

1 August 2005

The Chairman
Environmental Protection Authority
PO Box K822
PERTH 6842

Mr David G. Osborne
196 Burke Drive
ATTADALE 6156

Attention Mr Peter Walkington
(peter.walkington@environment.wa.gov.au)

Dear Sir,

Re : Non-confidential Submission on Worsley Alumina Pty Ltd Expansion ERMP

I have only recently become aware of the release of the above ERMP for public comment, with a closing date of 1 August 2005. This non-confidential submission may therefore not be as comprehensive as I would have wished.

Most of my comments below refer to the Executive Summary, and partly to Volume 1, Chapters 1 & 4. My comments on the Executive Summary also apply to the relevant sections in the main body of the document.

I would be pleased to contribute to subsequent clarification and/or discussion of any of the issues I have raised on the following pages.

Yours sincerely

A handwritten signature in dark ink, appearing to read 'D Osborne', written in a cursive style.

David Osborne

Worsley Alumina Pty Ltd Expansion ERMP

Submission by D.G. Osborne,

1 August 2005

I. INTRODUCTORY COMMENTS

My interest - My interest in the ERMP is as an active Perth-based bushwalker who spends part of most weekends from April to December of each year walking in the Darling Range, often as a leader or member of bushwalking groups. I have a good knowledge of areas of current and potential future interest to bushwalkers within 100km of Perth. My non-commercial website www.walkgps.com provides details of many (not all) bushwalking areas in the Perth region.

Stakeholder Consultation (Volume 1, Chapter 2) – It appears that Stakeholder Consultation may not have extended to some key community groups, including nature-based organisations such as the Perth Bushwalkers Club who have an obvious interest in the recreational values of most of the forested areas of the Darling Range, including those that will be affected, or potentially affected by the proposed mine expansion activities.

I was contacted in June/July 2004 during the ERMP preparation by Worsley's consultant. I was apparently contacted due to the relevance of my 'WalkGPS' website to the consultant's work. My response to the consultant was minimal in the context of what is relevant to the ERMP. That was because the consultant did not declare the background or specific purpose for which the information was ultimately to be used (including for which organisation) and asked only two questions on two walk areas.

Recreational values of the new mining areas to bushwalkers – The "Central" and "Brookton" areas that will be affected in part by the mining expansion have long been known to bushwalkers and have been growing in popularity for bushwalking activities in recent years. There are few formal recreational sites and trails within the proposed mining envelope, other than one or two picnic areas and a small section of the Bibbulmun Track. That may give a false impression that the areas are little used at present from a recreational point of view. Most of the existing recreational activity in the areas is informal and is therefore difficult to quantify. However, the areas do have high existing and future recreational potential for bushwalkers and others.

Factors that have attracted bushwalkers and other nature-lovers, have in part been identified in Chapter 4, Section 7.2.2 of the ERMP. They include:

- i) proximity to Perth;
- ii) accessibility via quite good roads (including Metro and Wearne Roads); and
- iii) scenic and nature qualities.

An additional attraction of the area is that, while being accessible, it also offers more scope for 'off-track' bushwalking for walkers who want variety and more solitude, away from the popular, heavily used, existing trails such as the Bibbulmun Track.

Some of the intrinsic “scenic and nature” qualities that attract bushwalkers to the area include the patches of mature wandoo woodlands, laterite breakaways, occasional stream gullies, scattered granite outcrops, and some scenic views. The Executive Summary of the ERMP (page 30, under Visual Amenities) correctly recognizes that *“Within the project area, the forested areas of the Brookton and Central mining envelopes could be perceived as having a high scenic amenity value as they contain natural features of the environment in a relatively undisturbed condition and allow for visitor and recreational use.”*

The Executive Summary however also states (page 23, under European Heritage and Recreation, bottom para.) that *“recreational values will be re-established in any areas where mining activities will disturb those values” and “the visual impact of mining operations will not be permanent” (page 24 under ‘Visual Amenities’)*. Those unqualified statements promote a misleading notion that the original values of an area currently enjoyed by bushwalkers can be severely impacted or destroyed and then reconstructed for their resumed enjoyment in the future. It is clear that post-mining ‘rehabilitation’ of the landscape cannot duplicate the original, intrinsic qualities of a particular area, even in the long term. The original value of the recreational amenity to bushwalkers may be largely lost forever. That potential outcome is inconsistent with the EPA objective of ensuring that *“existing and planned recreational uses are not compromised”* (refer Executive Summary, page 52).

In view of the above, **close consultation with the stakeholders** in advance of finalizing mining plans will be needed to avoid wherever possible the removal of particular natural features (including laterite breakaways and wandoo woodlands) which provide the intrinsic character in areas that attract walkers.

II. BUSHWALKING AREAS & DEFINITIONS

The ERMP refers to existing “walk trails” in the area (e.g. in Vol.1, Chap. 3: 8.2.2 and Vol. 1, Chap. 4: 7.2.1). Most bushwalking in the area is ‘off-track’, not on defined “trails”. **It therefore needs to be made clear in the ERMP that the absence of existing “trails” is not an indicator that an area is not currently used, or will not be used in future by bushwalkers.** Aside from the small section of the existing Bibbulmun Track that may be affected at Gringer Creek, there are various informal/undefined walking areas and ‘routes’ which are used by bushwalkers in and around the mining expansion corridor. Those ‘routes’ are not existing foot-tracks or paths. **To avoid misunderstanding by the Proponent and for the purposes of future Community Consultation, such ‘routes’ should therefore not be described as “walk trails” in the ERMP (Vol.1, Chap. 3: 8.2.2 and Vol. 1, Chap. 4: 7.2.1) but as “known walk areas”.**

Most off-track bushwalkers also find their own cross country ‘routes’ using map and compass (or GPS) navigation, which is part of the enjoyment and adventure of this increasingly popular recreational activity. Off-track bushwalking also does not create ‘tracks’ or ‘trails’ because the walkers seldom follow exactly the same route more than once (which in any event is very difficult to do, due to inherent navigation uncertainties with both GPS and compass). Off-track walkers therefore have a low impact on the environment, despite not being on existing trails. For example, off-track bushwalking has been popular in the Christmas Tree Well area for many years, but there is still no evidence of any ‘trails’ having developed as a result of that activity.

The attached map (**Figure 1**) shows a number of off-track ‘routes’ that are known by me to have been used in the area. These have been taken from the www.walkgps.com website and should not be considered comprehensive. There may be additional areas used by other bushwalkers.

For the reasons above, existing, and potential future, walking ‘routes’ in the area are best defined in terms of likely **areas** of interest to walkers rather than as if they are specific “trails”. The absence of a specific existing “trail”, does not mean an area is of no interest to current and future bushwalkers. **It is important that the Proponent is aware of this with regard to the Community and Stakeholder Consultation processes.**

The ERMP incorrectly states (e.g. Executive Summary page 23) that there are only “*a small number of recreational sites within and near the proposed mining areas*” and also that “*most of the identified sites are in the area around the Bibbulmun Track*”. Although it is correct that there are “few formal recreational areas” (page 29), there are in fact a significant number of valuable, informal recreational areas within the proposed mining areas, and they are not confined to the area around the Bibbulmun Track:

At least seven (7) of the example walk routes shown on the attached map (**Figure 1** of this submission) have potential to be significantly or substantially impacted by the mining expansion. They are in the following areas:

1. **Qualen Road** (off Yarra Rd) area (misabeled on ERMP Figure 3.17)
2. **Christmas Tree well area**
3. **Upper Dale River area** (Flint/north Gibbs) (misabeled on ERMP Figure 3.17)
4. **Geddes Rock area**
5. **Gibbs Rocks area**
6. **Boyagarring Reserve** (not shown on ERMP Figure 3.17)
7. **Bannister Hill area** (not shown on ERMP Figure 3.17)

Figure 2 of this submission includes photos from each of the walk areas. Additional representative photos of each area can be viewed on the www.walkgps.com website.

The ERMP (Vol. 1, Chap. 3, Table 3.27) includes brief descriptions of a number of the above walk areas.

Noteable omissions in the ERMP are the walk areas at Bannister Hill and Boyagarring Reserve and those areas need to be added to Figure 3.17 and Table 3.27, etc. The ‘Upper Dale’ walking area is also more extensive than shown in the ERMP.

Also two walk areas have been incorrectly identified on ERMP Figure 3.17 (e.g. the “Windsor Rocks Walk” label on ERMP Figure 3.17 should be corrected to read ‘Qualen Road Walk’, and the “Qualen Road Walk” label should be corrected to read ‘Upper Dale River Walk’.)

I provide the following comments on usage and potential impacts for each of the above seven example walk areas, as relevant to the ERMP :

1. **Qualen Road (off Yarra Rd) area** (see **Figures 1 & 3** of this submission)

Usage: The ERMP (Table 3.27) indicates “user numbers are estimated to be low”. However, the Perth Bushwalkers Club has had a number of group walks in this general area in past years. I recently led a group walk there in 2005. Walking will continue to increase in this area due to the growing popularity of off-track navigation will continue to increase in this popular area due to the growing popularity of off-track navigation.

