AMBERGATE RESERVE

(Reserve 22 614)

MANAGEMENT PLAN

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TABLE OF CONTENTS

SUMMARY AND RECOMMENDATIONS

The Ambergate Reserve is a 75 hectare remnant of high quality native vegetation located 9km south of the Busselton townsite,vested in the Shire of Busselton.

It is the Shire of Busselton's policy to regularly review the management plans for its vested reserves, generally every five years. In the case of the Ambergate Reserve, this task has indicated the need for an updated management plan, to a standard common to all Shire-vested reserve management plans.

The Management Committee responsible for the Reserve, the Busselton Naturalists Club, has the following aims for management of Ambergate Reserve:

- to protect and enhance the conservation values of the Reserve
- to encourage community involvement in management of the Reserve
- to raise community awareness of nature conservation and the importance of protecting remnant vegetation, and
- to encourage sustainable use of the Reserve for education and eco-tourism

Ambergate Reserve is vested in the Shire of Busselton as 'C Class' Reserve 22614 and is designated for the purpose of "Parkland". Land sharing common boundaries with Ambergate Reserve comprises cleared farmland pasture held by five separate landowners. One of these properties is operated by Department of Agriculture as an Agricultural Research Station.

Ambergate Reserve contains a vascular flora of 361 taxa (Appendix 1, Flora Species List for Ambergate Reserve). Of these 326 are natives and 35 weeds. Two species of Declared Rare Flora are recorded for Ambergate Reserve, the featherflower *Verticordia plumosa* var. *ananeotes* and the sedge *Tetraria australiensis*. Both species were considered to be extinct until their recent re-discoveries.

The vegetation of Ambergate Reserve is generally in excellent to very good condition with much of the area considered to be in pristine condition with low weed invasion. Disturbance of the bushland is associated with past clearing, grazing by livestock and too frequent fires, tracks, drains and past timber collection.

The location, condition and size of the Ambergate Reserve identifies the area as being of regional conservation value. One of the floristic community types Type 1b has been identified as "vulnerable" (Gibson et al. 1994), indicating that the community type is likely to become endangered in the near future if factors leading to its loss continue to operate.

The reserve contains a fauna of 99 species comprising 18 mammals (5 non-native), 49 birds (10 non-native), 15 herpetofauna, 26 arachnids, 1 aquatic crustacean and 1 mollusc (Appendix 2, Fauna Species List for Ambergate Reserve). The number and variety of fauna species that have been recorded in Ambergate Reserve indicate that the habitat supports a very diverse fauna for a relatively small and ecologically isolated area.

Ambergate Reserve offers local residents and visitors the opportunity to bushwalk on the 4km long circuit walk track through all four sectors of the Reserve (Figure 2, Ambergate Reserve Features). Other passive recreational pursuits in the Reserve include bird watching and observing wildflowers; there is a diverse range of bird and floral species present, in addition to fauna sightings.

A list of management objectives has been created in this Management Plan, accompanied by recommended actions to be addressed by the BNC over the term of this Plan before its review within five years of its adoption by the Shire Council. In Section 5.0, Management Issues and Recommendations, the recommended actions are prioritised as Priority 1, Priority 2, and Priorities 3 and 4 to indicate the appropriate timeframe for completion of each recommended action.

Although responsibility for management of Ambergate Reserve has been assumed by the BNC, the ultimate responsibility for the Reserve lies with the vesting body which is in this case, the Busselton Shire Council.

LIST OF RECOMMENDED ACTIONS

5.1.1 Flora and Vegetation

Number	Action	Priority
5.1.1 a)	Liaise with CALM on management of Declared Rare and Priority Flora; and Threatened Ecological Communities	1 Ongoing
5.1.1 b)	Clarify with CALM the ultimate responsibility for conservation of Declared Rare and Priority Flora in the Reserve	2
5.1.1 c)	Locate Gibson Plots (Floristic Type sites) within Threatened Ecological Communities	3
5.1.1 d)	Investigate population of Declared Rare Flora, particularly age of plants, existing threats and whether an outlier or remnant population	2
5.1.1 e)	Promote opportunities for scientific research within Ambergate Reserve.	2

5.1.1 f)	Establish monitoring quadrats to assess if perceived threats (weeds, fire, grazing, spraying) affect Declared Rare Flora	2
5.1.1 g)	Assess the effects of weeds and fauna grazing on inhibiting revegetation and the need for protection strategies. Implement where appropriate	1
5.1.1 h)	Investigate upgrading conservation status of Ambergate Reserve from 'C Class' to 'A Class' for Conservation	1

5.1.2 Weeds

Number	Action	Priority
5.1.2 a)	Create a weed map from aerial photos supported by ground-truthing.	2
5.1.2 b)	Prepare weed inventory incorporating control strategies	1
5.1.2 c)	Establish weed monitoring quadrats to allow assessment of success of weed control program	3
5.1.2 d)	Implement weed control measures to reduce populations of weed species in the Reserve • Spot spraying and hand removal of arum lily • Spot spraying and hand removal of watsonia species • Spot spraying, herbicide wipe or hand removal of african love grass	1 Ongoing
5.1.2 e)	Protect Threatened Ecological Communities by targeting weed control to individual species in these areas; use of monocot chemicals; no broadacre spraying	1
5.1.2 f)	Liaise with Department of Agriculture to assess suitability for trial biological control for bridal creeper.	2
5.1.2 g)	Identify and remove exotic species	1
5.1.2 h)	Concentrate control measures on eradication and control of other weed species	1 Ongoing
5.1.2 i)	Prevent introduction of weeds by discouraging dumping of	1

	garden refuse and minimise soil disturbance	
5.1.2 j)	Notify surrounding landowners of weed control program and inform of practises that they can also use to reduce further weed invasion into the Reserve.	1
5.1.2 k)	In areas where weeds dominate the understorey, establish rehabilitation program to assist native regeneration	2
5.1.2 l)	Establish weed monitoring program along walktracks to aid in concentrating weed control efforts where most needed	2

5.1.3 Disease

Number	Action	Priority
5.1.3 a)	Conduct a dieback survey (by an accredited *Phytophthora cinnamomi* interpreter) of the entire Reserve to determine the presence and extent of *Phytophthora cinnamomi* and other diseases	2
5.1.3 b)	Review existing disease hygiene requirements for all operations. Implement disease hygiene procedures. Emphasis on minimising the possibility of introducing or spreading disease	1
5.1.3 c)	Include disease hygiene requirements in all contract specifications.	1
5.1.3 d)	If required, research findings on the use of fungicides for application in the Reserve.	3

5.1.4 Fauna

Number	Action	Priority
5.1.4 a)	Protect fauna populations and their habitats	1
5.1.4 b)	Undertake a macro-invertebrate survey	3
5.1.4 c)	Investigate creation of a permanent water source and fringing habitat to attract waterbirds and provide summer refuge. Consider effect on the population of kangaroos in the Reserve	2 ongoing

5.1.4 d)	Establish a database to record bird-sightings within the Reserve.	2
5.1.4 e)	Establish a monitoring program for amphibians in the Reserve	2
5.1.4 f)	Establish vegetation corridors to allow fauna movement between the Reserve and neighboring bushlands	1 Ongoing
5.1.4 g)	Assess the feasibility of introducing fauna into the Reserve for other species that are threatened, or in need of special protection or otherwise vulnerable; or no longer occurring in the Reserve but known to occurred in the past	3
5.1.4 h)	Monitor the impact of grazing kangaroos. If impact is significant, assess means of reducing impact and implement	2

5.1.5 Introduced Animals

Number	Action	Priority
5.1.5 a)	Prepare and implement a control program for introduced animals with emphasis on: • controlling rabbits, • controlling and eradicating foxes • controlling and eradicating cats.	1 Ongoing
5.1.5 b)	Conduct 1080 fox and rabbit baiting program to protect native fauna	P1 ongoing
5.1.5 c)	Employ local contractor to conduct 1080 baiting in Reserve using sterile oats.	P1 ongoing
5.1.5 d)	Do not grant apiary licences within the Reserve.	
5.1.5 e)	Prohibit domestic dogs in the Reserve	1
5.1.5 f)	Encourage adjacent landowners to sterilise their domestic cats.	2
5.1.5 g)	Inform and educate local householders of the effects their domestic cats and dogs are having on the Reserve's flora and fauna	2

5.1.6 Fire

Number	Action	Priority
5.1.6 a)	Liaise with the Volunteer Bush Fire Brigades and CALM regarding the development of a long term fire management plan	1 Ongoing
5.1.6 b)	Implement a fire control program by maintaining a perimeter low fuel separation zone and control burning for vegetation management (conservation) and fuel reduction in scheduled areas	1 Ongoing
5.1.6 c)	Investigate fuel tonnages. Fuel loads should be monitored annually to ensure the road buffer zones are functioning properly and to indicate when a fire control burn is needed	2
5.1.6 d)	Weed control programs should be implemented following all cool fire burns to prevent weed infestation	2
5.1.6 e)	Reduce fuel loading in the Reserve by eradicating weeds. Investigate the use of selective residual herbicides for maintenance of low fuel separation zones around the outer perimeter of the reserve.	2
5.1.6 f)	Prepare and implement a wildfire suppression plan identifying: • Strategic roads and access points • Strategic water points • Specific strategies to be implemented to protect significant flora, restricted vegetation communities and fauna habitats. • fire suppression support units (local brigade).	2
5.1.6 g)	Liaise with adjacent landowners on fire management within the Reserve	1
5.1.6 h)	Investigate Reserve's fire history by accessing DOLA aerial photographs and assessing fire scars	3
5.1.6 i)	Implement a control burning regime frequency for each sector of a minimum of 8 years comprising 1 spring, 2 cool autumn burns and a no burn interval over a 32 year period until such time as the longterm fire management plan (Rec 5.1.1) comes into effect.	1
5.1.6 j)	Target DRF and priority flora species to determine burning regimes in those special areas. *Verticordia* needs a 15 year	2

	fire free period to set seed and rejuvenate root stocks	
	P2	

5.1.7. Water

Number	Action	Priority
5.1.7 a)	Monitor water levels and water quality (conductivity, pH, nutrients) in deep roadside drains, well, frog pond, artificial lake and associated drain.	2
5.1.7 b)	Install water level measuring posts relative to Australian Height Datum	2
5.1.7 c)	Create a database on which to record water monitoring.	2
5.1.7 d)	Plant the margins of the artificial lake with locally occurring native sedges and other indigenous riparian vegetation to stabilise the banks	2
5.1.7 e)	Measure actual well depth	2
5.1.7 f)	Regularly assess safety of well to visitors on the Reserve.	3
5.1.7 g)	Minimise the use of herbicides in the vicinity of the artificial lake and frog pond.	1
5.1.7 h)	Assess all proposed local operations and developments that have the potential to affect the Reserve's hydrology, especially drainage patterns	3

