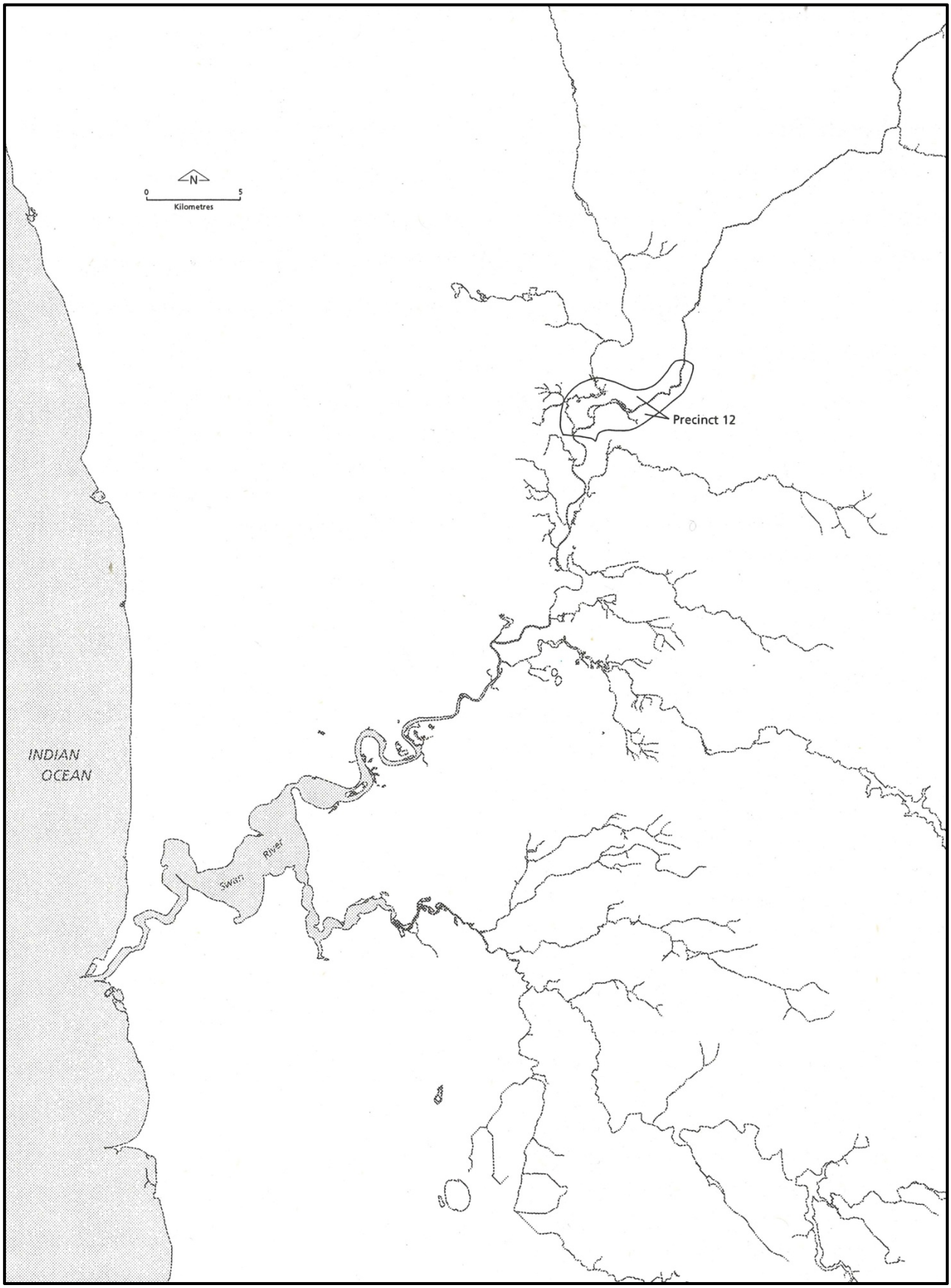
Precinct 12

Middle Swan – Ellen Brook to Bells Rapids



Summary

Middle Swan – Ellen Brook to Bells Rapids

The Swan River braids twice into two channels forming silty islands between the Ellen Brook confluence and Upper Swan Bridge. The river meanders in a irregular pattern and has several tributaries and backwaters joining the main channel. The section of river upstream from the Upper Swan Bridge is particularly attractive, as it is untrained and therefore 'natural' in appearance.

Silty banks form against fallen trees and on meander bends, while in several places bank erosion is quite serious. Further upstream at Bells Rapids, the Swan River becomes a series of pools and rapids. Here the water flows over granite outcrops, which have become smooth and polished with continual action. Adjacent to the main river channel the flood plain is made up of coarse river sand and pebbles.

The downstream section of the precinct is a flat alluvial plain which was originally cleared for agricultural purposes. Behind this the landscape becomes more steeply sloping being the alluvial fans in front of the steeply sloping Darling Range. Mount Mambup has a spectacular sloping face which provides a very attractive river valley. There are several rocky outcrops on the steep Darling Range which provide a textual and colour contrast to the flat grassy hills and dot like shrubs.

At Ellen Brook, modified open woodland occurs along the river channel consisting of paperbark, sheoak and flooded gum. Away from the river channel, remnant marri, banksia, and jarrah trees occur as isolated specimens adjacent to pasture, orchards and vineyards. At Bells Rapids, the vegetation communities are less disturbed with a number of different communities occurring. The most extensive vegetation unit in the area is the prickly dryandra and the road side tea trees.

Several river crossings in the form of road, rail and pedestrian bridges occur at this precinct. The main land uses the downstream section of the precinct viticulture and horticulture. Upstream there is a low density rural housing area at Brigadoon. Several horse studs and agistments occur on the lower slopes of the area. Bells Rapids is a recreation reserve which has a gravel road, informal parking areas and no amenities. On the middle slope of the range a railway crosses the Darling Range.

Biophysical Processes

Geological Processes

The precinct has many different geological units in the area. Metamorphic belts from the Acadian period include Chittering schists which are surrounded by granite coarse grained and igneous rocks of Archaean period (DCE, 1980). Chittering Metamorphic Belt has rocks with a regional strike to the north and steep dips to the east or west. They consist of aluminous schist which alternate with various gneisses. The gneisses are most probably metamorphosed sediments which consist of feldspars, biotite and quartz. The geology of the Bells Rapids Park is dominated by granitic and gneissic rocks which outcrop on the steep slopes above the river. Quartz-rich dolerite dykes intrude the granite in places. Clayey soils partially fill the base of the valley and make up river banks. Generally, slopes are covered by shallow soils (Shire of Swan, 1988).

Swan alluvial terraces with red earths and duplex soils are evident along the Swan River channel (McArthur and Bettenay, 1974). The Helena Soil Association which is found in the very deeply incised valleys of the Darling Scarp is characterised as being shallow red or yellow earths. Forrestfield Soil Association is characterised as being the laterite foothills of the Darling Scarp dominated by gravelly and sandy soils of the Ridge Hill Shelf geological unit.