Potential impact of mining operations :

- The ERMP notes that direct disturbance may occur in the southern area, and that “*temporary loss of access to trail*” may occur. **As throughout, the word “Trail” here should be replaced by “walk area”.**
- **The potential for loss of recreational and visual amenity through encroachment of mining on areas of mature wandoo woodland also needs to be specifically noted in the ERMP.**
- **Mining noise will also be a concern and that needs to be specifically noted.**
- The ‘indicative mine plan’ in the ERMP (e.g.. Figure 5 of the Executive Summary) suggests mining will occur right up to boundary of the adjacent proposed Wandoo National Park: **A buffer must be included to fully protect the conservation values of the future National Park.**

2. **Christmas Tree well area** (see **Figures 1 & 4** of this submission)

Usage: Due to its easy road access off Brookton Highway, and its areas of mature wandoo woodlands and stream gullies, this area has long been popular with bushwalkers. The ERMP (Table 3.27) correctly indicates that Perth Bushwalkers Club “organises regular walks” here (though those walks are not on a specific “trail”). Usually there are about 15-20 walkers on each walk. In addition to the route described on the www.walkgps.com site, the 1985 book “Forests on Foot” (Meney & Brown) included a detailed description of another off-track walk route (see **Appendix 1** of this submission) which has been popular for the many years since.

Walking will continue to increase in this area due to the growing popularity of off-track navigation (including by ‘Geocachers’, ‘Orienteers’, and ‘Rogainers’).

Potential impact of mining operations :

- **The ERMP (Table 3.27) notes that the “walk trail will not be directly disturbed”. That appears to be incorrect. In fact the eastern area of the walk area extends into the edge of the new mining area. The plan indicates a bauxite resource in that area. The ERMP statement that “an adequate vegetative buffer should ensure mining operations are not visible” may therefore not be valid. Direct disturbance appears likely in that area, which should be noted on Table 3.27.**
- There is also potential for loss of recreational and visual amenity through encroachment of mining on mature wandoo woodland and laterite breakaways in the easternmost area.

3. Upper Dale River area (Flint/north Gibbs) (see Figures 1 & 5 of this submission)

Usage: The Perth Bushwalkers Club has visited this area in recent years, including a walk I led in 2003 for 15 club members. Walking will continue to increase in this area due to the growing popularity of off-track navigation.

Potential impact of mining operations :

- The indicative conveyor belt route passes through the centre of this area and will be a direct disturbance in terms of noise, loss of recreational and visual amenity, and likely loss of access. Some mature wandoo woodland occurs in this area and would be affected along the transport corridor.
- **The indicative mine plan encroaches significantly on the southern part of this area. The mining operations would result in noise and loss of recreational and visual amenity which needs to be specifically noted in the ERMP, Table 3.27** (which mentions “direct disturbance” and “temporary loss of access”).
- An area to the southeast also provides a good bushwalking amenity, including wandoo woodlands. This southern area will be directly and substantially impacted by the extensive, indicative mine plan.
- **Vehicle access to the area relies on Metro Road remaining open to the public which should be specifically noted in the ERMP, Table 3.27.**

4. Geddes Rock area (see Figures 1 & 6 of this submission)

Usage: The Perth Bushwalkers Club visits this area usually at least once every year. Walking will continue to increase in this area due to the growing popularity of off-track navigation.

Potential impact of mining operations :

- The area lies immediately west of an area included in the indicative mine plan.
- Mining operations will result in direct noise and possibly visual disturbance (as noted on Table 3.27).
- **Vehicle access to the area relies on Metro, McCallum and Watershed Roads remaining open to the public which needs to be noted in the ERMP, Table 3.27.**

5. Gibbs Rocks area (see Figures 1 & 7 of this submission)

Usage: The Perth Bushwalkers Club visits this area, including a walk I led in 2002 for 11 club members. Walking will continue to increase in this area due to the growing popularity of off-track navigation.

Potential impact of mining operations :

- The indicative mine plan encroaches along the northeastern part of this area.
- **Mining operations will result in direct noise, visual disturbance, and potential permanent loss of recreational and visual amenity if laterite breakaways are affected, which needs to be noted in the ERMP, Table 3.27.**
- The indicative conveyor belt route passes immediately to the east of this area and a crusher plant location is planned in that area. **These will result not only in likely temporary loss of access (as noted on Table 3.27), but also disturbance in terms of noise and some loss of visual amenity, which needs to be noted in the ERMP, Table 3.27.**

- **Vehicle access to the area relies on Wearne and Pike Roads, and/or Metro Road, remaining open to the public which needs to be noted in the ERMP, Table 3.27.**

6. Boyagarring Reserve/Conservation Park (see Figures 1 & 8 of this submission)

This area needs to be added to ERMP Figure 3.17 and to Table 3.27.

Usage: Uncertain at present, but due to the wandoo woodlands and laterite breakaways the area will attract future walkers and other visitors.

Potential impact of mining operations :

- The indicative mine plan extends to within 1 km of the SW boundary of the Reserve.
- Mining operations will result in direct noise and probably visual disturbance.

7. Bannister Hill area (see Figures 1 & 9 of this submission)

This area needs to be added to ERMP Figure 3.17 and to Table 3.27).

Usage: This area within the Gyngoorda foresty block has long been very popular with bushwalkers due to its easy access from Albany Highway, its areas of mature wandoo woodlands, laterite breakaways, stream gullies, granite outcrops, scenic views, and variety of vegetation types and bird-life.

In addition to the route described on the www.walkgps.com site, the 1985 book “Forests on Foot” (Meney & Brown) included a detailed description of another off-track walk route (see **Appendix 1** of this submission) which has also been popular with off-track walkers, and extends north to the North Bannister-Wandering Road. Meney & Brown noted that this area is “particularly attractive for bushwalking”.

Perth Bushwalkers Club usually organises at least one walk in the area each year. Walking will continue to increase in this area due to the growing popularity of off-track navigation (including by ‘Geocachers’, ‘Orienteers’, and ‘Rogainers’).

Potential impact of mining operations :

- The indicative mine plan encroaches substantially on the area. **Mining operations will have a major impact on this walk area, resulting in noise, visual disturbance, and likely permanent loss of recreational and visual amenity and of recreational values, especially if laterite breakaways and mature wandoo woodlands are affected, which should be specifically noted in the ERMP, Table 3.27.**
- A crusher plant location is planned within the walk area, and the indicative conveyor belt route passes through the area. These will result in major direct disturbances in terms of noise, loss of recreational and visual amenity, and likely loss of access. Some beautiful wandoo woodland occurs in this area and would be affected along the transport corridor.

III. ROAD ACCESS TO WALK AREAS

Mining operations in the mining expansion envelope have a potential life of 30-35 years. The ERMP states (e.g. Executive Summary, bottom of page 23, under European Heritage and Recreation) that :

“In the short term, access to areas frequented for recreational pursuits will be prohibited (in some instances), or require access by alternative routes, which may be a minor inconvenience. Access will be re-established when mining operations cease.”

At least three known walk areas in the Central mining area (i.e. Upper Dale River, Geddes Rock, Gibbs Rocks) rely on vehicle access variously via Wearne, Pike, McCallum, part of Watershed, and/or Metro Roads. If any of those roads are blocked to public access within the mining expansion area, then much of the Central area could become effectively inaccessible to the public for bushwalking and other recreational purposes, for an unspecified period. That would be more than a “minor inconvenience” to bushwalkers.

The ERMP does not give any indication of the timeframe that the Proponent implies by “short term” loss of public access. If vehicle access is blocked along existing public roads within the mining expansion envelope, it will have the adverse impact of encouraging illegal access from the west (from Albany Highway) via existing forestry tracks through the ‘Jarrah Die-back Disease Risk Areas’.

This public access issue has not been adequately addressed in the ERMP and must be made a key item also for consultation with stakeholders.

IV. OTHER COMMENTS ON SPECIFIC ERMP CONTENT

1. Other references to the proposed transport corridor in the ERMP

(refer to Executive summary, pages 29-30; Recreation –in relation to Bauxite Transport)

In summarising the possible need for “*realigning walk trails*” or “*developing alternate trails*”, the Executive Summary (on page 29, under Recreation) indicates that the Proponent “*will continue to liaise withuser groups to come to an acceptable arrangement*”. The ERMP refers to two known walk “trails” (Upper Dale River and Gibbs Rocks) as being “*close to the proposed route of the transport corridor*”.

The ERMP Executive Summary (page 29 and elsewhere) needs to more accurately state that:

- **the proposed transport corridor passes through the middle of the Upper Dale River walk area** (i.e. not just “close” to it).

The ERMP (page 29 and elsewhere) also needs to add that:

- **the proposed transport corridor also passes through the Bannister Hill walk area;**
- **crusher plant locations are proposed within the Bannister Hill area and close to the Gibbs Rocks area.**

The statement on page 30 of the ERMP that the transport corridor “*will not significantly detract from the visual amenity values...due to the existence of other cleared linear corridors in the region (e.g. roads...)*” understates the impact that a new corridor will have on the visual amenity in the Upper Dale and Bannister Hill areas. **The potential impact in those areas should be clearly and specifically flagged in the ERMP to ensure proper stakeholder consultation during final corridor planning.**

In view of the potential confusion (as noted above) between existing “trails” and “known walk areas”, the ERMP Executive Summary needs to add another dot point under the possible actions (at bottom of page 29, under Recreation, and elsewhere), to read as follows: **“further consultation with stakeholders in instances where the proposed transport corridor will have potential impacts upon known walk areas”.**

2. References in ERMP to management measures related to Mining Operations

(refer to Executive summary, pages 23-24; European Heritage and Recreation and Visual Amenity.)

