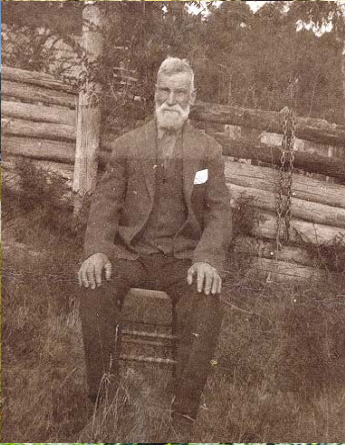


Blundells Flat area ACT: Management of Natural and Cultural Heritage Values Background Study for the Friends of ACT Arboreta



Mark Butz

Blundells Flat area ACT: Management of Natural and Cultural Heritage Values



**Background Study for
the Friends of ACT Arboreta**

Mark Butz

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The author welcomes correction of inaccurate or inappropriate statements or citations in this report, and additional information or suggested sources.

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Abbreviations

ACT	Australian Capital Territory
ACTEW	ACTEW Corporation (ACT Electricity & Water); ActewAGL
ACTPLA	ACT Planning & Land Authority
ANBG	Australian National Botanic Gardens
ANU (SRES)	Australian National University (School of Resources, Environment & Society)
asl	above sea level [elevation]
c.	about (<i>circa</i>)
CDHS	Canberra & District Historical Society
Co.	County – plural Cos.
COG	Canberra Ornithologists Group
CSIRO	Commonwealth Scientific & Industrial Research Organisation
<i>E.</i>	<i>Eucalyptus</i> [followed by species]
FACTA	Friends of ACT Arboreta
GL	Gigalitres (10 ⁹ litres)
ha	hectare(s) (10 ⁴ m ²)
km	kilometre(s) (10 ³ m)
LPINSW	Land & Property Information NSW, Department of Lands
m	metre(s)
ms.	manuscript
n.d.	no date
NLA	National Library of Australia
NPWS	National Parks & Wildlife Service, Dept of Environment & Conservation NSW
NSW	New South Wales
<i>P.</i>	<i>Pinus</i> [followed by species]
p.	page [cited] – plural pp.
<i>pers.comm.</i>	personal communication
Ph.	Parish – plural Phs.
sp.	species – plural spp.
unpubl.	unpublished

SUMMARY OF FINDINGS AND RECOMMENDATIONS

SIGNIFICANCE

The Blundells Flat area is in close proximity to Namadgi National Park and the adjacent Brindabella National Park in NSW, both of which are part of the Australian Alps National Parks system.

Although still recovering from the January 2003 wildfire, the Blundells Flat area and environs contains a diverse range of natural and cultural heritage values.

Natural heritage

- The area has high aesthetic value derived from its landform diversity, a setting enclosed by hills, reliable water in a complex stream, and proximity to valleys, cliffs and waterfalls, which have long been used for nature-based recreation.
- Its diverse vegetation types, include:
 - a complex wetland with extensive ecotones (this and nearby wetlands affected by fire)
 - significant areas of native grassland in open areas flanking the wetland
 - between the Flat and Mount Coree, a large stand of *Eucalyptus fastigata* Brown Barrel near the limit of its range (all nearby stands affected by fire); and
 - upstream of the wetland, a wet gully with ferns uncommon in the ACT (this and nearby wet gullies affected by fire).
- It has in the recent past supported the locally rare *Eucalyptus camphora* Mountain Swamp Gum (nearby localities affected by fire) and offers potential habitat.
- It has in the recent past supported the threatened *Pseudophryne pengilleyi* Northern Corroboree Frog (severely impacted by fire), and offers potential (although marginal) habitat.
- It appears to support a population of the unusual burrowing land crayfish *Engaeus cymus* which is uncommon in the ACT (all nearby habitat affected by fire).
- It has in the past supported the uncommon morabine grasshopper *Keyacris scurra*, although potential habitat may no longer be extant (virtually all upland habitat affected by fire); and
- It plays a role in regulating water yield and quality in the upper reaches of an increasingly important sub-catchment of the Lower Cotter water supply.