Topography

The Ridge Hill Shelf laterite foothills of the Darling Scarp are dominated by gravelly and sandy soil which grade into the flat Pinjarra Plain. Behind is the steeply sloping Darling Scarp where the hills are relatively topographically high. Against the skyline the Darling Scarp appears as a horizontal line of hills with small depressions where the valleys form.

The Bells Rapid area is situated in a valley which has been cut by the erosive action of the Swan River as it made its way through the edge of the Darling Scarp. Slopes on the northern side are steep, up to thirty degrees. Sediments carried down by the river have been deposited during high waters to produce flood plains which extend down to the coastal plain below (Shire of Swan, 1988). The hills are dotted with rocky outcrops which, due to the sparse low form of the vegetation are very prominent rises on the relatively smooth slopes.

Hydrological Processes

Water features

The Swan River braids into two channels upstream of Ellen Brook, the main channel being the northern section. The island created is quite steep and muddy and supports reeds' and melaleucas. Downstream of the Upper Swan Bridge, the river again bifurcates into two channels, with the northern route being the main channel. The island created is substantial in size and the channels are evidence of a constantly changing river route. Several tributaries enter the Swan River at this precinct, with drainage lines following the landform. At the base of Mount Mambup the river channel flows over rocky outcrops creating rapids as the water flow is disturbed by the irregular surfaces. The river channels have well sorted sediments with the flood plains having sections of coarse river sand adjacent to sections of small pebbles.

Bathymetry

The river channel is particularly shallow with the river channel only reaching a maximum depth of approximately one metre. The channel, although wider than it is deep is relatively narrow being in places less than 20 metres across. The channel has not been 'trained' and therefore is irregular in shape and depth.

Flooding

This section of the Swan River is subject to seasonal flooding, particularly in the lower lying sections of the river around the Pinjarra Plain. The upstream sections of the precinct have steep channel gradients and flooding is more often restricted to the wider flatter sections of the river where the flood plain can form unrestricted by rocky outcrops. Backwaters and evidence of flooding are presently adjacent to the Upper Swan Railway Bridge.

Erosion and accretion

Erosion is evident in areas where the riparian vegetation has been removed such as on the northern channel of the Swan River adjacent to the Upper Swan Bridge. Scouring of the banks occurs during periods of high water levels. Adjacent to the Upper Swan Railway Bridge there is evidence of erosion caused by flooding and lack of understorey. Backwaters which are seasonally wet have been gouged in the soft alluvial sediments.

Vegetation Communities

Native

Swan Complex

The Swan Complex edges only a small section between the Upper Swan Bridge and the Upper Swan Railway Bridge (DCE, 1980). The vegetation ranges from fringing woodland of flooded gum *(Eucalyptus rudis)* and swamp paperbark *(Melaleuca rhaphiophylla)* with localised occurrence of low open forest of sheoak *(Casuarina obesa)* and saltwater paperbark *(Melaleuca cuticularis).* Along the very fringe of the river the emergent shore rus'h *(Juncus kraussii)* and pale rush *(Juncus pallidus)* form a closed sedge land. The shore rush *(Juncus* sp), the native bulrush *(Typha domingensis)* and marsh club rush *(Bolboschoenus caldwellii)* are found in the emergent zone of this section of the Swan River. Occasional stands of lake club rush *(Schoenoplectus validus)* occur just north of the Ellen Brook confluence. Unfortunately, much of the riparian vegetation has been invaded by exotic grasses and other weeds.

Guildford Complex

Along Great Northern Highway, the original community would have been the Guildford Complex. It occurs on drier soils than the flooded gum communities. The complex ranges from a mixture of open to tall open forest of marri *(Eucalyptus calophylla),* wandoo *(Eucalyptus wandoo)* and jarrah *(Eucalyptus marginata).* The understorey species include, bull banksia *(Banksia grandis),* slender banksia *(Banksia attenuata)* and firewood banksia *(Banksia menziesii),* black gin *(Kingia australis),* blackboy *(Xanthorrhoea preissii),* prickly moses *(Acacia pulchella),* white myrtle *(Hypocalymma angustifolium),* Swan River myrtle *(Hypocalymma robustum),* common hovea *(Hovea trisperma)* and buttercup *(Hibbertia hypericoides).*

Forrestfield Complex

On the Ridge Hill Slope geomorphic unit, the vegetation changes to the Forrestfield Complex. The vegetation ranges from open forest of marri (Eucalyptus calophylla), *wandoo* (Eucalyptus wandoo) *and jarrah* (Eucalyptus marginata), *to an open forest of jarrah, marri and sheoak* (Allocasuarina fraseriana), *and various banksia species. Understorey species include bull banksia* (Banksia grandis), *woody pear* (Xylomelum occidentale), *parrot bush* (Dryandra sessilis), *zamia palm* (Macrozamia *riedlei),* and blackboy *(Xanthorrhoea preissii)*

Helena Complex

The Helena Complex occurs along river floodplains and other relatively moist areas. The vegetation ranges from a mixture of open forest of jarrah *(Eucalyptus marginata),* marri *(Eucalyptus calophylla)* and wandoo *(Eucalyptus wandoo)* through to health and herblands.

Dominant species include jug flower *(Adenanthos barbigerus),* variable leafed hakea *(Haekea varia),* currant bush *(Leptomeria cunninghamii),* beard heath *(Leucopogon capitellatus),* hairy flag *(Patersonia rudis),* and common pin heath (*Styphelia tenuiflora).*

