia integrifolia*) and *Melaleuca hypericifolia* are dominant to the South. Associated shrub species include Sweet Pittosporum (*Pittosporum undulatum*), *Pomaderris* sp., *Acacia brownei*, and Common Correa (*Correa reflexa*). Flannel Flower (*Actinotus helianthi*) is present in the ground layer.

Lower down the slope, closed heath is dominated by Scrub She-oak and Dagger Hakea (*Hakea teretifolia*), and is wind-sheared to 1m by salt laden southerly winds. Associated shrubs include Purple Flag (*Patersonia* sp.), *Oxylobium* sp., Geebung (*Persoonia linearis*), Guinea Flowers (*Hibbertia dentata* and *Hibbertia scandens*), Drumstick (*Isopogon* sp.), Fish Bone

(*Lomandra obliqua*), Rice Flower (*Pimelea* sp.), Mint Bush (*Prostanthera* sp.) and Paper-daisy (*Helichrysum* sp.).

These two plant communities relate to the Coastal Clay Heath described by the Royal Botanic Gardens and floristically to PC10 Headland Open – Scrub of Roger Lembit.

The west-facing slopes support a low open Woodland community dominated by Grey Ironbark (*Eucalyptus paniculata*) and Grey Gum (*E. punctata*) with an average tree height of 3-4m. Associated tree species include Stringybark and Turpentine (*Syncarpia glomulifera*). Forest Oak (*Allocasuarina torulosa*) is common in the low tree layer, and shrub layer species include Dogwood (*Jacksonia scoparia*), Native Currant (*Leptomeria acida*), Mock Olive (*Notelaea longifolia*) and Hopbush (*Dodonaea* sp.).

In the absence of fire, it is likely that further development of low tree layer rainforest species such as Mutton Wood (*Rapanea variabilis*) and Cheese Tree (*Glochidion ferdinandii*) will occur. Ground layer and vine species include Kangaroo Grass (*Themeda australis*), Blady Grass (*Imperata cylindrica*), Mauve Flax Lilly (*Dianella revoluta*), Mat Rush (*Lomandra longifolia*), Burrawang (*Macrozamia communis*), Wonga-wonga vine (*Pandorea pandorana*), Running Postman (*Kennedia rubicunda*) and Old Man's Beard (*Clematis aristata*).

2.4 Fauna

Bushranger's Hill has unfortunately been isolated by residential development. However, it does contain low Open Woodland and Coastal Heath and Scrub communities providing habitat for mammals and birds. The rock outcrops also provide shelter for reptiles.

The thick coastal heath, small creeks and large range of flowering plants at Bungan Beach Reserve provide habitat resources for a range of fauna. This is reflected in the species list, based on records kept by residents. Such long term record-keeping is particularly useful as it can result in better appreciation of the habitat value of the area. The fauna of Bushranger's Hill would be very similar to those that occupy and frequent the Bungan Beach Reserve but likely to be more diverse, due to the woodland habitat present on the Hill.

These Reserves provide important protected habitat for the regionally significant Long-nosed Bandicoot in an area otherwise dominated by urban development. The range of small birds including the Eastern Whipbird and reptiles such as the Yellow-faced Whip-snake further illustrate the habitat value these bushland areas afford for species which are scarce or missing from residential areas. Bushranger's Hill is also a recorded hilltopping site for the butterfly, *Deudorix diovis*, which is an extension of its southern distribution. In addition, it provides potential feeding habitat for the endangered population of Squirrel Glider, with winter flowering Grey Ironbark and Grey Gum.

Council's Habitat and Wildlife Corridor Conservation Strategy maps the Reserve as "Corridor - Co1" which indicates corridors or habitat areas though disturbed are likely to be of value due to good crown cover and/or understorey.

2.5 Aboriginal and Non-aboriginal Sites

There are no recorded Aboriginal sites within the Reserve, although there is potential for sites such as axe grinding grooves and engravings to occur in the area.

Early First Fleet diary entries record that Governor Phillip's party climbed this vantage point during their overland exploration to Broken Bay in 1788/89. Also, local folklore suggests the area was home to bushrangers who used the ridge as a lookout.

There is a small quarry area on the western slope, and a terrace near the crest may uncover previous uses.

3.0 Significance and Objectives

3.1 Statement of Significance

Bushranger's Hill Reserve is significant because:

- ❖ it protects an example of the bushland in Newport and Bungan Beach in a similar condition to that which occurred when the area was first visited by Europeans,

- ❖ it protects a sample of plant communities that are locally significant, namely Coastal Clay Heath,
- ❖ it protects a locally significant species Dogwood (*Jacksonia scoparia*),
- ❖ it contributes to the landscape quality of Bungan Beach, Pittwater and entry into the Peninsula,
- ❖ it has previously been Koala habitat, provides potential habitat for the endangered population of Squirrel Glider, is a hilltopping site for species of butterfly at its southern limit, and acts as a local refuge for fauna and stepping stone between larger habitat areas,
- ❖ it is a contact point with nature for residents and an educational resource, and
- ❖ it allows urban residents to undertake walking and scenic viewing in an enclosed bushland setting.

3.2 Management Objectives

The management objectives for Bushranger's Hill Reserve are:

- to protect the scenic nature of the Reserve and hillcrest
- ❖ to protect the natural, cultural and landscape features of the Reserve,
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve,
- ❖ to conserve the locally significant plant communities, namely Coastal Clay Heath and the locally significant species *Jacksonia scoparia*,
- ❖ to conserve the habitat values of the site for a range of fauna, including the endangered population of Squirrel Glider, the hilltopping by the species of butterfly at its southern limit,
- ❖ to maintain its function as a local refuge for fauna and stepping stone between larger habitat areas,

- ❖ to adequately manage the bushland in relation to encroachments and weed invasion,
- ❖ to utilise fire to maintain the diversity of native plants in the Reserve to conserve native flora and fauna,
- ❖ to control introduced animals in the Reserve,
- ❖ to provide opportunities for low impact recreational and educational use of the Reserve consistent with the other objectives, and
- ❖ to encourage community appreciation and neighbourhood participation in bushland management in the Reserve.

4.0 Management Issues

4.1 Weed Invasion

Weeds, common along the northern and western sides of the Reserve and particularly in disturbed areas, include Asparagus Fern, Lantana, Bitou Bush, Date Palm, *Polygala myrtilloida* and Pennywort.

4.2 Bush Regeneration

Work should initially be concentrated on the eastern slope as weed infestation is lighter in this area. Asparagus Fern is well established in the Reserve, indicating that a bush regeneration program will require a long-term approach.

4.3 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction. Following a burn

within the Reserve, a weed control programme should be initiated.

There has been a burn on the southern side of the crest with good growth of Coastal Banksia and Forest Oak leading the regeneration of the canopy.

4.4 Management of Native Fauna and Introduced Predators

Bushranger's Hill Reserve provides good habitat for fauna with a variety of habitat components. The one-time Koala habitat has been enveloped by suburban development. Native vegetation on the adjoining properties must be retained to provide a vegetated link to the Reserve to allow for the movement of wildlife and gene flow. This may be addressed in part by the initiation of a community-based bush regeneration program.

A Pittwater wide public awareness campaign will address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. Compliance or interpretive signs can assist this. Feral cat and fox predation is an issue that needs to be addressed through a Pittwater-wide control strategy.

The removal of significant components of adjoining bushland needs to be viewed closely when, not only is there inherent value to the bush but scenically this ridgeline dominates entry to the northern part of the peninsula. Already the existing zoning has allowed removal of whole blocks of bushland eg Lot 1 in DP 226774 and Lot 2 in DP619416.

4.5 Access and walking tracks

There is an access handle to the Reserve via the right of way used by No. 13 Bungan Head Road. Due to past quarrying, access to the upper parts of the Reserve and Trigonometrical Station are difficult. The Reserve provides spectacular views of the coastline.

4.6 Boundaries and neighbours

The boundaries are unclear and generally unfenced. A residents awareness campaign will focus on the special features of the Reserve and on bush friendly behaviour.

5.0 Performance

Management objectives	Performance Targets	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush regeneration	Letterbox drop for volunteer group	Natural Resources	When community demand	Staff time	\$1,400pa supervision & materials	Group commenced
Management of native fauna & introduced predators	Public awareness campaign for responsible pet ownership & feral animal program	Natural Resources & Compliance	When funds available as well as ongoing programs	Ongoing	Costed within a Pittwater wide feral animal control program	An increase in native fauna in the Reserve
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff time	Safe fuel levels & conservation
Boundaries & neighbours	Encourage community awareness & participation in the Reserve & regain any encroachments	Natural Resources & Compliance	Ongoing		Seek costs within overall reserve restoration program	No encroachments

Crescent Reserve, Newport

Reserve Number: 0089

Street Address: 164A & 164B Crescent Road, Newport.

1.0 Description & Category

1.1 Location and Description

Crescent Reserve is a foreshore Reserve located west of and abutting Crescent Road in Newport. The Reserve is contained in a gully that empties into a cove of southern Pittwater. It occupies 1.0ha and has a play area in the eastern portion. Sydney Water has an access road and Pumping Station (Lot 1 in DP 597102).

1.2 Land Tenure and Property Description

The Reserve is owned by Council, being described as Lot 2 in DP 597102 which is zoned 6(a) Open Space - Existing Recreation and includes Part Lots 19 and 20 in DP 160505 zoned 2(a). Foreshore reclaimed Crown land is managed as part of the Reserve under Council's care, control and management and is owned by the Department of Land and Water Conservation.

1.3 Category of Land

The Reserve is community land under the Local Government Act 1993. It is categorised as a natural area and further categorised as bushland (60%) and foreshore (20%). It meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2.0 Natural and Cultural Heritage

2.1 Topography, Geology and Soils

Crescent Reserve is located in a gully at the footslopes of a small catchment that commences at Bushrangers Hill and flows west to Pittwater. The Reserve has a general westerly aspect and the gully has an east-west axis with moderately sloping sideslopes. Downstream the Reserve

meets a tidal boundary of Yachtsmans Paradise, a bay in Pittwater.

The parent geology is underlying shales and sandstones of the Newport Formation in the Narrabeen Group. This geology has given rise to deep yellow podzols and some deep yellow earths on colluvial footslopes. These soils have been mapped as the Erina soil landscape. The footslopes experience seasonal waterlogging.