5.1.8 Rehabilitation

Number	Action	Priority
5.1.8 a)	Rehabilitate cleared and degraded areas in Reserve: • easement in north eastern sector • areas in south eastern sector	2
5.1.8 b)	Rehabilitate old section of walk track if re-routing occurs in future.	4
5.1.8 d)	All plant material (and topsoil/brush) utilised in Reserve must be sourced locally.	1

5.1.8 e)	Encourage regeneration of native vegetation by controlling water runoff, reinstating soil surface, controlling weeds, assisting revegetation by planting/seeding/brushing	2
5.1.8 f)	Protect young plants from grazing and mechanical damage by fencing, protective covers, signs if appropriate.	3
5.1.8 g)	If available, spread weed free topsoil over areas in south eastern sector to replenish the soil surface and thus accelerate regrowth of understorey.	2
5.1.8 h)	Survey existing re-vegetated areas for plant species that are not indigenous to Ambergate reserve. Leave these in place and revegetate between them. Ensure they are not spreading or invasive. Once revegetation is mature, reassess their removal.	3

5.2 RECREATION

Number	Action	Priority
5.2 a)	Provide a sign at the entrance to the Reserve informing the public that the following are not permitted in Ambergate Reserve: • Dogs (except on leash) • Horses • Trail bikes • Camping • Vehicles	1
5.2 b)	Provide a sign at the entrance to the Reserve requesting visitors to take their rubbish home with them	1
5.2 c)	Re-route unsuitable sections of the walk track to more suitable ground. Rehabilitate old walktracks	2
5.2 d)	Construct walktrail on crushed limestone base with a lignum sulphonite surface to a minimum width of 1.0m	1
5.2 e)	Construct boardwalks associated with walk track in wet area and at drain crossings	2
5.2 f)	Provide signage along walktracks to advise walkers of shorter routes to return to carpark, special points of interest and walking distances	2
5.2 g)	Provide park benches at regular intervals along the walk track and in the carpark. Benches should be designed to be rustic in nature and easily replaced or built of fireproof materials	2
5.2 h)	Resurface carpark with limestone (hostile to *Phytophthora cinnamomi*) and improve drainage	3
5.2 i)	Redevelop carpark as an entry statement to Reserve by providing landscape and shade planting, perimeter barriers and defined entrances/exits.	3

5.2 j)	Monitor use of the Reserve to: • assess patterns of use • ensure adequate facilities are provided • measure environmental impact.	3
5.2 k)	Provide interpretive information on the: • Reserve's recreation opportunities • natural hazards • history of the Reserve	2

5.3 EDUCATION

Number	Action	Priority
5.3 a)	Review existing information board and locality map of the Reserve at the entry point and if necessary upgrade it	1
5.3 b)	Establish smaller information boards to inform visitors of significant natural history in parts of the Reserve	2
5.3 c)	Establish signs on appropriate behaviour in the Reserve.	1
5.3 d)	Review current Reserve information on pamphlets	1
5.3 e	Provide a general information pamphlet on the Reserve summarising the conservation values and possible threats from nearby properties. Distribute to nearby residents, community and visitors to the Reserve	2
5.3 f)	Submit a yearly progress report to the Busselton Shire Council, include requests for future project funding prior to Council's 4 year projection plan and budget being finalised (April each year).	2
5.3 g)	Distribute information leaflets summarising the progress report to government bodies and groups involved in the Reserve's management. Provide leaflets on-site	3
5.3 h)	Encourage a "Reserve Watch" program with nearby residents.	3
5.3 i)	Establish contact with other community environmental groups for mutual educational benefits	3
5.3 j)	Encourage educational institutions to focus projects in Ambergate Reserve.	2

5.3 k)	Promote the Reserve to school groups, local government, local environmental interest groups and naturalists groups.	2
5.3 l)	Regularly nominate the Reserve Management Committee for community and conservation awards. Notify Busselton Shire Council of committee's interest in these Awards	3
5.3 m)	Include information on Ambergate Reserve on the Busselton Shire Council's Internet Home page.	2

6.1 MANAGING BODY

Number	Action
6.1 a)	The managing body will be the Busselton Naturalists' Club's Ambergate Reserve Committee consisting of a Chairman, Vice-Chairman, Warden and Assistant Warden and a minimum of six committee members.
6.1 b)	Management committee to liaise with relevant government bodies and community groups on management of the Reserve.
6.1 c)	Management committee to work towards achieving the objectives outlined in this Management Plan by addressing the listed recommended actions according to priority.
6.1 d)	Membership of the management committee should be for a term of three years, at such time members are eligible to reapply for their position on the committee.
6.1 e)	Appointment of members of the management committee will be the responsibility of the Busselton Naturalists' Club.
6.1 f)	The Ambergate Reserve Committee be recognised by the Shire of Busselton as a "Friends of Ambergate Reserve" and receive a similar level of support and recognition afforded to "Friends of" groups.

6.2 SHIRE ASSISTANCE

Number	Action	Priority
6.2 a)	Regularly notify Busselton Shire Council of future projects and funding assistance required so that Busselton Shire Council can plan its budget appropriately	1

6.3 EXTERNAL FUNDING

Number	Action	Priority

6.3 a)	Appoint a member of the management committee to be responsible for applying for grants	1
6.3 b)	Notify appropriate organisations of interest in applying for grants.	1
6.3 c)	Regularly update future plans for facilities within the Reserve to aid preparation for grant applications	2

6.4 TENURE OF MANAGEMENT PLAN

Number	Action	Priority
6.4 a)	Review this Management Plan within five years of Busselton Shire Council adoption of the Plan.	1

1. INTRODUCTION

1.1 BACKGROUND

The Ambergate Reserve is a 75 hectare remnant of high quality native vegetation located 9km south of the Busselton townsite,vested in the Shire of Busselton. In 1984, the Busselton Naturalists Club became aware of attempts to purchase or lease the Reserve for grazing.

The Club approached the Busselton Shire Council with a proposal that, in exchange for protecting the reserve's natural values, the Club would prepare a Management Plan for the Reserve and assist in its management. The Council agreed to defer sale of the land until after the Club had carried out biological surveys and made a formal presentation to Council.

Over the next three years, 25 vegetation and wildlife surveys were conducted in the Reserve, by both professional and amateur biologists, including Club members. In 1987 a draft Management Plan was presented to the Busselton Shire Council. The listed recommended actions included control of fire, weeds and feral animals, tourist visits, rubbish removal, signage, vehicle access and adjoining landowners.

In 1987, the Busselton Shire Council accepted all recommendations of the Management Plan and officially appointed the Busselton Naturalists Club as the Management Committee to care for, control and manage Ambergate Reserve pursuant to Section 181 of the Local Government Act. The Club subsequently formed a Management Committee comprised of eleven Club members to oversee and coordinate management of the Reserve. The honorary position of Reserve Warden was also created, responsible for day-to-day management activities.

A list of management objectives has been created in this Management Plan, accompanied by recommended actions to be addressed by the BNC over the term of this Plan before its review within five years of its adoption by the Shire Council. In Section 5.0, Management Issues and Recommendations, the recommended actions are prioritised as Priority 1, Priority 2, and Priorities 3 and 4 to indicate the appropriate timeframe for completion of each recommended action.

It should be noted that although responsibility for management of Ambergate Reserve has been assumed by the BNC, the ultimate responsibility for the Reserve lies with the vesting body which is in this case, the Busselton Shire Council.

It is the Busselton Shire Council’s policy to regularly review the management plans for its vested reserves, generally every five years. In the case of the Ambergate Reserve, this task has indicated the need for an updated management plan, to a standard common to all Shire Council-vested reserve management plans.

1.2 AIMS

The Busselton Naturalists Club has the following aims for management of Ambergate Reserve:

- to protect and enhance the conservation values of the Reserve
- to encourage community involvement in management of the Reserve
- to raise community awareness of nature conservation and the importance of protecting remnant vegetation, and
- to encourage sustainable use of the Reserve for education and eco-tourism

1.3 OBJECTIVES

To date, management of Ambergate Reserve has been directed towards achieving the listed objectives:

- to construct a walk track within the Reserve to allow for recreation and display of conservation values to visitors
- to protect and conserve the native vegetation, flora, fauna and habitats
- to document the biodiversity represented within the Reserve
- to prevent introduction of disease, particularly dieback
- to monitor possible waterborne pollutants
- to protect the flora diversity by control and proper use of fire
- to minimise weeds and feral animals
- to protect important areas from degradation by erosion

Each of these objectives have been addressed by actions of the BNC and marked progress has been achieved in management of the Reserve. A new list of expanded objectives has therefore been created in this Management Plan, accompanied by recommended actions to be addressed by the BNC over the term of this Plan.

In Section 5.0, Management Issues and Recommendations, the recommended actions are prioritised as Priority 1, Priority 2, and Priorities 3 and 4 to indicate the appropriate

timeframe for completion of each recommended action. A Priority 1 action would be expected to be completed by the end of 2002, Priority 2 actions by the end of 2005 and Priorities 3 and 4 actions after this time or when funding and volunteers are available.

2.0 GENERAL DESCRIPTION

2.1 LOCATION

Ambergate Reserve is located within a rural area 9km south of the Busselton townsite, within the Shire of Busselton. Ambergate Reserve is rectangular in outline, divided into four roughly equal parts by the intersection of Queen Elizabeth Avenue and Doyle Road (Figure 1, Ambergate Reserve Location). It is bounded by cleared farmland pasture used for stock, predominantly beef cattle and agricultural research (Figure 2, Ambergate Reserve Aerial Photograph). The total area of the Reserve is 75 ha.

2.2 PAST USE

Settlement Group 44 was located on the site of Ambergate Reserve in December 1922 for a period of at most two years, before moving to a site on the Vasse River. The only evidence of this previous occupation remaining in the Reserve is a collapsed well, located near the walk track in the north-east sector. There is a second well sited next to the walktrack (Figure 3, Ambergate Reserve Features).