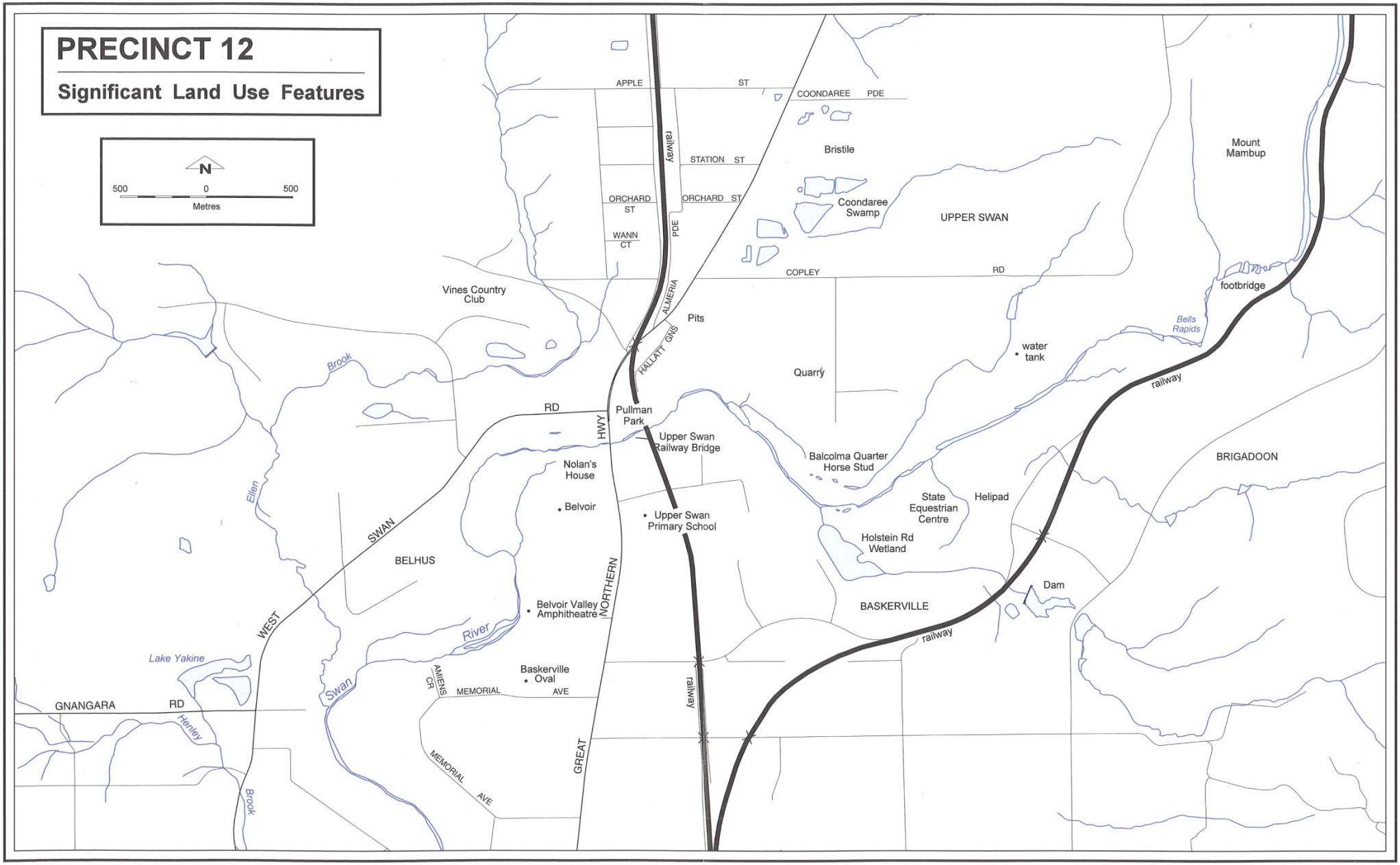
There is a heath dominated by graceful honeymyrtle *(Melaleuca radula)* at the southern bank of the Bells Rapids footbridge. The plant community also has road side tea tree *(Leptospermum erubescens),* a small dryandra *(Dryandra fraseri)* and prickly dryandra *(Dryandra armata).* Wandoo *(Eucalyptus wandoo)* is often found scattered at low densities in the heath community.

On the slopes of Mount Mambup there is an abundance of prickly dryandra *(Dryandra armata)* and road side tea tree *(Leptospermum erubescens)* which are both shrub forms. Most areas have been degraded only having up to 50 % cover remaining (Shire of Swan, 1988). At the base of the slope, flooded gum *(Eucalyptus rudis)* and wandoo *(Eucalyptus wandoo)* are also found among the dryandra and teatree communities. In addition, along the drainage lines marri *(Eucalyptus calophylla)* is present. There are small areas along the south side of the river at Bells Rapids supporting leafless wattle *(Acacia restiacea).*

The swamp paperbark *(Melaleuca rhaphiophylla),* mohan *(Melaleuca viminea)* and the lesser bottlebrush *(Callistemon phoeniceus)* form open shrubland on the lower slopes of Mount Mambup and the rocky bed of the river at Bells Rapids. The mohan forms an attractive neat round shrub with dull grey green foliage. The swamp paperbark has a less dense canopy and a larger taller trunk which is often branched. The lesser bottlebrush forms an attractive round dense blue grey bush along the river's edge.

Darling Scarp Complex

The vegetation which occurs on the steep slopes of the Darling Scarp ranges from low open woodland to lichens according to the depth of the soil (DCE, 1980). Woodland components are chiefly wandoo *(Eucalyptus wandoo),* Darling Range ghost gum *(Eucalyptus laeliae)* and marri *(Eucalyptus calophylla).* Other plant species which can be found at these sites are rock sheoak *(Allocasuarina huegeliana),* pincushion *(Borya nitida),* marble hakea *(Hakea incrassata),* narrow fruit hakea *(Hakea stenocarpa),* fuchsia grevillea *(Grevillea bipinnatifida),* goodenia *(Goodenia fasciculata),* and spindly grevillea *(Grevillea endlicheriana).*


PRECINCT 12
Significant Land Use Features
N
500
0
500
Metres
APPLE ST
COONDAREE PDE
railway
STATION ST
ORCHARD ST
ORCHARD ST
WANN CT
PDE
Bristile
Coondaree Swamp
UPPER SWAN
Mount Mambup
COPLEY RD
footbridge
Vines Country Club
ALMERIA
Pits
HALLATT GNS
Bells Rapids
water tank
Quarry
railway
Brook
RD
Pullman Park
HWY
Upper Swan Railway Bridge
Balcolma Quarter Horse Studs
BRIGADOON
Nolan's House
Belvoir
Upper Swan Primary School
State Equestrian Centre
Helipad
Holstein Rd Wetland
Ellen
SWAN
BELHUS
NORTHERN
Belvoir Valley Amphitheatre
BASKERVILLE
Dam
WEST
River
railway
Lake Yakine
Baskerville Oval
AMIENS CR
MEMORIAL AVE
Swan
GNANGARA RD
Henley
GREAT
MEMORIAL AVE
Brook

Murray and Bindoon Complex

The Murray and Bindoon Complex is represented at the Upper Swan valley floors. The vegetation type ranges from open forest jarrah *(Eucalyptus marginata),* and marri *(Eucalyptus calophylla)* with some Swan River blackbutt *(Eucalyptus patens)* to low open forest of flooded gum *(Eucalyptus rudis)* to swamp paperbark *(Melaleuca rhaphilophylla)* on the valley floors. Other plants include hairy gland flower *(Adenanthos barbigerus),* honey bush *(Hakea lissocarpha),* sword sedge *(Lepidospermum angustatum)* and common pin head *(Styphelia tenuiflora).*

Exotic

Weeds include buffalo grass *(*Stenotaphrum secundatum),* one sided oats *(*Avena barbata),* blowfly grass *(*Brixa minor),* dock *(*Rumex crispus),* sedges nutgrass *(*Cyperus* sp), fennel (**Foeniculum vulgare),* couch *(*Cynodon dactylon),* salt water couch *(*Paspalum vaginatum)* and dense stands of Sodom's apple *(*Solanum sodomeum).*

Historical Land Use and Resulting Environmental Changes

The land north of the confluence of the Swan River and Ellen Brook was explored on foot by Captain Stirling and his party in March 1827. Unable to go any further upstream due to debris and a lack of water in the stream, Stirling recorded that they found a large freshwater lake which is believed to have been Coondaree Swamp and a freshwater lagoon which is believed to have been the lower part of Ellen Brook.