2.2 Hydrology

Located on the foreshore, the Reserve is at the bottom of a largely residential catchment. The upper catchment is limited by Bushrangers Hill and Barrenjoey Road and contains some steep slopes.

The foreshore and creekline have been extensively modified by Water Board works.

2.3 Vegetation

The northern side of the Reserve supports a Narrabeen Slopes community dominated by Grey Ironbark (*Eucalyptus paniculata*), Grey Gum (*E. punctata*) and Turpentine (*Syncarpia glomulifera*). The low tree and shrub layer includes locally significant Guioa (*Guioa semiglauc*), Smooth Mock Olive (*Notelaea venosa*), Yellow Pittosporum (*Pittosporum revolutum*), Native Peach (*Trema aspera*), Bottlebrush (*Callistemon spp.*). The groundcover and vine layer includes Blue Flax Lily (*Dianella caerulea*), Native Geranium (*Geranium solanderi*), Native Raspberry (*Rubus spp.*), Kidney Weed (*Dichondra repens*) and *Centella asiatica*.

The southern slope supports a diverse native plant community with a modified understorey.

The modified gully floor supports a Swamp Oak Woodland community dominated by Swamp Oak (*Casuarina glauca*) with remnant Cabbage-tree Palms (*Livistona australis*) and Prickly-leaved Paperbark (*Melaleuca styphelioides*).

2.4 Fauna

It is likely that the threatened Glossy Black-cockatoo forages in the maturing Swamp Oak. Arboreal mammal scratch marks are evident on Grey Gums and numerous birds regularly frequent the Reserve. The Reserve also provides continuity for fauna moving to adjacent bushland understorey.

Council's Habitat and Wildlife Corridor Conservation Strategy maps the Reserve as "Corridor - Co3" which indicates residential areas with some tree cover but requiring supplementary planting to aid faunal movement. The Newport area is a high priority for enhancement as a wildlife movement area.

2.5 Aboriginal and European Heritage

There are no recorded Aboriginal sites within the Reserve, although there is potential for Aboriginal sites such as middens to occur in the area. There are no known European Heritage sites in the Reserve.

Areas where previous disturbance associated with the Water Board Pumping Station and a sealed access road along the northern slope lessens the likelihood of intact sites in the disturbed parts of the Reserve.

3.0 Significance and Objectives

3.1 Statement of Significance

Crescent Reserve is significant because:

- ❖ it provides an enclosed bushland setting on the foreshore with potential to incorporate a picnic area
- ❖ it protects a sample of a thin band of rainforest which includes locally significant species, namely *Guioa semiglauc*
- ❖ it contributes to the landscape quality of Pittwater and Newport

- ❖ it provides a record of the original landscape and the changes wrought by settlement and development,
- ❖ it acts as a local refuge for fauna and provides potential feeding habitat for the threatened Glossy Black-cockatoo,
- ❖ it provides a stepping stone between larger areas of habitat due to the diversity of flowering eucalypts and rainforest species,
- ❖ it is a contact point with nature for residents and an educational resource, and
- ❖ it allows urban residents to undertake informal recreation pursuits in an enclosed bushland setting.

3.2 Management Objectives

The management objectives for Crescent Reserve are:

- ❖ to protect the natural, cultural and landscape features of the Reserve,
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve,
- ❖ to protect the locally significant stand of *Guioa* (*Guioa semiglauc*)
- ❖ to conserve habitat features for fauna, such as winter flowering eucalypts Grey Ironbark (*Eucalyptus paniculata*) and Grey Gum (*E. punctata*), Swamp Oak (*Casuarina glauca*) and Cabbage-tree Palms (*Livistona australis*)
- ❖ to provide supplementary planting to aid faunal movement
- ❖ to adequately manage the bushland in relation to weed invasion and restore the creekline erosion and water quality
- ❖ to improve the bushland character of the Reserve with a revegetation program in the previously disturbed areas, and restrict mowing practices on southern slope
- ❖ to manage fuel and protect life and property from fire whilst maintaining a near natural fire

regime in the Reserve to conserve native flora and fauna,

- ❖ to control introduced animals in the Reserve,
- ❖ to provide opportunities for low impact recreational and educational use of the Reserve consistent with the other objectives, and
- ❖ to encourage community appreciation and neighbourhood participation in bushland management in the Reserve through support of the volunteer bush regeneration group

4.0 Management Issues

4.1 Weed Invasion and Bush Regeneration

The extensive earthworks within and adjoining the Reserve have allowed numerous weed species to dominate. These include African Olive, Small and Large-leaved Privet, Lantana, *Acacia saligna*, Fennel and Ivy. The fill slope below the cleared park area is dominated by Kikuyu and the lower area has includes Ivy, Honeysuckle, Moth Vine and Asparagus Fern.

A bush regeneration program in the Reserve should include the following:

- ❖ The north-eastern corner of the Reserve has been weeded and maintained by a volunteer group. The group should be encouraged to maintain their focus on the upper slope prior to working down into the Reserve.
- ❖ The southern slope is regularly slashed and this should be gradually restricted to mowing only of the lower parts. The upslope areas should be allowed to regenerate naturally and to extend into the gully.
- ❖ The Swamp Oak Woodland between the access road and the creek requires regular treatment to remove the weedy vines.
- ❖ The foreshore area with its boulder wall should be enhanced using local sedges and grasses with some mown areas.
- ❖ A border to the parking area near the road should be improved by planting of wildlife-

corridor trees, understorey and ground covers.

Other areas that are weed infested do require treatment, but are lower priority than the above areas and should be commenced after the other areas have been consolidated.

4.2 Stormwater Management

The creekline has been extensively modified. It discharges from a pipe from the embankment into a drainage line that has two basins formed by gabions to collect stormwater debris which includes vegetation, sediment, roadway pollutants and litter. These basins require a regular maintenance program.

The creek appears to breach its banks prior to being piped into the bay, discharging at the boulder embankment. Dense planting of native sedges along the top of the embankment may assist in stabilising the drainage line.

The boating activities within the bay may pollute the waterway through fuel spillage and bilge water.

The impact of stormwater and motor boat activity on water quality should be incorporated into a monitoring program which includes community education.

4.3 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan.

The small size of the Reserve, the rainforest vegetation present in part of the Reserve and its location within a gully indicate a low fire risk. When hazard reduction is required necessary, it should be co-ordinated with the bush regeneration program.

Ecological considerations such as avoiding burning fire sensitive species, particularly rainforest species and Swamp Oak, will be

assessed by Council Environmental Staff to determine methods of hazard reduction.

4.4 Management of Native Fauna and Introduced Predators

Crescent Reserve provides a good stepping stone habitat for fauna with a variety of habitat components. The Casuarinas, Eucalypts and Cabbage-tree Palms encourage diversity and year-round food availability. Supplementary planting will be undertaken to aid faunal movement.

A Pittwater wide public awareness campaign will address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. Compliance signs can assist this.

Feral cat and fox predation is an issue that needs to be addressed through a Pittwater-wide control strategy.

4.5 Access, Walking Tracks and Recreation

The sealed road provides vehicular access to the Pumping station for maintenance crews.

An informal path from the play area to the foreshore could be combined with a bush regeneration program. The foreshore area is well used for boating, dinghys are stored on the grass and the seats are regularly occupied.

Development of the foreshore area with more bush planting and the incorporation of a picnic area would improve the aesthetic quality of the area and provide a community facility.

4.6 Boundaries and Neighbours

Where residential properties border the Reserve, dumping of vegetation and building excavation material has occurred, spreading weeds, increasing nutrients and creating fire hazard. Public awareness and possible involvement in the regeneration work being undertaken may improve this practice.

5.0 Performance

Management objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital Cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration	Continue volunteer support	Natural Resources	Ongoing		\$1000pa supervision & \$400pa materials	A healthy bushland Reserve
Stormwater Management	Plant embankment & monitor water quality	Natural Resources & Compliance	Ongoing		Staff time Planting incorporated into bush regeneration program	Minimal water quality degradation
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff time	Safe fuel levels & conservation
Management of Native Fauna & Introduced Predators	Public awareness campaign for responsible pet ownership Feral animal control program Supplement habitat planting	Natural Resources & Compliance	When funds available as well as ongoing programs	Ongoing Planting as part of volunteer program	Costed within a Pittwater wide feral animal control program	An increase in native fauna in the Reserve
Access and walking tracks & recreation	Informal path construction, picnic table	Natural Resources & Reserves	When funds available	\$2,500	Maintenance costs & staff time	Appropriate public use of reserve & greater public awareness
Boundaries & neighbours	Bush friendly information distributed	Natural Resources & Compliance		Leaflets \$150	Staff time	Sympathetic public behaviour

Fauna Species List Newport

Key

Record

APM - Angophora Reserve Plan of Management; L - likely to occur

Status

R=resident F=frequent visitor W=winter migrant

O=occasional or uncommon visitor S=summer migrant

Bold = regionally significant species **Bold Italic** = Threatened species

* - introduced species

Common Name	Scientific Name	Record	Status
Birds			
Spotted Turtle-dove *	Streptopelia chinensis	APM	F
Sulphur-crested Cockatoo	Cacatua galerita	APM	F
Little Correla	Cacatua sanguinea	APM	F
Galah	Cacatua roseicapilla	APM	F
Australian King-Parrot	Alisterus scapularis	APM	F
Crimson Rosella	Platycercus elegans	APM	F
Eastern Rosella	Platycercus eximius	APM	O
Scaly-breasted Lorikeet	Trichoglossus chlorolepidotus	APM	O
Rainbow Lorikeet	Trichoglossus haematodus	APM	F
Common Koel	Eudynamys scolopacea	APM	S
Channel-billed Cuckoo	Scythrops novaehollandiae	L	S
Southern Boobook	Ninox novaeseelandiae	APM	R
Powerful Owl	<i>Ninox strenua</i>	L	O
Tawny Frogmouth	Podargus strigoides	L	R
Spine-tailed Swift	Hirundapus caudacutus	L	S
Kookaburra	Dacelo novaeguinea	APM	R
Sacred Kingfisher	Halcyon sancta	L	S
Dollarbird	Eurystomus orientalis	APM	S
Black-faced Cuckoo-shrike	Coracina novaehollandiae	APM	R
Golden Whistler	Pachycephala pectoralis	APM	R
Grey Fantail	Rhipidura fuliginosa	L	R
Rufous Fantail	Rhipidura rufifrons	L	S
Eastern Whipbird	Psophodes olivaceus	APM	R
Superb Fairy-wren	Malurus cyaneus	APM	R
Variegated Wren	Malurus lamberti lamberti	APM	F
White-browed Scrubwren	Sericornis frontalis	APM	R
Brown Thornbill	Acanthiza pusilla	APM	R
Eastern Spinebill	Acanthorhynchus tenuirostris	L	R
Red Wattlebird	Anthochaera carunculatus	APM	R
Little Wattlebird	Anthochaera chrysoptera	APM	R
Yellow-faced Honeyeater	Lichenostomus chrysops	APM	W
Noisy Miner	Manorina melanocephala	APM	R
White-naped Honeyeater	Melithreptus lunatus	APM	W
Noisy Friarbird	Philemon corniculatus	APM	R
White-cheeked Honeyeater	Phylidonyris nigra	L	F
New Holland Honeyeater	Phylidonyris novaehollandiae	L	F
Mistletoebird	Dicaeum hirundinaceum	APM	O
Spotted Pardalote	Pardalotus punctatus	APM	F
Silvereye	Zosterops lateralis	APM	F
Red-browed Finch	Emblema temporalis	L	F
Common Mynah	Acridotheres tristis	APM	R
Olive-backed Oriole	Oriolus sagittatus	L	S
Spangled Drongo	Dicrurus hottentotus	L	S