- **“Management measures”** intended to reduce adverse recreational impacts (as summarized in Executive Summary, page 23, under dot points) needs to include as an additional dot point: **“advance consultation with recreational stakeholders prior to finalizing mining plans for a potentially affected area”.**
- The **“vegetation protection strategy”** (as summarized in Executive Summary, page 23, under dot points) needs to include as an additional dot point: **“identifying areas of visual/aesthetic significance to recreational stakeholders”** (i.e. not only **“areas of “conservation significance”** as currently).
- The Proponent’s continuing practices for managing the **“visual impact”** of mining operations (as summarized in Executive Summary, page 24, under dot points) need to be expanded by addition of a dot point with the following words: **“consult with stakeholders to establish the intrinsic scenic amenity value of existing landscapes and avoid wherever possible damage or loss of natural features (e.g. laterite breakaways and mature wandoo woodlands) that have significant scenic and recreational value”.**

3. Comments on “Consolidated Proponent Commitments”

(refer to EMPR Executive Summary, Table 8, pages 42-47.)

Commitment # 10 (Project Wide, page 45) : Noise & Vibration

- **“Community consultation”** needs to be extended to specifically include recreational stakeholders, not only nearby residents/occupants of **“noise sensitive premises”** (as referred to on page 27).
- Additional dot point is also needed, to read as follows : **“measures of impact on informal and formal recreational areas.**

Commitment # 11 (Project Wide, page 45) : European Heritage

- Additional dot point is needed, to read as follows : **“continued public access to recreational areas via suitable existing roads, wherever safely possible during mining operations”**.

Commitment # 13 (Transport corridor, page 45) : Operation

- Additional dot point is needed, to read as follows : **“measures to maintain public access to recreational areas via suitable existing roads, wherever safely possible during mining operations”**.

Commitment # 14 (Transport corridor, page 45) : Noise

- Additional dot point is needed, to read as follows : **“identification of potential impacts on recreational users of area.”**
- “*Community consultation*” needs to be extended to specifically include recreational stakeholders, not only occupants of “*noise sensitive premises*” (as referred to on page 27).

4. Comments on “Summary of relevant environmental factors”

(refer to EMPR Executive Summary, Table on pages 48-56.)

a. European heritage and recreation (Mining Operations, page 52)

- The summary of the “Existing environment” (page 52) is inaccurate and misleading. It states that only “*a small number of recreational sites occur within and in the near vicinity of the proposed mining envelopes..*”
The “Existing environment” summary needs to state that **“there are few formal recreational areas, but there are a significant number of informal recreational areas, including known walk areas (as distinct from “walk trails”) within the proposed mining areas, and those are not confined to the area around the Bibbulmun Track.**
- The summary of “Potential impacts” (page 52) needs to include the following :
 - i) Impacts **“on known walk areas”** (not only on existing “walk trails”);
 - ii) **“Mining operations may potentially alter the long-term intrinsic value to users of a particular area”**.
 - iii) **“Potential for loss of public access by road to known walk areas, for potentially long periods”**.
- The summary of “Environmental management” (page 52) needs to also state the following :
 - i) **“Consultation with stakeholders to identify in advance of mining to identify natural features of significant scenic and recreational amenity value”**;
 - ii) **“Avoidance wherever possible of damage or loss of natural features (e.g. laterite breakaways and mature wandoo woodlands) of significant scenic and recreational amenity value”**;

b. Visual amenity (Mining Operations, page 52)

- The summary of the “Existing environment” (page 52) states that Brookton and Central mining (and two other) mining areas are “located within and surrounded on most boundaries by State Forest”. That is correct, but it needs to be also stated that **“the Brookton mining area has a common boundary in part with the**

proposed Wandoo National Park” and the Central mining area is adjacent to the SW boundary of the Boyagarring Conservation Park. Under “Environmental Management” of Vegetation and Flora on page 48, it also needs to be specified that there be **“buffers between mining areas and National Parks and reserves”**, not just around areas of conservation significance within the mining area.

- The summary of the “Environmental outcome” (page 52) states that “the impact on visual amenity is temporary...”. This is an over-simplification. It needs to be stated that **“there may be “some long-term and effectively permanent loss of visual amenity in relation to some intrinsic scenic values in known walk areas”** (especially if laterite breakaways and mature wandoo woodlands are affected).

c. Recreation (Bauxite Transport Corridor, page 56)

- The summary of the “Existing environment” (page 56) states that *“No recreational areas are known to exist close to the proposed bauxite transport corridor”*. That statement is incorrect. It needs to be stated that **“the proposed transport corridor passes close to, and in at least two instances through known walk areas. Crusher plant locations are proposed close to or within two walk areas.”**
- The summary of “Potential impacts” (page 56) needs to state that **“Noise from the transport corridor and crushers will impact on at least three known walk areas”**.

V. OTHER RECOMMENDATIONS

1. For the reasons I have noted above, I believe nature-based organizations such as Perth Bushwalkers should have been specifically invited to comment on the ERMP. I recommend that their advice and input should still be obtained and considered in due course.
2. The ERMP notes (e.g. Executive Summary, page 5) that the independently chaired Community Liaison Committees are *“a primary focus for input to the ERMP and project activities including the development of environmental management measures”*. Given the significance of the mining expansion to bushwalking groups and to individual bushwalkers, it would be appropriate to invite bushwalking groups to have representation on a relevant Community Liaison Committee (despite some difficulties for physical representation due to the location of the committees at the refinery or Boddington).

D.G. Osborne

www.walkgps.com
1 August 2005

LIST OF SUBMISSION FIGURES & APPENDIX

FIGURES

- Figure 1:** Map showing examples of off-track routes within or near the mining extension.
- Figure 2:** Photos of bushwalking areas within or near the mining extension (from www.walkgps.com).
- Figure 3:** Map of Qualen Road area: Example off-track bushwalking route.
- Figure 4:** Map of Christmas Tree Well area: Example off-track bushwalking route.
- Figure 5:** Map of Upper Dale River area: Example off-track bushwalking route.
- Figure 6:** Map of Geddes Rock area: Example off-track bushwalking route.
- Figure 7:** Map of Gibbs Rocks area: Example off-track bushwalking route.
- Figure 8:** Map of Boyagarring area: Example off-track bushwalking route.
- Figure 9:** Map of Bannister Hill area: Example off-track bushwalking route.

APPENDIX

- Appendix 1:** Additional Christmas Tree Well and Bannister Hill off-track walk routes and descriptions (from “Forests on Foot -40 walks in W.A.” by K. Meney and P. Brown, 1985).

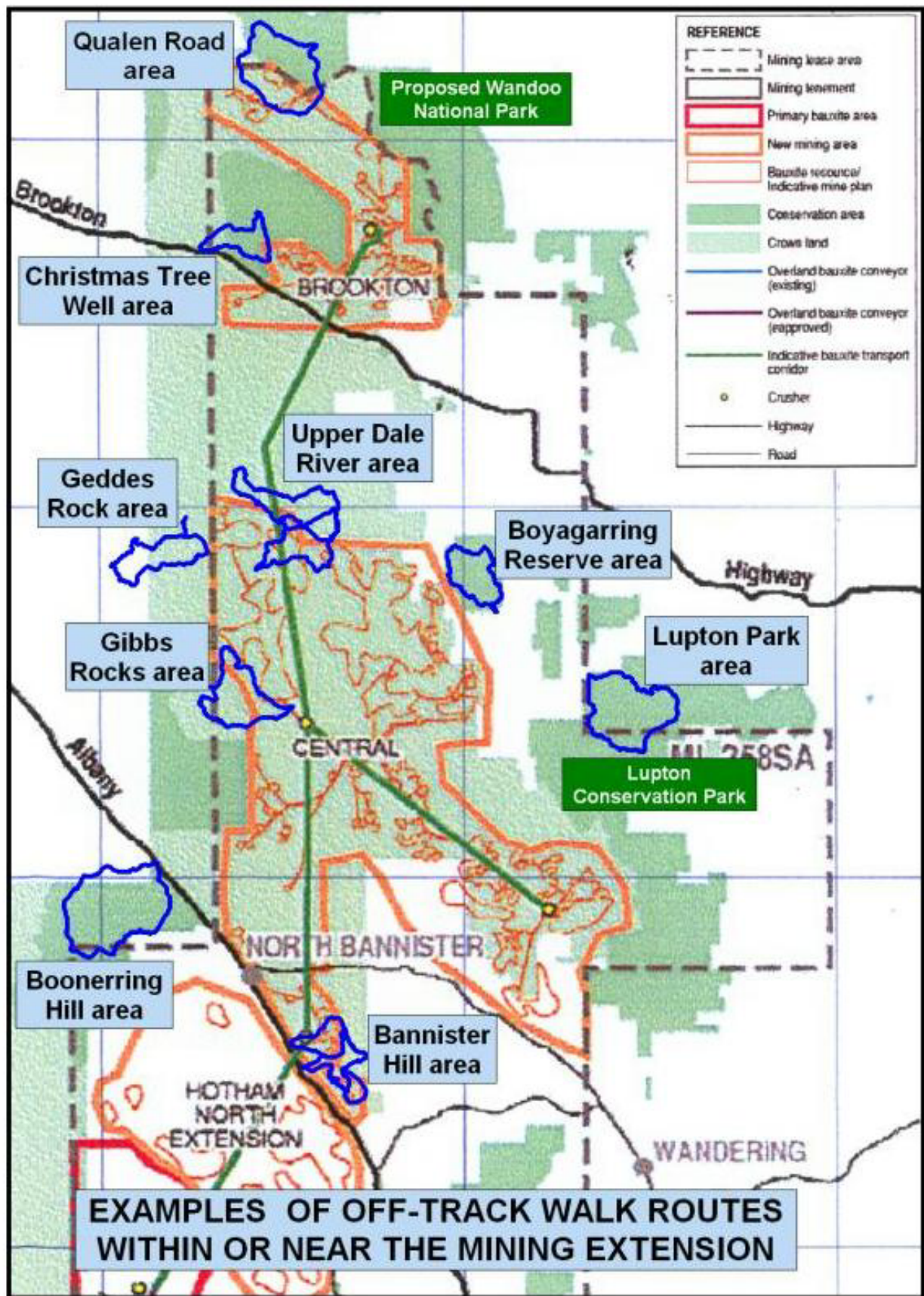


Figure 1: Map showing examples of off-track routes within or near the mining extension.