Cultural heritage

- The area contains significant Aboriginal sites that may assist our understanding of past use of the landscape, including association with Bogong moth exploitation on the Brindabella Range and moth consumption at Uriarra.
- It has association with Aboriginal people guiding settlers to resources and routes, and subsequent layers of historic use of these routes, particularly from Canberra (Uriarra and Yarralumla) to Brindabella, and beyond to Cooleman and Kiandra.
- It has association with early settler families (Blundell; McKenzie; Shumack; McDonald), and in turn with notable pioneer landholders of Canberra (Campbell at Duntroon; Davis and Wright at Lanyon; Murray at Yarralumla); some of these families also have associations with development of mountain pastures and outstations.
- It has association with 19th century descriptions of travels in the mountains west of Canberra (Murray; Mowle; Gale).
- It has association with the establishment of the Federal Capital Territory, relating to water catchment (Cotter) and border survey (Sheaffe; Pulver); and
- It has significant value for forestry heritage, including remains of the largest and most diverse conifer arboretum established by the Commonwealth Forestry Bureau. It also has association with: planting trials and development of an Australian and local softwood (pine and poplar) industry; notable foresters (e.g. Lane-Poole; Pryor) and noted international plant breeders; and the Australian Forestry School following its move to Canberra.

**BLUNDELLS FLAT AREA, ACT: MANAGEMENT OF NATURAL AND CULTURAL HERITAGE VALUES
EXTRACT FROM BACKGROUND STUDY FOR THE FRIENDS OF ACT ABORETA**

CONCLUSIONS

- The Blundells Flat area appears to have been under-valued to some extent because of its modified condition. As a result, some natural heritage attributes of the area have not been consistently acknowledged or adequately protected.
- Most cultural heritage values of the area (other than the pine arboretum) have received very limited acknowledgement or attention in management and interpretation/education.
- The aftermath of the January 2003 wildfire provides an opportunity to re-think the landscape desired, and to manage for a wider range of heritage values and community benefits.
- However, some of the area's values are being degraded in the post-fire period, and urgent action is required to restore effective management and to educate people about the values of the area.
- The area has the potential to be a showpiece of wetland/riparian restoration and plantation reconfiguration for biodiversity and catchment objectives, with active community participation.
- With ready accessibility from Canberra, the area has the potential to be a significant node for recreation and interpretation close to the periphery of both Namadgi and Brindabella National Parks.

RECOMMENDATIONS

Management approach

- 1) Manage the Blundells Flat area and environs through a sub-catchment management plan:
 - as an integrated system rather than as separate components
 - for its complete range of natural and cultural heritage values and attributes
 - with priority objectives to be the protection of natural and cultural heritage and catchment values
 - as a teaching example and model of good practice in wetland/riparian restoration and plantation reconfiguration.
 - 2) Apply the precautionary principle by managing the area for values which were present in the past, even where these have not yet been proven to be extant, to avoid foreclosing on options for future restoration of these values.
 - 3) Encourage close formal liaison and coordination between ACT Forests and Environment ACT, and the NPWS.
 - 4) Facilitate active community participation in planning, landscaping and monitoring.
- 7) Commence an on-going program of comprehensive biological survey and monitoring
 - 8) Ensure that native species regeneration is not compromised by use of machinery or fire
 - 9) Undertake weed control, willow removal, and other post-fire clean-up along Condor Creek, ensuring practice that balances protection of stream form, riparian zone and in-stream habitat
 - 10) Monitor feral animal activity and address impacts promptly
 - 11) Control active erosion to minimise sediment inputs to the wetland and creek

Strategic actions and further enquiry

- 12) Consult with Aboriginal people on their interests in the area and their views on publication of information about the area's Aboriginal heritage
- 13) Re-orient recreational opportunities to emphasise passive activities and appreciation of natural and cultural heritage, including more extensive interpretive and recreational trails.
- 14) Determine the values of wetland areas at Blundells Flat in relation to others in the region and consider listing in the directory of nationally important wetlands
- 15) Consider listing of the Flat and associated ranges on ACT and NSW heritage registers
- 16) Consider salvage of physical materials from sites of former Blundell farmhouses

High priority actions

- 5) Restore controls on vehicular access to steeper areas and the picnic area
- 6) Convert some former plantation and arboretum areas to buffers of native vegetation adjacent to the wetland, Condor Creek and key tributaries, with linkages to surrounding native forests.