Grey Butcherbird	Cracticus torquatus	APM	R
Australian Magpie	Gymnorhina tibicen	APM	R
Pied Currawong	Strepera graculina	APM	R
Australian Raven	Corvus coronoides	APM	R
<u>Mammals</u>			
Sugar Glider	Petaurus breviceps	UBS	R
Squirrel Glider	Petaurus norfolcensis	L	F
Common Ringtail Possum	Pseudocheirus peregrinus	APM	R
Common Brushtail Possum	Trichosurus vulpecula	UBS	R
Koala	Phascolarctos cinereus	UBS	R
Long-nosed Bandicoot	Perameles nasuta	APM	R
House Mouse	Mus domesticus	L	R
Black Rat	Rattus rattus	APM	R
Grey-headed Flying-fox	Pteropus poliocephalus	APM	O
Gould's Wattled Bat	Chalinolobus gouldii	F	R
<u>Reptiles</u>			
Eastern Water Dragon	Physignathus leseurii	L	R
Eastern Water Skink	Eulamprus quoyii	APM	R
Copper-tailed Skink	Ctenotus taeniolatus	APM	R
Grass Skink	Lampropholis delicata	APM	R
Weasel Skink	Saproscincus mustelina	L	R
Blue-tongued Lizard	Tiliqua scincoides	L	R
Eastern Long-necked Tortoise	Chelodina longicollis	L	R
<u>Frogs</u>			
Common Eastern Froglet	Crinia signifera	APM	R
Brown-striped Frog	Limnodynastes peronii	APM	R
Green Tree Frog	Litoria caerulea	L	R
Peron's Tree Frog	Litoria peronii	L	R

Elizabeth Park, Scotland Island

Reserve Number: 0062

Street Address: 86A Thompson St, Scotland Island.

1.0 Description & Category

1.1 Location and Description

Elizabeth Park is a 6.8ha bushland Reserve covering the apex of Scotland Island in Pittwater. It is surrounded by houses and access is possible via a four-wheel-drive fire trail from the north and on foot via 3 other illegal tracks on east, west, and south.

1.2 Land Tenure and Property Description

The Reserve is owned by Council, being described as Lot 2 in DP 533183. The land is zoned 6(a) Open Space - Existing Recreation.

1.3 Category of Land

The Reserve is community land under the Local Government Act 1993. It is categorised as a natural area and further categorised as bushland. It meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2.0 Physical and Natural Heritage

2.1 Topography, Geology and Soils

Elizabeth Park is located 93m above sea level atop Scotland Island in Pittwater. A flat-topped ridge runs east to west across the middle of Elizabeth Park falling away increasingly steeply to the north and south. The apex of the island, in the west of the Reserve is capped by Hawkesbury Sandstone underlain by the shales and sandstones of the Newport Formation in the Narrabeen Group.

Soils at the top of the Reserve are derived from Hawkesbury Sandstone and further down the slopes they are characterised by the Watagan

soil landscape derived from the Narrabeen Group geology.

2.2 Vegetation

The vegetation of Elizabeth Park is Spotted Gum Forest. Tree species present include Spotted Gum, Red Bloodwood (*Corymbia gummifera*), Grey Ironbark (*Eucalyptus paniculata*) and Broad-leaved Apple.

Understorey structure and composition varies with aspect. In sheltered areas there is a small tree layer of rainforest associated species and Forest Oak (*Allocasuarina torulosa*). The ground layer is dominated by ferns and Spiny Mat-rush (*Lomandra longifolia*).

In more open areas the shrub layer has a lower density and includes Native Cherry (*Exocarpos cupressiformis*), Hickory (*Acacia implexa*), *Acacia longissima* and Blackthorn (*Bursaria spinosa*). The ground layer of medium to high density dominated by grasses. Species present include Blady Grass (*Imperata cylindrica*), Spiny Mat-rush, *Entolasia marginata*, Purple Pratia (*Pratia purpurescens*), Kangaroo Grass (*Themeda australis*) and *Lepidosperma laterale*.

Spotted Gum Forest is significant in NSW as it is inadequately conserved in the state's national parks. It has a limited distribution within the Pittwater area.

2.4 Fauna

As there is limited scope for recruitment from mainland populations, the faunal diversity of Scotland Island is particularly vulnerable to diminution. Major disturbances that have reduced the faunal diversity of Elizabeth Park are weed invasion, domestic pets and too-frequent fire. Additionally, the aggressive nature of a colony of noisy miners dominating the Reserve, tends drive smaller birds away.

The Reserve is an important frequently used foraging area for the endangered Glossy Black-cockatoo which feeds on the cones of the

abundant Forest Oaks. Echidna has also been recorded on the Island, as have breeding Owlet-nightjars, an elusive nocturnal bird which preys on insects. Whistling Kites nest on the island and the Powerful Owl may also occasionally visit the Reserve to prey on arboreal mammals, or flying foxes when present.

Due to the age class of the spotted gums, few tree hollows are available for the range of fauna which requires this habitat niche. However, as these trees age and regeneration of the understorey continues, the diversity and abundance of fauna should increase.

Council's Habitat and Wildlife Corridor Conservation Strategy maps the Reserve as "Major Habitat - MH " which indicates major habitat areas. This signifies a high degree of diversity within the Reserve in both habitat types and species presently using it.

2.5 Aboriginal and Non-aboriginal Sites

There are no recorded Aboriginal sites within the Reserve, although there is potential for sites such as axe grinding grooves and engravings to occur in the area.

There are no known sites of European Heritage in the Reserve.

Scotland Island was first granted to Andrew Thompson, a reformed and successful convict, in 1810 and after a succession of owners and partitions was subdivided into its current residential arrangement, including Elizabeth Park Reserve, in 1922.

In 1978, there were approximately 130 houses on Scotland Island. Development has been fairly rapid and there are now almost 300 houses on the island.

3.0 Classification Significance and Objectives

3.1 Statement of Significance

Elizabeth Park is significant because:

- ❖ it protects an example of the bushland of Scotland Island in a similar condition to that which occurred when the area was first visited by Europeans,
- ❖ it protects Spotted Gum Forest which has been identified as a vegetation community significant in NSW,
- ❖ it provides valuable habitat and food resources for species such as the threatened Glossy Black-cockatoo and Powerful Owl, and
- ❖ the ridgetop locality of the Reserve provides scenic amenity and a contact point with nature for residents.

3.1 Management Objectives

The management objectives for Elizabeth Park are:

- ❖ to protect the structural and floristic diversity of the bushland of the Reserve
- ❖ to protect the habitat for flora and fauna and landscape features of the Reserve,
- ❖ to adequately manage the Reserve in relation to encroachments and weed invasion,
- ❖ to utilise fire to maintain the diversity of native plants in the Reserve to conserve fauna and flora,
- ❖ to control unrestricted domestic pets in the Reserve,
- ❖ to provide opportunities for low impact recreational and educational use of the Reserve, consistent with other objectives, and

- ❖ to encourage community appreciation and participation in management of the Reserve.

4.0 Management Issues

4.1 Weed Invasion

Weed infestation occurs to varying degrees throughout Elizabeth Park. The highest concentration occurs around the boundaries of the Reserve, while only scattered weeds occur in the central ridge areas.

Lantana and Asparagus Fern are both widespread in the Reserve. Lantana clearing was carried out by Council from 1990 -1993, and is now actively being followed up by Council and . It is present in the Reserve primarily as seedlings and regrowth, however dense thickets occur on neighbouring properties. Asparagus Fern is especially prominent in the north and central sections of the Reserve where Lantana was removed.

Other weeds occurring in the Reserve include Cassia, Ochna, Passionfruit, Bamboo and Spider Plant.

4.2 Bush regeneration

Elizabeth Park is in fairly good condition due to its position at the apex of Scotland Island, protecting it from many of the impacts such as urban water runoff and water-borne weeds.

A good tree canopy has been maintained over much of Scotland Island and a medium density understorey exists on many properties bordering the Reserve. However, as the population of the area increases, further development will erode this protective buffer.

Prior to 1989 weed infestation and other problems built up to high levels. Moderate investment of staff time between 1989 and 1993, saw steady improvement in the condition of the Reserve through the removal of large areas of lantana and other weeds.

The current program of weed control should be continued and expanded to cover a three year period to substantially complete primary and secondary weed control within the entire park. "Priority should be given to the central ridge area of the park where the bush is currently in the best

condition, moving progressively downslope with the park boundaries being the last areas to be cleared of weeds. An exception would be the western and proposed eastern entrances to the park and in scenic areas along the proposed new walking trail on the south side which would be cleared of weeds for aesthetic reasons" (Brad Jones, 1994).

4.3 Stormwater Management

Erosion control on the fire trail is required. It is suggested that suitable material, such as crushed sandstone, be brought in to build up damaged sections of the fire trail instead of grading.

4.4 Fire regime

The fire regime of the Reserve needs to be closely managed as the re-establishment of native flora and fauna can be highly sensitive to inappropriate fire practices, would be difficult on an island Reserve such as Elizabeth Park.

