

## **Natural Heritage Trust Project on Knocklofty Reserve.**

**October 1999 to December 2002**

**Project No. BCC200866 and BCC30570**

**Subject:** The achievements of bushland restoration on Knocklofty Reserve between 1999 and 2002 with references to all documents published during this period.

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### **Summary**

This summary outlined briefly all the actions carried out by the Friends of Knocklofty during the three and a quarter years of the NHT project. All documents detailing activities carried out as part of the NHT project are included as Attachments or as separate copies.

### **Details**

#### **INTRODUCTION**

Knocklofty Reserve is a Hobart City Council bushland reserve of over 140 hectares, nestling in the foothills of Mt. Wellington. Its eastern boundary is only 3 km from the GPO of the City of Hobart. The bulk of the reserve was purchased from private interests in 1942.

Interest in the restoration of the reserve as a bushland available to the citizens of Hobart was initiated in 1983 with the publication of a Hobart City Council [HCC] Development and Management plan<sup>1</sup>. This plan addressed issues of environment, current land use, vegetation, weed infestation, fire hazards, and recreation potential. Sixteen recommendations relating to use by visitors, fire hazard minimisation, and rehabilitation of degraded bushland were made in this plan.

These recommendations were not addressed immediately by the HCC, although measures were taken to drain some of the water filled quarries, a carpark was established at the upper Forest Road entrance, and some tracks were up graded to assist fire access.

In 1992, following a meeting of members of the local community, the Friends of Knocklofty Bushcare Group [FOKL] was formed as an informal group of people interested in rehabilitating the bushland. Activities would include removing the woody weeds and planting native seedlings in areas where native plant regrowth was poor. IN the early years, small seed grant of \$2,500 from the Commonwealth Government assisted the group by providing some equipment and also seedlings and protective materials for planting. Work by the group during this period was mainly near the West Hobart sub division of Fielding Drive and near the lower Forest Road entrance to the reserve.

In 1995, the Hobart City Council appointed a Bushland Officer, a position which was later expanded to a Bushland group with a Manager, Bushcare Co-ordinator, and Bushcrew. This group encouraged the formation of bushcare groups in all HCC reserves around Hobart, and provided assistance through supervision, advertising, and the supply of equipment, plants, and materials for the various groups to work in the reserves. As a result, FOKL expanded its programme of weeding and planting around the eastern side of Knocklofty Reserve near the suburb of West Hobart and started monthly Sunday afternoon work activities.

In 1998 the HCC, through the employment of a consultant botanist and also environmental consultants, produced a Fire Management Plan<sup>ii</sup> for Knocklofty Reserve. This contained the results of a survey of the flora and fauna of the reserve, complete with types of vegetation community and a plan for fire hazard reduction burns consistent with the type of vegetation community and the weeds present in this community. The reserve was divided into 26 units for fire hazard control with recommendations regarding the pre-fire weeding required and the frequency of burns to minimise the fire hazard and retain the integrity of each vegetation community.

In 1999 FOKL applied to the Natural Heritage Trust [NHT] for a grant to assist with the financing of a three year project to “Restore the threatened flora communities and habitats for threatened fauna on Knocklofty Reserve”<sup>iii</sup>. This application had seven objectives:-

**Long term objectives** (after three years)

1. Protect and re-establish local flora to improve habitat for endangered species as per recovery plans.
2. Eliminate soil erosion by re-directing run-off into permanent wetlands, thus preventing tunnel erosion and increasing the frog population.
3. Improve the environment for endangered swift parrots and eastern barred bandicoots by providing extra habitat and food sources [by the planting of suitable vegetation].
4. Improve public awareness of indigenous plants and animals and also of the role of the public in protecting natural heritage.

**Short term objectives** (to be achieved in three years or less)

5. Restore and replant degraded and eroded areas with 1600 seedlings of local flora.
6. Re-establish former wetlands in the Reserve.
7. Improve the awareness of natural heritage in the local community, by erecting educational signs, involving the community and schools in the project, publishing awareness brochures, etc.

Funding was provided for this project from November 1999 and continued following annual applications until the end of December 2002. The outcomes and the documents produced to advertise these outcomes are outlined in the following sections.