A prominent land holder of the early settlement was Peter Broun who sailed with Stirling on the Parmelia with his family and three servants. He took up a portion of rich alluvial land at the Upper Swan which he designated Coulston after the family home in Scotland. The other land was at East Perth Power House and Perth and Fremantle town lots (Carter, 1986).

The Bells Rapids area was once part of Millendon Station, which was a property used for the agistment of sheep for sale in Perth and live export. A bridge was constructed over the river at Bells Rapids to move animals from one side to the other. The original bridge has since been demolished and pedestrian footbridge replaced it (Shire of Swan, 1988).

In relatively recent times, Bells Rapids and surrounding areas were fertilised and seeded from the air to promote the growth of fodder crops. Pastures sown included a wide variety of clovers and grasses. Intense grazing together with frequent fires have destroyed the indigenous vegetation.

Ownership of the Bells Rapids station moved to the Bond Corporation who subdivided it into rural and residential lots in 1984. A condition of subdivision was that the foreshore area of Bells Rapids be transferred to the Shire of Swan freehold.

Present Land Use and Social Patterns

The Belvoir Amphitheatre is located adjacent to the Swan River. It is open to the public for performances only. Adjacent is Belvoir homestead which was established as a grazing property at the turn of the century. Similarly, adjacent to the Upper Swan Bridge is Nolan's House which was also an early agricultural property. Upstream of Belvoir and around Nolan Avenue, viticulture and fruit growing are the dominant land uses.

Midland Brick Company has areas around Apple Street, Upper Swan, which were used to excavate clay. Prior to these purposes most of these sites were cleared of native vegetation and developed for pasture. Some of the recent excavations have been subject to environmental conditions as the area is the habitat of the extremely rare and endangered western swamp tortoise (*Pseudemydura umbina)* (EPA, 1991 & 1992). The sites are adjacent to the Ellen Brook Nature Reserve and are outside the study area.

Upper Swan Primary School is located on the eastern side of Great Northern Highway.

Brigadoon is a special rural subdivision which has allowed several new homesteads to be built on what was once pastured land. The homesteads commonly are associated with one or two fields used for horse agistments or low intensity grazing. The homesteads' mainly new large buildings and the gardens are immature.

The State Equestrian Centre is located on Cathedral Avenue at Brigadoon. The site has several fields and a helipad.

At present Bells Rapids is used as a recreation reserve which caters for picnics and passive recreation, although there are no barbecues or toilets in the area.

Recreation nodes

Pullman Park is on the northern bank adjacent to the Upper Swan railway crossing. It is presently inaccessible to the public due to road maintenance. It supports remnant flooded gum vegetation.

Bells Rapids Park is an area of Public Open Space and is one of the Swan River's larger rapids. The area is considered to be of high conservation and recreational value. The Rapids are the last great obstacle of the Avon Descent. The main drop is though a shoot in the centre of the river followed by several small shoots. The several trees in the river are considered easy obstacles in the river.

Public access

Access to Bells Rapids National Park is along a gravel road. There are several pedestrian and horse trails near the State Equestrian Centre. Belvoir Valley Amphitheatre is only open to the public on special occasions.

Sites of Nyungar & Wider Australian Community Significance

Nyungar significance

It is likely that the area around Bells Rapids would have been an ideal camping area for Nyungars because of the presence of food and water. The Swan River in this area has been used by Nyungars as a main thoroughfare from the scarp to the coastal plain.

Other significance

Ellen Brook Reserve and Twin Swamps reserve are on the National Estate Register. These sites are outside the precinct study area.

Belhus Upper Swan was granted to G. Leake in 1829 and leased by William Cruse until 1865. It was purchased by the Barrett Leonard family in 1897. Millendon was established in 1879. Nolan House on Great Northern Highway was established 1870. The original Upper Swan Bridge site was built in 1851 and was one of the first public works carried out by convicts.

Belvoir at Millendon has a house built in 1879 which is now used as a private residence. Farm buildings originate from 1851-1880 and two labourers cottages from the same period.