Qualen Road area



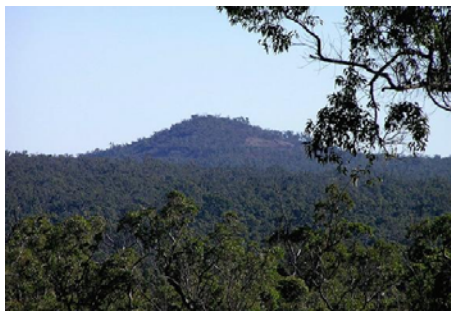
Upper Dale River area



Christmas Tree well area



Geddes Rock area



Gibbs Rock area
(view to Geddes Rock)



Boyagarring Reserve area
(view SW)



Bannister Hill area



Bannister Hill area

Figure 2: Photos of bushwalking areas within or near the mining extension
(see www.walkgps.com for additional photos from each of the above walk areas.)

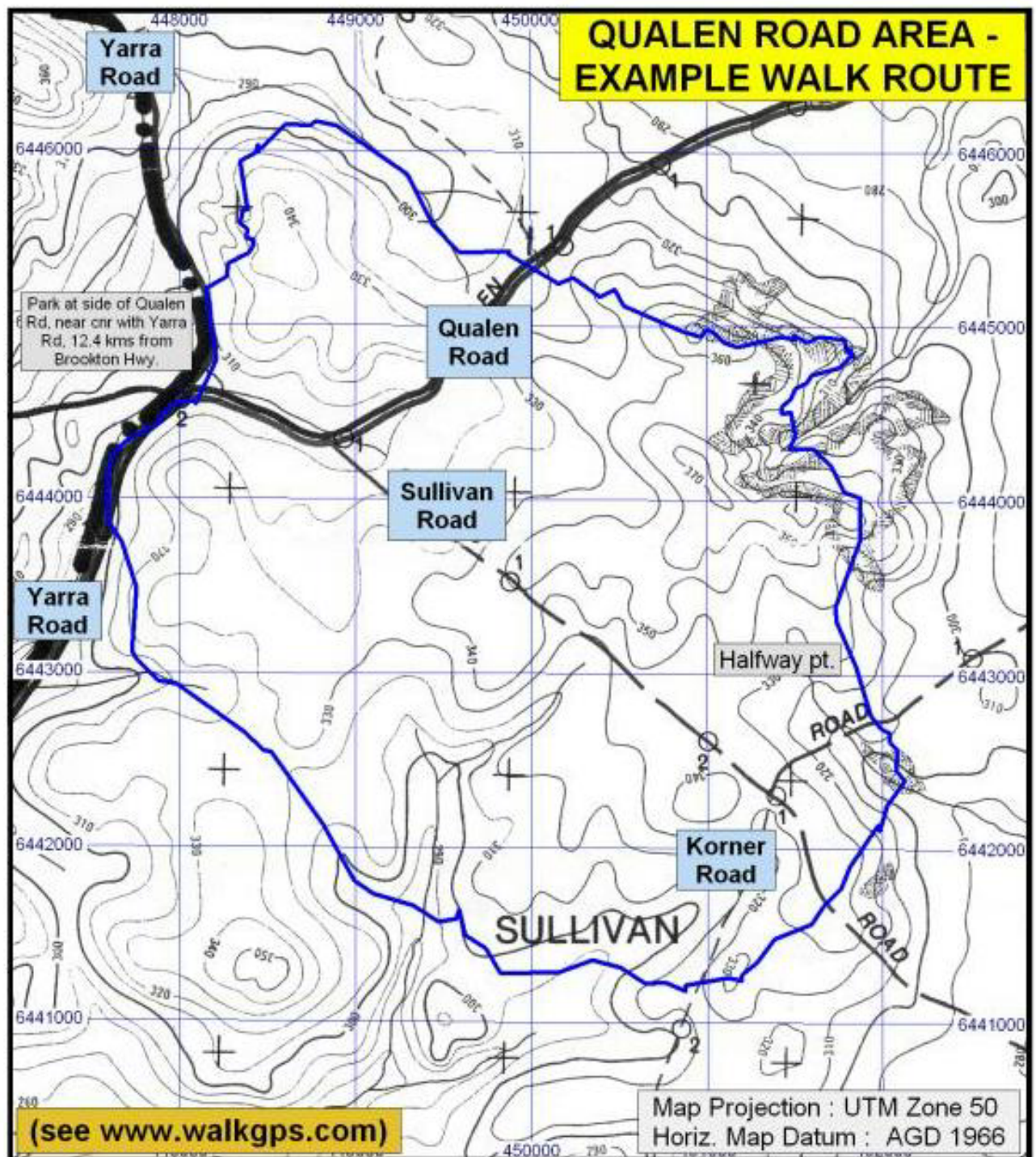


Figure 3: Map of Qualen Road area: Example off-track bushwalking route.