Although a controlled burn was conducted in 1991, insufficient heat was developed to establish Eucalypt species, and only a small number of species in the Fabaceae family germinated. Due to a lack of fire south of the central ridge, there has been a spread of Sweet Pittosporum (*Pittosporum undulatum*) and Blueberry Ash (*Eleocarpus reticulatus*) which are usually found in rainforest margins. They both hinder the germination of Eucalypt and Angophora species by altering the micro-climate. A hot fire in the eastern part of the Reserve did achieve good Fabaceae regeneration.

Although no fire history currently exists, a reliable fire record should be maintained.

4.5 Management of native fauna

Clearing for houses on the island in the last 15 years has resulted in a decrease in native vegetation. This may partly account for a decrease in smaller shrub-dwelling fauna species.

The threatened Glossy Black-cockatoo, which primarily feed on She-oak cones, has been sighted in Elizabeth Park. Forest Oak (*Allocasuarina torulosa*) is abundant in the Reserve and would provide a good food resource. Large hollows which are required for nesting, are diminishing on the island as development increases.

4.6 Introduced predators

Domestic cats and dogs are a problem in the Reserve as they attack native fauna. This is compounded by the lack of council dog control law enforcement. This problem should be addressed by the distributed of information brochures on the damaging effects of domestic pets on wildlife and enforcement of the dog act. Rats are also a common pest and presumably predate on numerous micro-fauna species.

4.7 Access, walking tracks and recreation

One main fire trail, which acts as a water channel, runs up the hill into the north of the Reserve and across its centre. It is used by an increasing number of 4WD vehicles, increasing erosion in wet weather. A minimal amount of maintenance has been carried out. Council has graded the trail, gradually lowering the road surface over the years. Many tracks have proliferated with land owners creating access tracks to their houses without Council approval.

Restricting the network of tracks is essential to preserve the integrity of the bushland. Improved methods of water control and the rebuilding of previously damaged sections is required. Voluntary compliance by residents to keep off the fire trail would be initially sought or a boom gate installed, with restricted key access, to close the fire trail to private vehicles.

Pedestrian access is via the fire trail from the north, and an informal track from the west. Signposting walking routes would encourage public use.

4.8 Boundaries and neighbours

There is no clear boundary definition to the Reserve and encroachments by residents bordering the park include planting of exotic plants, erection of sheds, storage of equipment and parking. These encroachments erodes the viability of the bushland. Firewood and bush rock has been illegally removed from the Reserve.

5.0 Performance

Management objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration	Continue & expand regen activities with a 3yr contract program. Rehabilitate areas around trees.	Natural Resources	Ongoing in current program & when additional funds available		\$10,000 pa	Healthy bushland reserve
Stormwater management	Erosion control works	Engineers & Natural Resources	When funding available	Seek detailed costings	Integrate into works & maintenance program	Erosion minimised on fire trail
Management of native fauna & introduced predators	Public awareness campaign for responsible pet ownership & feral animal control	Natural Resources & Compliance	When funds available as well as ongoing programs	Ongoing	Costed within a Pittwater wide feral animal control program	An increase in native fauna in the Reserve
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff time	Safe fuel levels & conservation
Access, Walking tracks & Recreation	Regenerate unnecessary tracks & upgrade fire trail	Natural Resources & Urban Infrastructure	Tracks when resources available	Obtain detailed costings	Integrate maintenance within staff resources & existing programs	Good track condition with no unnecessary tracks.
Boundaries & neighbours	Regain encroachments	Compliance & Natural Resources		Staff time		Bushland returned to public ownership

Leahvera Reserve, Scotland Island

Reserve Number: 0064

Street Address: Corner of Robertson Road and Richard Roads, Scotland Island.

1.0 Category & Description

1.1 Location and Description

Leahvera Reserve is located on the western foreshore of Scotland Island. The Reserve occupies 0.58ha and is bounded by residential properties, public roads and the foreshore. Access is via the public wharf, Cargo Wharf, linked to the road system, a sandy beach and a pedestrian path by a vehicular track.

1.2 Land Tenure and Property Description

The land is described as Fitzpatrick Avenue with associated widenings. It has a concrete public access road. It is owned by the Department of Land and Water Conservation. The land is zoned 6(a) Open Space - Existing Recreation.

1.3 Category of Land

The land is Crown Land and managed according to principles of Crown Land Management Act, 1989, and is also managed as community land compatible with the Local Government Act 1993. For consistency, it may be categorised as a natural area and further categorised as bushland and foreshore. It also meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2.0 Natural and Cultural Heritage

2.1 Topography, Geology and Soils

Leahvera Reserve is located on the footslope of a steep west-facing slope on the island. The foreshore is defined by a sandy beach with exposed rock strata rising sharply from the high tide mark.

The soils are derived from the shales and sandstones of the Newport Formation in the Narrabeen Group. These soils have been mapped as the colluvial Watagan soil landscape and are prone to mass movement, presenting a severe soil erosion hazard when disturbed.

2.2 Hydrology

The Reserve has a westerly aspect and although a dry slope, has ephemeral drainage lines during rain.

2.3 Vegetation

The dry western aspect features a Spotted Gum Forest community dominated by Spotted Gum (*Corymbia maculata*) in association with Grey Gum (*Eucalyptus punctata*). Species in the sparse shrub layer include Forest Oak (*Allocasuarina torulosa*) and Prickly Moses (*Acacia ulicifolia*). There is a dense groundlayer which includes species such as Kangaroo Grass (*Themeda australis*), Spiny Mat-rush (*Lomandra longifolia*) and Hardenbergia (*Hardenbergia violacea*).

2.4 Fauna

In August 1996, a pair of Crested Hawks (Pacific Baza) were recorded nesting in the Reserve. Uncommon in the area, their preferred food source is leaf insects and treefrogs.

Council's Habitat and Wildlife Corridor Conservation Strategy maps the Reserve as "Corridor - Co1" which indicates corridors or habitat areas though disturbed are likely to be of value due to good crown cover and/or understorey.

2.5 Aboriginal and Non-aboriginal Sites

An open midden, consisting of oysters, mud oysters, cockles, mussel and whelk shell types, occurs near the shoreline. A Kurrajong tree grows in the midden. It is possible it may have been transported in from another area and

planted by aboriginal people via the midden. Though the midden has been extensively disturbed and the tree felled following storm damage, the tree stump is reshooting. The significance and conservation of the midden should be taken into account when planning any future works in the Reserve.

There are no sites of European heritage recorded within the Reserve.

3.0 Significance and Objectives

3.1 Statement of Significance

Leahvera Reserve is significant because:

- it protects an example of bushland on Scotland Island representing a similar bushland community to that which occurred when the area was first visited by Europeans;
- ❖ it protects Spotted Gum Forest, a plant community considered significant in NSW;
- ❖ it contributes to the landscape quality of Scotland Island and Pittwater;
- ❖ it is an education resource and a contact point with history and nature for residents;
- ❖ it allows urban residents to walk through bushland to the sandy beach foreshore;
- ❖ it provides habitat and forms an important link in the wildlife corridor for faunal movement from the Peninsula to the National Park.
- ❖ the public wharf facility links the Reserve to the mainland and Church Point.

3.2 Management Objectives

The management objectives for Leahvera Reserve are:

- ❖ to protect the natural features of the Reserve, particularly the significant Spotted Gum Forest community.

- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve;
- ❖ to protect the reserve from soil erosion and effects of urban runoff;
- ❖ to adequately manage the bushland in relation to weed invasion and encroachments;
- ❖ to protect life and property from wildlife and to maintain ecological processes by seeking to maintain a near-natural fire regime in the Reserve to conserve native flora and fauna in the Reserve;
- ❖ to protect the Aboriginal site;
- ❖ to control introduced animals in the Reserve especially domestic dogs and cats;
- ❖ to provide opportunities for low impact access and recreational and educational use of the Reserve consistent with the other objectives;
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve;

4.0 Management Issues

4.1 Weed Invasion and Bush Regeneration

High levels of weed cover occur in the understorey. African daisy, Mother of millions, Asparagus Fern have infested the slope. There should be initial hand weeding in this area before a revegetation program in the mid-slope fill area is commenced.

The Reserve's perimeter should be the next priority working downslope and maintaining the track edge. Revegetation of unused road tracks should be incorporated into a bush regeneration program.

The local volunteer group should be encouraged to continue their work into this Reserve

4.2 Eucalypt dieback

The road cutting and engineering works have dissected the Reserve and disturbed tree root systems, which has stressed the established forest community. The trees require treatment and their condition monitored over time.

4.3 Management of significant plant species and communities:

A buffer zone removing disturbance and relieving compaction, should be created around the Kurrajong tree and its health monitored. In the past earthworks associated with the road cutting have changed the water regime throughout the Reserve, stressing the existing plant community. A program of planting species indigenous to the Reserve should be undertaken.

4.4 Aboriginal sites

The Aboriginal midden and associated Kurrajong tree require an interpretive sign to assist in recognition and appropriate respect and protection of the site.

4.5 Water quality

Development on the island has highly modified drainage lines, as the Reserve has been used as a distribution point for building materials across the island. Roadworks have directed urban runoff and subsequent engineering solutions have been used to solve the surface water discharge. The resultant concrete roadway and pipes and pits are located down the centre of the Reserve.

4.6 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in

accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction. Following fuel reduction burns a weed control program will be initiated in the Reserve.

4.7 Management of Native Fauna and Introduced Predators

Leahvera Reserve provides foreshore habitat for fauna with a variety of habitat components. The winter-flowering Spotted Gum and dry sclerophyll species are important habitat components. The Pacific Baza forms part of the diverse use of the Reserve; although an infrequent visitor its presence is an indicator of the importance the habitat in the Reserve provides.

A Pittwater wide public awareness campaign will address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. Feral animal control is an issue that needs to be addressed through a Pittwater-wide control strategy.

4.8 Access, walking tracks and recreation

The Reserve provides residents with the main access point for building material and is an occasional public ferry pickup and dropoff point. The informal steps to the foreshore need to be upgraded. The foreshore area provides residents with a sandy beach access to the water and is also used for boat storage. There is potential for a small picnic area midslope on an area of dumped fill. This site requires rehabilitation and revegetation with a landscape plan to be initiated.

4.9 Boundaries and neighbours

An encroachment of private landscaping along the southern water edge of the Reserve should be investigated and rectified.