The existing carpark adjacent to the information shelter is also utilised as a road metal depot by the Shire of Busselton. A Telstra fibre optic cable has been laid down in an easement on the east side of Queen Elizabeth Avenue and along Doyle Road. The vegetation on these easements has successfully regenerated.

The south-east sector has been utilised in the past by the Shire of Busselton as a sand borrow pit. The two sandpits and accompanying mounds of sand and rubbish have been partially rehabilitated and revegetated, including creation of a lake and island which provide permanent water on the Reserve for fire control use and also attract waterbirds throughout the year.

In the past, the Reserve has also been subjected to grazing by stock from adjacent properties and timber removal (marri and jarrah).

2.3 ADJACENT USES

Land adjacent to Ambergate Reserve is cleared farmland pasture supporting beef cattle and associated farm uses.

Department of Agriculture operate the Vasse Research Station to the south-east of the Reserve and has been involved in the creation of a 2km long wildlife corridor extending east from the Reserve to the Vasse River traversing the Research Station. Two thousand trees have been planted within this fenced 20m wide corridor.

3.0 LAND TENURE

3.1 RESERVE

Ambergate Reserve is vested in the Shire of Busselton as 'C Class' Reserve 22614 and is designated for the purpose of "Parkland". It comprises two former "Stopping Place" and "Drainage Works Depot" reserves.

3.2 ADJACENT LAND

Land sharing common boundaries with Ambergate Reserve comprises cleared farmland pasture held by five separate landowners. One of these properties is operated by Department of Agriculture as an Agricultural Research Station.

4.0 DESCRIPTION OF RESERVE ENVIRONMENT

4.1 LANDFORM AND SOILS (Keighery et al. 1996)

Ambergate Reserve is located on the Swan Coastal Plain where the Pinjarra Plain is the predominant land surface. The Pinjarra Plain is a "flat to very gently undulating plain comprising predominantly Pleistocene fluviatile sediments and some Holocene alluvium" (Van Gool 1990). Substantial areas of the Pinjarra Plain are overlain by shallow Bassendean sands and in some areas low Bassendean Dunes occur as deeper sands. While the area is mapped as deeper Bassendean Dunes (Belford 1987), the sands are associated with varying proportions of clay. Also there are areas of ironstone exposed in the north-west fire trail and adjacent paddock, indicating the presence of an impeding layer at varying depths in the area of the Reserve. This relationship between the sands, ironstone and underlying Pinjarra Plain appears to be the basis for the occurrence of extensive palusplain and limited damplands (after Semeniuk 1987) throughout the Reserve. The soils have also been mapped as flats and low rises on the uplands and winter wet flats and slight depressions on the seasonally inundated areas, all with sandy grey brown duplex and gradational soils by Tille and Lantzke (1990).

4.2 VEGETATION (Keighery et al. 1996)

The vegetation map (Figure 3, Ambergate Reserve Vegetation Communities) shows the distribution of the principal plant communities in the Reserve: Jarrah (*Eucalyptus marginata*) and *Banksia* Woodland, Marri (*Eucalyptus calophylla*) Woodland and Wetland Mosaic.

Jarrah and Banksia Woodland (mapped as jbw)
On the sandiest soils, Jarrah and *Banksia attenuata* Woodland is found. Scattered Marri is also associated with this community as well as *Allocasuarina fraseriana* and *Agonis flexuosa. Jacksonia* sp. Busselton, *Acacia extensa, Stirlingia latifolia, Adenanthos meiseneri, Melaleuca thymoides, Hibbertia hypericoides, Phlebocarya ciliata* and *Cyathochaeta clandestina* are characteristic of the understorey.

Marri Woodlands (mapped as mW)
Marri Woodlands are characteristic of the better drained sands and sandy clays. Jarrah is associated with these woodlands and is scattered through some areas. *Persoonia longifolia, Persoonia elliptica, Xylomelum occidentale, Agonis flexuosa* and *Banksia grandis* are found in some areas. These woodlands have a diverse and dense understorey of shrubs, herbs and sedges. Characteristic understorey species are: *Kingia australis, Stirlingia latifolia, Xanthorrhoea preissii, Hibbertia hypericoides, Acacia extensa* and *Mesomelaena tetragona*. These Marri Woodlands grade into the Wetland Mosaic communities described below.

Wetland Mosaic

A series of communities can be distinguished in the seasonally inundated areas. These range from Marri Open Woodland through *Melaleuca preissiana* Low Open Woodland, mixed Heaths and Shrublands, often dominated by *Pericalymma*, to Sedgelands and Herblands. The mosaic nature of these plant communities is a feature of the heavy soil wetlands on the Swan Coastal Plain (Keighery and Trudgen 1992; Gibson et al. 1994; Keighery, Keighery and Gibson 1996). The presence of the different communities is related to the surface and subsurface soi layers and the degree and duration of winter inundation.

On the areas of dampland (seasonally waterlogged depressions, Semeniuk 1987) associated with the soils with the highest percentage of clay and the longest period of waterlogging, *Melaleuca uncinata* and *Melaleuca rhaphiophylla* are found. *Melaleuca uncinata* Tall Shrublands is a distinctive community (mapped as muS) characterised by areas of Herbland rather than a dense shrub and sedge layer.

On the wet flats or palusplain, *Melaleuca preissiana* Low Open Woodland (mapped as mpW and jmpW), mixed Heaths and Shrublands, often dominated by *Pericalymma* over Sedgelands and Herblands are found (mapped as xS). The shrubs and sedges characteristically form a dense understorey. *Kingia australis, Xanthorrhoea preissii, Hakea ceratophylla, Acacia extensa, Pericalymma ellipticum, Isopogon formosus* subsp. *dasylepis, Hypocalymma augustifolium* and *Grevillea brachystylis* are characteristic of the shrublands while *Leptocarpus co-angustatus, L. tenax, Tetraria octandra, Mesomelaena tetragona* and *Hypolaena exsulca* are characteristic sedges. *Baxteria australis* is generally associated with the herb layer. On the soils with the highest percentage of sand, Jarrah is found as well as *Melaleuca thymoides*.

On the drier areas of palusplain, Open Marri Woodland occurs and the understorey ranges from that characteristic of the wetflats to that of the better drained Marri areas (mapped within mW).

Floristic Community Types

There are three identified and two indicated floristic community types in Ambergate Reserve:

type 1b Southern Marri Woodlands on heavy soils

type 2 Southern Wet Shrublands

type 4 *Melaleuca preissiana* Damplands

type 21b Southern *Banksia attenuata* Woodlands

type 7 Herb-rich saline Shrublands on clay flats

Vegetation Condition

The vegetation of Ambergate Reserve is generally in excellent to very good condition with much of the area considered to be in pristine condition. With just thirty-five weeds recorded for the bushland, less than 10% of the flora, and the general restriction of these weeds to disturbed areas, weed invasion is low.

Disturbance of the bushland is associated with past clearing, grazing by livestock and too frequent fires, tracks, drains and past timber collection. Timber collection and frequent fires are evident in the absence of the expected number of mature Jarrah and Marri trees and the presence of many young Marri trees on the wetflats.

The areas that have been cleared and/or grazed are regenerating and if weeds are controlled in these areas regeneration will occur naturally from the adjacent intact vegetation. Often such areas are initially species poor, such as the south-western corner where Bracken (*Pteridium esculentum*) forms the principle understorey species in what, before clearing and grazing, would have been a *Melaleuca preissiana* Low Open Woodland. One area that has been cleared, the gravel and sand borrow pit on the western boundary of the south-eastern block, is being assisted to regenerate by controlling weeds and planting. A number of the species planted are not recorded for the Reserve.

Conservation Value

The location, condition and size of the Ambergate Reserve identifies the area as being of regional conservation value. One of the floristic community types Type 1b has been identified as “vulnerable” (Gibson et al. 1994), indicating that the community type is likely to become endangered in the near future if factors leading to its loss continue to operate.

The Department of Environmental Protection has identified the Ambergate Reserve as being a “Threatened and Poorly Reserved Community in need of interim protection” (DEP 1994).

Consideration of the plant communities present in the Reserve further defines the conservation value of the remnant. The Reserve contains a series of plant communities and their associated flora, that are now rare on the Swan Coastal Plain.

Ambergate Reserve is the largest remaining area of the southern Marri and *Banksia* woodlands and wetlands on the southern side of the Plain in the Busselton area and is one of the largest such areas on the Plain.

Floristic community Type 2 is confined to the southern area of the Plain south of Busselton. Ambergate Reserve contains the largest known area of floristic community Type 2.

4.3 FLORA (Keighery et al. 1996)

Ambergate Reserve contains a vascular flora of 361 taxa (Appendix 1, Flora Species List for Ambergate Reserve). Of these 326 are natives and 35 weeds. Four of these taxa are non-flowering vascular plants, 147 are monocotyledons (136 natives and 11 weeds) and 210 are dicotyledons (187 native and 23 weeds). The Mytaceae (22 taxa), Cyperaceae (30 taxa including 1 weed), Poaceae (16 taxa, 5 weeds), Asteraceae (16 taxa, 8 weeds), Anthericaceae (15 taxa), Ochidaceae (26 taxa), Papilionaceae (34 taxa, 4 weeds), Proteaceae (27 taxa), Stylidiaceae (18 taxa), Dasypogonaceae (13 taxa), Droseraceae (12 taxa), Haemodoraceae (12 taxa) and the Restionaceae (15 taxa) are the most species diverse families.

Twenty-four taxa present in the Reserve are characteristic of the heavier soils of the southern side (or eastern side of the Plain north of Capel) of the Swan Coastal Plain. There are also at least ten taxa that are only recorded on the Plain to the south of Capel.

Significant Flora

Two species of Declared Rare Flora are recorded for Ambergate Reserve, the featherflower *Verticordia plumosa* var. *ananeotes* and the sedge *Tetraria australiensis*. Both species were considered to be extinct until their recent re-discoveries. *Verticordia plumosa* var. *ananeotes* was re-discovered in Ambergate Reserve in 1991.

Verticordia plumosa var. *ananeotes* is a pink flowered featherflower which is difficult to locate in the dense shrub layer on the wet flats unless it is flowering.