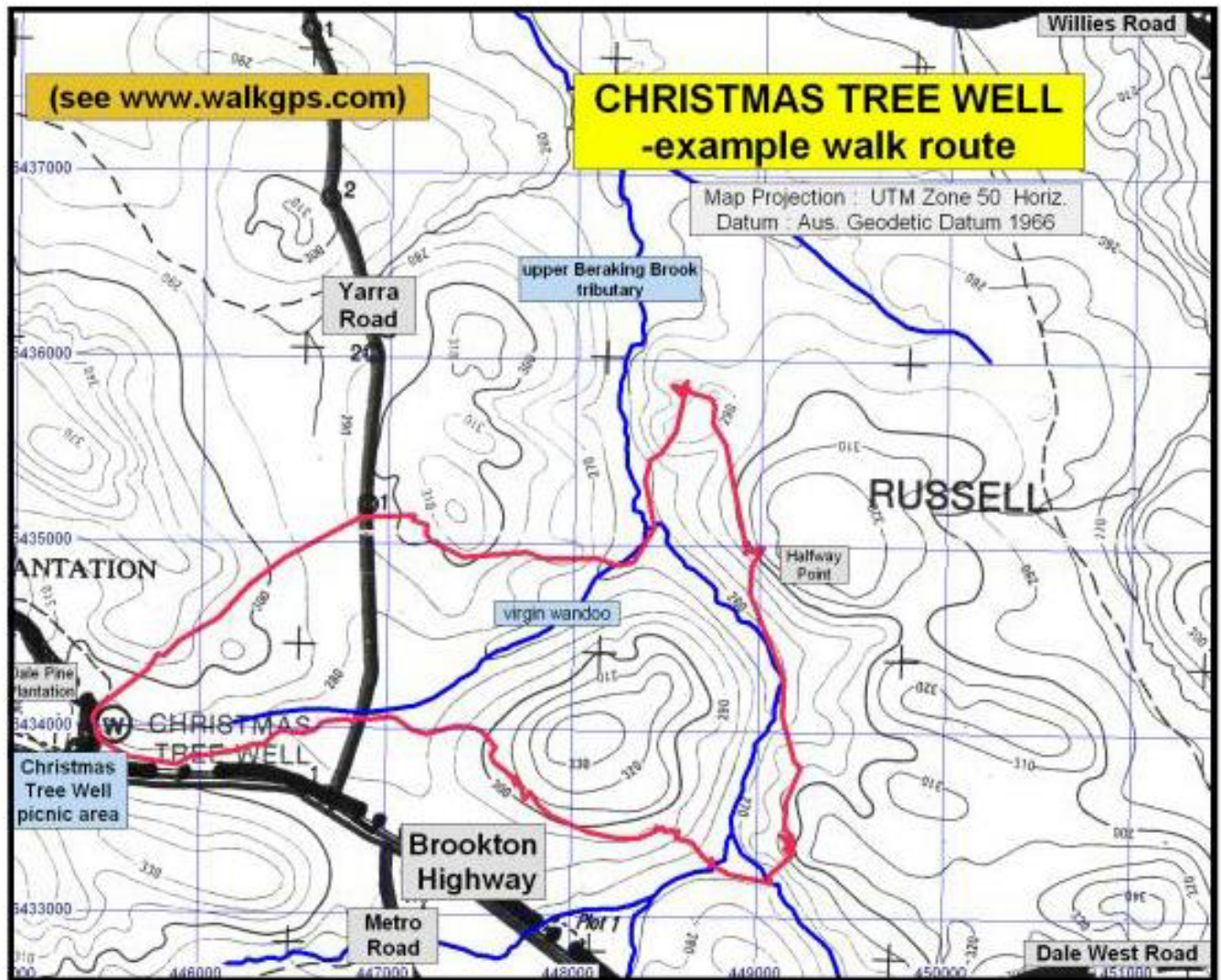


Figure 4: Map of Christmas Tree Well area: Example off-track bushwalking route

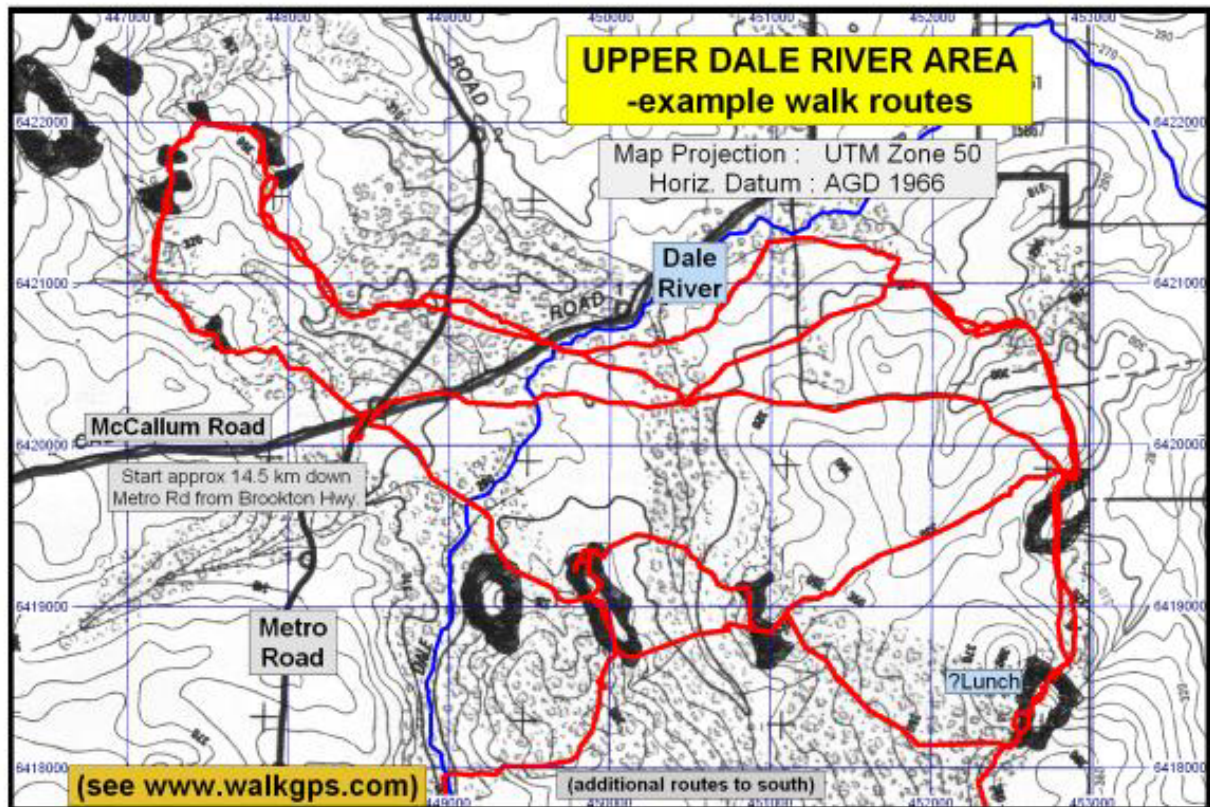


Figure 5: Map of Upper Dale River area: Example off-track bushwalking routes.