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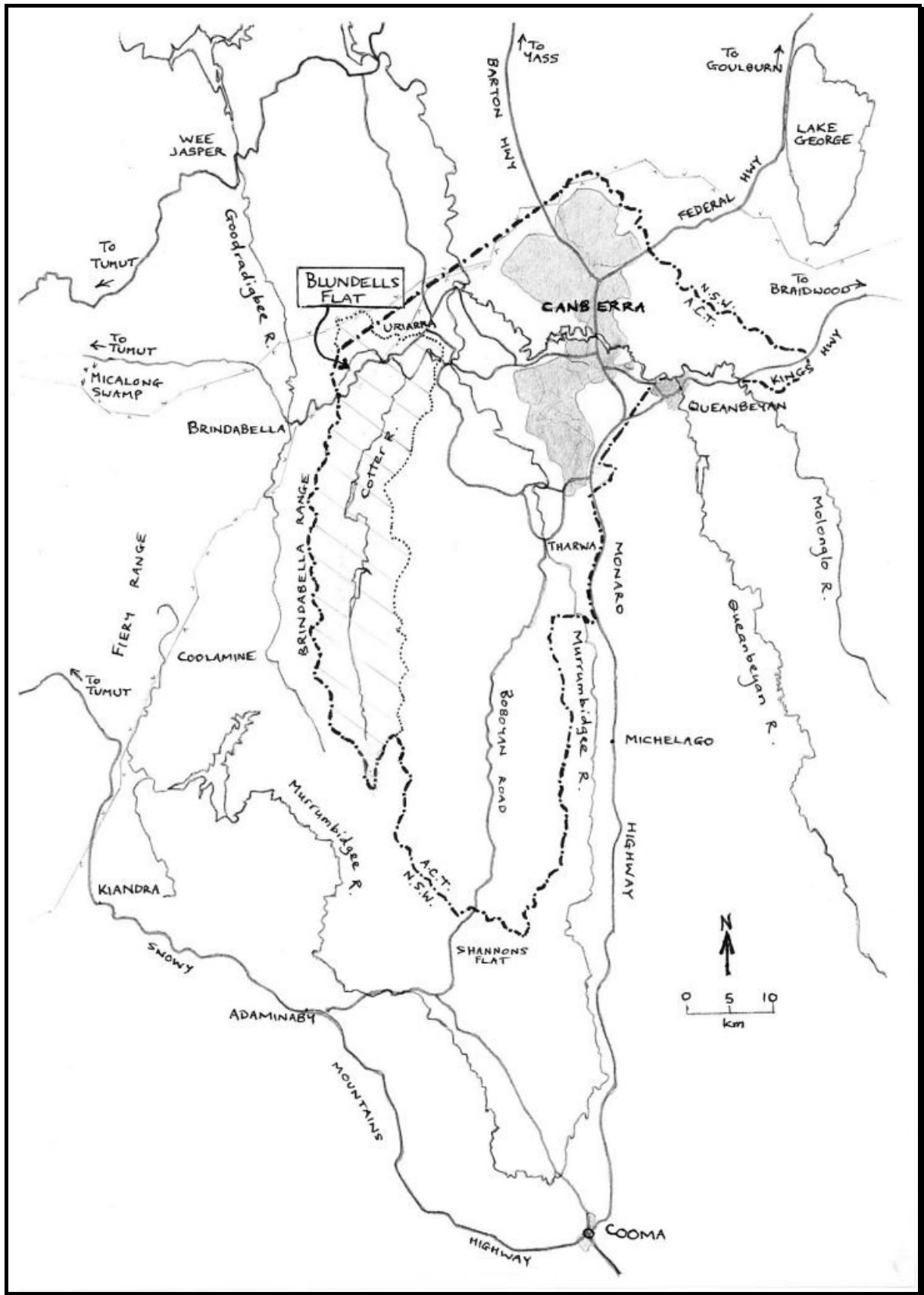


Figure 1 Sketch map - physical context of Blundells Flat area

BACKGROUND

BRIEF

This background study has been prepared at the request of the Friends of ACT Arboreta.