Conservation Areas

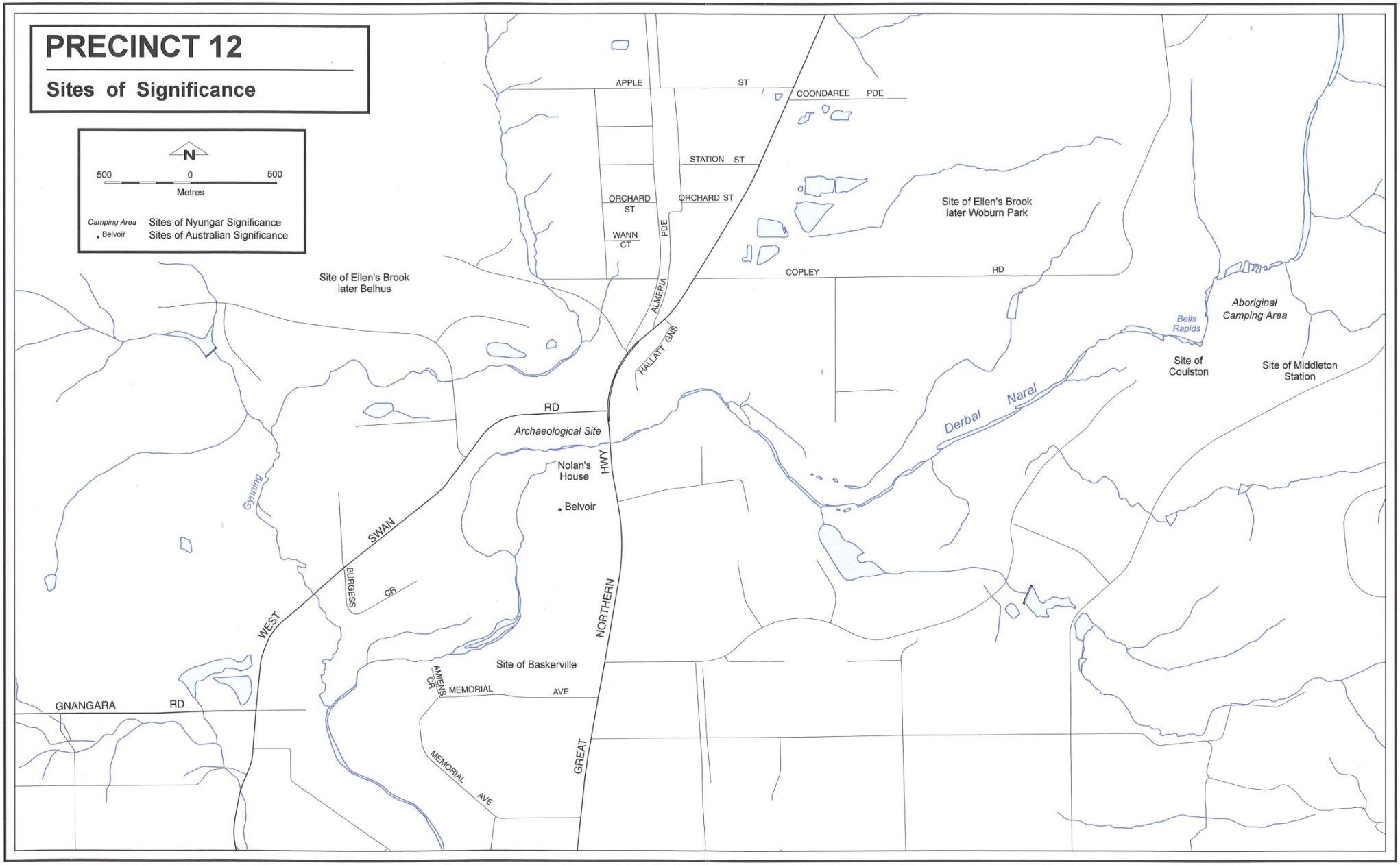
System 6

M17 Ellen Brook and Twin Swamps Wildlife Sanctuaries, Upper Swan

The recommended areas are situated about 4 and 7 km north of Upper Swan and are for the preservation of fauna such as the short necked tortoise, *(Pseudemydura umbina),* both areas are vested in the WA Wildlife Authority. The adjacent area has a major clay deposit. Clay extraction, in combination with ground water extraction, natural rainfall variations and changes in land use on adjoining land, may lower water levels in the swamps and thus adversely affect the breeding habitat of the tortoises. The reserves also have high conservation value since they are particularly high in aquatic plants and contain a number of rare plants and a variety of invertebrates and fish. It is recommended that a protective buffer area be sought through planning procedures.

M19 Swan River - Guildford to Walyunga National Park

The recommended area extends along the Swan River from Guildford to Walyunga National Park. The natural vegetation along much of this length of river is reduced to scattered trees along the banks, though above the Swan's confluence with Ellen Brook. the banks are relatively well wooded. Flooded gum, swamp sheoak and paperbark occur throughout the reaches of Middle and Upper Swan, in some sections saplings and seedlings are present but elsewhere animals have prevented regeneration. The land adjacent to the river is mainly used for stock while vineyards occupy most of the remainder of the valley.


PRECINCT 12
Sites of Significance
N
500
0
500
Metres
Camping Area
Belvoir
Sites of Nyungar Significance
Sites of Australian Significance
APPLE ST
COONDAREE PDE
STATION ST
ORCHARD ST
ORCHARD ST
WANN CT
PDE
ALMERIA
Site of Ellen's Brook later Woburn Park
COPLEY RD
Site of Ellen's Brook later Belhus
HALLATT GNS
Aboriginal Camping Area
Bells Rapids
Site of Coulston
Site of Middleton Station
Derbal Naral
RD
Archaeological Site
Nolan's House
HWY
Belvoir
Gymning
SWAN
BURGESS
CR
WEST
NORTHERN
Site of Baskerville
AMIENS CR
MEMORIAL AVE
GNANGARA RD
MEMORIAL AVE
GREAT

Precinct Description

Waterform and natural riparian zone

Adjacent to Belvoir Valley Amphitheatre, the Swan River braids into two channels forming a central island. This pattern is repeated just before Upper Swan Bridge. The two channels are narrow and silty flood deposited levees form the banks. The islands banks are steep and reach a height of around five metres which is well above the height of the silty levees. The river takes a more east-westerly direction upstream of Upper Swan Bridge to Bells Rapids. The river meanders in an irregular pattern and has several tributaries and backwaters joining the main channel.

The section of river upstream from the Upper Swan Railway Bridge is particularly attractive as it is untrained and therefore 'natural' in appearance. There are several dead trees and branches fallen in the channel. The irregular and meandering channel is shallow compared to its width. Silty banks are formed against fallen obstacles and on meander bends, while areas of erosion are quite evident in several places. The banks are lumpy and the winter floods have gouged the flood plains. Several backwaters are present. During the summer months these dry into muddy basins. Exotic grasses such as kikuyu and couch are present and replace the fringing reeds which only occur in small nodes. In places, the paperbarks overhang the water creating an aesthetically pleasing riparian vegetation. At Holstein Close, Brigadoon, there is a small wetland which has had most of its fringing vegetation removed although the steep retaining banks have some remnant wandoo and marri woodland. Adjacent to the State Equestrian Centre the channel becomes relatively straight although its width is quite irregular.

Further upstream at Bells Rapids, the Swan River becomes a series of pools and rapids. The water flows over granite outcrops which have become smooth and polished with continual action. There are numerous fallen trees, logs and other debris in the channel which also create obstacles to the water flow. The granite rocks during the periods of low water show distinct bands of mud and different shades of colour. The rocks range in size from large platforms to small rocks which provide a textural contrast between the larger flatter boulders. The several rapids are not only visually pleasing but are one of the few spots along the river where the sound of the water rushing over the rocks is one of the dominant noises to the river user. Due to the meandering and the rock forms, the viewer can only see sections of the river which leads to an experience of expectation. There are several melaleuca trees which are emergent from the edge of the channel. The paper like bark becomes darkened when wet and provides a complementary texture to the rocks. There are several sand banks in the river which during low flow periods form exposed tapered banks of sediment. The floodplain has many textures which range from fine silts, to coarse grains and small smooth polished pebbles. These floodplain sediments are typically well sorted so the viewer is presented with ribbons of dark shiny pebbles contrasted with patches of dull light coloured sand.

Landform

This precinct has a range of landforms. At the downstream section, the flat alluvial plains are an important landscape element. The flat gradient is emphasised by the hilly backdrop of the Darling Range. In contrast, the immediate river channel area is a river valley which has been gouged into the soft alluvial sediments. Often the valley has a steep face where landslides are quite regular due to the lack of fringing vegetation. Adjacent to the railway bridge, one of the most salient features of the river area is the cleared ploughed fields. The ploughed areas have been levelled to flat expanses of orange soil which contrast with the edges of green grass and riparian vegetation. The flatness is the dominant landscape feature in the area and due to the lack of trees is the most conspicuous to the river viewer.

Mount Mambup on the north side of Bells Rapids reaches a height of 220 m ADH. The spectacular steeply sloping face adjacent to Bells Rapids reaches 90 metres AHD and provides an attractive and unique landform to the river. The hill encloses the viewscape and its valley focuses the viewscape on the river channel and rapids. There are several boulder outcrops on the steep slope which provide a contrasting texture to the grassy hills and the dot-like shrubs. The hills have depressions and valleys which provide an irregular skyline and are important for increasing a sense of depth and scale which is not common along most stretches of the river, where the landform is generally much flatter and depth plays a less important role in the riparian precinct.

