

Shire of Busselton

**MANAGEMENT PLAN
HAYES RESERVE (29524)**



Calothamnus graniticus var graniticus
Photo Keith Clay

**Prepared by the
Toby Inlet Catchment Group Inc.**

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1. Introduction

1.1. Aims of the Plan

The aim of the management plan is to produce a working plan, as a guide for the protection of the Reserve, so that conservation values can be improved. These values will be achieved by providing baseline assessment of flora and vegetation, fauna and habitats, the control of weeds and feral animals and the impact of predators, fire prevention and control measures, soil erosion and rehabilitation techniques. Recreational strategies must be addressed so that impact by use does not threaten conservation values. Diseases such as die back need to be identified, and controlled, if possible, using current techniques.

There is a need to identify management issues, and then provide policies and recommendations to address those issues.

As Hayes Reserve has been used for gravel extraction, there are some 12 ha that has been degraded. Dieback (*Phytophthora sp.*) has also been introduced. Some areas have fairly extensive erosion problems that need addressing. The remnant vegetation that remains on the Reserve, has retained a comprehensive diversity of native vegetation.

This remnant vegetation needs to be protected, soil erosion controlled, and the remaining degraded areas rehabilitated with local dieback resistant plant species.

The whole area needs to be retained as a Conservation and Recreational Reserve for public use.

To achieve management recommendations, the Shire of Busselton needs to formulate other management criteria to establish partnerships with local community groups.

The recommendations outlined in the Management Plan are considered necessary to ensure that the optimum management criteria are met, and consequently implemented under the Shire of Busselton, who are responsible for control and management of the Reserve.

1.2. Management Objective

The management objective for the Hayes Road Reserve, is to maintain, and if possible improve, its conservation, landscape and recreational values.

1.3. General Description

Hayes Reserve is approximately 7 kilometres south of Dunsborough at Latitude S 33 40' 08.2", Longitude E 115 05' 36.0".

Entry to the Reserve is from Commonage Road just north of the junction of Hayes and Commonage Roads. (See Figure 1.)

The reserve is approximately 20 hectares, with about 12 hectares having been used for gravel extraction. Healthy and diverse vegetation still remains on the east and south sections. The creekline to the southeast is well vegetated with riparian vegetation. The vegetation to the east and south of the gravel extraction site, is likely to be affected by dieback if not contained. The extent of the dieback has not as yet been determined.

The area surrounding Hayes Reserve is privately owned and is used for agriculture, rural-residential, tourism and viticulture.

2. Site Description

2.1. History

Hayes Reserve, vested with DOLA, was used for gravel extraction. It is understood that extraction began in late 1979, and continued on till the late eighties. An attempt to rehabilitate the work site was attempted in 1990 by the Shire of Busselton. However, as the area was not landscaped, and topsoil was not replaced, establishment of introduced species was very poor. Growth rate, especially the Eastern States Eucalyptus spp. has been about 1 metre to 2 metre in 9 years. Regeneration of endemic shrubs and herbs has also been slow and isolated.

At the beginning of 1999, the Toby Inlet Catchment Group conducted a first stage flora survey. With permission from the Shire of Busselton, a rehabilitation program was also started with the understanding, that a 'Management Plan' be instigated, and that the Reserve be re-vested to 'Landscape Protection'.

The Shire committed \$10,000.00 for landscaping and other works, to be completed before June 2000. The Toby Inlet Catchment Group committed some \$2,500.00. The funds were spent on preparing the ground by scarifying, ripping, and returning some of the available topsoil to the scarified areas. Seed was purchased and sown at the rate of 1.5kg per hectare. Fertiliser was purchased and spread over the seeded area. Oaten straw was purchased and spread over the seeded area. The TIC Group planted seedlings and sowed seed, conducted fauna and flora surveys, and collated all data. "In kind" donations amounted to some \$3,000.

The TIC Group applied to GeoCatch for a \$5,000.00 grant, to assist with some experimental studies. Data from Results will be forwarded to GeoCatch, on conclusion of the trials.

2.2. Landform and Soils

Classification for the Reserve falls within the Yelverton Shelf land system, Tille and Lantzke (1990). This land system consists of gently inclined slopes rising from the Swan Coastal Plain at an elevation of about 40m above sea level, to an undulating plain of between 60-80 metres above sea level. The reserve is located from 35m to 60m above sea level. In some sections the area varies from a gentle undulating slope to moderately steep slopes. Within the Yelverton Shelf land system there are a variety of soil types. The soil type that occurs within most of the reserve is shallow gravel over ironstone. The north and southeast sections of the reserve are part of a drainage depression and the eastern section is part of an area of deep bleached sands.