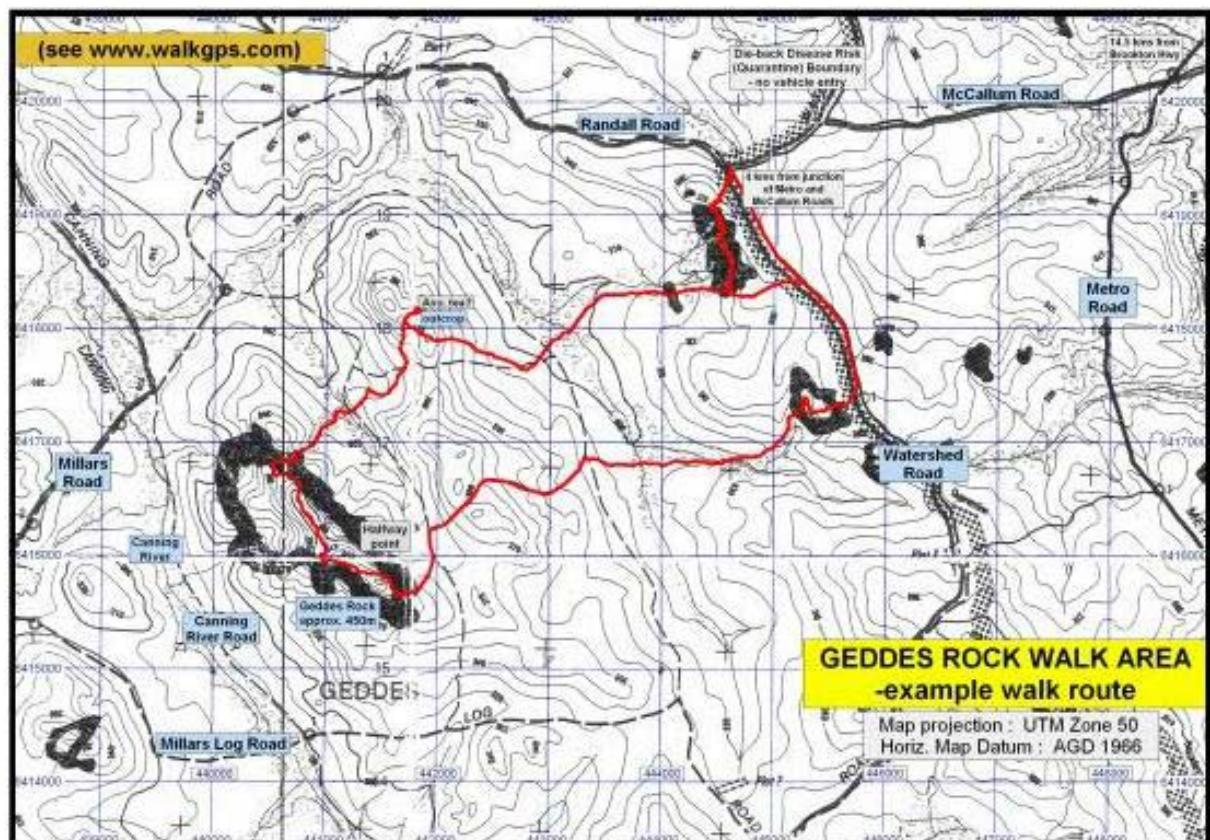


Figure 6: Map of Geddes Rock area: Example off-track bushwalking route

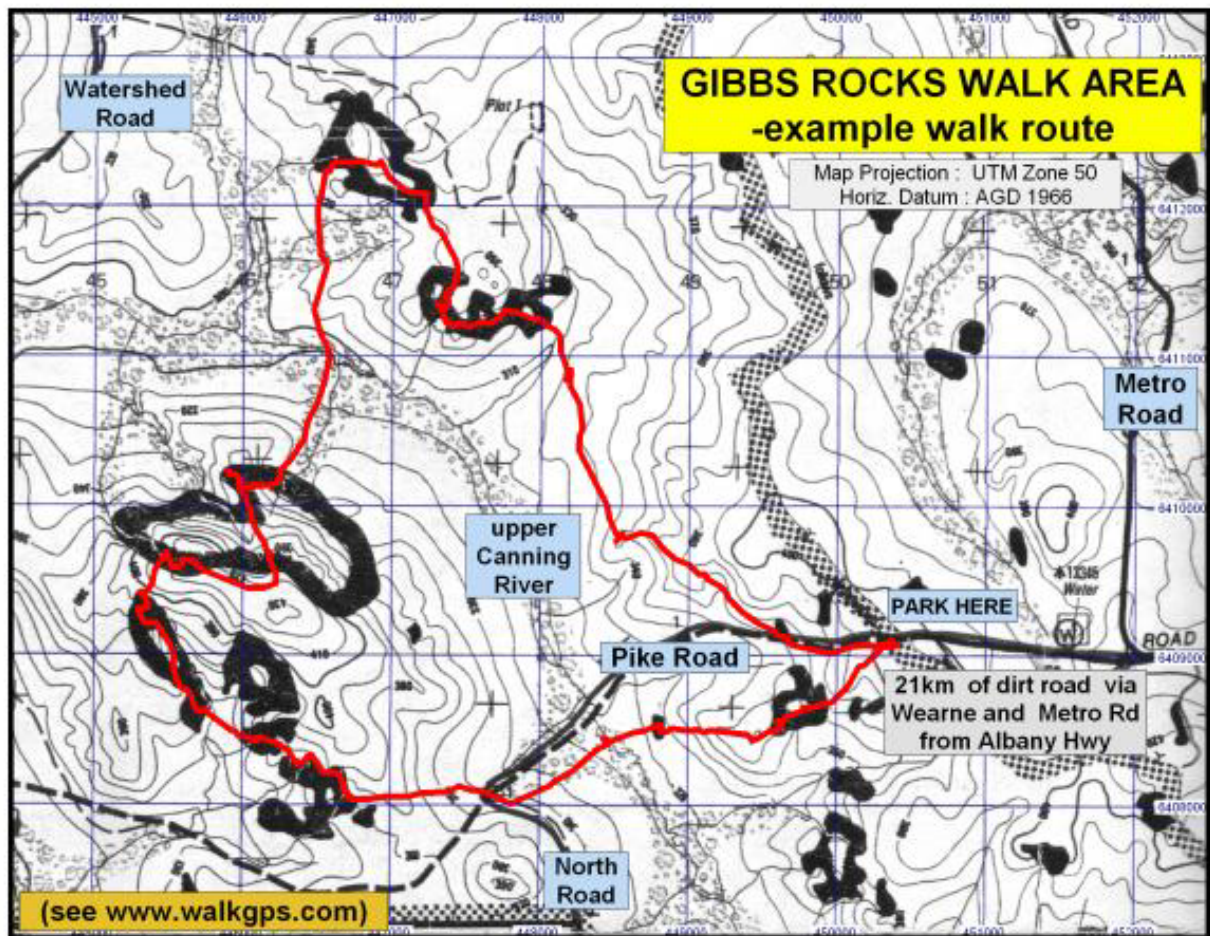


Figure 7: Map of Gibbs Rocks area: Example off-track bushwalking route.

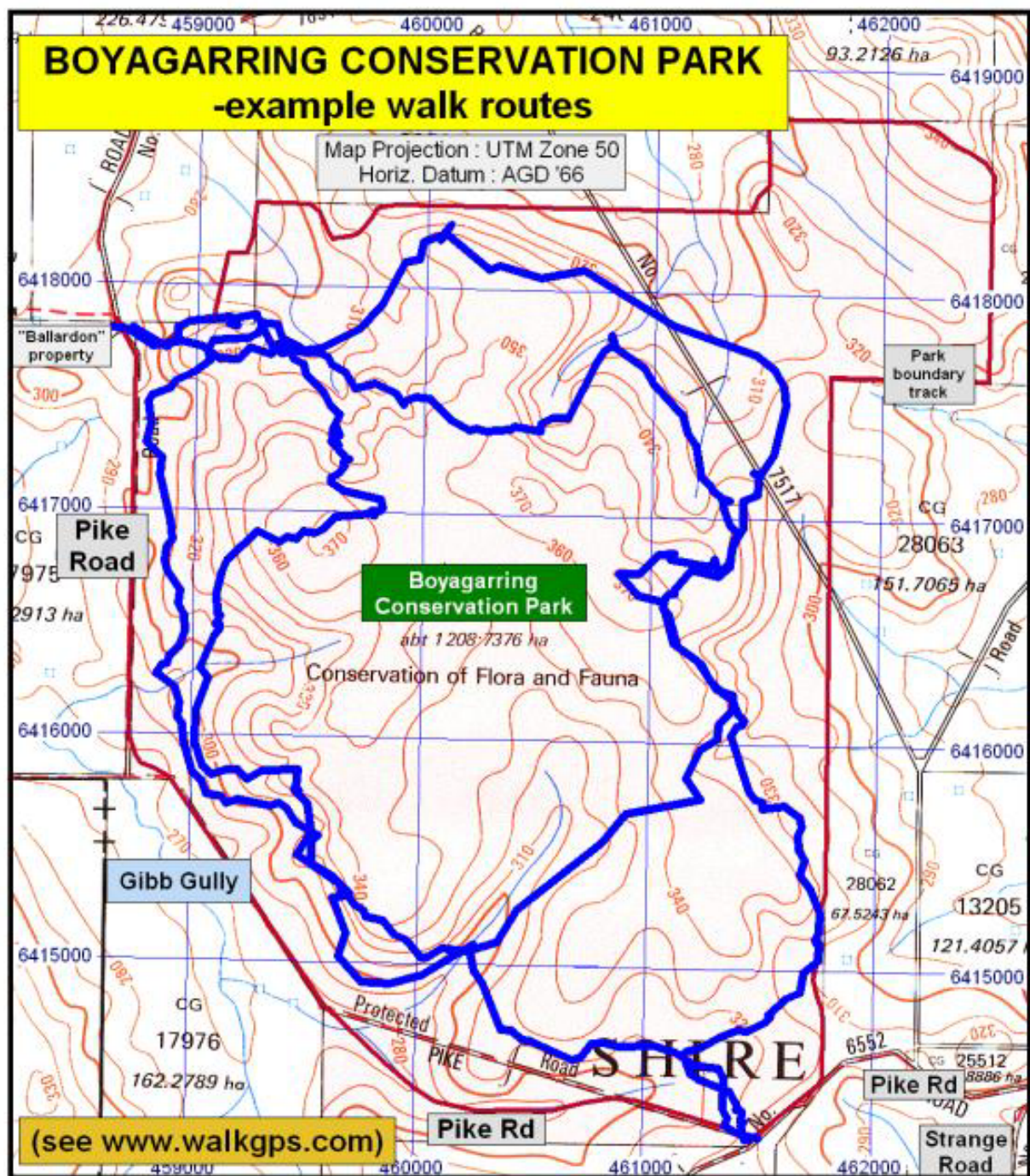


Figure 8: Map of Boyagarring area: Example off-track bushwalking routes.

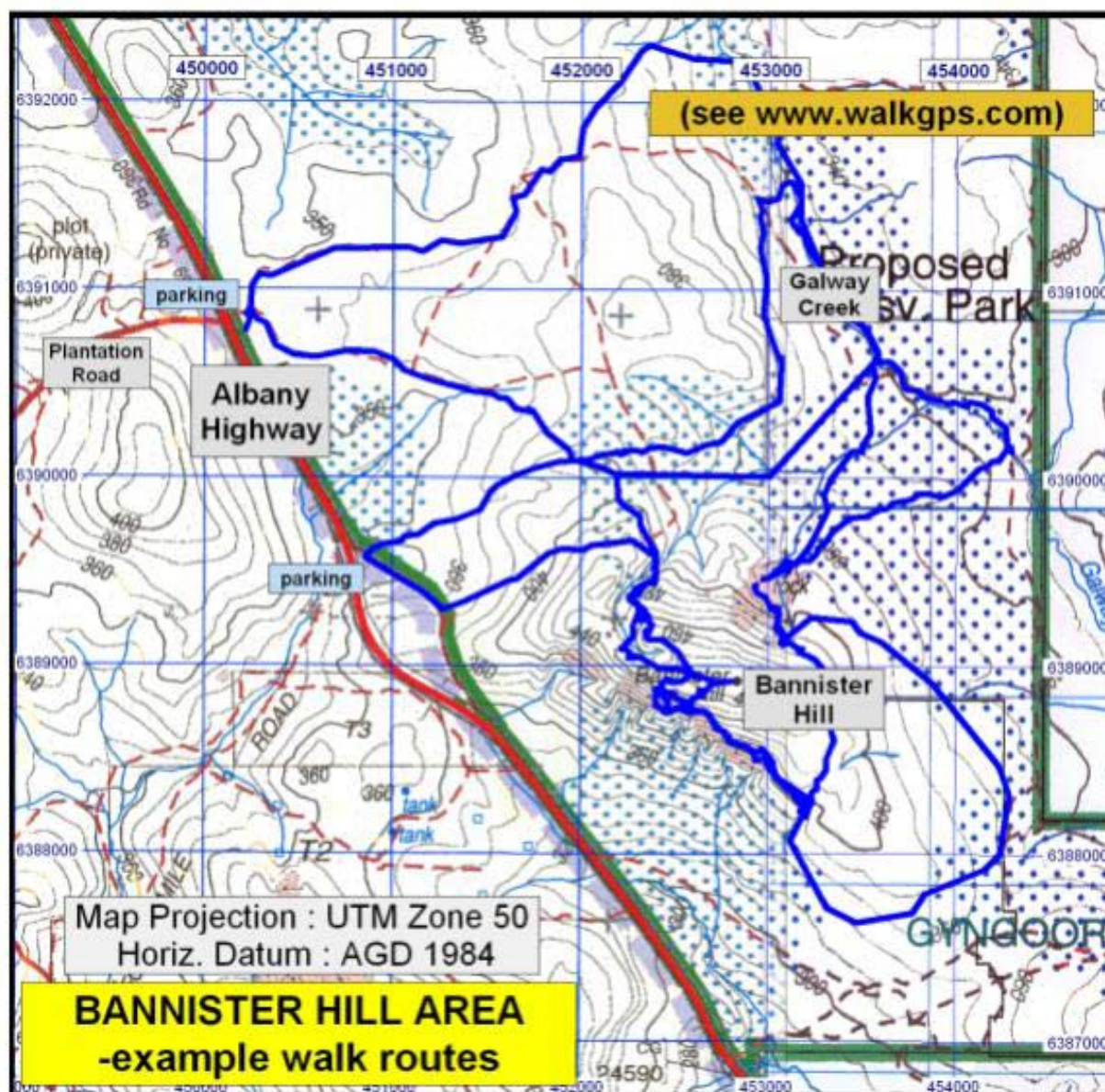


Figure 9: Map of Bannister Hill area: Example off-track bushwalking route.