In areas where roads and pathways have been constructed a variety of rocks and soils have been exposed. The differing textures and colours of granites and schists make an attractive landscape element.

Vegetation

At Ellen Brook, modified open woodland occurs and has paperbark, flooded gum and sheoak. The understorey is mainly exotic weeds, however along the river edge pale rush and lake club rush occur in isolated patches. North of the Ellen Brook confluence, marsh club rush is abundant. The Darling Range acts as a backdrop to the flat alluvial fans which are cleared for pasture and which give an effect of pastured woodland idealised

by English landscape gardeners. At the Swan River, the narrowness of riparian vegetation emphasises the interesting layering of vegetation. The small brushy melaleucas creating an often dense lower layer above which rise the loosely branched flooded gums. Around Nolan Road, most of the indigenous vegetation has been cleared for agriculture; however the green vines and often well established residential gardens provide a predominantly light bright green vegetation cover. This contrasts with the backdrop of dark eucalypt green and soft cream of the cleared areas of the Darling Range. Along the river, the riparian vegetation is attractive with the continuing flooded gum and paperbark community providing a soft dark green belt of foliage. The rough pealing bark of both trees adds to the 'naturalness' of the vegetation and emphasises the flood debris that is found along the channel.

At the State Equestrian Centre, there is predominantly shore rush and native bulrush. The lake club rush also occurs along with an abundance of exotic weed species. The riparian area is characterised by remnants of sheoak and melaleuca which occur on the clayey untrained banks.

At Holstein Close, Brigadoon, there are modified freshwater wetlands which have an open woodland of marri, flooded gum and jarrah overstorey. The understorey is a matrix of weeds. Close to the lake flooded gum and swamp paperbark enclose the water feature.

The flora of Bells Rapids is varied with types associated with the river and areas of different soil depths on the slopes. The most extensive vegetation unit consists of prickly dryandra and road side tea trees. This vegetation grows over the northern area where the soil is shallow. In the same area graceful honeymyrtle heath and, the leafless wattle heath, are also abundant. Along the river bank paperbark and an open woodland of flooded gum and sheoak also occur.

Riparian land use

Downstream of the Upper Swan Bridge, the river valley has been cleared almost to the channel for grazing. There are several sections where severe erosion has resulted in cutting back the embankments or evidence of bank slides. The earth slides expose the red alluvial soils and the disturbance is a detracting landscape element.

The Upper Swan Bridge is currently being upgraded. The bridge, as with the others in the area, is low formed and supported by heavy, narrowly spaced, wooden piles.

Further upstream is the Upper Swan railway crossing bridge which is a narrow line of concrete with concrete support structures. The bridge is visually fairly unobtrusive due to the surrounding fringing vegetation. There are several horse trails which run adjacent to the river's channels which like so many other types of riparian land use have resulted in loss of much of the fringing vegetation and the flourishing of weed species.

At Bells Rapids, a wooden pedestrian bridge crosses the rapids. The bridge is an attractive low form structure. The wooden planks have weathered into a soft grey colour which is sympathetic with the fringing vegetation and rocky waterform. Adjacent to the present day bridge, are the old piles of the original crossing. The piles were constructed from local rocks and cement, so, to the casual observer, these small mounds of rocks are not apparent as man-made structures. There are several informal car parks at Bells Rapids Park, however there are no amenities or barbecue facilities. Several fireplaces have been built using the rocks from the river. Most of the roads in the park are gravel and the park is scoured with informal paths through the vegetation complexes.

Land use

The Belvoir Valley Amphitheatre is located adjacent to the braiding section of the Swan just upstream of the Ellen Brook confluence. Close to the amphitheatre is a small tin shed and old derelict farm cottage on the flat plain behind the river valley. In the same viewscape is the metal arch gateway of Belvoir - Shaw Estate, the driveway of which is lined with pine trees. The estate consists of a farm house and several other buildings which were originally built as labourers' dwellings. The farmstead has dark brown wooden walls and a red painted tin roof and is quite a distinctive feature on the landscape. The flat field has only a few remnant gum trees which stand in isolation. The treelessness only serves to emphasise the flat landform.

The Upper Swan Primary School is located on a rise between Great Northern Highway and the railway line. The school buildings have corrugated metal roofs and brick walls. The newer buildings are constructed of rammed earth and are an attractive colour in the context of the surrounding landforms. Adjacent to the railway line there are several vineyards and stone fruit orchards. The vines run perpendicular to the Darling Range which focuses the viewscape towards the hills. The residential buildings are generally single storey bungalows which are well spaced apart. Corrugated metal sheds for the vineyards are also other land use features. The occasional rows of stone and citrus fruit trees provide a contrasting colour and vegetation type along this section of the river.

At the end of Campersic Road the drainage lines running off the Darling Ranges have been dammed adjacent to Baskerville Wines. As a result, there are two large water bodies near the railway lines. Downstream at Holstein Close, a wetland has formed adjacent to the Swan River. The wetland is a wide water body which is edged by flooded gum and wandoo, with a non indigenous understorey.

Brigadoon Country Club is a low density 1990s housing estate. The estate has a brick entrance which faces the Darling Ranges and has decorative street signs and road bollards. The houses are generally quite large homestead style brick and tile buildings. Due to the previous grazing land use, there are very few mature trees. Most properties have retained the cleared land for horse agistments and lined the paddocks with trees, often with paperbarks and non indigenous eucalypts. Many of the properties remain undeveloped and the proposed commercial centre has yet to be built, the only non residential property along the main road being a small fire station which has been built in a turn of the century style. The area designated for public open space is a dampland and exotic bulrush has invaded the freshwater pools.

The State Equestrian Centre has the Bond Connell Pavilion which is a modern cream bonded styled building constructed in a style similar to many offices. A car park and entrance way are lined with melaleuca and conifers and several flag poles stand in the entrance viewscape. The caretaker's house is a small bungalow adjacent to the entrance of the centre. Several large cleared fields stretch down to the band of riparian vegetation.

The Balcolma Quarter Horse Stud is typical of the riparian land uses on the northern banks of the river. The stud occurs on the wide flat plain in front of the Darling Range. The land is cleared of the indigenous vegetation, except for a few shade trees which are typically flooded gum, wandoo and other eucalypts. The horse shelters dot the fields which are grassed and weedy. Horse agistments are the most prominent land uses in the area. One or two orchards and vineyards still remain south of Copley Road. At Copley Road, Upper Swan, new homestead styled houses continue to dominate the land use. These 1990s styled houses are large and often two storeys high. Typically, the properties are partly used as horse agistments, although some graze a few cattle and goats. The properties have been cleared of indigenous vegetation although new eucalypts have been planted along the edges of the fields, emphasising the square fields. A water tank at the end of Copley Road is one of the prominent features on Mount Mambup. It is one of the only structures on the rise and despite the green painted roof and some screening vegetation it stands out among the indigenous vegetation. Revegetation around the tank would enhance the viewscape.