Tetraria australiensis is a perennial sedge and is difficult to locate in bushland until the first summer after a fire when it flowers en masse. It is relatively inconspicuous at other times. The sedge was located at Ambergate in summer after a fire in the previous year. Nine rare taxa are also present in the Ambergate Reserve (Atkins 1995, Appendix 2). Four of these taxa are endemic to the Swan Coastal Plain and restricted to the southern side of the Plain (or eastern side of the Plain north of Capel).

Other Taxa of Interest

There are seventeen other taxa in the Ambergate Reserve which are of interest due to their being of a particular growth habit; at limits of their range; recently recognised sub-species; not previously recorded or uncommon on the Swan Coastal Plain; and hybridising species:

Baxteria australis
Chorizandra cymbaria
Conospermum flexuosum subsp. *laevigatum*
Daviesia rhombifolia
Drosera huegelii
Drosera myriantha
Gompholobium ovatum

Hibbertia ferruginea
Hibbertia stellaris
Hodgsoniola junciformis
Johnsonia lupulina
Leptomeria ericoides
Lepidosperma carphoides
Lomandra brittanii
Podocarpus drouyianus
Podolepis gracilis (Swamp form)
Tribonanthes

Weeds

Thirty-five weeds, most of which are annual species, are recorded in Ambergate Reserve (Appendix 1). Most of these species are confined to and/or occur in significant densities on the edges of the tracks and drains or are found in areas which have been partially cleared and/or grossly disturbed by grazing in the past. Most of the species recorded are not known to become established in significant densities in intact bushland (Dixon and Keighery 1995). However several species, Love Grass (*Eragrostis curvula*) and Arum Lily (*Zantedeschia aethiopica*), can be invasive. While not recorded for the bushland, the bulbous weed *Sparaxis bulbifera*, was found in the car park, its seeds being carried down the drain along Queen Elizabeth Avenue. This and any other bulbous weeds have the potential to become established if not controlled.

Conservation Value

The flora of the Ambergate Reserve shows a high level of species diversity. The Marri woodlands and the mixed shrublands/heaths contain a particularly diverse shrub, sedge and herb flora. Associated with this diverse flora area are a series of declared rare, rare and restricted taxa that contribute to the area's significance.

4.4 FAUNA

The fauna of Ambergate Reserve has been the subject of 14 surveys by members of the Busselton Naturalists Club, assisted by herpetologists from the WA Naturalists Club and Department of Conservation and Land Management (CALM) officers. The reserve contains a fauna of 99 species comprising 18 mammals (5 non-native), 49 birds (10 non-native), 15 herpetofauna, 26 arachnids, 1 aquatic crustacean and 1 mollusc (Appendix 2, Fauna Species List for Ambergate Reserve).

Of this fauna, 97 are native whilst 15 do not naturally occur in the region. Six of the native birds are migratory during autumn; the herpetofauna comprises 4 frogs, 9 lizards and 2 snakes. Large bull-ant nests and termite mounds have also been recorded in the Reserve.

The number and variety of fauna species that have been recorded in Ambergate Reserve indicate that the habitat supports a very diverse fauna for a relatively small and ecologically isolated area.

Significant Fauna

Some of the fauna species listed in Appendix 2 are rare, geographically restricted or well outside their normal range. All of the herpetofauna present are in their known distribution except one, *Ctenotus catenifer*, the discovery of which has extended this species' range by approximately 100km north.

The Black-backed Snake *Rhinoplocephalus nigriceps* has been collected on several occasions from Ambergate Reserve, a species that has only recently been included in the WA Museum's latest guide to snakes.

The Ringtail Possum (*Pseudocheirus peregrinus*) is a Declared Rare Fauna species, although it is reasonably common in the Busselton area. The Southern Brown Bandicoot (*Isoodon obesulus*) and its diggings has been sighted in the Reserve. Up to recently, this species was considered to be an Endangered Fauna species, but is now classified as Conservation Dependent because it is more common than the infrequent sightings of this secretive animal might indicate.

Many of the arachnids recorded in the Reserve are common species that are widely distributed in Australia or Western Australia. Of particular interest is the pseudoscorpion *Synsphyronus magnus* . This large species is uncommon in the south-west of this state. The Ambergate population is an additional locality, with numerous individuals.

A specimen of a snail believed to be *Bothriembryon irvineanus* was collected from the Reserve in 1997, a species only rarely collected from granitic outcrops on the Leeuwin-Naturaliste Ridge. This is of great interest because Ambergate Reserve presents a very different habitat, being on the Swan Coastal Plain. This species is considered to be vulnerable and is on the international register of threatened species.

Introduced and Feral Species

Feral cats and foxes are frequently seen in the Reserve and their presence undoubtedly adversely affects the populations of frogs, lizards, birds and small mammals. Rabbits and rabbit warrens also occur in the Reserve. These introduced animals are controlled on a regular basis by distribution of 1080 eggs and oats, trapping and ripping of warrens.

4.5 HYDROLOGY AND DRAINAGE

The Ambergate Reserve has a sandy soil locally underlain by ironstone. Drainage throughout the Reserve, is impeded, causing extensive winter-wet flats and slight depressions which are seasonally inundated.

Within the Reserve, there is a man-made lake and frog-pond in the south-east sector, created from rehabilitation of sand borrow pits by the BNC. The water level in this lake varies seasonally subject to rainfall. These levels are regularly monitored but not formally recorded.

The well next to the walk track in the north-east sector is occasionally monitored for water quality (A sample set of salinity records is presented in Appendix 3, Salinity Records for Well in Ambergate Reserve). The salinity records indicate that in winter there is a one to two metre layer of low salinity water at the surface of the well (e.g. 78mg/l), overlying water of higher salinity (>5000mg/l). As summer progresses, the surface water evaporates, with the low salinity layer slowly disappearing and the more saline water reaching the top of the water column. While this evaporation occurs, the ground water level also recedes, so that by mid-summer there is less than one metre of water left at the bottom of the well i.e. the more saline water has moved deeper into the soil profile.

There is a deep drain running along the western side of Queen Elizabeth Avenue and along the south-west boundary of the Reserve that is operated by the Water Authority of Western Australia (WAWA). This drain is a part of the extensive network which drains low-lying areas south of the Busselton townsite. This drain connects into the Vasse diversion Drain that empties into Geographe Bay.

4.6 FIRE HISTORY

Ambergate Reserve does not contain formal firebreaks to control outbreak of fires. Fires in the Reserve are contained within each of the four sectors by the surrounding farmland, Queen Elizabeth Avenue and Doyle Road. The perimeter boundary of the Reserve is sprayed and occasionally mown to reduce fuel levels adjacent to fencelines and private property.

The four sectors have been subjected to unscheduled fires in the past, despite regular control burns by the BNC to keep fuel levels low in the Reserve. The south-east sector was last control burnt in 1991 and again subject to fire in 1992. The north-west sector was last burnt in 1994 and the south-west sector in 1998. The north-east sector was control burnt in Autumn 2002.

4.7 DIEBACK

Dieback (*Phytopthora cinnamomi*) is a fungal disease that poses a serious threat to many plant species in the south-west of WA. The fungus is borne by water or when soil

is moved. It moves down slopes and along water courses as well as in soil carried by vehicles, people or animals. Dieback can also be transferred between plant roots. It kills plants by preventing their roots from taking up water and nutrients (Bailey,1995).

Ambergate does not show evidence of dieback caused by *Phytopthora cinnamomi*, although a couple of trees in the north-east sector were thought to have been infected in 1998 as evidenced by leaf loss. These trees were treated for dieback by spraying with phosphite up to a 50m radius and have since made a good recovery. The leaf loss was possibly not due to dieback infection, but the result of a long hot summer with very late seasonal rains.

Dieback control measures in operation at Ambergate Reserve require visitors to disinfect their shoes by walking over a soaked pad at the start of the circuit walk track.

4.8 RECREATION

Ambergate Reserve offers local residents and visitors the opportunity to bushwalk on the 4km long circuit walk track through all four sectors of the Reserve (Figure 2, Ambergate Reserve Features). Other passive recreational pursuits in the Reserve include bird watching and observing wildflowers; there is a diverse range of bird and floral species present, in addition to fauna sightings.

The walk track commences from the carpark area on Queen Elizabeth Avenue, via an information shelter and dieback control pad. There are over 100 signs placed alongside the walk track, identifying plant species in the Reserve.

There is no evidence within the Reserve of camping and only rarely of uncontrolled access by cars, bicycles, motorbikes or horses.

4.9 EDUCATION

Ambergate Reserve is visited by children from local primary and secondary schools for the purpose of biology and geography studies, taking full advantage of the Reserve's high conservation value, close proximity and ease of access.

The Busselton Naturalists Club has prepared and produced four information pamphlets detailing the particular natural heritage characteristics offered within the Reserve in each of the four seasons of the year. These pamphlets are supplied in the information shelter on-site for visitors to pick-up and use during their walk to enhance their experience of the Reserve.

4.10 HERITAGE

As detailed in Section 2.2, Settlement Group 44 was located on the site of Ambergate Reserve in 1922 for two years.

The Aboriginal history of the Reserve has not been investigated to date. Rivers, estuaries and wetlands were very important to the Nyungar people of the south-west region, both spiritually and as sources of food and water (O'Connor et al.,1995). The Wardandi people, meaning 'the people that lived by the ocean and followed the forest paths' were a group of Nyungar people that occupied the coastal margin of the Geographe Bay catchment area (Shire of Busselton and Friends of Peron Reserve, 2000). The Wardandi seasonally migrated between the coastal plain and its hinterland to exploit various food and water resources and it is likely that they visited the site of the Reserve during these movements.

5.0 MANAGEMENT ISSUES AND RECOMMENDATIONS

5.1 CONSERVATION

5.1.1 Flora and Vegetation

Objectives

- Maintain existing diversity of species, growth habits and age classes.
- Protect species and communities known to be rare, geographically restricted, at limit of range or otherwise in need of protection.
- Enhance public awareness of the conservation value and ecology of the Reserve's communities.

Issues

The Swan Coastal Plain is under increasing pressure from land clearing and urbanisation which threaten the existence of many of the plant species that are restricted to it. This places great significance on those species and communities in reserves that are managed for conservation. Plant species and communities within reserves are still at threat from invasion of weeds, frequent fire, grazing by fauna, increased human use and inappropriate management practices.