## **DEVELOPMENT OF A VEGETATION MANAGEMENT PLAN**

Funding from the NHT grant was used to finance a consultant botanist to carry out weed mapping of the reserve. This resulted in the production of "Knocklofty Reserve Vegetation Management Plan"<sup>iv</sup>. A copy is attached.

This plan describes the findings of a botanical survey and brings together previous survey information. It includes species data and plant community information. The status of threatened species and the extent of major environmental weed infestations has been documented both verbally and via maps. The report also identifies priorities for management, in The Management Site Action Plan, mindful of the need for a co-ordinated approach with the Fire Management Plan. A review of Eastern Barred Bandicoots and Swift Parrots, two nationally significant fauna species, is also included. Detailed information of native plantings and their success over the previous 6 years, propagation rates of locally collected species, and a visitors survey, are included - all undertaken by FOKL during the first 15 months of the NHT project.

The plan also includes a prescriptive labour costed, three year action plan for FOKL and the HCC as they work towards the restoration of the bushland values of Knocklofty Reserve.

## **WEED REMOVAL UNDER THE ACTION PLAN**

The Management Site Action Plan has been updated in Attachment 1<sup>v</sup> to show how much of the plan has been implemented in the last three years. This plan is supplemented by maps of the area which show the sites which have been cleared of woody weeds. During the past three years, woody weeds have been cleared from 98.7 hectares, compared to the 22 hectares planned in the original NHT application. Of the 140 sites requiring weed removal on the reserve, primary weed removal has been completed on 101 sites and partial weed removal has been carried out on another 10 sites. This is due to the massive increase in resources applied to the problem and the complementary weed removal done as part of the Fire Management Plan.

The weed removal effort was increased during the three year period of the project by a combination of; more FOKL work days [averaging 22 half days per year], 12 weeks of work from CVA volunteers in 2000 and 2001, and over 1200 person hours by the contractors Tasflora in 2001 and 2002. Tasflora spent their time removing gorse infestations on sites 54 to 58 in fire management unit K18, where the CVA were unwilling to work because the weed density was between 30 and 80%. Tasflora also were contracted to carry out spraying of weed reseeding on all the cleared sites during autumn and spring of 2002.

1.44 hectares of gorse infested bush remains in K18 with a weed density between 50 and 80%. FOKL will be using money obtained under the Envirofund to prepare this area for in-fill planting in 2003 as outlined in Project ID 38332. GPS mapping in Attachment 2<sup>vi</sup> shows the area still to be cleared as well as the area as part of the whole reserve.

## PLANTING UNDER THE ACTION PLAN

The original planting plan was 1600 seedling per year [4900 over the 3 project]. The actual number of seedlings planted over the three years was 13214. The Vegetation Management Plan [VMP], first produced as a draft in the middle of 2000, highlighted the need to place priority on preparing sites for which subsequent plantings were recommended. In 2000 there was no time to plan extensive planting which was limited to 2101 seedlings, still above the planned annual planting. A seedling take count early in 2001 showed that over 70% had survived.

With the VMP available, it was possible to plan and implement plantings on most of the recommended sites, using the seedling mix recommended for each site. Over the three years, there were 68 plantings on 38 sites.

The bulk of the seedlings [8314] were planted in 2001. 2159 of these were by FOKL and other local groups, 4205 by CVA volunteers, and 1600 seedlings by 150 volunteers on National Tree Planting Day in July 2001. This was a fortunate year for planting, as above average rains were obtained from June 2001 to February 2002, giving plenty of time for the seedlings to get established under moist conditions.

In 2002, a total of 2799 seedlings were planted, most by FOKL, with some help by school children and other volunteers in a Telstra sponsored planting day in September. Unfortunately many of the seedlings planted in early spring [September and October] have died because of the drought conditions suffered by Hobart since November 2002, and still persisting at time of writing [mid February 2003]. Rainfall between mid November and mid February has been 28mm compared with the long term average for this period of 150 mm.

The details of the plantings, when and where in the reserve they were planted and the number of each species planted, are given in the VMR for the year 2000, and those for 2001 and 2002 are shown in Attachment 3 <sup>vii</sup>. A colour coded map of the planting sites is also shown in the attachment.