5.0 Performance

Management Objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush regeneration	Support & increase volunteer bush regeneration	Natural Resources	Ongoing		Approx \$1400pa supervision & materials	Volunteers continuing to work in the Reserve
Eucalypt Dieback	Treat trees & monitor canopy health	Natural Resources	Ongoing		Staff time	
Hydrology and water Quality	Enrichment planting & revegetate unnecessary tracks	Natural Resources		Staff time	Integrate costing into works & existing maint. programs	Improved water quality
Management of native fauna & introduced predators	Public awareness campaign for responsible pet ownership, feral animal program	Natural Resources & Compliance	When funds available	Seek funds for animal programs	Costed within a Pittwater wide feral animal control program	An increase in fauna in the Reserve
Aboriginal Site	Install interpretive sign	Natural Resources	1998/99	\$800		Better protection and understanding of site
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff Time	Safe fuel levels & conservation of biodiversity
Access and Walking tracks & recreation	Upgrade steps Landscape & revegetate fill area	Natural Resources & Urban Infrastructure	1998/99	\$15,000		Improved public access & use
Boundaries & neighbours	Community awareness & participation in the Reserve & regain encroachment	Natural Resources & Compliance	When funds available		Staff time	No encroachments & good resident practices

Pathilda Reserve, Scotland Island

Reserve Number: 0061

Street Address: Both sides of road, between 55 & 57 Florence Terrace, Scotland Island.

1.0 Category and Description

1.1 Location and Description

Pathilda Reserve is located across a steep east-facing slope on Scotland Island. The Reserve occupies 0.4 hectares and runs from Thompson Street, between residential properties, straddling Florence Terrace, to the waterfront.

1.2 Land Tenure and Property Description

The Reserve is owned by Council, being described as Lots 362 & 363 in DP12749. The land is zoned 6(a) Open Space - Existing Recreation.

1.3 Category of Land

The Reserve is community land under the Local Government Act 1993. It is categorised as a natural area and further categorised as bushland and watercourse. It meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2.0 Natural and Cultural Heritage

2.1 Topography, Geology and Soils

Pathilda Reserve, located on a moderate to steep slope, contains a gully running in a north-easterly direction. The gully broadens as it approaches a sandy beach where it changes to a gently sloping rock floor. The soils are derived from the shales and sandstones of the Newport Formation in the Narrabeen Group. These moderately deep yellow, brown and red podzols, associated with the Watagan soil landscape, deepen downslope.

2.2 Hydrology

The moderate to steep slope has a perennial creekline that receives intense and rapid runoff from roadways and residential hard surfaces. The Report "Scotland Island Wastewater Impact Study 1996" provides more information on the catchment.

2.3 Vegetation

The Reserve, divided by Florence Terrace, supports a remnant Spotted Gum Forest community (*Corymbia maculata*). Although the understorey is sparse, the groundlayer species include Hardenbergia (*Hardenbergia sp*) and numerous grasses such as Kangaroo Grass (*Themeda australis*).

Below Florence Terrace, in the lower part of the Reserve species feature rainforest elements including Turpentine, Sandpaper Fig (*Ficus coronata*), Blueberry Ash and Lilly-Pilly. During the 1980's Casuarinas were planted in this part of the Reserve.

The area adjacent to the beach includes *Eucalyptus umbra* and *Casuarina glauca*.

2.4 Fauna

The birdlife and arboreal mammals are part of the fauna likely to use the Reserve. The faunal diversity of Scotland Island is particularly vulnerable to fire regimes and introduced animals, as there is limited scope for recruitment from mainland populations.

There is a large active Whistling Kite nest in a mature Spotted Gum near the water's edge. The presence of this species indicates the importance of the bushland for fauna. During 1996/97 an adjoining resident recorded two sightings of Echidna and a Diamond Python was found on their property. The Reserve and its foreshore association with a sandy beach and no seawalls provide potential nesting habitat for Little

Penguin known to feed in the surrounding waters and intertidal habitat for aquatic invertebrates. Council's Habitat and Wildlife Corridor Conservation Strategy maps the Reserve as "Corridor - Co1" which indicates corridors or habitat areas though disturbed are likely to be of value due to good crown cover and/or understorey.

2.5 Aboriginal and Non-aboriginal Sites

There are no recorded Aboriginal sites within the Reserve, although there is potential for sites such as axe grinding grooves and engravings to occur in the area.

There are no known sites of European Heritage in the Reserve.

3.0 Significance and Objectives

3.1 Statement of Significance

Pathilda Reserve is significant because:

- ❖ it protects an example of bushland of Scotland Island in a similar condition to that which occurred when the area was first visited by Europeans;
- ❖ it includes an example of Spotted Gum Forest, a plant community significant in NSW;
- ❖ it provides forest, creekline and intertidal habitat for a range of native fauna;
- ❖ it contributes to the landscape quality of Scotland Island and Pittwater, providing a record of the original landscape and the changes wrought by urban development;
- ❖ it is an education resource and a contact point with history and nature for residents;
- ❖ it allows urban residents to undertake informal recreational pursuits in a bushland setting;
- ❖ it is an important part of the habitat and wildlife corridor for faunal movement from the Peninsula to the National Park.

3.2 Management Objectives

The management objectives for Pathilda Reserve are:

- ❖ to protect the natural features of the Reserve, particularly the significant Spotted Gum Forest community and the habitat values of the Reserve;
- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve;
- ❖ to adequately manage the bushland in relation to weed invasion and encroachments;
- ❖ to protect life and property from wildfire and to maintain ecological processes by seeking to maintain a near-natural fire regime in the Reserve to conserve native flora and fauna in the Reserve;
- ❖ to control introduced animals in the Reserve especially domestic animals;
- ❖ to provide opportunities for low impact recreational and educational use of the Reserve consistent with the other objectives;
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve;

4.0 Management Issues

4.1 Weed Invasion and Bush regeneration

Weeds within the area between the two roads are limited to Fleabane, Cobblers' Pegs, Asparagus Fern, and some Lantana. This area has been weeded by the volunteer group and requires regular follow-up treatment. Weed infestation increases as the drain and water-borne weeds impact upon the Reserve below Florence Terrace. Garden encroachments such as Giant Bamboo and Bananas also have an impact.

The area below Florence Terrace has been recently cleared of Lantana and burnt in 1996. The rainforest area along the creekline should not be burnt. Secondary weeding should occur following the influx of annuals. The necessity for revegetation with rainforest species such as Turpentine, Sandpaper Fig, Veiny Wilkiea and Grey Myrtle.

4.2 Stormwater Management

The catchment's gradient coupled with the direction of road and residential runoff has caused the drainage line to scour and carry a high sediment load. Erosion control structures such as rubble lining of the channel at scour points, combined with binding vegetative cover, using species such as *Gahnia* sp. and *Lomandra longifolia* to stabilise the base of the drainage line and stop channel regression. The manual implementation of any erosion control structures is the preferred approach.

4.3 Fire Regime

Management of the fire regime in Pathilda Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council's Environmental Staff to determine methods of hazard reduction.

The area of the Reserve above Florence Terrace was burnt in 1993/94. The resultant regeneration

is indicative of a fairly hot burn. In winter 1996, the area below Florence Terrace was burnt, following manual hazard reduction and pile burns. The replanted rainforest species will require manual hazard reduction.

4.4 Management of Native Fauna and Introduced Predators

Pathilda Reserve provides good habitat for fauna with a variety of habitat components. The winter-flowering Spotted Gums and She-oaks encourage diversity and year-round food availability. To provide potential intertidal habitat for Little Penguin, it is recommended that no seawall be built along the foreshore of this Reserve.

A Pittwater wide public awareness campaign will address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve.

Feral animal predation is an issue that needs to be addressed through a Pittwater-wide control strategy.

4.5 Access, walking tracks and recreation

The two roads allow access to the Reserve, although no track exists in the area above Florence Terrace. Track maintenance is required from Florence Terrace to the foreshore and a new sign is needed at the roadside entry. The foreshore, which provides a sandy beach and water access, is also used for dinghy storage which should have a more defined area.

5.0 Performance

Management objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush regeneration	Continue volunteer support Replant rainforest species	Natural Resources	Ongoing		Approx \$1400pa supervisor & materials	Volunteers continuing to work in the Reserve
Stormwater control and drainage	Erosion control works on drainage line & revegetation	Engineers & Natural Resources	When funding available	Seek detailed design & costing	Integrate into works & maintenance programs	Erosion minimised & reduced sediment
Management of native fauna & introduced predators	Public awareness campaign, enforce the Dog Act & Pittwater wide feral animal control program	Natural Resources & Compliance	Ongoing & when funds available	Seek detailed costings & feral animal control	Staff time & resources	
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff Time	Fire regime that caters for safe fuel levels & conservation of plant & animal communities
Access and walking tracks	New Sign & Track maintenance	Reserves	Sign 1997/98	Sign \$400 Track as part of ongoing maintenance programs	Maintenance costs & staff time	

Harold Reserve, Scotland Island

Reserve Number: 0065

Street Address: End of Harold Avenue, Scotland Island.

1.0 Description & Category

1.1 Location and Description

Harold Reserve is located in the south east corner of Scotland Island providing pedestrian access to the public Carol's Wharf. The Reserve occupies 0.2ha with unfenced boundaries defined by the foreshore, residential properties and the intersection of Richard and Harold Roads.

1.2 Land Tenure and Property Description

Harold Reserve is owned by Council and is described as Lot 364 in DP12749. The land is zoned 6(a) Open Space - Existing Recreation.

1.3 Category of Land

Harold Reserve is community land under the Local Government Act 1993. It is categorised as a natural area and further categorised as bushland, foreshore and watercourse. It meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas.

2.0 Natural and Cultural Heritage

2.1 Topography, Geology and Soils

The Reserve lies along a narrow gully, which is steeply sided and opens onto a level area, leading to a small beach. The parent geology is shale and sandstone of the Newport Formation in the Narrabeen Group. Soils derived are moderately deep brown or gleyed podzols and have been mapped as the Watagan soil landscape.

2.2 Hydrology

The Reserve is located in the lower section of the catchment and receives water from the roads and along natural drainage lines that have been affected by septic systems associated with residential development. The main drainage line within Harold Reserve although severely degraded is vegetated by dense ground cover and debris that re-enforce the bank and channel. Additional information can be found in the report "Scotland Island WasteWater Impact Study 1995/6", which identifies the Reserve within catchment 9 and a nearby sampling point 12.