2.3. Hydrology

The reserve is generally well drained with water flowing to the east to a small creek which runs to the north east, along the southeast corner of the Reserve, before entering Creekview Creek.

A shallow soak well, near the west boundary, indicates that the shallow ground water flows in a north east direction, flowing in the same direction as it does on the flood plains.

2.4. Vegetation Communities and Flora

The remnant vegetation is primarily marri-jarrah forest, with the dominant tree species being Marri (*Eucalyptus calophylla*), Jarrah (*E. marginata*), and peppermint (*Agonis flexuosa*), *Banksia attenuata*, *Banksia grandis* and *Allocasuarina fraseriana*. The understorey is quite diverse and includes such shrubs as *Kunzea glabrescens*, *Hakea amplexicaulis*, *Hakea trifurcata*, *Acacia*

nervosa, *Acacia laterticola* glabrous variant, *Xylomelum occidentale*, *Hibbertia* spp., *Grevillea trifida* and *Persoonia longifolia*.

A diverse range of herbaceous plants such as *Conostylis aculeata*, *Conostylis setigera*, *Stylidium amoenum*, *Acantocarpus preisei* and *Patersonia* spp. were recorded.

A total of 129 plant species of vascular plants have been recorded to date. The flora survey was undertaken in summer and it is anticipated that the total species list will increase when flora surveys are completed.

Several introduced species, such as *Eucalyptus saligna* and *Eucalyptus resinifera*, used in rehabilitation work, have been recorded. There are no Shire records on species used.

A current plant species list has been included in Appendix 1.

The vegetation on the southern and south eastern sections of the reserve, is supported, by a diverse representation of plant species. The vegetation on the northern and north eastern section has been affected by dieback (*Phytophthora cinnamomi*), with a loss of certain species. On the western boundary juvenile *Banksia grandis* have been infected with dieback from gravel used on the upgrade of Commonage Road.

The level of weed infestation in the reserve is very low.

2.5. Fauna

Fauna recorded within the area is well documented, Fauna of the Commonage Precinct, Clay 1999. (Appendix 2), and Field Guide, Birds of Cape Naturaliste, Pauline and Brian Clay, 1996 (Appendix 3).

During the latter part of 1998 and several runs in 1999, the Toby Inlet Catchment Group, instigated a fox baiting program from Caves Road in the West to Vasse / Quindalup siding road in the East. By observation, it has been noted that there has been a large increase in the local fauna.

For example:

The Quenda (*Isodon obesulus*) has now been observed in a number of localities at fairly frequent intervals. The Ringtail Possum (*Pseudocheirus occidentalis*), the Common Brushtail Possum (*Trichosurus v. vulpecula*), the Honey Possum (*Tarsipes rostratus*), the Pygmy Possum (*Cercartetus concinnus*) have all been observed in localities throughout the Commonage Precinct, with few recorded sightings prior to 1996, except for road kills. The Western Brush Wallaby (*Macropus irma*) has also been observed in four different locations. It is not yet known if these observations of the Brush Wallaby, are the same family group.

Reptiles such as King's Skink, (*Egernia kingii*), Southern Crevice Skink, (*Egernia napoleonis*), and the Varanids, *Gould's Monitor* (*Varanus gouldii*), *Rosenberg's Monitor*, (*Varanus rosenbergi*) are now sighted regularly.

It could be suggested, that with the reduction of fox numbers, and reported visual sightings of native fauna, that populations of native fauna have increased. Animals such as the Quenda are now being observed regularly at locations where animals have not been seen before. These sightings did not occur some two years ago.

Rabbits have been observed in the Reserve, and it could be suggested that foxes use the Reserve.

2.6. Landscape and Recreational Value

Hayes Reserve has value as a Conservation reserve in an area that is surrounded by viticulture and rural-residential development. Currently, the Reserve is only used for bush walking. The Reserve has been degraded with the clearing for gravel extraction, the introduction of dieback and very poor landscaping and rehabilitation using trees from the Eastern State. Due to poor landscaping, soil erosion and gullies have occurred.

With existing remnant vegetation and with rehabilitation works being carried out, the Reserve should attract more visitors, and thus increase the usage. Added to the above is the ever growing local population, of which there will be a fairly large percentage of people who will use the Reserve for pleasure. The Reserve also offer outstanding views of Geographe Bay owing to its high topographical position in the landscape.

2.7. Land Tenure

A re-vesting proposal of the Hayes Reserve, to 'Landscape Protection', has been made to the Department of Land Administration, by the Shire of Busselton.