Appendix 1: Additional Christmas Tree Well and Bannister Hill off-track walk routes and descriptions (from "Forests on Foot -40 walks in W.A." by K. Meney and P. Brown, 1985).

CHRISTMAS TREE WELL

LOCATION: This circuit walk starts from the Christmas Tree Well picnic area, approximately 64kms SE of Perth, left off the Brookton Highway.

LENGTH OF WALK: 9kms; 4-5 hrs; Easy; Circuit.

ACCESS: Follow the Brookton Highway from Perth for approximately 64kms, turning left at the signpost to Christmas Tree Well. Leave your car here.

FACILITIES: Picnic ground with barbeques at Christmas Tree Well.

WATER SUPPLY: None.

EQUIPMENT: Compass, water. Long pants advised.

ESCAPE ROUTE: Bear S to Brookton Highway.

BEST TIME TO VISIT: Spring, Winter.

This pleasant short day walk is best viewed as a bush wander rather than a bush walk, and leaves much scope for individual exploring. The walk route passes through some beautiful areas of virgin wandoo (*Eucalyptus wandoo*) in the Russell Management Priority Area. This is the largest remaining woodland of uncut wandoo in the south west, and is therefore of immense conservation value. Virgin forest of any kind is sadly scarce in WA and it is imperative that such areas are not further lost to destructive land uses.

The character and form of the widely spaced virgin wandoo creates a most unique Bush atmosphere which is a delight to any bushwalker. This walk combines the broad soft stretches of open wandoo woodland with open jarrah and marri forest, and a harsher shrubland environment.

Begin the walk at Christmas Tree Well, so called because of the profusion of the parasitic WA Christmas tree (*Nuytsia floribunda*). This is actually one of the many mistletoes which becomes a golden blaze of beauty when flowering in the summer months. From the picnic area, follow the closed road N of the picnic area heading almost directly N for 5 mins (0.1km). At this point there is a cross-road; take the track heading E on the right and follow gently uphill for 1.25km to reach Yarra Rd, passing through disturbed jarrah forest and into wandoo woodland.

Turn right on Yarra Rd and follow for about 15m until a distinctive drain is visible on the left. Follow along this drain for 5 mins until it disappears, and continue along a bearing of 100 (ESE) through open wandoo woodland.

The scrub layer is quite dense here with the pincushion coneflower (*Isopogon dubious*), several grevilleas and poisonbush (*Gastrolobium spp*) common over a carpet of couch honeypot (*Dryandra nivea*). Prickly bitter-

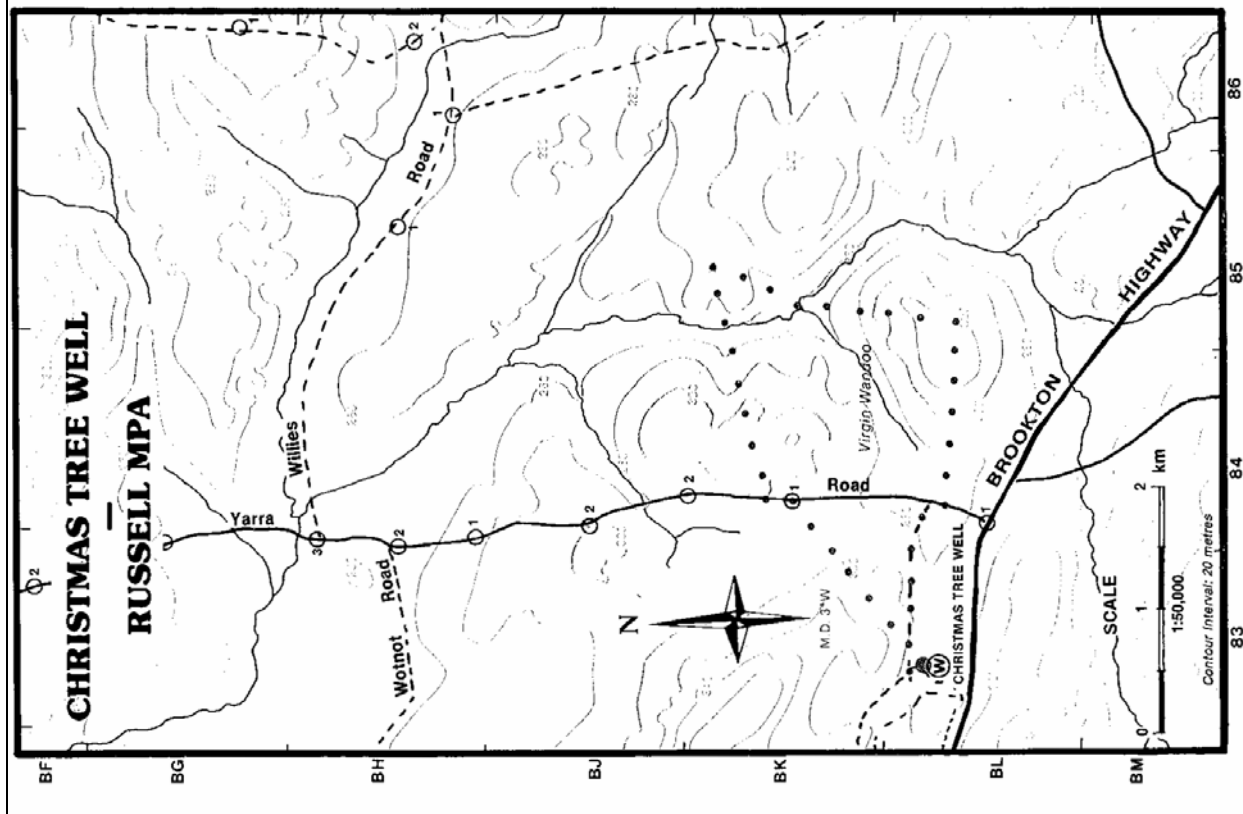


POWDERBARK WANDOO
(*Eucalyptus accedens*)



WANDOO
(*Eucalyptus wandoo*)

S.S.



pea (*Daviesia pectinata*), blackboys and the odd zamia palm (*Macrozamia reidii*), become more common as the route moves further uphill into open jarrah woodland (0.5km). Snakebush (*Herniandra pungens*) and triggerplants (*Stylidium spp*) are common smaller attractions in spring. Thickets of prickly moses (*Acacia pulchella*) soon become visible downslope to the left. The wise walker will quickly learn to avoid these uncomfortable shrubs which emerge quite frequently in wandoo country.

In 30 mins (1.5kms from Yarra Rd), you should be well into virgin wandoo on the plateau of a fascinating hill. Follow along the ridge for about 0.5km (10 mins) until it begins to gently descend. Jarrah and marri replace wandoo and the ridge winds more NE (about 30) here. Take a bearing directly N descending gently for 1km to reach the fork of a small gully. Bear 25 (NNE) from the gully junction. The white heads of native rose (*Pimelea rosea*) cover this area in spring.

Pass through a very open valley depression in 5 mins with a low stand of honeymyrtles (*Melaieuca sp*) and a carpet of everlasting in spring. Directly ahead after 20 mins walking (1km), there should be a prominent, small rounded hill devoid of vegetation apart from two or three tall powderbarks (*Eucalyptus accedens*). Climb to the top of this hill which looks like a giant anthill.

Bear 260 (WSW) from the top of the hill and head downhill. Cross another small gully after 0.5km, passing through an admixture of jarrah and wandoo. Directly ahead is an impenetrable thicket of prickly moses bordering the far side of a gully depression (this holds a fair amount of water in winter). Continue along bearing, crossing the gully and heading gently uphill.

The environment adopts a harsher beauty with its display of tall dryandras and banksias on the tops of the laterite hills. The understorey is much thicker in this section of the walk and you will pass over several small ridges before re-entering the easier walking wandoo woodland (1km). A further 0.5km should bring you to Yarra Rd (2kms from the 'anthill'). Turn left and look for the reference tree marker on your left (BK 84 1).

Bear 234 (SW) through the bush from this marker. This bearing follows and crosses some vague tracks initially. You will notice the strong contrast between this well-logged low jarrah forest and the tall open uncut wandoo left behind in Russell MPA. Cross a main track after 20-30 mins walking and follow the bearing for 0.5km back to Christmas Tree Well.

BANNISTER HILL

LOCATION: Gyngoorda MPA is located 100kms SE of Perth in the eastern perimeter of the State Forest. It is bordered by Albany Highway and Wandering Rd.

LENGTH OF WALK: 14.5kms; 6-7 hrs; Easy; Circuit.

ACCESS: Turn left off the Albany Highway at the road to Wandering just past North Bannister. Leave your car at a parking area on the left 6kms along Wandering Rd.

FACILITIES: None.

WATER SUPPLY: Creeks are seasonal and unreliable.

EQUIPMENT: Compass, water.

ESCAPE ROUTE: Bear W to Albany Highway.

BEST TIME TO VISIT: Early Spring, Autumn, Winter.