The arboretum at Blundells Flat was one of eighteen destroyed by the wildfires of January 2003. The Friends of ACT Arboreta obtained a small grant from the ACT Bushfire Recovery Taskforce to consider the feasibility of restoring the amenities and values afforded by the arboretum and adjacent flat.

This study was commissioned to support preparation of a management plan by addressing:

- cultural heritage values
- environmental values associated with the wetland area and Condor Creek; and
- measures to conserve and manage these values, including further work required.

In accordance with the brief, most of this report relates not to the conifer arboretum itself, but to Blundells Flat and its immediate surrounds. However, the importance of coordinated management involving ACT agencies and NSW agencies has necessitated attention also to the whole upper catchment of Condor Creek (above Thompsons Corner) [see Figure 2].

The process undertaken was essentially a literature review, supplemented by personal communications and limited field visits. Most of the work was undertaken in September to November 2003.

Because of the brief period available, this report is a preliminary study only, offering background information and basic guidance for post-fire decision-making.

The author intends to prepare a more comprehensive account of the heritage of Blundells Flat and Condor Creek and their linkages with the Blue Range-Uriarra area. This will include more detailed information, as well as making use of the great variety of images and historic maps located during preparation of this report.

ACKNOWLEDGEMENTS

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The work would not have been possible without the assistance of staff and volunteers of:

- National Library of Australia, Parkes
- Canberra & District Historical Society, Civic
- Heraldry & Genealogy Society of Canberra, Hughes
- ACT Heritage Library, Woden
- Library, Australian Government Department of Environment & Heritage, Parkes
- Library, Australian National Botanic Gardens
- ACT Land Information Centre and Plan Room, ACT Planning & Land Authority
- ACT Forests
- Wildlife Research & Monitoring Unit, Environment ACT, Gungahlin
- Parks & Conservation, Environment ACT, Lyneham
- Heritage Unit, Environment ACT, Lyneham
- National Trust of Australia (ACT), Civic
- National Parks & Wildlife Service, Department of Environment & Conservation NSW, Queanbeyan.

See also 'Personal Communications' at the end of this report. This lists only sources cited within this report, and information provided by other people may be represented in the more detailed work still to come.

The views expressed in this report are those of the author and are not necessarily the views of the Friends of ACT Arboreta or any of the sources cited.