## SEED AND CUTTING PROPAGATION

In the original NHT project application, a total of \$12,250 was allowed for plants, and \$7,350 for bags, mats, and stakes. Subsequently, the HCC decided to provide the bulk of the plants, bags, mats, and stake as an “in-kind” contribution. This enabled the number of seedlings to be significantly increased, as under the budget estimate, the 13214 seedlings would have cost \$39,642. Some of the budgeted money was re-allocated to other costs, such as fencing materials, mulch, and the purchase of “socks”. Socks are mesh tubes which protect grassy seedlings from grazing animals without the need for more expensive bags, mats, and stakes. Approximately \$2000 was spent on purchasing seedlings from local nurseries.

FOKL started a seed propagation programme in 2000 as part of the “in-kind” contribution. In order to obtain local provenance seedlings not easily obtained from the HCC or other nurseries, and for the purpose of germinating seedlings of the *Acacia*

*gunnii* [r3 category - a species with a small, localised population on Knocklofty Reserve], seeds and cuttings were obtained from Knocklofty Reserve. The programme was directed by one of the FOKL members, Bruce Champion, who is a life time member of the Australian Plant Society [APS]. Training of interested FOKL members in propagation techniques was carried out at the APS nursery in Howden.

Over the last three years, several interested members have spent one or two afternoons per month propagating seed and cuttings, producing a total of 1526 seedlings, of which 698 have to date been planted back on Knocklofty Reserve. See Attachment 4<sup>viii</sup>.

Special interest was taken in propagating seeds and cuttings of the *Acacia gunnii*, with experiments carried out on the best method of pre-treatment of the seeds, the effect of time delays between collecting and planting the seeds, all with a view to maximising germination rates. The comparison in strike rate for cuttings from propagated *Acacia gunnii* compared to those collected from the reserve was also made. The results of this experiment was written up as a paper and published in Eucryphia, the Newsletter of the APS Tas Inc branch. Attachment 5<sup>ix</sup>.

#### SEED COLLECTION

In 2002, Barry Hardwich of Greening Australia provided training in seed collection for FOKL members. The subsequent seed collection excursions organised by him provided FOKL with the bulk of the seeds used for propagating seedlings for Knocklofty Reserve. 46 species of seed were collected and form the basis of the Knocklofty seed bank to be used by the HCC Nursery and by FOKL members at the APS Nursery. See Attachment 6<sup>x</sup>. Seedlings produced will be planted on the reserve as part of the year 2003 planting plan. Two FOKL members prepared the propagation plan for 2002 and the planting plan for 2003. These plans were based on using seeds from the Knocklofty Reserve seed bank and cuttings they collected from the reserve before each propagation session. Seed collection sessions are continuing in 2003.

#### IN-KIND RESOURCE CONTRIBUTION

The higher than expected resources used to tackle the weed problem, the expanded planting programme, and the new seed propagation programme, are highlighted by the much higher “in-kind” expenditure actually provided by the proponents of the NHT project proposal compared to that pledged in the application. [ie]

“ In-Kind” contribution	Proponent [FOKL]	Contributor 1 [HCC]	Contributor 2 [Wildcare]	Total
Pledged	\$51300	\$116100	\$15000	\$182400
Actual	\$113368	\$213557		\$326925
% Increase	221	184		179

Details of the “in-kind” expenditure by FOKL is shown in Attachment 7<sup>xi</sup>.

This record shows that the co-ordinators spent an average of 7.5 hours each week on administration and planning matters. When attendance at and supervision of group activities is included, time spent on the project was nearly 22 hours per week, over the three years of the project.

Clearly without the availability of retired people with management skills, a project of this magnitude could not be done without a paid administrator.

#### **PHOTOGRAPHIC RECORD**

As part of the obligation under the NHT grant, a photographic record was made of selected sites to show the effect of rehabilitation activities on various parts of the reserve. A total of 47 photopoints were selected in accordance with the guidelines provided by the NHT unit. The FOKL Co-ordinators have a photographic record, including photopoints, of improvements on each of the 47 sites.

Seven sites were selected for special comment. A description of each of these sites with accompanying photographs is given in Attachment 8<sup>xii</sup>. They show the effects of removing different types of woody weed, the effects of mulching and planting, the rate of seedling growth, wetland improvements, improving fauna habitats, and improving orchid habitats, all on the selected sites before, during, and after completion of restoration work.