Understanding the vegetation communities is the key to achieving the management objectives for Ambergate Reserve. Collection of baseline data with respect to flora species and communities present in the Reserve has been completed, and is on which past management strategies have been based. Comparison of this data over time with future survey data can be used to monitor the success of the management plan.

To further understand the diversity and uniqueness of the vegetation communities in the Reserve, opportunities for scientific research should be encouraged through the promotion of surveys and research projects within institutions such as universities or government research agencies. Any proposed works or research with potential to impact upon Declared Rare Flora or Threatened Ecological Communities should be documented and referred to CALM for comment and appropriate licensing prior to commencement.

Recommended Actions

Number	Action	Priority
5.1.1 a)	Liaise with CALM on management of Declared Rare and Priority Flora; and Threatened Ecological Communities	1 Ongoing
5.1.1 b)	Clarify with CALM the ultimate responsibility for conservation of Declared Rare and Priority Flora in the Reserve	2
5.1.1 c)	Locate Gibson Plots (Floristic Type sites) within Threatened Ecological Communities	3
5.1.1 d)	Investigate population of Declared Rare Flora, particularly age of plants, existing threats and whether an outlier or remnant population	2
5.1.1 e)	Promote opportunities for scientific research within Ambergate Reserve.	2
5.1.1 f)	Establish monitoring quadrats to assess if perceived threats (weeds, fire, grazing, spraying) affect Declared Rare Flora	2
5.1.1 g)	Assess the effects of weeds and fauna grazing on inhibiting revegetation and the need for protection strategies. Implement where appropriate	1
5.1.1 h)	Investigate upgrading conservation status of Ambergate Reserve from ‘C Class’ to ‘A Class’ for Conservation	1

5.1.2 Weeds

Objectives

- Protect rare and endangered flora and threatened communities from impacts of weeds and weed control measures.
- Eradicate weed species from Ambergate Reserve.
- Educate public and landowners on threat of weeds in Ambergate Reserve.

Issues

Weeds cause major problems within native bushland by competing with indigenous species, discouraging other plant growth, increasing fire hazard and creating habitat for introduced species. Ambergate Reserve is a small area surrounded by private farmland and intersected by roads. This fragmentation increases risk of weed infestation. The worst weed-affected areas in the Reserve are along the road verges and around the perimeter of the Reserve.

Suitable weed control strategies include manual removal, mowing, slashing, herbicide wipe or spot spraying. Burning should not be used for weed control as escapees could prove detrimental to values in the Reserve and may exacerbate further weed invasion. Control of weed species should be scheduled before the plants set seed. Any proposed weed control measure with potential to impact Declared Rare Flora or Threatened Ecological Communities such as spraying, mowing or disturbance of soil in the vicinity (weeding) should be documented and referred to CALM for comment and appropriate licensing prior to commencement.
.
Consideration should be given to applying the Bradley Method to areas of weed infestation. The idea of this successful method is to attack areas of weeds starting from the outer edges where the infestation is less intense and existing native vegetation can naturally regenerate into areas when weeds are removed. Only small areas are tackled at one time so regeneration can occur apace. Large areas of the soil surface are not disturbed at any one time as this makes it easy for weeds to regrow instead of native vegetation.

The limited extent of weeds in Ambergate Reserve will result in weed control measures being successful, if due care is taken to control weeds before they invade further into undisturbed areas of the Reserve. Some weed species have a large seedbank and will prove difficult to eradicate if efforts are not continued from year to year.

Weed control should be carried out several times per year in winter and spring to reduce vegetative growth and spread of seed. The reduced competition will assist regrowth of understorey. Weeding and herbicide application should be repeated within two months to reduce regrowth. Revegetation utilising locally occurring seed and plants should commence when the weed infestation has decreased.

Recommended Actions

Number	Action	Priority
5.1.2 a)	Create a weed map from aerial photos supported by ground-truthing.	2
5.1.2 b)	Prepare weed inventory incorporating control strategies	1
5.1.2 c)	Establish weed monitoring quadrats to allow assessment of success of weed control program	3

5.1.2 d)	Implement weed control measures to reduce populations of weed species in the Reserve • Spot spraying and hand removal of arum lily • Spot spraying and hand removal of watsonia species • Spot spraying, herbicide wipe or hand removal of african love grass	1 Ongoing
5.1.2 e)	Protect Threatened Ecological Communities by targeting weed control to individual species in these areas; use of monocot chemicals; no broadacre spraying	1
5.1.2 f)	Liaise with Department of Agriculture to assess suitability for trial biological control for bridal creeper.	2
5.1.2 g)	Identify and remove exotic species	1
5.1.2 h)	Concentrate control measures on eradication and control of other weed species	1 Ongoing
5.1.2 i)	Prevent introduction of weeds by discouraging dumping of garden refuse and minimise soil disturbance	1
5.1.2 j)	Notify surrounding landowners of weed control program and inform of practises that they can also use to reduce further weed invasion into the Reserve.	1
5.1.2 k)	In areas where weeds dominate the understorey, establish rehabilitation program to assist native regeneration	2
5.1.2 l)	Establish weed monitoring program along walktracks to aid in concentrating weed control efforts where most needed	2

5.1.3 Disease

Objectives

- To prevent disease from being introduced into Ambergate Reserve.
- To minimise the spread of *Phytophthora* and other diseases if they are present in the Reserve.

Issues

To determine the presence of dieback in Ambergate Reserve, the vegetation should be assessed by an accredited *Phytophthora cinnamomi* interpreter. Monitoring of the following factors will help determine the presence of dieback in the Reserve:

- Presence of indicator species such as *Banksia, Adenanthos, Persoonia, Xylomelum* and *Macrozamia* indicates that dieback is not present.

- Pattern of death with respect to a majority of indicator species suggests a high probability of dieback being the cause.

- Pattern of development where there is no regeneration or new growth of existing indicator species over time.

- Vector of disease introduction. Identifying the location in which infection originated and areas next at risk will determine future management of area.

- Elimination of false symptoms such as other diseases, natural water stress, insect damage, salt and fire.

There is an increased risk of introducing and spreading *Phytophthora* when soil is moved. This may be due to management activities or on the soles of walker's shoes. Implementing strict dieback hygiene conditions will reduce the risk of its introduction and spread.

Armillaria and aerial cankers are other diseases that pose a risk to vegetation in the Reserve. These diseases could be introduced into the Reserve via infected brush material or seedlings for revegetation.

Recommended Actions

Number	Action	Priority
5.1.3 a)	Conduct a dieback survey (by an accredited *Phytophthora cinnamomi* interpreter) of the entire Reserve to determine the presence and extent of *Phytophthora cinnamomi* and other diseases	2
5.1.3 b)	Review existing disease hygiene requirements for all operations. Implement disease hygiene procedures. Emphasis on minimising the possibility of introducing or spreading disease	1

5.1.3 c)	Include disease hygiene requirements in all contract specifications.	1
5.1.3 d)	If required, research findings on the use of fungicides for application in the Reserve.	3

5.1.4 Fauna

Objectives

- To protect and conserve the native fauna populations and their habitats that occur within Ambergate Reserve. Place management emphasis on species that are threatened, in need of special protection, or vulnerable to disturbance.

- Assess the Reserve's suitability as a location to reintroduce species which are the subject of specific programs.

- Manage the reserve's fauna habitat, comprising flora, vegetation and pests to facilitate long-term viability of fauna populations.

- Encourage community awareness of the Reserve's fauna and management programs.

Issues

Further information on fauna is required to prepare and implement effective management programs. Information to be gathered comprises:

- geographical range of species occurring in Reserve.

- species known to occur in the local area and region.

- species no longer occurring but known to have formerly occurred in the area and region.

- the conservation status of the occurring and formerly occurring species in the Reserve and local area.

In the past, large numbers of kangaroos have been reported in Ambergate Reserve. Grazing by kangaroos at high densities can adversely affect vegetated areas and those under rehabilitation. The farmland adjacent to the Reserve was culled in 1994-1995, the licence allowed for 80 animals to be taken.

The impact of grazing kangaroos needs to be monitored and if significant the number of kangaroos may need to be reduced. Culling and removal of water and food sources reduces grazing pressure on native vegetation and decreases the breeding rate. Removal rates and procedures must be defined and monitored prior to culling by licensed professional shooters. The proposed creation of a permanent water source to attract water birds and provide summer refuge may be in conflict with management of the kangaroo population in the Reserve.

Fire, predators, pollution and loss of habitat can adversely impact upon amphibian populations. Collection of amphibian data relevant to these issues can provide additional baseline data for future comparison, especially after fire or particular management activities.

A long-term monitoring program of amphibians in the Reserve could be conducted through Ribbons of Blue, which organises local school and community groups to collect frog calls for identification.

Outbreak of fire in Ambergate Reserve can affect native fauna by destroying key habitat and food sources. The Reserve is isolated from other areas of bush and has a high fire risk, therefore consideration should be given to increasing the chance of fauna survival by establishing vegetation corridors to bushlands in the vicinity. The Reserve fauna populations would also benefit from the exchange of genetic material via such corridors.

AGWEST has commenced establishment of a vegetation corridor on the Vasse Research Station, extending from Ambergate Reserve to the Vasse River. Further assistance and involvement in this project should be sought to ensure successful establishment of the vegetation corridor.

Recommended Actions

Number	Action	Priority
5.1.4 a)	Protect fauna populations and their habitats	1
5.1.4 b)	Undertake a macro-invertebrate survey	3
5.1.4 c)	Investigate creation of a permanent water source and fringing habitat to attract waterbirds and provide summer refuge. Consider effect on the population of kangaroos in the Reserve	2 ongoing
5.1.4 d)	Establish a database to record bird-sightings within the Reserve.	2
5.1.4 e)	Establish a monitoring program for amphibians in the Reserve	2
5.1.4 f)	Establish vegetation corridors to allow fauna movement between the Reserve and neighboring bushlands	1 Ongoing
5.1.4 g)	Assess the feasibility of introducing fauna into the Reserve for other species that are threatened, or in need of special protection or otherwise vulnerable; or no longer occurring in the Reserve but known to occurred in the past	3
5.1.4 h)	Monitor the impact of grazing kangaroos. If impact is	2

	significant, assess means of reducing impact and implement	

5.1.5 Introduced Animals

Objectives

- Protect and conserve the Reserve's native fauna.
- Prevent further introduction of non-native fauna.
- Control, with the aim of eradicating, existing populations of introduced fauna.
- Educate public and landowners on threat of introduced animals in Ambergate Reserve.