Essential services which are visually prominent in the area include the high tension powerlines across the northern section of the precinct. A railway used by a commercial train skirts the hillside adjacent to the river valley. Although not particularly visually intrusive, the noise generated by the trains echoes in the valley.

Landscape Interpretation

Dominant Landscape Character

The western foothills would have been gravelly and covered by an open eucalyptus forest. To the eastern side the scarp landscape would have been granite and gneisses with shallow soils and covered in a woodland of wandoo to low heaths. The immediate landscape around the river would have been a rich alluvial terrace with melaleucas and sedges.

Today, most of the precinct's landscape character has been altered to a rural landscape. The original vegetation has been cleared, and replaced by grasses and, in some areas, vineyards and orchards. The residential buildings are sparsely spaced over the landscape. At Brigadoon, the residential area has been built at a relatively low density and most properties have associated paddocks and sheds. The overall landscape character is a rural landscape. North of the Swan River, clay pits have been dug, however most of this industrial land use is well hidden by a buffer of trees.

At Upper Swan and Ellen Brook, new subdivisions are taking place. The residences are closely built with common front gardens. The landscape is suburban. West of Great Northern Highway, there is a small section of older houses which were built in association with the clay mining in the area.

On the eastern portion of the precinct, there is a large area of a relatively natural landscape. This area is mainly steeply sloping granite outcrops unsuitable for rural land use. The vegetation condition and density appears quite natural although there is some weed invasion. There is little infrastructure around the river and that which is there does not significantly intrude on the landscape.

Significant Viewscapes

There are several significant viewscapes in the precinct. The views of Bells Rapids and the steep slope of Mount Mambup is quite spectacular. The viewscape is quite unique in the study area as there are few sections where the Swan River passes through such steep topography and relatively natural vegetation.

From the rise of the scarp at Brigadoon, there is an attractive view of the rural properties in the area. As the rural landscape is increasingly under pressure from suburban land use, this viewscape in the vicinity of the Swan River is an important one.

Conforming and Non Conforming Elements in the Landscape

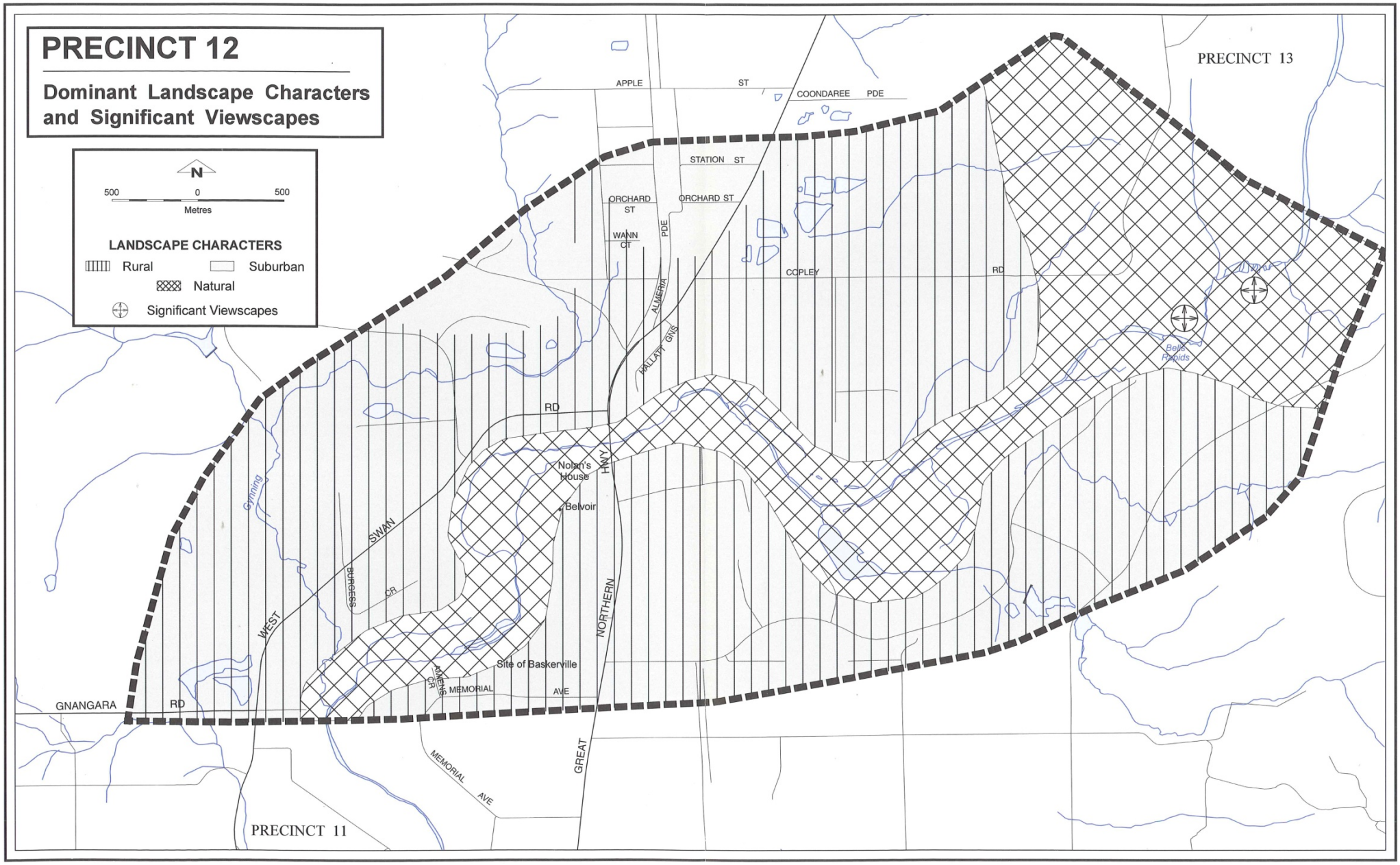
There are several areas in Upper Swan where the fringing vegetation has been degraded by encroaching rural land use. Several sections of the riparian vegetation have been lost resulting in erosion of the banks, as shallow root exotic grasses are unable to support the bank.

The wooden pedestrian bridge at Bells Rapids is an example of a low formed bridge which has minimal impact on the visual landscape.

Many of the rural properties have planted non endemic species as wind breaks and fence lines. The use of local species would enhance the landscape and give it more local identity.