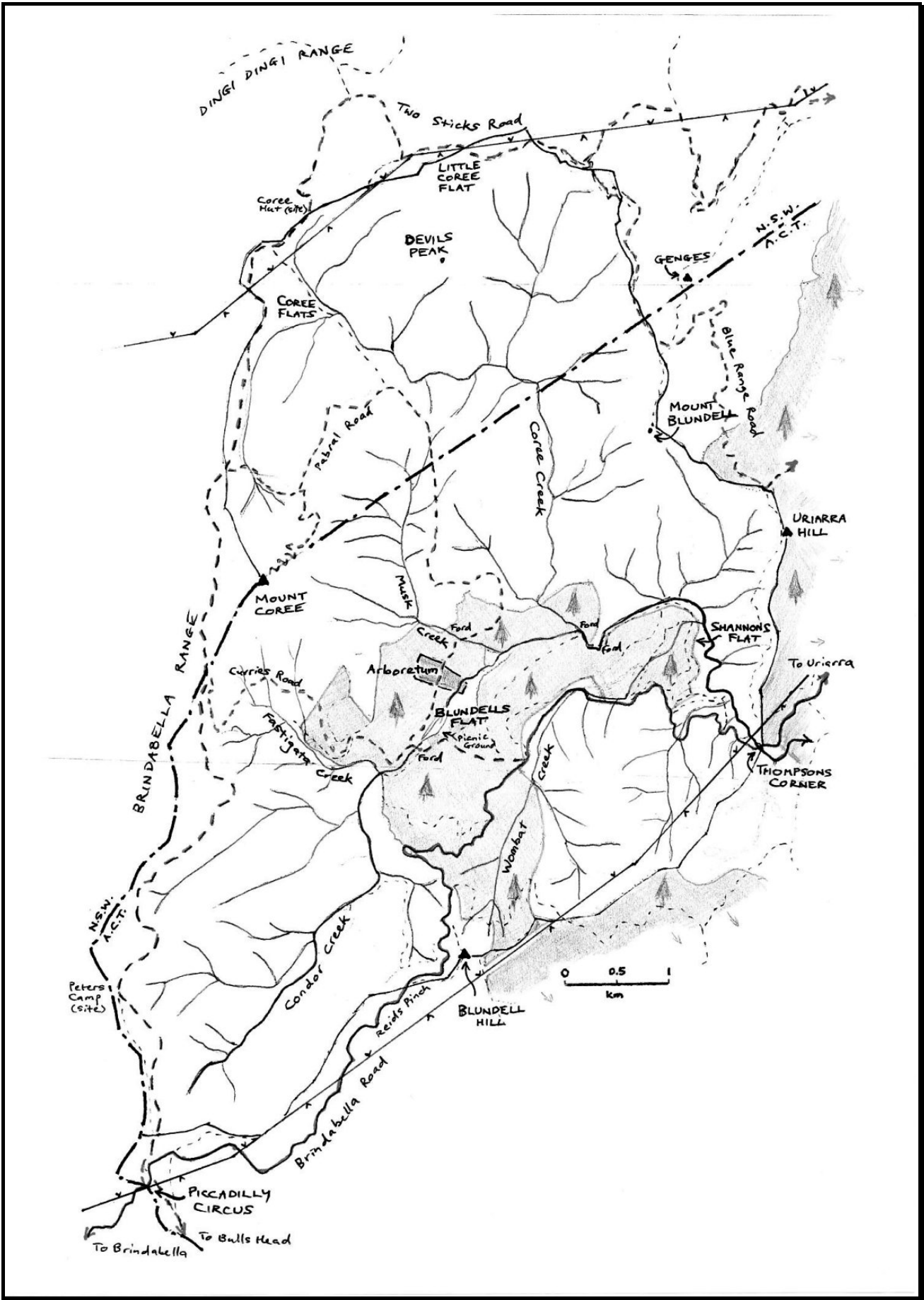


Figure 2 Sketch map of Blundells Flat - Upper Condor Creek catchment

PHYSICAL LOCATION AND CONTEXT

Blundells Flat is located 27km west of Canberra city, at about 740m asl, just inside the north-western corner of the ACT, which is marked by Mount Coree [see Figure 2].

The Flat is almost completely encircled by hills and ranges.

The Brindabella Range forms the western horizon, from the gap at Piccadilly Circus (c.1,250m asl) northwards past three small peaks (c.1,300m asl) to the high point of Mount Coree (1,421m asl).

The northern horizon is formed by a prominent spur of Coree and beyond this Devils Peak (c.1,310m asl).

The Blue Range forms the eastern horizon, dominated by Mount Blundell (1,225m asl) and a spur past Uriarra Hill (c.1,050m asl).

The southern horizon is formed by an un-named range past Blundell Trig or Hill (1,047m asl) and extending to a 1,320m peak in NSW just beyond the starting point at Piccadilly Circus (shown on some maps as Brindabella Mountain).

The Flat includes a wetland area formed on Condor Creek, which is sourced near Piccadilly Circus. It flows north-east to be joined by Fastigata Creek before flowing through the Flat. It is joined by Musk Creek draining from the north-east spurs of Mount Coree, and then by Coree Creek draining from Coree Flats in NSW and the flanks of Devils Peak via the obscure Coree Falls.

From this point Condor Creek turns eastwards to cut its way through rocky country between the Blue Range to the north and the unnamed range to the south. From this incised point the creek flows past Shannons Flat where it is joined by Wombat (formerly Shannons) Creek draining from Blundell Hill. Condor Creek meets the Brindabella Road at Thompsons Corner, turning to the south-east past the site of Condor Camp.

It is joined by Lees Creek draining from Lees Springs near Piccadilly Circus, shortly before it meets the Cotter River downstream from Vanitys Crossing.