2.3 Vegetation

The vegetation is Spotted Gum Forest dominated by Spotted Gum (*Corymbia maculata*) in association with Turpentine (*Syncarpia glomulifera*). Rainforest species such as Grey Myrtle (*Backhousia myrtifolia*) and Figs (*Ficus SP.*) occur along the creek line. New South Wales Christmas Bush (*Ceratopetalum gummiferum*) and *Logania albiflora*, have a limited distribution on the island and a specimen of Graceful Bush-pea (*Pultenaea flexilis*) may be the last on the island (B Jones, 96). The dense groundlayer includes with shade loving vines, ferns including Common Maidenhair Fern (*Adiantum aethiopicum*), Rasp Fern (*Doodia aspera*) and sedges.

On the foreshore a seawall, sandy beach, a stand of Grey Mangroves (*Avicennia marina*) and mudflats occur.

2.4 Fauna

Harold Reserve provides creek line, forest and intertidal estuarine habitats for fauna.

Council's Habitat and Wildlife Corridor Conservation Strategy maps Harold Reserve as "Corridor - Co1" which indicates corridors or habitat areas though disturbed are likely to be of value due to good crown cover and/or understorey.

2.5 Aboriginal and Non-aboriginal Sites

There are no recorded Aboriginal sites within the Reserve. There is potential for Aboriginal sites to occur in the area such as axe grinding grooves and engravings.

There are no known European Heritage sites in the Reserve, however an old cottage borders the eastern side of the Reserve.

3.0 Significance and Objectives

3.1 Statement of Significance

Harold Reserve is significant because:

- ❖ it includes a sample of Spotted Gum Forest, a plant community significant in NSW;
- ❖ it protects an example of bushland on Scotland Island in a similar condition to that which occurred when the area was first visited by Europeans;
- ❖ it contributes to the landscape quality of Scotland Island and the foreshores of Pittwater and provides a record of the original landscape and the changes wrought by urban development;
- ❖ it is an education resource and a contact point with history and nature for residents;
- ❖ it allows urban residents to undertake informal recreational pursuits in a bushland setting;
- ❖ it is an important part of the habitat and wildlife corridor for faunal movement from the Peninsula to the National Park.

3.2 Management Objectives

The management objectives for Harold Reserve are:

- ❖ to maintain the natural range of structural and floristic diversity of bushland in the Reserve, in particular the significant Spotted Gum Forest community and uncommon species;

- ❖ to adequately manage the bushland in relation to weed invasion and encroachments;
- ❖ to protect life and property from wildlife and to maintain ecological processes by seeking to maintain a near-natural fire regime in the Reserve to conserve native flora and fauna;
- ❖ to control introduced animals in the Reserve, in particular domestic pets;
- ❖ to provide opportunities for low impact recreational and educational use of the Reserve consistent with the other objectives;
- ❖ to encourage community appreciation and neighbourhood participation in bushland management of the Reserve;

4.0 Management Issues

4.1 Weed Invasion & Bush regeneration

The understorey is infested by weeds such as Erharta and Fishbone Fern. Larger weeds such as Lantana, Arundo and Loquat have invaded the residential perimeter as garden escapes and cleared areas along the road embankment. The south-west side of the Reserve is least weed infested but has been impacted by pedestrian traffic.

A grove of Grey Myrtle should regenerate once pedestrian access is limited to the path and cleared area. Restoration work to define the creek line by lining the channel with sandstone rubble has been carried out in the lower, cleared portion of the Reserve. The area along the creek line above and next to Harold Road needs careful action to prevent destabilisation of the channel. A volunteer Bush regeneration group works within the Reserve.

4.2 Stormwater management

The impact of urbanisation of the island, is a threat to the integrity of the bushland because of increased sediment and degraded water quality flowing through the Reserve. The report "Scotland Island Waste Water Study 1997" provides a reference.

The construction of velocity dissipation structures linked to the road swales and drains to dissipate stormwater flow will reduce sediments and potential for scour within the Reserve. Any improvements to water discharged from residences will aid in the growth of native plants in the Reserve.

4.3 Fire Regime

Management of the fire regime in Harold Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserve will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction.

4.4 Management of Native Fauna and Introduced Predators

Harold Reserve provides good habitat for fauna with a variety of habitat components. The winter-flowering Spotted Gums, rainforest plants and mangroves encourage diversity and year-round food availability.

A Pittwater wide public awareness campaign will address the value of bushland as habitat for fauna and how residents can be responsible neighbours by ensuring that domestic cats and dogs do not roam in the Reserve. Compliance signs can assist this. Feral animal predation is an issue that needs to be addressed through a Pittwater-wide control strategy.

4.5 Access, walking tracks and recreation

Access to Carol's Wharf is through the Reserve on a paved pedestrian path and the majority of use is for boat and ferry access. A picnic area and terraced areas are frequently used. The terracing is also used for dinghy storage.

5.0 Performance

Management objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush regeneration	Support & increase volunteer bush regeneration	Natural Resources	Ongoing		Approx \$1400pa supervision & materials	Volunteers continuing to work in the Reserve
Stormwater management	Construction of stormwater dissipators	Natural Resources & Works & Services	When funds available	Seek detailed design & costing	Integrate costing into works & existing maintenance programs	Improved water quality
Management of significant plant sp. & communities	Limit fire and clearing in sensitive areas	Natural Resources & Compliance	Ongoing		Staff time	Sustainable plant community
Management of native fauna & introduced predators	Public awareness campaign for responsible pet ownership & feral animal program	Natural Resources & Compliance	When funds available as well as ongoing programs	Ongoing	Costed within a Pittwater wide feral animal control program	An increase in native fauna in the Reserve.
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff Time	Fire regime that caters for safe fuel levels & conservation of plant & animal communities
Access, walking tracks & recreation	Regenerate unnecessary tracks	Natural Resources		Implement within the bush regeneration program	Staff Time	Reduced compaction from pedestrian traffic
Boundaries & neighbours						

Fauna Species List Scotland Island

Key

Record (most recent)

UBS - Urban Bushland Survey Summer (95-96); UBW - Urban Bushland Survey winter '95; DC - D. Campbell pers comm; L - species as yet unconfirmed but considered likely to occur

Status

R=resident F=frequent visitor O= occasional visitor W=winter migrant S=summer migrant

Bold Italic - Threatened Species

Common Name	Scientific name	Record	Status
Spotted Turtle-dove *	Streptopelia chinensis	UBS	R
Sulphur-crested Cockatoo	Cacatua galerita	UBS	F
Galah	Cacatua roseicapilla	UBS	F
<i>Glossy Black-Cockatoo</i>	<i>Calyptorhynchus lathami</i>	<i>UBS</i>	<i>F</i>
Australian King-Parrot	Alisterus scapularis	UBS	F
Crimson Rosella	Platycercus elegans	UBS	F
Eastern Rosella	Platycercus eximius	L	F
Musk Lorikeet	Glosopsitta concinna	L	O
Little Lorikeet	Glosopsitta pusilla	L	O
Scaly-breasted Lorikeet	Trichoglossus chlorolepidotus	L	O
Rainbow Lorikeet	Trichoglossus haematodus	UBS	F
Fan-tailed Cuckoo	Cuculus pyrophanus	UBS	R
Shining Bronze-Cuckoo	Chrysococcyx lucidus	L	S
Common Koel	Eudynamys scolopacea	L	S
Channel-billed Cuckoo	Scythrops novaehollandiae	L	S
Southern Boobook	Ninox novaeseelandiae	UBW	R
<i>Powerful Owl</i>	<i>Ninox strenua</i>	<i>L</i>	<i>O</i>
Tawny Frogmouth	Podargus strigoides	UBW	R
Owlet-nightjar	Aegotheles cristatus	DC	R
Kookaburra	Dacelo novaeguinea	UBS	R
Sacred Kingfisher	Halcyon sancta	L	S
Dollarbird	Eurystomus orientalis	UBS	S
Noisy Pitta	<i>Pitta versicolor</i>	<i>FOC 91</i>	<i>O</i>
Black-faced Cuckoo-shrike	Coracina novaehollandiae	UBS	R
Grey Fantail	Rhipidura fuliginosa	L	R
Rufous Fantail	Rhipidura rufifrons	L	S
Eastern Whipbird	Psophodes olivaceus	L	R
Superb Fairy-wren	Malurus cyaneus	L	R
Variegated Wren	Malurus lamberti lamberti	L	F
White-browed Scrubwren	Sericornis frontalis	L	R
White-throated Warbler	Gerygone olivacea	L	S
Striated Thornbill	Acanthiza lineata	L	O
Brown Thornbill	Acanthiza pusilla	L	R
Eastern Spinebill	Acanthorhynchus tenuirostris	L	F
Red Wattlebird	Anthochaera carunculatus	UBS	R
Little Wattlebird	Anthochaera chrysoptera	L	R
Yellow-faced Honeyeater	Lichenostomus chrysops	L	W
Noisy Miner	Manorina melanocephala	UBS	R
White-naped Honeyeater	Melithreptus lunatus	L	W
Spotted Pardalote	Pardalotus punctatus	UBS	F
Silvereye	Zosterops lateralis	UBS	F
Common Mynah	Acridotheres tristis	UBS	R
Spangled Drongo	Dicrurus hottentotus	L	S
Grey Butcherbird	Cracticus torquatus	UBS	R
Australian Magpie	Gymnorhina tibicen	UBS	R

Pied Currawong	Strepera graculina	UBS	R
Australian Raven	Corvus coronoides	UBS	R
<u>Mammals</u>			
Short-beaked Echidna	Tachyglossus aculeatus	DC	R
Sugar Glider	Petaurus breviceps	L	R
Common Brushtail Possum	Trichosurus vulpecula	UBW	R
House Mouse	Mus domesticus	L	R
Black Rat	Rattus rattus	L	R
Grey-headed Flying-fox	Pteropus poliocephalus	L	O
Chocolate Wattled bat	Chalinolobus morio	L	F
Gould's Wattled Bat	Chalinolobus gouldii	L	F
Freetail bat	Mormopterus sp (loriae)	L	F
Common Bent-wing Bat	Miniopterus schreibersii	L	F
Greater Broad-nosed bat	Scoteanax ruepelli	L	F
Pale Eptesicus	Vespadelus vulturnus	L	F
<u>Reptiles</u>			
Blind Snake	Ramphotyphlops nigrescens	L	R
Yellow-faced Whip Snake	Demansia psammophis	L	R
Lace Moniotr	Vranus varius	DC	R
Leaf-tailed Gecko	Phyllurus platurus	L	R
Eastern Water Skink	Eulamprus quoyii	L	R
Striped Skink	Ctenotus robustus	L	R
Copper-tailed Skink	Ctenotus taeniolatus	L	R
Grass Skink	Lampropholis delicata	L	R
Garden Skink	Lampropholis guichenoti	UBS	R
Three-toed Skink	Saiphos equalis	L	R
Blue-tongued Lizard	Tiliqua scincoides	L	R
<u>Frogs</u>			
Common Eastern Froglet	Crinia signifera	UBS	R
Brown-striped Frog	Limnodynastes peronii	L	R
Peron's Tree Frog	Litoria peronii	L	R

Reserves of Elvina Bay and Lovett Bay (South)

Reserve Number:

Street Address:

1.0 Category & Description

1.1 Location and Description

The Reserves described are located from McCarrs Creek, including Elvina Bay, to the southern side of Lovett Bay on the western foreshores of Pittwater.