Issues

The presence of introduced animals in Ambergate Reserve can reduce the Reserve's conservation value. Most non-native animals such as feral cats, foxes, rabbits and domestic pets can adversely affect native fauna and flora by competing for food and habitat, destroying habitat (grazing, trampling and digging), introducing weeds and predation. The fox and rabbit are both Declared Animals under the Agriculture and Related Resources Act.

Rabbits are often sighted in the Reserve and some adjacent landowners consider their population to be high. The introduced rabbit control virus, Myxomatosis, strikes in November when the rabbit population is high. Numbers of rabbits then increase throughout the year until the following spring, when the disease again reduces the population. Rabbit warrens do exist in the Reserve, despite ongoing efforts to destroy them and reduce the rabbit population. High rabbit densities can result in shrubs being ringbarked and damage to small trees, lowering the regeneration rates of native flora in the Reserve. This can have a long-term impact on the Reserve.

Research in Western Australia has suggested a link between foxes and the decline of medium-sized native animals (Christensen, 1980); and that removal or reduction of foxes correlates to increasing numbers of native fauna populations (Kinnear *et al*, 1988).

Cats are opportunistic predators, feeding on invertebrates, fish, reptiles, birds and mammals. Food availability limits the density of feral cat populations. A Cat Welfare Strategy has been formulated by the Busselton Shire Council to address the problem of the regions cat overpopulation. Its purpose is to encourage cat owners to sterilise, licence and contain their cats through economic incentives and it will come into effect in

the 2000/2001 year. Education of local cat-owners is the most effective method to reduce the impact of cats on the Reserve's fauna.

Control measures for rabbits and foxes include destroying rabbit warrens and fox dens, and baiting for both species, using poison oat trails and poison eggs respectively. Baiting programs using 1080 have been found to significantly reduce populations of foxes (CALM Pers. Comm.). Its effect on cats has not been investigated. Eradication of the fox and rabbit will depend on continuing vigilance in monitoring and control of these species.

Grazing of stock also presents a threat to the Reserve's Conservation value by introducing weeds and causing erosion.

Feral bees have not been recorded in Ambergate Reserve. However it should be noted that feral bees and bees from apiary sites can compete with native invertebrates for food resources.

Recommended Actions

Number	Action	Priority
5.1.5 a)	Prepare and implement a control program for introduced animals with emphasis on: • controlling rabbits, • controlling and eradicating foxes • controlling and eradicating cats.	1 Ongoing
5.1.5 b)	Conduct 1080 fox and rabbit baiting program to protect native fauna	P1 ongoing
5.1.5 c)	Employ local contractor to conduct 1080 baiting in Reserve using sterile oats.	P1 ongoing
5.1.5 d)	Do not grant apiary licences within the Reserve.	
5.1.5 e)	Prohibit domestic dogs in the Reserve	1
5.1.5 f)	Encourage adjacent landowners to sterilise their domestic cats.	2
5.1.5 g)	Inform and educate local householders of the effects their domestic cats and dogs are having on the Reserve's flora and fauna	2

5.1.6 Fire

Objectives

- Minimise the risk of wildfires burning large areas within the Reserve.
- Protect human life (neighbours, fire fighters, visitors) from wildfires within the Reserve.
- Implement a fire management regime that will assist in conservation by not impacting upon the floral and genetic diversity within the Reserve.

Issues

Fire is a common occurrence in Australian bushland and native vegetation has evolved to survive its effects. Plants use a number of strategies to deal with the impact of fire. These include fire resistant seed that germinate after fire, and resprouting from rootstocks. However, very frequent hot wild fires adversely affect the ability of many plant species to recover after fire.

Management of fire in Ambergate Reserve requires a combination of excluding fire for conservation reasons, as well as using fire to reduce fuel loads to decrease the risk of a very hot burn and to protect adjacent properties.

The Busselton Naturalists Club liaises regularly with the Fire and Emergency Services Authority (FESA) and with the two fire officers responsible for fire prevention and control in each of the northern and southern halves of the Reserve. They are equipped with two fire units and assisted by volunteers as required. They are present to assist at all control burns. CALM is notified prior to prescribed burning or in the event of wildfire. Fire suppression is undertaken by use of hose-lays and existing fire access tracks without further physical disturbance of the Reserve (ie establishment of new fire breaks). Access for fire management is available via neighbouring farmland, Queen Elizabeth Avenue and Doyle Road.

The Busselton Naturalists Club has attempted to establish an 8 year control burning frequency for the Reserve, one sector of the Reserve being burnt every second year. This fire frequency allows for the many plants that need 5 to 6 years to commence flowering and setting seed after fire, and eucalypt trees which require 8-10 years for seedlings to attain sufficient height to survive fire.

The Department of CALM recommends that seasonally wet sites should not be burnt at intervals of less than 12-14 years and jarrah forest ecosystems should not be burnt at frequencies less than 6 - 8 year intervals (Burrows, Ward & Robinson 1995). These

intervals should be considered as an absolute minimum, and many would recommend at least twice this.

For flora/vegetation management purposes, CALM recommends a control burn regime of 2 spring burns, 1 autumn burn and a no burn interval over a period of 32 years. However the Busselton Naturalists Club strongly supports cool autumn burns to avoid the spring seed setting period for flora and nesting period for birds. These burns are conducted following rain to ensure a cool burn which lowers fuel levels on the ground.

CALM does not support a constant fire regime of cool autumn burns in the Reserve. In order to maintain and enhance biodiversity, variation in disturbance types is necessary for diversity of ecological responses. Particular species will be either favoured or disadvantaged and conditions for recruitment and availability of hollow, woody debris and other fauna habitat may be limited over time. Studies indicate that late spring burns have limited impact upon bird species with 80% having fledged by this time. Frequent autumn burns may also encourage winter weed establishment.

To ensure that fire management is compatible with conservation objectives, particular flora species need to be investigated and their susceptibility to fire assessed. A burning regime of 15 years for both Declared Rare Flora species and Threatened Ecological Communities should be maintained. As an interim guideline CALM supports the proposed burn interval of 8 years for other areas, however this may be adjusted in light of future research.

Fire can result in increased weed infestations as weed species grow and can set seed quickly and immediately colonise soil laid bare from disturbance. Weed infestations after fire cause a greater fire hazard than native vegetation and grasses generate a large dry biomass during summer.

Implementation of fire management and weed management programs must therefore be compatible. The fuel loads present in Ambergate Reserve need to be monitored yearly and managed to lower the risk of a hot burn occurring. Future development of the fire management program should be supported by research of the Reserve's fire history, existing fuel loads and fire coping strategies and preferences of significant flora species and vegetation communities.

Ambergate Reserve does not have any firebreaks. Preliminary investigations reveal that Busselton Shire Council requires all private land and its own vested reserves to have firebreaks. Creation of a cleared firebreak inside the perimeter fence around the entire Reserve would involve removal of a significant quantity of native trees and vegetation which would be unacceptable to the Busselton Naturalists Club's conservation objectives for managing the Reserve. An alternative to firebreaks that is more consistent with consrvation objectivesof the reserve is recommended consisting of a raked/mown/sprayed low fuel separation zone, cleared of leaf/twig debris; and overhanging branches to keep fences clear of flamable material. The low fuel separation zone will be regularly monitored and maintained.

Creation of access tracks for management activities into the Reserve is not considered compatible with the Club's conservation objectives. The Reserve is unique in that it is sectioned into four equal parts by Doyle Road and Queen Elizabeth Avenue which provides fire fighting access to the Reserve. Access for fire management purposes will continue to be via adjacent properties and roads which intersect the Reserve. These barriers also act as strategic firebreaks negating the need to construct additional firebreaks and greatly reduce the need for control burns to reduce fuel loads.

The areas that present the greatest fire risk to Ambergate Reserve are the road verges along Doyle Road and Queen Elizabeth Avenue which suffer from high weed infestation in some parts. Being adjacent to roads, these areas are most likely to receive discarded cigarette butts from passing cars or be the target of vandals. The fuel loads on these road verges should be kept as low as possible at all times by management of weeds and also cool burns, mowing or slashing the understorey where appropriate.

A separate fire management plan should be prepared for those areas supporting significant flora and vegetation communities. This plan should concentrate on achieving the objectives of the Reserve's fire management plan whilst fulfilling the Club's conservation objectives for the Reserve. Fire management in these special areas may involve more labour intensive methods of reducing fuel loads such as hand pulling weeds, raking or mowing.

Recommended Actions

Number	Action	Priority
5.1.6 a)	Liaise with the Volunteer Bush Fire Brigade and CALM regarding the development of a long term fire management plan	1 Ongoing
5.1.6 b)	Implement a fire control program by maintaining a low fuel separation zone around the perimeter and control burning for vegetation management (conservation) and fuel reduction in scheduled areas	1 Ongoing
5.1.6 c)	Investigate fuel tonnages. Fuel loads should be monitored annually to ensure the road buffer zones are functioning properly and to indicate when a fire control burn is needed	2
5.1.6 d)	Weed control programs should be implemented following all cool fire burns to prevent weed infestation	2
5.1.6 e)	Reduce fuel loading in the Reserve by eradicating weeds. Investigate the use of selective residual herbicides for maintenance of low fuel separation zones around the outer	2

	perimeter of the reserve.	
5.1.6 f)	Prepare and implement a wildfire suppression plan identifying: • Strategic roads and access points • Strategic water points • Specific strategies to be implemented to protect significant flora, restricted vegetation communities and fauna habitats. • fire suppression support units (local brigade).	2
5.1.6 g)	Liaise with adjacent landowners on fire management within the Reserve	1
5.1.6 h)	Investigate Reserve's fire history by accessing DOLA aerial photographs and assessing fire scars	3
5.1.6 i)	Implement a control burning regime frequency for each sector of a minimum of 8 years comprising 1 spring, 2 cool autumn burns and a no burn interval over a 32 year period until such time as the longterm fire management plan (Rec 5.1.1) comes into effect.	1
5.1.6 j)	Target DRF and priority flora species to determine burning regimes in those special areas. *Verticordia* needs a 15 year fire free period to set seed and rejuvenate root stocks	2

5.1.7. Water

Objective

- To ensure that water quality in Ambergate Reserve is maintained.