The Condor Creek catchment thus forms a significant part of the lower Cotter water supply catchment.

The earliest survey encompassing the area of the Flat placed it within Parish Tidbinbilla in County Cowley. The first landholders along this part of Condor Creek were John McDonald and John Blundell from the 1860's.

A Travelling Stock Reserve was declared in the 1880's between Condor Creek (Thompsons Corner area) and the Goodradigbee River at Brindabella, passing along the un-named range. This formalised a long established route leading from the Canberra area across the Brindabellas to the mountain pastures of the Snowy Mountains.

ADMINISTRATIVE AND LEGISLATIVE CONTEXT

The **Ngunnawal** people are the traditional owners of this area.

ACT Forests (an ACT Government business enterprise) manages Blundells Flat and associated arboreta and plantations, at the western extremity of the Uriarra Pine Forest.

The **ACT Parks & Conservation Service** (Environment ACT) manages Namadgi National Park, which abuts the plantation area to the west and north, including Mount Coree and Mount Blundell. Namadgi is part of the Australian Alps National Parks system. The Service is formed under the *Nature Conservation Act 1980*. Parks and reserves are dedicated under the *Land (Planning and Environment) Act 1991*, but managed under the *Nature Conservation Act 1980*.

The **NSW Department of Environment & Conservation** (Parks Division, formerly NSW National Parks & Wildlife Service) manages Brindabella National Park, which adjoins Namadgi National Park to the west and north, including Mount Coree (western face), Coree Flats and Devils Peak. The local area office is at Queanbeyan, the regional office at Tumut. Brindabella National Park is part of the Australian Alps National Parks system.

The **Wildlife Research & Monitoring Unit** (Environment ACT) exercises responsibilities for biodiversity conservation across tenures under the *Nature Conservation Act 1980*.

The **ACT Heritage Unit** (Environment ACT) has responsibilities for heritage issues across tenures, currently under the *Land (Planning and Environment) Act 1991* and for moveable objects under the *Heritage Objects Act 1991*. New ACT heritage legislation is likely to come into force in 2004, as will new Commonwealth heritage legislation.

Other parts of **Environment ACT** administer provisions for pest plants and animals, management agreements, and natural resource management investments, including community engagement such as landcare and waterwatch.

The **National Capital Authority** has an interest, since the Commonwealth remains the owner of land in the Territory, including that managed by the ACT Government. The National Capital Plan is prepared under the (Commonwealth) *Australian Capital Territory (Planning and Land Management) Act 1988* and provides policies for permitted uses Territory Land under a range of land use categories, including 'mountains and bushlands'.

The **ACT Planning and Land Authority** is established by the *Planning and Land Act 2002* as an independent authority, replacing ACT Planning and Land Management which existed within the Department of Urban Services.

ACTPLA are responsible for preparing the Territory Plan under the (Commonwealth) *Australian Capital Territory (Planning and Land Management) Act 1988*. This provides a range of policy frameworks which are consistent with the National Capital Plan, but which may not be specific to some of the values of the area considered in this report. ACTPLA also currently manages environmental impact provisions of the *Land (Planning and Environment) Act 1991*.

The water supply catchment values of Blundells Flat/Condor Creek are relevant to the *Environment Protection Act 1997*, *Water Resources Act 1998*, and related statutory instruments administered by the **Environment Protection Authority**. In line with these, **ACTEW** has responsibilities for water resources and catchment condition. ACT Forests has responsibility for catchment condition in plantation areas, and Environment ACT for aquatic and riparian zone biota across tenures.

Where transmission lines cross the area (southern and northern extremities of the upper Condor Creek catchment), the energy carrier **TransGrid** has an interest.

For further details of relevant legislation, the reader is referred to Rawson (2003).

NATURAL HERITAGE VALUES

LANDSCAPE

The Blundells Flat area has high aesthetic value as an upland flat in otherwise steep and mountainous terrain. Its horizon is circumscribed by timbered hills and ridges, offering a strong sense of remoteness, with prominent rocky peaks, cliffs, gorges and a waterfall on Mount Coree, Mount Blundell and Devils Peak.