Recommendations for Maintenance and Enhancement of the Present Landscape Character

- Maintain the natural landscapes so that the condition of the vegetation and other natural landscape elements such as slopes and floodways are not degraded both visually and physically.
- Consider the use of native plants as wind breaks in place of non endemic species. This would provide for improved local identity, visual amenity and ecological integrity.
- Ensure that riparian and surrounding land use does not infringe on the natural landscapes of this precinct.
- Consider the importance of retaining a rural landscape in the Swan River System and consider how retaining rural elements may be achieved. There is great pressure for subdivision of rural properties for suburban developments.
- Consider developments which enhance the rural amenity with building styles and housing densities.


PRECINCT 12
Dominant Landscape Characters and Significant Viewscapes
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Metres
LANDSCAPE CHARACTERS
Rural
Suburban
Natural
Significant Viewscapes
PRECINCT 13
PRECINCT 11
APPLE ST
COONDAREE PDE
STATION ST
ORCHARD ST
ORCHARD ST
WANN CT
PDE
COPLEY RD
ALMERIA
BALLATT GNS
RD
Nolan's House
HWY
Belvoir
Gymning
SWAN
BURGESS
CR
WEST
NORTHERN
Site of Baskerville
AMENS CR
MEMORIAL AVE
GNANGARA RD
MEMORIAL AVE
GREAT
Bells Rapids

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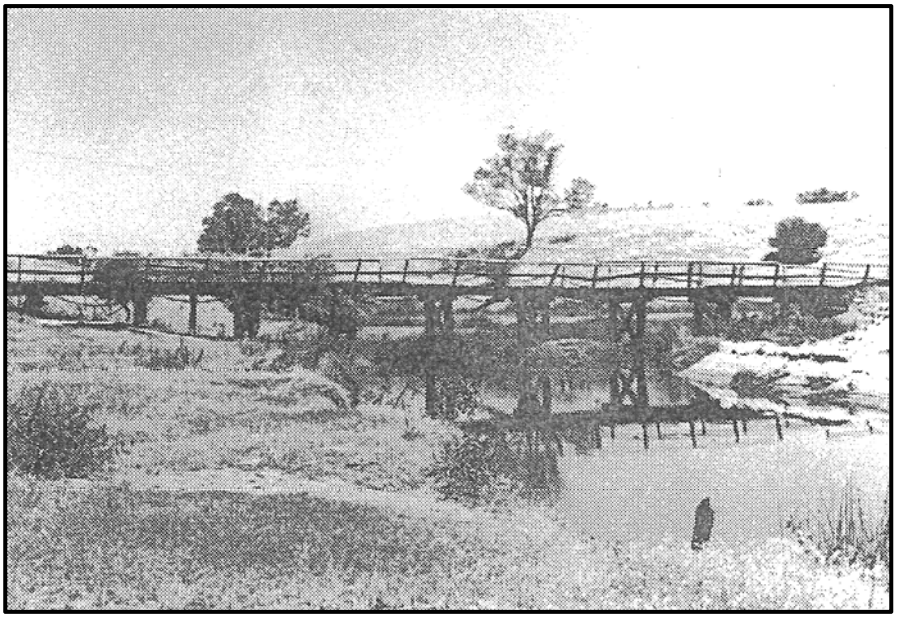
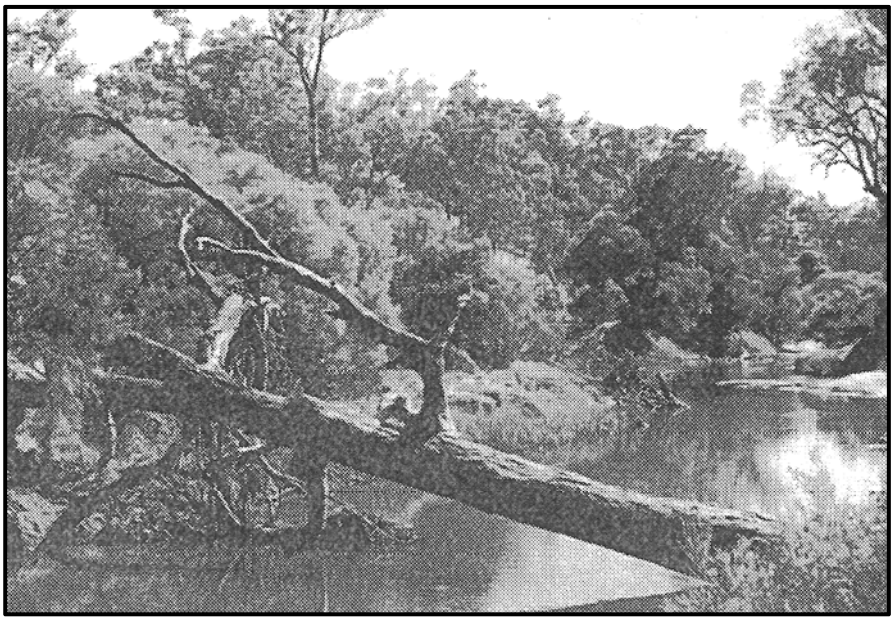
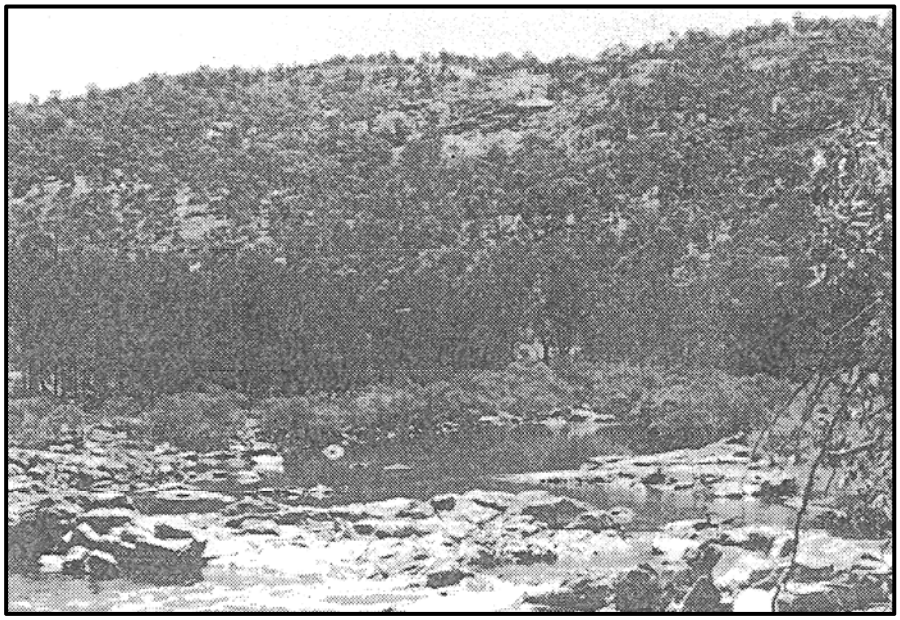


Upper Swan Bridge, 1976.
Battye Library 5420P.



Near Noack Road, Upper Swan, 1995.
Swan River Trust.



Bells Rapids, Upper Swan, 1995.
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