Issues

Deep roadside drains traverse Ambergate Reserve carrying water drained from rural land further south of Busselton's townsite. This drainage water carries water containing elevated levels of nutrients and possibly salt and other pollutants which could potentially impact on the Reserve via seepage into the groundwater or flooding. Therefore regular monitoring of water quality and levels in these drains, well, frog pond and artificial lake on the Reserve should be conducted and recorded on a database.

Water levels will be useful in planning further revegetation of the lake's banks or earthworks; and water quality records will assist in completing the environmental picture of Ambergate Reserve and possible threats to its conservation value.

Recommended Actions

Number	Action	Priority
5.1.7 a)	Monitor water levels and water quality (conductivity, pH, nutrients) in deep roadside drains, well, frog pond, artificial lake and associated drain.	2
5.1.7 b)	Install water level measuring posts relative to Australian Height Datum	2
5.1.7 c)	Create a database on which to record water monitoring.	2
5.1.7 d)	Plant the margins of the artificial lake with locally occurring native sedges and other indigenous riparian vegetation to stabilise the banks	2
5.1.7 e)	Measure actual well depth	2
5.1.7 f)	Regularly assess safety of well to visitors on the Reserve.	3
5.1.7 g)	Minimise the use of herbicides in the vicinity of the artificial lake and frog pond.	1
5.1.7 h)	Assess all proposed local operations and developments that have the potential to affect the Reserve's hydrology, especially drainage patterns	3

5.1.8 Rehabilitation

Objectives

- To rehabilitate the flora, fauna and landscape of Ambergate Reserve given its past uses.

- Apply rehabilitation techniques to progress degraded areas to a stage where vegetation communities are self sustaining.

Issues

The majority of vegetation at Ambergate Reserve is in good condition and has not been adversely affected by past uses. The rubbish and debris dumped within the Reserve in the past have been removed by the BNC. However there are some areas that could benefit from a rehabilitation program:

- former track access to private property in the north-east sector parallel to northern boundary.
- road verges, including those sections used for utilities such as fibre optic cable.
- cleared degraded area surrounding frog pond and artificial lake and associated area in south eastern sector.
- parts of existing walk track to be re-routed out of seasonally wet areas in the future or replaced with a boardwalk in places.

Rehabilitation efforts in these areas should concentrate on encouraging regeneration of native vegetation by control of water runoff, reinstating the soil characteristics, weed control, planting/seeding and protecting young plants from grazing.

To maintain provenance any proposed rehabilitation in the Reserve should utilise locally occurring seed. Propagation should be undertaken at a dieback accredited nursery. Brushing, if used, should also be sourced locally. All materials brought into the Reserve must be free of dieback.

Recommended Actions

Number	Action	Priority
5.1.8 a)	Rehabilitate cleared and degraded areas in Reserve: • easement in north eastern sector • areas in south eastern sector	2
5.1.8 b)	Rehabilitate old section of walk track if re-routing occurs in future.	4
5.1.8 d)	All plant material (and topsoil/brush) utilised in Reserve must be sourced locally.	1
5.1.8 e)	Encourage regeneration of native vegetation by controlling water runoff, reinstating soil surface, controlling weeds, assisting revegetation by planting/seeding/brushing	2
5.1.8 f)	Protect young plants from grazing and mechanical damage by fencing, protective covers, signs if appropriate.	3
5.1.8 g)	If available, spread weed free topsoil over areas in south eastern sector to replenish the soil surface and thus accelerate regrowth of understorey.	2

5.1.8 h)	Survey existing re-vegetated areas for plant species that are not indigenous to Ambergate reserve. Leave these in place and revegetate between them. Ensure they are not spreading or invasive. Once revegetation is mature, reassess their removal.	3

5.2 RECREATION

Objectives

- To encourage and provide for low impact recreation activities that are compatible with the conservation values of Ambergate Reserve.

- To provide facilities and opportunities that will enhance appreciation of the Reserve's values.

Issues

Ambergate Reserve does not attract large numbers of visitors. This is indicated by the lack of rubbish and good condition of unconstructed paths. Therefore management of the Reserve for recreation should place emphasis on conservation, with low impact recreation use and minimal amenities being provided in the Reserve.

Bird watching and bushwalking are not generally of concern unless the public wander from established paths. Some bushwalkers also like to take their dogs for exercise. The high conservation value of Ambergate Reserve indicates that dogs should not be permitted in the Reserve.

The Reserve is a good location for bird watching and this should be recognised in the provision of educational material, bird hides and rest sites alongside the walktracks. Park benches are required at regular intervals along the walk track to provide opportunities for visitors to rest, birdwatch and enjoy the peace of the bush. Signs indicating special points of interest could be erected alongside the benches. These structures should be either constructed in fireproof materials or from logs available in the Reserve or sourced locally.

Trailbike riding is an unacceptable pursuit in the Reserve due to damage to the landscape and danger to other visitors. Horseriding should also be discouraged as animal manure carries seeds.

There are no public amenities in Ambergate Reserve due to the type of recreation for which the Reserve is managed, Facilities such as picnic tables, barbecues or toilets should not be provided as they are incompatible with the low impact recreation objectives of the Reserve.

Encouraging passive recreation in Ambergate Reserve will heighten the community's appreciation of its conservation value. The population in the vicinity of the Reserve is likely to increase due to further subdivision and tourism in the region. This will increase the number of people visiting Ambergate Reserve and measures must be prepared to ensure this doesn't negatively impact on the Reserve's conservation values.

Increased numbers of visitors to the Reserve will result in more rubbish. The Shire does not collect domestic rubbish from bins in Ambergate, therefore no rubbish bin can be provided. Visitors should be encouraged to take their rubbish home with them by the erection of an appropriately worded sign in the carpark area.

A 4km long circuit walk track currently traverses all four sectors of Ambergate Reserve. The majority of the walk track is well sited but some parts are badly affected by water in winter and are sited on soils unsuitable for sustained walking use. The walk track is not underlain by a base or properly formed and thus its integrity is continually threatened by overgrowth and roots/rocks. Parts of the walk track need to be rerouted to higher or more suitable ground or boardwalks need to be installed in appropriate areas. The entire walk track would benefit from being constructed on a limestone base with a lignum sulphonite surface to a width of 1.0 m minimum. This would improve safety to walkers and decrease the amount of time needed for track maintenance.

Boardwalks would be appropriate solutions to allow walkers to cross drains and damp areas in comfort and safety. Signs located at road crossings are needed to advise walkers the shortest routes back to the carpark.

The carpark is the visitors' introduction to Ambergate Reserve and as such could be used to advantage by raising the Reserve's profile and displaying the level of community involvement to the passing public. The existing carpark is not attractive, being affected by flooding and weeds. Its entrance /exits are not well defined. Development of the carpark as an entry statement to the Reserve is required. This could involve resurfacing, better drainage, landscaping, shade planting and perimeter barriers.

<u>Recommended Actions</u>

Number	Action	Priority
5.2 a)	Provide a sign at the entrance to the Reserve informing the public that the following are not permitted in Ambergate Reserve: • Dogs (except on leash) • Horses • Trail bikes • Camping • Vehicles	1

5.2 b)	Provide a sign at the entrance to the Reserve requesting visitors to take their rubbish home with them	1
5.2 c)	Re-route unsuitable sections of the walk track to more suitable ground. Rehabilitate old walktracks	2
5.2 d)	Construct walktrail on crushed limestone base with a lignum sulphonite surface to a minimum width of 1.0m	1
5.2 e)	Construct boardwalks associated with walk track in wet area and at drain crossings	2
5.2 f)	Provide signage along walktracks to advise walkers of shorter routes to return to carpark, special points of interest and walking distances	2
5.2 g)	Provide park benches at regular intervals along the walk track and in the carpark. Benches should be designed to be rustic in nature and easily replaced or built of fireproof materials	2
5.2 h)	Resurface carpark with limestone (hostile to *Phytophthora cinnamomi*) and improve drainage	3
5.2 i)	Redevelop carpark as an entry statement to Reserve by providing landscape and shade planting, perimeter barriers and defined entrances/exits.	3
5.2 j)	Monitor use of the Reserve to: • assess patterns of use • ensure adequate facilities are provided • measure environmental impact.	3
5.2 k)	Provide interpretive information on the: • Reserve's recreation opportunities • natural hazards • history of the Reserve	2

5.3 EDUCATION

Objectives

- Increase community understanding, awareness and enjoyment of the Reserve's natural values.

- Increase community understanding and awareness of the Busselton Naturalists Club's approach to managing the Reserve.

- Encourage use of the Reserve for educational purposes.

Issues

An important part of managing a Reserve is disseminating information. Ambergate Reserve is a valuable source of information and education for the community because it has unique conservation values. Education raises the community's awareness and appreciation of the natural environment. It can also be used to communicate management strategies, safety information and foster appropriate behaviour that minimises environmental impact. An important benefit of education is that it can tap into local knowledge regarding the Reserve and its conservation values that the Busselton Naturalists Club may be unaware of.

Ambergate Reserve has the potential to be used as a research site and for educational purposes. It can play a role in environmental education and interpretation programs for school groups, local government, local environmental interest groups and naturalists groups.

There is a need to provide and upgrade on-site and off-site information as follows;

- pre-visit information
- orientation of walktracks
- regulatory signs
- interpretive points
- directional signs

Educational facilities provided on-site need to be maintenance free and easily accessible to visitors. Track signs and display boards might be appropriately located within the Reserve providing information on conservation and rehabilitation strategies, significant flora and fauna, cultural history and cautionary signs for removal of flora, littering, dumping of garden refuse etc.

Signs which are worded in a positive tone and explain why certain activities are discouraged are often more effective than simply prohibitive signs.

Off-site educational facilities can inform and educate the community, nearby residents and tourists on the Reserve's conservation and cultural values.

The Busselton Naturalists Club could try to involve nearby residents in the management and conservation of the Reserve. This could be achieved by providing informative pamphlets on how nearby residents can prevent environmental impacts in the Reserve (e.g. firebreaks, pets, motor vehicles, horse-riding, fertiliser and spray drift, weed control, picking native flora, planting declared plants on their land).