Priority 1=Urgent. Priority 2=Needs to be addressed. Priority 3=Not urgent

3 Management Physical Resource

3.1. Climate and Weather

The area experiences a Mediterranean climate with warm to hot summers and mild wet winters. Mean annual rainfall of 821.7mm. at Busselton and a mean annual rainfall at Cape Naturaliste of 824.7mm. (Bureau of Meteorology, 1903 – 1993) suggest that the lower flood plains experience a similar rainfall pattern. However the mean average rainfall on the ridge from 1991 to 1998 of 976mm. suggests that the mean average rainfall on the ridge is greater than the low country (Clay – Rainfall records - Lot 1 Commonage Rd. 1991-1998).

The affects of high rainfall has, and will have, an impact on cleared and degraded land causing ponding and erosion.

Water has created numerous channels, which in some cases have turned into small gullies. These erosion sites need treatment with on site rocks and or logs to arrest the flow of water. Hopefully, once the area becomes revegetated and gullies dealt with, erosion will be arrested.

Issue

- i. Severe weather patterns, and or a return to a wet cycle will exacerbate the problems of erosion by flooding.

Objective

- i. To understand the general flow of water down the slopes, and redirect and or stabilise these flow rates, using local materials.

Action

- i. Direct water flow, with channels, away from potential erosion areas. **Priority 1.**
- ii. To stabilise eroded areas with various treatments, such as rock fill and or logs. Logs and rocks are on site. **Priority 1.**
- iii. To stabilise water flow where appropriate, re-vegetate

with endemic plants.

Priority 1.

4 Management of Biological Resources

4.1 Vegetation and Flora

4.1.1. Vegetation Communities

The remnant vegetation is predominantly *Eucalyptus marginata* and *E. calophylla* with a fairly diverse understorey. This plant community exists on the lower east and south east sections of the reserve. The area that has been disturbed, does not contain any dominant tree species, and the shrubs that have returned, are forming plant communities in isolated pockets. These plant communities are struggling to colonize degraded areas.

4.1.2. Flora

A total of 129 plant species of vascular plants have been identified. Apart from the eastern states *Eucalyptus species* planted in the original rehabilitation program, there have been no further weeds recorded.

The dominant remnant and understorey still retains a diverse plant community, which needs protecting and upgrading. The area of dieback needs to be assessed and controlled at its boundaries to avoid further spread, and to ensure the diversity of plants is retained.

No declared rare flora has been recorded.

Issue

- i. Conservation of remnant vegetation.

Objectives

- i. Try to protect the diversity of plant species.
- ii. Ensure adequate protection from fire, weeds and feral animals.

Action

- i. Control access with signage. **Priority 1.**
- ii. Complete flora survey. **Priority 3.**
- iii. Complete and instigate a fire protection plan. **Priority 2.**
- iv. Establish an ongoing monitoring program, for all of the above. **Priority 3.**
- v. Collate all data to the computer using GIS programs **Priority 3.**

4.2. Fauna

4.2.1. Mammals, Reptiles, Amphibians

Seven species of native mammals, and four introduced, have been recorded close to the Reserve. Breeding has been observed with the Bandicoot (*Isodon obesulus*) and Pygmy Possum (*Cercartetus concinnus*).

Eight species of frog have been recorded in and around the Reserve, and apart from common species such as the Western Banjo Frog (*Limnodynastes dorsalis*), some aquatic frog numbers

seem to have declined, perhaps due to falling water tables, due to the below average rainfall, over the past twenty years. A.R. Main, 1965, "Frogs of Western Australia", states that, 'the elements referred to as the biotic environment, such as rainfall, drought, and high or low temperatures, can cause high mortalities in aquatic frogs. An example of a water system drying up was Lake Banganup, where the population of *Ranidella glauerti* was depleted dramatically from 1975 to 1989 (Clay 1990).

Thirteen reptiles have been recorded, with some species such as the King Skink (*Egernia kingii*), on the increase. A fairly rare secretive nocturnal snake, Black-Headed Snake, (*Suta gouldii*) was captured, identified and released.

The Crowned Snake (*Drysdalia coronata*), rarely seen, was recorded at O'Byrne Road.

Issue

- i. Conserve remnant vegetation and habitats for fauna.

Objective

- i. Manage remnants by controlling dieback and fires.
- ii. The establishment of local vegetation in the rehabilitation area as fauna habitats.
- iii. Establish records of animals and habitats.