The Reserves are dominated by bushland in largely undeveloped areas. The major landuse adjacent to the Reserves is Ku-ring-gai Chase National Park with adjoining residential

properties, many with waterfrontages and Crown land.

1.2 Land Tenure and Property Description

There are 15 parcels of land described as Reserves either owned by Council or Crown land owned by the Department of Land and Water Conservation (DLWAC), under Council's care, control and management. They are all zoned 6(a) Existing Recreation and are listed in table 1 showing the property description.

Table 1: Property Description

RESERVE No	TITLE DESCRIPTION	Location	OWNERSHIP	NAME
PR VG 81/1	Lot 19 to 29 in DP 10002	Mc Carrs Creek	Council	
PR VG 81/2	Lots 10 & 11 in DP 13449	Elvina Bay (S)	Council	Wirringula Reserve
	Lot 12 in DP 13449	Elvina Bay (S)	DLWAC	Wirringula Reserve
PR VG 81/3	Lots 13&14 in DP 13449	Elvina Bay (S)	Council	Wirringula Reserve
PR VG 81/4	Lot 49 in DP 13449	Elvina Bay	Council	Elvina Park
PR VG 81/14	Lot 26 in DP 13449 Lots 1 to 4 in MPS(RP) 14518)	Elvina Bay & Lovett Bay	Council	
PR VG 81/12	Lot 3 in DP 13464	Elvina Bay & Lovett Bay	Council	
Pr VG 81/13	Lot 5 in DP 13856	Elvina Bay & Lovett Bay	Council	
PR VG 81/9	Lots 7, 10-12,15-24 in DP 13856	Lovett Bay	Council	
PR VG 81/8	Lot 57 in DP 8013	Lovett Bay	Council	
PR VG 81/7	Lot 43 in DP 8013	Lovett Bay	Council	
PR VG 81/6	Lot 1 in DP 13464	Lovett Bay	Council	Floods Peninsula Reserve
PR VG 81/5	Lot 27 in DP 8013	Lovett Bay	Council	Floods Peninsula Reserve
PR VG 81/11	Lot 1 in DP 605633	Lovett Bay	Council	Rocky Point Reserve
PR VG 81/ 15	Lot 1 in DP 614614	Lovett Bay	DLWAC	

1.3 Category of Land

The Reserves of Elvina Bay and Lovett Bay (South) on the western foreshores are community land under the Local Government Act, 1993 and are categorised as natural areas. Some are further categorised as bushland, watercourse, escarpment and/or wetland. The Reserves meets the definition of urban bushland described in State Environmental Planning Policy No 19 - Bushland in Urban Areas. This plan is prepared under the Local Government Act but also meets the Principles of Crown Land Management under the Crown Lands Management Act, 1989.

2.0 Natural and Cultural Heritage

2.1 Topographic, Geology and Soils

The geology of the Western Foreshores is Hawkesbury Sandstone on the higher slopes and ridges and underlain by the shales and sandstones of the Newport Formation in the Narrabeen Group which characterises the lower slopes.

The soils of the upper slopes have been mapped as the Lambert, Oxford Falls and Hawkesbury soil landscapes, and the lower slopes feature the yellow to red podzols of the Watagan soil landscape. These soils have a higher clay content than the sandstone-derived soils and present a mass movement hazard, prone to severe soil erosion.

2.2 Hydrology

The majority of the Reserves are located above urban or man-made influences. Several however include watercourses that originate in Ku-ring-gai Chase National Park. Upstream influences on the water quality and quantity in the Reserves can include fire trails, illegal walking tracks and in some foreshore Reserves influence from septic seepage.

2.3 Vegetation

Elvina Park supports an example of Spotted Gum Tall Open-forest. The dominant species, Spotted Gum (*Corymbia maculata*), reaches a

height of 40 metres in sheltered situations. Associated tree species include Rough-barked Apple (*Angophora floribunda*) and Grey Ironbark (*Eucalyptus paniculata*). The small tree species include Forest Oak (*Allocasuarina torulosa*), Cabbage Tree Palm (*Livistona australis*), Veiny Wilkiea (*Wilkiea hugeliana*), Lillypilly and Blueberry Ash.

Shrub species present include *Pultenaea flexilis*, Tree Heath (*Trochocarpa laurina*), Common Correa (*Correa reflexa*), Bastard Rosewood and *Maytenus silvestris*. Vines are prevalent, including Sweet Sarsparilla (*Smilax glycyphylla*), Dusky Coral Pea (*Kennedia rubicunda*), Native grape (*Cissus hypoglauca*), Lawyer Vine (*Smilax australis*) and Pearl Vine (*Sarcopetalum harveyanum*).

Ground layer species include False Bracken (*Calochlaena dubia*), Hop Goodenia (*Goodenia ovata*), Spiny Mat-rush (*Lomandra longifolia*), *Poa affinis* and Bracken Fern.

At Rocky Point, the vegetation consists of Spotted Gum Forest dominated by Spotted Gum and Grey Ironbark. Red Bloodwood (*Corymbia gummifera*) and Broad-leaved White Mahogany (*E. umbra*) are associated tree species. The small tree layer is largely made up of suppressed individuals of Spotted Gum and Grey Ironbark. Other species include Hickory Wattle (*Acacia implexa*), Forest Oak, Hard Corkwood (*Endiandra sieberi*) and Blueberry Ash (*Elaeocarpus reticulatis*).

Smaller shrubs include Mountain Holly (*Oxylobium ilicifolium*), Prickly Moses (*Acacia ulicifolia*), Breynia (*Breynia oblongifolia*) and Narrow-leaf Geebung (*Persoonia linearis*).

Ground layer species include Blady Grass (*Imperata cylindrica*), Grass Tree *Xanthorrhoea macronema*, Kangaroo Grass (*Themeda australis*) and Basket Grass (*Oplismenus imbecillis*).

2.4 Fauna

Elvina Park

The habitat complexity of the tall moist forest and its connection to Ku-ring-gai Chase National Park means that Elvina Park is able to support a diverse fauna assemblage. A number of important sightings have been made in the vicinity including the rare spotted-tailed quoll,

brush turkey and the vagrant noisy pitta. The noisy pitta uses such wet forests in the Sydney region as stopover points between rainforests to the north and south. Cabbage tree palms, lillypillies and rainforest vines provide food for frugivorous pigeons, parrots and cuckoos. The thick damp groundcover makes it suitable for a range of reptiles and some terrestrial mammals.

Council's Habitat and Wildlife Corridor Conservation Strategy maps the Reserve as "Major Habitat - MH " which indicates major habitat areas. This signifies a high degree of diversity within the Reserve in both habitat types and species presently using it.

2.5 Aboriginal and Non-Aboriginal Sites

There are numerous Aboriginal sites within the Reserves. These include caves and shelters, axe grinding grooves and engravings sites.

There are a number of sites of European Heritage in the Reserves including settlers graves.

3.0 Significance and Objectives

3.1 Statement of Significance

The Reserves in Elvina Bay and Lovett Bay are significant because:

- ❖ they contain Spotted Gum Forest communities which are significant at a State level;
- ❖ they contain significant aboriginal sites
- ❖ they provide major habitat and habitat complexity for a diverse assemblage of native fauna including threatened and significant species, namely the spotted-tailed quoll, brush turkey and the noisy pitta;
- ❖ they provide panoramic views to Barrenjoey Headland and Pittwater;
- ❖ they contribute to the landscape quality of the Pittwater foreshore and are used for a range of activities in a bushland setting;

- ❖ they provide a record of the original landscape and the changes wrought by urban development; and
- ❖ they are an educational resource and a contact point with nature for residents.

3.2 Management Objectives

The management objectives for the Reserves in Elvina Bay and Lovett Bay are:

- ❖ to protect and maintain the natural range of structural and floristic diversity of bushland in the Reserves in particular the significant communities, species and habitats;
- ❖ to conserve the habitat complexity for a diverse assemblage of native fauna including threatened and significant species, namely the spotted-tailed quoll, brush turkey and the noisy pitta;
- ❖ to adequately manage the bushland in relation to encroachments, weed invasion and access tracks;
- ❖ to protect life and property from wildfire and to maintain ecological processes by seeking to maintain a near-natural fire regime to conserve native flora and fauna in the Reserves;
- ❖ to control introduced animals in the Reserves;
- ❖ to provide low impact recreational and educational use of the Reserves consistent with the other objectives, and
- ❖ to encourage community appreciation and participation in bushland management of the Reserves.

4.0 Management Issues

4.1 Weed Invasion

The major weeds present include Blackberry, Lantana, Crofton Weed, Mist Flower and Wandering Jew.

Weed invasion in the area is predominantly associated with watercourses, areas bordering urban development, areas of past habitation within the Park, tracks and specific areas of high public usage and some small areas of undisturbed bushland.

Plant communities most severely affected are in Reserves which have urban development in their catchment. Boundary areas and tracks can be severely affected by weed invasion but the extent is usually restricted to a short distance. Where a watercourse adjoins the boundary area, weed infestation may extend. Increased runoff and erosion has led to sedimentation in watercourses, providing a substrate for weed growth. Sources of weed propagules include dumped garden refuse, invasive garden escapees dispersed by birds and wind, and mature weeds established in the National Park.