#### **FROG PONDS**

13 small borrow pits, quarries, and depressions were investigated for restoration as frog ponds during 2000. As a result hard landscaping was carried out in 8 areas in order to direct more run-off into these ponds, to reduce erosion by providing temporary collection areas during heavy rain, to excavate areas to enable more water to be retained for longer, and to build a new pond to collect overflow from a pond higher up the slope. Soft landscaping was carried out around five of these ponds, with a total of 2451 seedlings planted on the various sites as shown in the table below.

Site	2000	2001	2002	Total
Frog Bog [62]	50	90		140
Heathy Pond [67]	207	149	89	445
Frog Dam [84]	110	942	122	1174
Triangle Pond [82]	330			330
Reedy Pond [109]			362	362

A major effort was made in restoring the Frog Dam from an old industrial dam. Work on this pond started in 1998 with work by Greencorp to restore the sandstone walls of the

old dam. An investigation by FOKL members resulted in a grant of \$5000 being given by the HCC to partially seal the old dam so that water was retained permanently. The story of this restoration work, which had the objective of bringing frogs back permanently to Knocklofty, was prepared as a booklet for primary schools as described in Attachment 9<sup>xiii</sup>. This booklet was a joint effort by FOKL members with voluntary contributions ranging from the initial idea, the scientific investigation, the writing of the story, the drawings, the calligraphy, and the editing.

During 2000, some of the funds from the NHT grant were used to excavate the remaining part of the old industrial dam. A viewing area was constructed and tracks leading to and from the dam were provided. Later a ditch was dug to direct run-off to feed into the dam and to enable water to be added from a fire hydrant during extended periods of dry weather. The two areas now form a single pond when the water level is more than 50% full, and the pond has had permanent water since construction was completed. Since this work was done, a fence has been built around the perimeter to keep dogs out while the soft landscaping is being implemented, and the surrounding area has been progressively mulched and planted with a range of grasses and small shrubs, totalling 1174 seedling to date. Mulching and planting the remaining area surrounding the pond will continue in 2003 and 2004.

Late in 2002, rehabilitation of the largest pond on the reserve was started by the HCC Bushcrew. This pond was infested with Parrots feather [*Myriophyllum aquaticum*] which has recently been sprayed. Restoration of this pond will continue over the next two or three years.

#### **WATER WATCH**

With the rehabilitation of 8 frog habitats on the reserve during the last three years, Water Watch activities were started to monitor the quality of the water in the ponds and to assess the nature of the invertebrates and tadpoles living in the pond. Training, Water Watch monitoring was initially provided by the local Water Watch Co-ordinator. Water Watch monitoring of all the ponds commenced in the spring of 2002, following the purchase of Water Watch equipment using a grant from the Commonwealth Government as part of the International Year of the Volunteers.

Three members of FOKL have been trained to use this equipment, and the results of the surveys carried out in 2002 are given in Attachment 10<sup>xiv</sup>. These show that water quality is good for typical pond life, with low levels of salts, ortho-phosphates, and a pH consistent with bushland. The dissolved oxygen levels varied in accordance with the replacement rate of water in these ponds, and most of the ponds contained a range of moderately sensitive invertebrates and large numbers of tadpoles during the main frog breeding season. The hard landscaping carried out to deepen and enlarge some of the ponds significantly increased the period of time they retained water. This enabled most frogs to complete their breeding cycle before drought dries up the ponds. It is planned to continue monitoring during 2003.

#### **SMALL MAMMAL HABITAT**

Knocklofty Reserve is home to many small native mammals, including the Eastern Barred Bandicoot [EBB]. A survey of diggings by a consultant showed the presence of bandicoot diggings on several parts of the reserve, from the summit to the “open grassy areas” adjacent to the West Hobart suburbs. One of these areas has been substantially planted with prickly native shrubs to provide shelter for the bandicoots. Over 900 shrubs and grasses have been planted in this shelter as described in the photopoint attachment.

In 2001, using funds from the NHT grant, the consultant [Stephen Mallick] was commissioned to carry out trapping surveys with the help of volunteers from FOKL on the summit and in an area of the “green”, where diggings were prominent. The results of these surveys are reported in Attachment 11<sup>xv</sup>. These surveys failed to trap any EBBs on the “green” but trapped two in the summit grid. The presence of a variety of other native mammals was confirmed, especially potoroos among the light bushland on the eastern boundary of the reserve adjacent to the Fielding Drive sub division of West Hobart. Stephen Mallick drew the following conclusions.