Action

- i. Physical fauna survey. **Priority 3.**
- ii. Collate all records of fauna and habitats onto a data base. **Priority 3.**

5 Management – Protection and Other Issues

5.1 Dieback

Dieback, caused by the fungus *Phytophthora cinnamomi*, is present in the Reserve. It is understood that machinery used for the gravel and sand extraction, introduced the fungus to the Reserve, as dieback is found predominantly around the edges of the extraction site. It has been determined that fungus has spread down the eastern and northern slopes. Apart from the deaths of regrowth *Banksia grandis* in the degraded area, it is hard to determine the extent of the dieback in the extraction site. There is a need for an on site survey to determine areas that are dieback affected. The southern section of the remnant vegetation appears to be clear of dieback, although there appears to be small pockets of infection at the top of the hill, east of Commonage Road. Those areas that appear to be free of the fungus, will need a plan to ensure these areas are protected. Movement of people and vehicles into, and out of the Reserve, will need to be controlled with signage indicating infected areas.

Issue

- i. Dieback has invaded a large section of the worked gravel pit, and appears to be a threat to the remnant vegetation.

Objective

- i. Where practical, treat affected dieback areas with fungicide, and restrict movement with signage.

Action.

1. Treat vegetation threatened by dieback with fungicide. **Priority 1.**

- ii. Record areas treated, results, and area of infestation. **Priority 3.**
- iii. Plan walk trails and firebreaks to minimise spread. **Priority 3.**
- iv. Erect signage to define movement and affected areas. **Priority 2.**
- v. Ensure use of dieback resistant species in rehabilitation. **Priority 1.**

5.2. Rehabilitation

Over a third of the reserve has been cleared for gravel extraction (see Figure 2). Due to poor techniques and the use of introduced species, the early rehabilitation of the gravel extraction site has produced poor results. Regeneration that that occurred was been minimal and with poor results. In 2000 the Shire of Busselton undertook a direct seeding method using double the normal seed mix and double the fertilizer to compensate for the lack of topsoil present. To date this technique has produced some promising results with good early seed recruitment.

In 1999 the Toby Inlet Catchment Group and Friends of the Creekview and Hayes Reserves, started their own rehabilitation work. Approximately 4 ha was ripped and scarified, and where available top soil was replaced. Oaten straw was a also used as a substitute for soil. Seed was sown into this medium. The whole of the treated area was fertilised as per CALM and ALCOA specifications.

Seeds used were dieback resistant and endemic to the area, with a dominance of *Acacia spp.*, especially *Acacia pulchella*. Plots were laid out, and these plots received various treatments so that an informed approach may be taken as to the best methods to rehabilitate a gravel pit. These data have yet to be collated and analysed before presentation to GeoCatch, the sponsors.

All plants and or seeds used in the rehabilitation process of the Reserve, will be local and dieback resistant species.

Issue

- i. Stabilise the erosion and other run off problems such as nutrients.

Objective

- i. To rehabilitate and stabilise the site as part of the Toby Inlet Catchment Management Plan and ensure that this water system is not contaminated.
- ii. Create habitats for local fauna.
- iii. Recreate bio-diversity within the system.

Action

- i. Rip and scarify where necessary. **Priority 1**
- ii. Return available top soil and or straw as medium for growth **Priority 1**
- iii. Rehabilitate all degraded areas using local native species of seed and plants. **Priority 1**

5.3 Weed and Feral Animal Control

Weed infestation in the reserve is very low. The spreading of topsoil and mulch to assist regeneration of vegetation may lead to an increase in weeds. The area needs to be monitored and weed control undertaken as necessary. From reports there is at least one Victorian tea-tree in the reserve, location not known. It should be eradicated and a complete survey undertaken to assess any further problems.

Foxes, rabbits and deer have been observed in the reserve. Warrens for both fox and rabbit have been recorded, and cat tracks have been observed. Most frequently used area is in the lower sandy slopes. Fox control, using eggs injected with 1080, has been undertaken, by the TIC Group, on adjacent properties since 1998. Evidence of an increase in sightings of local fauna, indicates that the baiting program has been a success.

Issue

Weeds, foxes, rabbits, deer and possibly cats.

Objective

- i. Control by eradication.

Action

- i. Eradicate weeds with appropriate herbicides, and control feral animals with poison baits.

Priority 2

5.4 Fire Control and Prevention

The issue of fire and bush management is a complex one, as there is always a need to burn to reduce fuel loading for safety reasons. Fire is also a natural part of the Australian environment, and as a management tool it must be used with caution, as frequent burning results in degradation of bush areas.

There does not appear to be a fire history for the Reserve, as fire records do not exist. It is apparent there has not been a major fire in this area for the last 25 years (Clay 2000). An assessment of the fire hazard of the reserve will need to be carried out.