Prior to the January 2003 wildfire, the visual amenity offered by the arboreta, plantations and adjacent tall wet forests attracted a high level of recreational use for relatively passive uses such as picnics and bushwalking. This was bolstered by its convenience as a starting point for more active pursuits in the surrounding landscape, including bush driving and bike riding, rock climbing and orienteering.

GEOLOGY/GEOMORPHOLOGY

The area offers some striking contrasts in landform derived from different geology. The areas upstream and downstream of the Flat are based on the oldest rocks in the area, Ordovician age Nungar Beds of fine quartz arenite, siltstone and slate. The Flat is developed on the Condor Granodiorite which was emplaced during the late Silurian period as part of the Gingera Batholith. The hard rocky profiles of Mounts Coree and Blundell are based on the youngest rocks in the area, which are the Devonian age Mountain Creek Volcanics of rhyolitic lava and ignimbrite, tuff, agglomerate and sediments rich in feldspar (Owen & Wyborn 1979).

The contact between the volcanics and granite has led to some mineralisation, which was exploited late in the 19th century at the Mount Blundell base metal prospect. This was a small operation exploiting lead, silver, gold and zinc (Gilligan 1975; Owen & Wyborn 1979).

Condor Creek follows a single confined channel on sedimentary rocks upstream of the Flat, becoming multi-branched in a broad soak on the granites before taking a serpentine course in some tight meander sequences.

Below the wetland, alluvial flats tend to be loosely consolidated, perhaps due to sub-surface burning of binding organic material. Banks are generally less than 1 metre in height and reveal fine material below large waterworn pebbles. In some sections the stream abuts granite outcrops and (further downstream) is deeply incised in sedimentary rocks, forming shallow alluvial flats on the inside curves of bends.

Soils on granites are the most dispersible, varying through those on volcanics to less dispersible soils on sedimentary rocks. Runoff and soil loss in all types are greatly increased if litter cover is reduced and more so if soils are dry. Cover of less than 7 tonnes/ha allows increased runoff, erosion and stream turbidity. Soils under pine litter become water-repellent when dried out, and are particularly prone to erosion in intense storms. Streamside alluvium is extremely dispersible and prone to erosion and contributes most of the turbidity in streams (REGC 1973).

Predictably, since the January 2003 wildfire and subsequent rain events, water yield from the catchment has increased due to loss of litter cover and reduced transpiration. Images show that after early post-fire rains Condor Creek carried a high load of debris, ash and suspended solids.

One impact of this load is inferred from post-fire monitoring, which yielded no fish from sampling sites on Condor Creek and Coree Creek (Carey et al. 2003), where Rainbow Trout *Oncorhynchus mykiss*, Brown Trout *Salmo trutta* and Mountain Galaxias *Galaxias olidus* were previously taken (Mark Lintermans *pers.comm.*).

There is evidence of higher than normal flow rates, bank undercutting and recent slumping, and there is extensive woody debris in the stream. Some breaching of necks between meanders may be allowing the stream to take a more direct course. Incision of this sort may further increase sediment loads and may lower water levels in the upstream wetland.

The fires have directly affected granite outcrops by causing significant exfoliation.

ECOLOGY

Biological elements of the area noted in published sources include:

- vegetation of Blundells Flat, wetland and Condor Creek
- native forests and woodlands adjoining the pine plantations (including also wet gullies and rocky heaths)
- at one time the only known stand in the ACT of *Eucalyptus camphora*
- the threatened Northern Corroboree Frog *Pseudophryne pengilleyi*
- the unusual burrowing land crayfish *Engaeus cymus*; and
- the uncommon morabine grasshopper *Keyacris scurra*.

These are discussed below as individual elements. However, because threatening processes arise on a landscape scale, and conservation efforts need to be directed at that scale, a more integrated approach is followed in subsequent sections on management issues and actions.

Vegetation structure of the Flat, wetland and Condor Creek

The area encompasses several distinct vegetation structures, from the wetland soak (itself diverse), a band of riparian woodland, through open meadows and flats, pine plantations, a pine arboretum, poplar arboretum, and native forests.