“It is difficult to state with any certainty whether the population of eastern barred bandicoots is resident (in the sense of being present year-round and including male and breeding female animals), where barred bandicoots are most likely to occur, and how many eastern barred bandicoots are present within the reserve. The number of diggings recorded by Mallick (1999) indicated that eastern barred bandicoots were common on cleared pasture (particularly at The Green), as well as in native woodland on the upper slopes of Knocklofty Hill. A number of dead eastern barred bandicoots have been picked up on The Green, indicating that the species does in fact frequent this area. However, the results of a systematic trapping survey of The Green and native woodland habitats failed to capture any eastern barred bandicoots on The Green, and only two young males were captured along the power-line easement in native woodland habitat.”

Following his advice, it is planned to carry out further trappings in 2003 using volunteers from FOKL and led by a member who is a wildlife veterinarian. This trapping will focus more on determining the range of small mammals in the reserve in areas near the West Hobart suburbs. The findings will be used for a public information campaign and to prepare guidelines for control of domestic animals, particularly dogs, on the reserve. The proposal is attached as Attachment 12<sup>xvi</sup>. DPIWE staff are currently assessing our permit applications.

#### **SWIFT PARROT HABITAT**

The 2000 state-wide survey of swift parrots, showed the parrots use Knocklofty Reserve as a “fly-by” feeding area. A report on the sightings on Knocklofty in 2000 is given in the Vegetation Management Plan.

Since this time, the presence of the swift parrot has been reported by various individuals. On the 20<sup>th</sup> and 21<sup>st</sup> of December 2001, a large number of swift parrots were observed on Knocklofty among flowering *Eucalyptus globulus* on the eastern slope of Knocklofty. During that summer, flowering of the *Eucalyptus globulus* was particularly prolific thanks to the very wet winter, spring, and early summer.



As an on-going response to swift parrot sightings, with the purpose of providing more feeding areas for them, FOKL and the HCC have been busy revegetating two areas of the reserve with *Eucalyptus globulus* along the approach path of the visiting swift parrots. Seedlings planted in the mid 1990s are now 5-6 m high, as shown in the photopoint attachment of site 109. Since 1999, 87 *Eucalyptus globulus* have been planted on this site and site 92, adjacent to the bandicoot corridor shelter.

#### **ABORIGINAL HERITAGE ASSESSMENT**

As part of FOKL commitment to the NHT project, an aboriginal heritage assessment was commissioned. The assessment is shown in Attachment 13<sup>xvii</sup>. The consultant found no aboriginal sites within Knocklofty Reserve during any phase of the assessment.

#### **INDUSTRIAL HISTORY**

As part of the FOKL commitment to “Improve the awareness of natural heritage in the local community -----”, two FOKL members carried out research on the history of Knocklofty Reserve since white settlement in 1803. This history has been prepared in a form ready for pamphlet production and has been made available to educational institutions, visitors to the reserve, and local residents. The information has also been used to prepare the interpretative signs for the reserve, and for brief handouts about the reserve. Attachment 14<sup>xviii</sup> contains the industrial history in pamphlet form.

#### **INTERPRETATIVE AND DIRECTIONAL SIGNS**

Another commitment by FOKL and the HCC in the NHT project was to prepare and erect interpretative signs on Knocklofty Reserve. Interpretive signs have been erected at the main Forest Rd. entrance and at the Frog Dam. Maps of the reserve and naming signs have been erected at all the main entrances, and directional bollards at 43 road and track junctions. A significant amount of the preparatory work was carried out by FOKL volunteers. This work included drafts of the interpretative signs and all the design and drafting of the directional bollards. The “in-kind” contribution by FOKL has been estimated at 138 hours or \$5,620. Funding from the NHT project was used to pay for the building and erection of the interpretative signs, maps, and naming signs. The HCC contribution included graphic design work, planning, and the building and erection of the directional bollards. Examples of the signs erected are shown in Attachment 15<sup>xix</sup>.