Controlled burning should only be carried out if there is a fuel hazard problem, and to create a buffer zone around part of the boundary. Fuel reduction is needed to help stop wild fires from entering the Reserve. As a management tool the total area is too small to sub-divide into smaller blocks for control burns.

Access tracks with a reduction of fuel loading to a distance of some 60m along the boundaries is an ideal method of fire control. Fuel loading, especially light fuels can be slashed, small areas only, or the use of a cool burn can be recommended.

A fire protection action plan, as a management tool, over and above the basic Shire requirements of one external firebreak, is needed to ensure that costly rehabilitation of plants are not burnt before the plants have reached an age that will tolerate fire.

Issue

- i. Uncontrolled wild fires, and fire as a management tool.

Objective

- i. To prevent uncontrolled fires from entering the Reserve and if necessary the use of fire as a management tool.

Action

- i. Complete fire access tracks, only on the existing cleared areas of the Reserve along the margins of the remaining vegetation without clearing or damage to this vegetation.. **Priority 1**
- ii. Reduce fuel loading from approved tracks in the Reserve for some 20 m, where the Manager, Community law has determined these fuel loads to be very high. **Priority 1**
- iii. Determine fuel loading for the remaining remnants **Priority 2**
- iv. Consider dual use fire access and walk trails where appropriate **Priority 3**
- v. Progress a fire plan after completion of surveys **Priority 3**

6 Management – Recreation

6.1 Access

Defined dual walk trails / access tracks and information signs need to be provided to restrict access to various vegetation communities. Erosion, the spread of weeds and dieback needs careful planning of pathways so that people do not move from one zone to another without thought of spreading dieback or weeds. Consideration as to the appropriate location of pathways or lookout facilities could also be made to maximise the scenic lookout opportunities at the Reserve

Restricted defined car parks need to be put in place so that cars are confined to one area. It is recommended that pine posts be used as markers.

Issue

- i. Recreation

Objective

- i. Provide walking tracks for enjoyment and information without disturbing the ecological balance.
- ii. Examine the oppoertunities for scenic lookout facilities at the Reserve

Action

- i. Apply for funding through Trails West to fund proposed walking trails / fire access tracks. **Priority 3**
- ii. Complete information signage **Priority 3**
- iii. Define car parks with appropriate posts. **Priority 2**
- iii. Assess the opportunities to provide scenic lookout facilities for this Reserve. **Priority 3**

6.2 Reserve boundary

The reserve boundary is not well defined in certain sections. It is suggested that this needs to be addressed. It is considered that fencing is inappropriate, and that markers, if needed, could be used to define the boundary.

Issue

- i. Boundary definition.

Objective

- i. Define the boundary where it is needed.

Action

- i. Survey and define boundary (where needed).

7. Community Relations

7.1. Education and information

With newsletters and brochures, the local community needs to be well informed on all aspects of management and the benefits of good management on the total wellbeing of the whole of the environment.

7.2. Community Liaison and Involvement

It is important to liaise with the local community, and obtain their input on management plans and to assist with management. The formation of a 'Friends of Reserve' should be formed, if the local community is willing to be part of such a group. If such a group is formed they should be encouraged to participate in all aspects of management.

Issue

Ensure the Community is aware of the values of the Reserve.

Objective

- i. Encourage community involvement with management and ensure that management is in accordance with the management plan.

Action

- i. Relay information to the community via news letters.

8 Research and Monitoring

Initial research has commenced on flora, fauna, dieback, methods of rehabilitation etc. Further surveys and research need to be seen as ongoing projects, so that management proceeds with the optimum information available.

Issue

Base line data to ensure efficient management.

Objective

- i. To ensure all the necessary data is available for management.

Action

- i. Collate all available data.

Priority 3

9. Plan Implementation

The Shire of Busselton needs to agree on a management plan so that recommendations can be put in place. As the Shire retains responsibility and control, the Shire need to address the level of assistance required from local communities, and the degree of involvement, which is also acceptable to local communities. Partnerships have been suggested as a means to management.

9.1. Priorities

Priorities have been addressed, and a suggested priority number assigned to each phase of a project by nominating the urgency to any particular project. These nominations will vary during the time frame set, and therefore should be flexible.

9.2. Funding

Funding for general works by The Shire of Busselton.

Funding for walk trails, fencing and the like will be sourced from various funding bodies.

9.3. Evaluation and Review

An initial review stage to be set to assess how well the objectives outlined here, have been addressed. At this stage management can be modified to address deficiencies or altered objectives.

If funding is not available then management will not proceed.

10. References

Some references have been included to suggest further reading.

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