Gyngoorda MPA is an excellent area for bushwalking, particularly during the wildflower months. The area is quite rich botanically, containing a wide range of vegetation types in small areas. The scenic views, granite outcropping and laterite capping on Bannister Hill make the area particularly attractive for walking. Wandoo (*Eucalyptus wandoo*) occurs on the upper and middle slopes and gullies, with powderbark (*Eucalyptus accedens*) restricted to several ridges. An open forest of jarrah and marri covers the remainder of the area. The wide variety of birds inhabiting Gyngoorda are a further attraction of the walk.

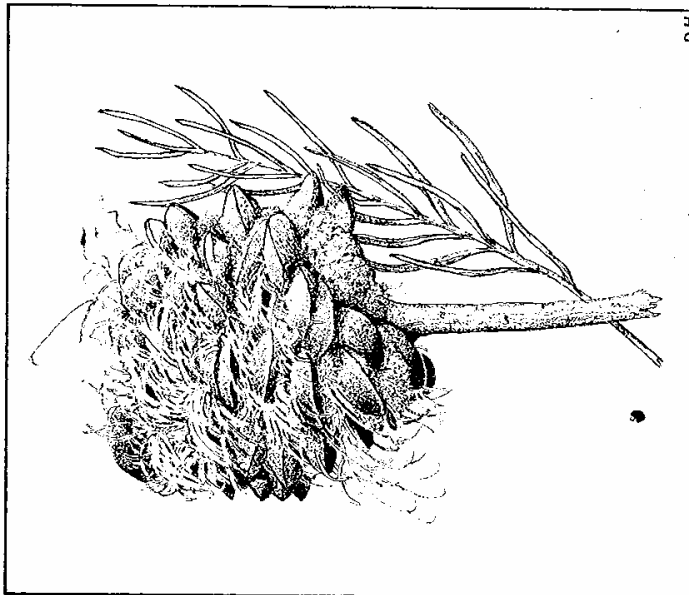
From the parking area, walk along the main road for 0.5km to reach a track on the right following farmland. Turn right onto this track which you will be following for 6.2kms. Within 10 mins the track heads uphill and Bannister Hill is in view ahead. The track continues to pass over laterite uplands dominated by the wavy leaved hakea (*Hakea undulata*), fuchsia grevillea (*Grevillea bipinnatifida*), scrub sheoak (*Casuarina humilis*) and dryandras. After 2kms the track heads back downhill to cross a gully then veers right and away from the paddock perimeter for 0.5km. Pass a track which appears on the right in a further 5 mins (2.8kms).

The next 2kms continue fairly close to the paddock passing an odd powderbark wandoo on a ridge to the right (after the first 1km). At 2kms the track again crosses a gully. White myrtle (*Hypocalymma angustifolium*) occurs as quite a tall dense shrub in this area. Continue to follow the track into jarrah country until it branches right on a hill (after 2kms). There are good views across to farmland from here.

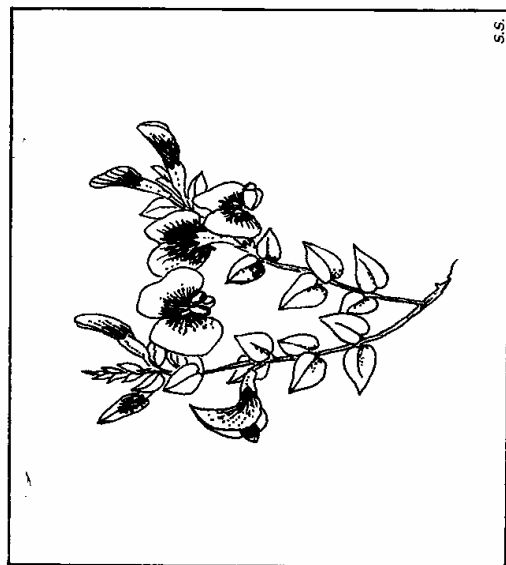
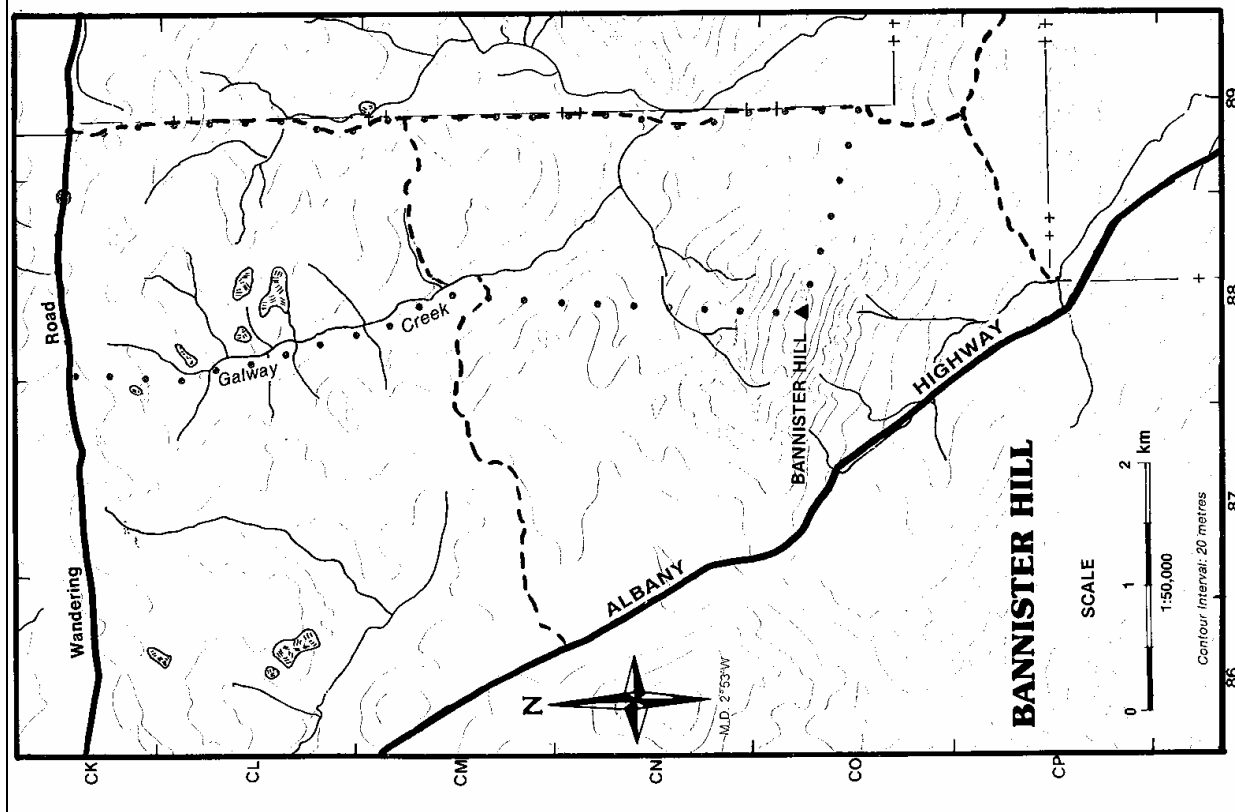
Bear 295 (WNNW) from this intersection heading toward Bannister Hill. In 15 mins a gentle climb brings you through a shrub cover of tall parrot bush (*Dryandra sessilis*), spike hakea (*Hakea ruscifolia*) and pincushion cone flower (*Isopogon dubious*) to pass an untidy stand of curved-fruit hakea (*Hakea cyclocarpa*) and the prostrate banksia, (*Banksia sphaerocarpa*). Good views open up as the top of Bannister Hill is neared.

On reaching the top of the hill, follow the laterite ridge meandering W to the summit of Bannister Hill (485m), passing through a tall stand of Hakea and into parrot bush before reaching the cairn at the summit.

In the wildflower months, the bright yellows of the wattles (*Acacia spp*) and hibbertias, interweave with the pinks and whites of honey bush (*Hakea lissocarpa*) and beard heath (*Leucopogon pulchellus*) to form a thick, attractive shrub cover. Numerous smaller wildflowers sprinkled throughout the understory, complete this forest rainbow, enhanced by the white bark of the tall wandoo overstorey.



NARROW LEAF BANKSIA
(*Banksia sphaerocarpa*)



A PEA FLOWER
(*Bossiaea pulchella*)

From the summit (do not be concerned if you have not found the cairn), head due N. The pea family (sub family Papilionaceae) is well represented with genera such as *Gastrobium*, *Oxylobium*, *Daviesia* and *Bossiaea* displaying vivid red, orange and yellow flowers. Many of these are poison plants.

The northerly bearing leads to a flat granite outcrop, opening up some beautiful views of the hills ahead and farmland to the E. A thick low shrub cover of mouse ears (*Calothamnus rupestris*), scrub sheoak, wattles (*Acacia* spp) and featherflowers (*Verticordia* spp) surround the rock. There is an isolated drummonds gum (*Eucalyptus drummondii*) before the outcrop. Further N a taller hakea shrub cover precedes a small gully at the base of the hill which should be reached in 20 mins. Continue N through wandoos and occasional powderbark before entering jarrah and marri country in 5 mins.

Cross a vague track 1km from the base of Bannister Hill and again in 20-30 mins, moving into wandoos woodland. This area is very pretty (and prickly!) when the thickets of prickly moses (*Acacia pulchella*) are in flower. A gully appears on the right in 5 mins; follow it as it heads slightly W of N.

At 1.5kms the overstorey is a jarrah-marri-wandoo admixture. When the gully disappears, keep on a N bearing to reach the road in a further 2kms (35 mins). Turn right and walk 1km back to your car.