Regular meetings between nearby residents and the Management Committee to discuss ongoing management and conservation issues could be conducted to ensure there is free exchange and communication between these two groups.

Information pamphlets and brochures on Ambergate Reserve could be supplied to the Tourist Bureau, Environment Centre, CALM, Library and the Shire Council Offices for use by the wider community and tourists.

Preparation of regular progress reports can be an important management tool to focus the management committee's efforts and prioritise key issues. A progress report could be distributed to members of the Busselton Naturalists Club and submitted to the Busselton Shire Council to keep it up to date on management issues and help gain funding and resources required to complete future projects and programs. The progress report could also be made available to the various government bodies, interest groups and nearby residents who are involved in managing the Reserve.

Information leaflets could also be used in conjunction with the progress reports to summarise management progress and provide information on upcoming events concerning the Reserve such as busy bee days and important current issues concerning management of the Reserve (surveys, weed/pest control, firebreaks etc.) These leaflets could be placed in the information shelter at the Reserve entrance.

Another avenue of educating the wider community and raising their awareness of Ambergate Reserve's conservation values is to regularly nominate the Reserve and its Management Committee for Awards periodically given to community and conservation projects such as the John Tonkin Greening Award, Banksia Environmental Award, Readers Digest Environment Award and the Busselton Shire Council's Landcare Award.

Details of Ambergate Reserve should also be included on the Busselton Shire Council's Internet Home page. This facility would enable the information included in information brochures to be distributed to the wider community and internationally.

Recommended Actions

Number	Action	Priority
5.3 a)	Review existing information board and locality map of the Reserve at the entry point and if necessary upgrade it	1
5.3 b)	Establish smaller information boards to inform visitors of significant natural history in parts of the Reserve	2
5.3 c)	Establish signs on appropriate behaviour in the Reserve.	1
5.3 d)	Review current Reserve information on pamphlets	1
5.3 e	Provide a general information pamphlet on the Reserve	2

	summarising the conservation values and possible threats from nearby properties. Distribute to nearby residents, community and visitors to the Reserve	
5.3 f)	Submit a yearly progress report to the Busselton Shire Council, include requests for future project funding prior to Council's 4 year projection plan and budget being finalised (April each year).	2
5.3 g)	Distribute information leaflets summarising the progress report to government bodies and groups involved in the Reserve's management. Provide leaflets on-site	3
5.3 h)	Encourage a "Reserve Watch" program with nearby residents.	3
5.3 i)	Establish contact with other community environmental groups for mutual educational benefits	3
5.3 j)	Encourage educational institutions to focus projects in Ambergate Reserve.	2
5.3 k)	Promote the Reserve to school groups, local government, local environmental interest groups and naturalists groups.	2
5.3 l)	Regularly nominate the Reserve Management Committee for community and conservation awards. Notify Busselton Shire Council of committee's interest in these Awards	3
5.3 m)	Include information on Ambergate Reserve on the Busselton Shire Council's Internet Home page.	2

6.0 IMPLEMENTATION OF MANAGEMENT PLAN

6.1 MANAGING BODY

Objective

- To ensure that Ambergate Reserve is managed appropriately through establishment of a managing body.

Issues

In 1987, the Busselton Shire Council officially appointed the Busselton Naturalists Club as the Management Committee for Ambergate Reserve pursuant to Section 181 of the Local Government Act. Since that time, Ambergate Reserve has been managed by an 11 member subcommittee of the Busselton Naturalists Club with all day-to-day management activities coordinated by a Club-appointed Reserve Warden.

The Busselton Naturalists Club has expressed concern that in recent years day-to-day management of the Reserve has fallen on the shoulders of a few committed individuals for whom the task has become too large to handle. To ensure that responsibility for management of the Reserve is shared equally between a number of interested and committed individuals, it is proposed that on an annual basis BNC make a call to the public by advertising in the local press and selected on the basis of their qualifications for membership to the Ambergate Reserve Management Committee.

Membership of the Ambergate Reserve Management Committee should be open to all interested persons. To ensure appropriate management of the Reserve and that the objectives of this Management Plan are achieved, it is preferable some committee members have an interest or background in the areas that the committee will have to address and manage, such as flora and fauna, weed/pest control, fire control, dieback and recreation. Ambergate Management Reserve Management Committee meetings should be open to both CALM and the Shire representatives and the same should also be notified by sending of meeting agendas.

Insurance arrangements for the ARMC come via the BNC and therefore all non-government members and representatives of the AMRC shall be signed up members of the BNC.

The Reserve's Management Committee in the past has not requested sufficient funding and resources from the Busselton Shire Council and also needs expertise to prepare applications for State and Federal Grants funding. For Shire purposes the Ambergate Reserve Management Committee should be recognised as a Friends of Group and thereby afforded the same support given to other Friends of Reserves.

Shire assistance to Friends of Groups is primarily in the form of technical advice and coordination in the preparation of management Plans. The shire can also support and assist preparation of applications for external funding. Provision of seedlings, rubbish removal, control feral animals, weed control, fire management and signage, where provided for in Councils budget, may also be made availabe where consistent with the management plan.

Recommendations

Number	Action
6.1 a)	The managing body will be the Busselton Naturalists' Club's Ambergate Reserve Committee consisting of a Chairman, Vice-Chairman, Warden and Assistant Warden and a minimum of six committee members.
6.1 b)	Management committee to liaise with relevant government bodies and community groups on management of the Reserve.
6.1 c)	Management committee to work towards achieving the objectives outlined in this Management Plan by addressing the listed recommended actions according to priority.
6.1 d)	Membership of the management committee should be for a term of three years, at such time members are eligible to reapply for their position on the committee.
6.1 e)	Appointment of members of the management committee will be the responsibility of the Busselton Naturalists' Club.
6.1 f)	The Ambergate Reserve Committee be recognised by the Shire of Busselton as a "Friends of Ambergate Reserve" and receive a similar level of support and recognition afforded to "Friends of" groups.

6.2 SHIRE ASSISTANCE

Objective

- To request funding, technical assistance and resources where available from the Busselton Shire Council.

Issues

To date, management of Ambergate Reserve has required little financial assistance and resources from the Busselton Shire Council. With the release of this management plan, the Shire will be more involved in day-to-day management of the Reserve. The management committee will look to the Shire Council for technical assistance and resources (such as equipment, plants, fertiliser, materials etc.) where it is needed and available.

It would be the committee's responsibility to forward its future funding requirements to the Busselton Shire Council to meet certain deadlines for the Busselton Shire Council's annual budget and 4 year projection plan.

The Busselton Shire Council may want to appoint an officer to provide liaison to the Shire Council on management and finance issues.

Recommended Action

Number	Action	Priority
6.2 a)	Regularly notify Busselton Shire Council of future projects and funding assistance required so that Busselton Shire Council can plan its budget appropriately	1

6.3 EXTERNAL FUNDING

Objective

- To regularly apply for grants offered by State and Federal Governments to finance capital works and conservation projects in Ambergate Reserve.

Issues

The management committee will need to actively seek funding for projects and works programs from various organisations. A number of State and Federal funding opportunities are made available to volunteer community groups, particularly those overseen by local government bodies.

Funding sources to which the management committee for Ambergate Reserve may be eligible to apply are presented in Table 2 Project Funding Sources.

Table 1: Project Funding Sources

Funding Source	Project Type	Name of Grant and Organisation
Local Government	Playrounds, BBQ's	Community Small Local Projects Grant
Local Government	BBQ's, toilets, paths	Community Facilities Grant (WA Lotteries Commission)

WA Government	Surveys, weed, vermin, conservation projects	W.A. Lotteries Commission
WA Government	Walktrails	Trailswest (Ministry of Sport and Rec)
WA Government	Plants, seed	Greening WA
WA Government	Weeds	Community Conservation Grant (Department of Environment)
WA Government	Information shelters, walktrails, boardwalks	Tourism Development Fund (South West Development Commission)
WA Government	Educational	Australian Family Foundation
WA Government	Conservation	Land for Wildlife Grant (Department of Conservation)
Federal Government	Surveys, weed, vermin conservation projects	Gordon Reid Foundation for Conservation
Federal Government	Rehabilitation, walktrails	Natural Heritage Trust (Environment Australia)
Federal Government	Rehabilitation, walktrails	Save the Bush Program Grant (Environment Australia)
Federal Government	Conservation, weeds, fencing, vermin	National Conservation Trust

In the past, the Busselton Naturalists' Club has taken advantage of several grants to finance production of brochures and signage for the Reserve. The total value of grants received for projects within the Reserve to date is small, compared to the value of grant monies received by other managing bodies for Reserves of comparative conservation value.

Each of these funding sources are directed towards projects with different emphasis. For example, some support projects of a conservation nature while others are more tourism oriented. Some grants are required to be matched by funding from the Busselton Shire Council and contributions in kind.

To access these funds, the Reserve management committee must be on the appropriate mailing lists so that it receives notification of applications and deadlines for

submissions. The Busselton Shire Council, South West Tourism Development Commission and W.A. Ministry of Planning are good places to commence queries.

Recommended Actions

Number	Action	Priority
6.3 a)	Appoint a member of the management committee to be responsible for applying for grants	1
6.3 b)	Notify appropriate organisations of interest in applying for grants.	1
6.3 c)	Regularly update future plans for facilities within the Reserve to aid preparation for grant applications	2

6.4 TENURE OF MANAGEMENT PLAN

Objectives

- To ensure that management of Ambergate Reserve for the purpose of conservation is maintained.

- Prepare a Management Plan Report annually to determine whether long and short term objectives and goals are being met and recommendations being addressed, and review the past year's activities and achievements.

Issues

Once adopted by the Busselton Shire Council, this Management Plan will remain active until an updated version is adopted. This Management Plan should be reviewed within five years of Shire Council adoption of the plan, with provision for the plan to be amended as required.

This review will enable the Busselton Shire Council and the Reserve management committee to measure progress against each recommended action and determine the need to update the Management Plan.

Throughout the term of this Plan, new information will become available as a result of research and monitoring. This information may direct management in a direction not

suggested by this Plan. Management direction may also be altered by changes in community attitudes and expectations. By implementing the review process, required changes can be incorporated into the following year's works program.

Recommended Actions

Number	Action	Priority
6.4 a)	Review this Management Plan within five years of Busselton Shire Council adoption of the Plan.	1

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