Fire trails, also used for bush walking, disturb areas which are then colonised by weeds from the edges into the adjoining bushland, which reach maturity quickly and produce large amounts of seed. This type of weed species include Cobblers' Pegs and Paddy's Lucerne.

In areas of past habitation, weed species are of garden origin and vary for each site. Although, high in number, their concentration is mainly restricted to the habitation site.

4.2 Bush Regeneration

The basic principles of weed removal are:

- ❖ to work from the least to the most heavily weed infested areas
- ❖ to minimal soil disturbance,
- ❖ to allow native plant regeneration to dictate the rate of weed removal,
- ❖ to consider catchment and adjoining influences in the regeneration program.

The weed management strategy should be based on a system of priorities for managing current weed problems and preventing potential infestations. In particular, the likely rate of spread should be given consideration. The broad priorities for the Elvina Bay and Lovett Bay Reserves, in priority order, are:

- ❖ Weed invasion into regionally significant communities, such as Spotted Gum Forest, which is likely to increase.
- ❖ Weed invasion into undisturbed bushland which is likely to escalate if immediate remedial action is not taken.

4.3 Fire Regime

Management of the fire regime in the Reserve will be undertaken by the Warringah Pittwater Bush Fire Management Committee in accordance with Circular C10 - Planning for Bush Fire Prone Areas. The Reserves will be regularly monitored for fuel loadings and any hazard reductions required will be undertaken in accordance with the Draft Fuel Management Plan.

Ecological considerations will be assessed by Council Environmental Staff to determine methods of hazard reduction, together with staff of the National Parks and Wildlife Service.

Following fire, a weed control program should be undertaken.

The 1994 wild fires affected the Reserves and appropriate interval between burns needs to be incorporated into the fire regime.

4.4 Management of significant plant species and communities

Spotted Gum Forest communities, which occur in many of the Reserves, is regionally significant at a State level and has a limited distribution within the Pittwater area. Monitoring the health and weed condition of these communities should occur.

4.5 Management of Native Fauna and Introduced Predators

The Reserves provide good habitat for fauna with a variety of habitat components. The location extends from ridgetop to the foreshore estuarine area with woodland, open forest and closed forest associations providing year-round food availability.

A Pittwater wide public awareness campaign will address the value of bushland as habitat for fauna and how residents can be responsible

neighbours by ensuring that domestic cats and dogs do not roam in the Reserves. The control and removal of all introduced animals from the Reserve would be an ultimate goal, but would have to proceed with adjoining landowners such as the National Parks and Wildlife Service. Some residents of the western foreshores elect not to keep domestic predators as pets. Currently this is an individual decision, however, if the community were to collectively make this decision, it would provide enormous benefits for the native fauna of the area.

Feral cat and fox predation is an issue that needs to be addressed through a Pittwater-wide control strategy.

4.6 Access and walking tracks

A network of unsealed fire trails exist providing access to most Reserves. Access through many of the Reserves is minimal.

5.0 Performance

Management objectives	Performance Targets (Actions)	Responsibility	Completion date	Capital cost	Recurrent Cost	Performance Measures
Weed Control & Bush Regeneration	Continue & expand volunteer support	Natural Resources	Ongoing		\$1400pa supervisor & materials	Healthy bushland reserves
Management of significant plant sp. & communities	Monitor health of Spotted Gum communities	Natural Resources		Staff Time	Seek to include in ongoing monitoring program	
Management of native fauna & introduced predators	Public awareness campaign for responsible pet ownership & feral animal program	Natural Resources & Compliance	When funds available as well as ongoing programs	Ongoing	Costed within a Pittwater feral animal control program	Public understanding & responsible pet ownership
Fire Management	Maintain appropriate fire regime	Bushfire Services & Natural Resources	Ongoing		Staff Time	Safe fuel levels & biodiversity conservation
Access and walking tracks	Ensure good track design & maintenance	Natural Resources & Urban Services	To be included within works programs	Within maintenance program		Limit erosion and weed distribution

Fauna Species List Elvina Bay

Key

Status

R=resident F=frequent visitor

W=winter migrant

O=occasional or uncommon visitor

S=summer migrant

Bold = regionally significant sp

Bold Italic = Threatened sp

Common name	Scientific name	Status
<u>Birds</u>		
Brown Goshawk	Accipiter fasciatus	O
White-bellied Sea-Eagle	Haliaeetus leucogaster	O
Whistling Kite	Haliastur sphenurus	O
Little Eagle	Hieraaetus morphnoides	O
Brush-turkey	Alectura lathamii	R
Topknot Pigeon	Lopholaimus antarcticus	O
Brown Cuckoo-Dove	Macropygia amboinensis	O
Common Bronzewing	Phaps chalcoptera	O
Sulphur-crested Cockatoo	Cacatua galerita	F
Galah	Cacatua roseicapilla	F
Glossy Black-Cockatoo	Calyptorhynchus lathamii	F
Australian King-Parrot	Alisterus scapularis	R
Crimson Rosella	Platycercus elegans	F
Eastern Rosella	Platycercus eximius	R
Musk Lorikeet	Glosopsitta concinna	O
Little Lorikeet	Glosopsitta pusilla	O
Scaly-breasted Lorikeet	Trichoglossus chlorolepidotus	F
Rainbow Lorikeet	Trichoglossus haematodus	R
Fan-tailed Cuckoo	Cuculus pyrophanus	R
Shining Bronze-Cuckoo	Chrysococcyx lucidus	S
Common Koel	Eudynamys scolopacea	S
Channel-billed Cuckoo	Scythrops novaehollandiae	S
Southern Boobook	Ninox novaeseelandiae	R
Powerful Owl	Ninox strenua	O
Tawny Frogmouth	Podargus strigoides	R
Owlet-nightjar	Aegotheles cristatus	R
Kookaburra	Dacelo novaeguinea	R
Sacred Kingfisher	Halcyon sancta	S
Dollarbird	Eurystomus orientalis	S
Noisy Pitta	Pitta versicolor	O
Superb Lyrebird	Menura superba	R?
Black-faced Cuckoo-shrike	Coracina novaehollandiae	R
Eastern Yellow Robin	Eopsaltria australis	R
Rose Robin	Petroica rosea	W
Golden Whistler	Pachycephala pectoralis	R
Rufous Whistler	Pachycephala rufiventris	W
Grey Shrike-thrush	Colluricincla harmonica	R
Leaden Flycatcher	Myiagra rubecula	O
Black-faced Monarch	Monarcha melanopsis	S
Grey Fantail	Rhipidura fuliginosa	R
Rufous Fantail	Rhipidura rufifrons	S
Eastern Whipbird	Psophodes olivaceus	R
Superb Fairy-wren	Malurus cyaneus	R
Variegated Wren	Malurus lamberti lamberti	O
White-browed Scrubwren	Sericornis frontalis	R

White-throated Warbler	Gerygone olivacea	S
Brown Warbler	Gerygone mouki	S
Striated Thornbill	Acanthiza lineata	O
Brown Thornbill	Acanthiza pusilla	R
Sitella	Neositta chrysoptera	O
White-throated Treecreeper	Climacteris leucophaea	R
Eastern Spinebill	Acanthorhynchus tenuirostris	R
Red Wattlebird	Anthochaera carunculatus	R
Little Wattlebird	Anthochaera chrysoptera	R
Yellow-faced Honeyeater	Lichenostomus chrysops	W
Noisy Miner	Manorina melanocephala	R
Lewin's Honeyeater	Meliphaga lewinii	R
White-naped Honeyeater	Melithreptus lunatus	W
Spotted Pardalote	Pardalotus punctatus	R
Silvereye	Zosterops lateralis	R
Red-browed Finch	Emblema temporalis	R
Common Mynah	Acridotheres tristis	R
Spangled Drongo	Dicrurus hottentotus	S
Satin Bowerbird	Ptilonorhynchus violaceus	R?
Grey Butcherbird	Cracticus torquatus	R
Australian Magpie	Gymnorhina tibicen	R
Pied Currawong	Strepera graculina	R
Australian Raven	Corvus coronoides	R
<u>Mammals</u>		
Short-beaked Echidna	Tachyglossus aculeatus	R
Tiger Quoll	Dasyurus maculatus	O
Brown Antechinus	Antechinus stuartii	R
Swamp Wallaby	Wallabia bicolor	R
Sugar Glider	Petaurus breviceps	R
Common Ringtail Possum	Pseudocheirus peregrinus	R
Common Brushtail Possum	Trichosurus vulpecula	R
Koala	Phascolarctos cinereus	O
Long-nosed Bandicoot	Perameles nasuta	R
Bush Rat	Rattus fuscipes	R
Black Rat	Rattus rattus	R
Grey-headed Flying-fox	Pteropus poliocephalus	O
Common Bent-wing Bat	Miniopterus schreibersii	O
Fox	Vulpes vulpes	O
<u>Reptiles</u>		
Blind Snake	Ramphotyphlops nigrescens	R
Green Tree Snake	Dendrelaphis punctulatus	R
Golden-crowned Snake	Cacophis squamulosus	R
Eastern Small-eyed Snake	Rhiniplocephalus nigrescens	R
Black-bellied Swamp Snake	Hemiaspis signata	R
Red-bellied Black Snake	Pseudechis porphyriacus	R
Yellow-faced Whip Snake	Demansia psammophis	R
Diamond Python	Morelia spilota spilota	R
Lace Monitor	Varanus varius	R
Eastern Water Dragon	Physignathus leseurii	R
Leaf-tailed Gecko	Phyllurus platurus	R
Eastern Water Skink	Eulamprus quoyii	R
Striped Skink	Ctenotus robustus	R
Copper-tailed Skink	Ctenotus taeniolatus	R
Grass Skink	Lampropholis delicata	R

Garden Skink	Lampropholis guichenoti	R
Three-toed Skink	Saiphos equalis	R
Weasel Skink	Saproscincus mustelina	R
Blue-tongued Lizard	Tiliqua scincoides	R
<u>Frogs</u>		
Common Eastern Froglet	Crinia signifera	R
Green Tree Frog	Litoria caerulea	R
Eastern Dwarf Tree Frog	Litoria fallax	R
Peron's Tree Frog	Litoria peronii	R
Leaf Green Tree Frog	Litoria phyllochroa	R