#### **FRIENDS OF KNOCKLOFTY WEBSITE**

A website for FOKL has been constructed and is hosted by the HCC web site. This website provides brief information about the natural heritage of Knocklofty Reserve, the purpose and activities of FOKL, and how individuals can participate in FOKL restoration work. The website links to other websites such as the DIPWE Threatened Species Unit, Landcare, and the Natural Heritage Trust. The website address is:-

<http://www.hobartcity.com.au/bushcare/knocklofty/index.htm>

**VIDEO**

Two members of FOKL prepared a video about the Knocklofty Reserve and the Friends of Knocklofty Bushcare Group in 2000. This video highlights the bushland beauty of the reserve, shows the weed problem, introduces members of FOKL, and shows how they carry out various restoration activities. This is a wonderful memorial to the producer of the video, Werner Stadler, who died shortly after completing it and after many years of enthusiastic support for FOKL and for restoration of Knocklofty Reserve. A copy is included with this summary<sup>xx</sup>.

**PUBLICITY**

Apart from the publicity obtained from the various actions addressed above, FOKL has provided regular information on restoration activities and outcomes on Knocklofty to the local community through TV, radio, and in print. This has included a radio interview with Cadence FM, on-site interviews for TV, radio, and newspapers during FOKL organised work activities, and reports and articles written for newsletters or sent out by email. Examples of some of these actions is given in Attachment 16<sup>xxi</sup>.

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## LIST OF DOCUMENTS AND ATTACHMENTS

- <sup>i</sup> “Knocklofty Reserve Development and Management Plan” by David R Brown July 1983.
- <sup>ii</sup> “Knocklofty Reserve McRobies Gully Fire Management Plan” by AVK Environmental Management and Urban Bushland Management Consultants Pty Ltd.
- <sup>iii</sup> “Restoration of threatened flora communities and habitats for threatened fauna on Knocklofty Reserve” an application to the NHT for funding in 1999-2000.
- <sup>iv</sup> “Knocklofty Reserve Vegetation Management Plan” by Andrew North June 2001
- <sup>v</sup> Attachment 1. “Weed Maps and Management Site Action Plan updated to 31 December 2002” by Tony Ault
- <sup>vi</sup> Attachment 2. “GPS mapping of the gorse infested area in K18 of Knocklofty Reserve” by Tony Ault
- <sup>vii</sup> Attachment 3. “Plantings completed in 2001 and 2002” compiled by Tony Ault.
- <sup>viii</sup> Attachment 4. “FOKL seed propagation between 2000 and 2002” compiled by Tony Ault
- <sup>ix</sup> Attachment 5. “Saving *Acacia gunnii* on Knocklofty Reserve” prepared by FOKL members and published on P.10 of *Eucryphia* Volume 15 No. 4 January 2003
- <sup>x</sup> Attachment 6. “Seed for 2002 propagating and 2003 planting” compiled by Tony Ault
- <sup>xi</sup> Attachment 7. “NHT expenditure records of FOKL” by Tony Ault
- <sup>xii</sup> Attachment 8. “Photopoints showing rehabilitation on Knocklofty Reserve between 1999 and 2002” compiled by Janet and Tony Ault.
- <sup>xiii</sup> Attachment 9. “Bringing the Frogs back to Knocklofty” by Friends of Knocklofty Bushcare Group
- <sup>xiv</sup> Attachment 10. “Water Watch data for Knocklofty Reserve” compiled by Tony Ault.
- <sup>xv</sup> Attachment 11. “Trapping surveys for native mammals, including the threatened eastern barred bandicoot on two grids in Knocklofty Reserve” by Stephen Mallick, Wildlife Consultant.
- <sup>xvi</sup> Attachment 12. “Identification of small mammals on Knocklofty Reserve” prepared by David Obendorf and Tony Ault
- <sup>xvii</sup> Attachment 13. “Aboriginal Heritage Assessment – Knocklofty Reserve” by Stephen Stanton.
- <sup>xviii</sup> Attachment 14. “A Pamphlet History of Knocklofty Reserve” researched and written by Janet Ault and Sandra Champion.
- <sup>xix</sup> Attachment 15. “Examples of interpretative signs, map, and directional signs”.
- <sup>xx</sup> “Friends of Knocklofty” a Video-film by Werner Stadler.
- <sup>xxi</sup> Attachment 16. “Examples of publications in the print media advertising Knocklofty Reserve activities.