The complex boundaries between some of these offer numerous and diverse transition zones. Such ecotones can be significant for the diversity and population density of fauna species, which may include species of adjoining communities plus species found only in transition zone.

Of particular interest are opportunities offered to species which require two or more adjacent communities of different structure as part of their life history (e.g. the Corroboree Frog and burrowing crayfish – see below). Population densities generally increase with increased length of ‘edge’ per unit area, so are enhanced by complex shapes.

The ecotones at Blundells Flat would have been altered by the pine plantation, and this may obscure understanding of which parts were naturally open.

The original portion plans for the area were compiled in a succession of surveys from 1871 to 1899, and include contemporary descriptions of vegetation.

In 1871 the wetland was flanked to the south-east by ‘well grassed open forest’ on granite, with survey marks cut into peppermints, messmate (most likely Brown Barrel *Euclayptus fastigata*) and gum. Further east (along the current access road) in 1883 ‘undulating’ country lay below a ‘steep densely wooded peppermint and gum ridge’.

To the south along Condor Creek were ‘steep stony and barren ridges’ while along Fastigata Creek ‘very steep ridges’ were ‘heavily timbered’ with ‘gum and peppermint timber’. Downstream, in 1893-99 Musk Creek and Coree Creek drained ‘lightly grassed mountainous country’ which was ‘heavily timbered with gum, messmate and a little peppermint’.

There is some information about the practices of European settlers at the Flat, with about 10 acres of ‘clearing’ shown in 1871, corresponding to the current picnic ground, and an area of ringbarking shown in 1883 on steeper country to the east.

Biologist John Calaby speculated in the past that the Flat was probably kept open by use of fire by Aboriginal people (Flood 1980). However, the effects of variable waterlogging and cold air drainage would probably be sufficient to explain the relative openness of the Flat.

Although caution is required in interpreting botanical descriptions by surveyors, the portion plans imply that much of the Flat downstream of the wetland was less open than it is now, carrying open forest or woodland with a grassy understorey.

Blundells Flat is unusual as a discrete flat and wetland within otherwise steep and heavily forested terrain. Most notable flats in the ACT and immediate surrounds are at elevations greater than 1,000m and are sub-alpine ecosystems. The closest in NSW is Coree Flats 4km to the north, at about 1,050m asl.

Within the montane environment, Blundells Flat (at c.720m) is perhaps more closely related to Dingo Dell Flats 10km to the north in NSW at 850m asl.

No comparative study of the various montane and sub-alpine flats in the region has been located. However, it is reasonable to consider the Blundells Flat wetland as intermediate between high altitude bogs, which tend to be acidic and dominated by *Sphagnum* moss, and fens of the coastal escarpment, which tend to be more basic and dominated by *Carex* sedges.

Although wetland vegetation is still re-establishing after the January 2003 wildfires, Blundells Flat appears to have both *Sphagnum* and *Carex* present. It may therefore be of value as a benchmark to assess biological changes in wetlands at both higher and lower altitudes.

The same observation has been made of Micalong Swamp 28km to the west in Buccleuch State Forest (Butz 1981). However, Micalong Swamp is a significant peatland, whereas no references have been located that suggest the presence of peat at Blundells Flat.

The wetland zones of the Flat are diverse in form, including bogs and fens as well as multi-branched channels and seepages, and show great seasonal variation in waterlogging and surface water. No references have been located which acknowledge wetland values at this site, and no comprehensive flora survey has been located.

A wide range of aquatic species are regenerating after the January 2003 wildfires, including areas of reeds, sedges, other macrophytes, and various mosses including *Sphagnum*. An equally diverse range of herb and heath species is re-establishing in meadow areas.

There are many exotic species in the wetland, including willow, blackberry, docks, sorrel and mint. Notwithstanding this, the wetland system is likely to play an important role as wildlife habitat, including habitat for specialised species, and as a filtration system in an upper catchment, reducing turbidity and erosion and in turn improving downstream water quality.

Native forests and woodlands adjoining the pine plantations

The adjacent forests and woodlands from the highest to lowest elevations include:

- a woodland of Snow Gum *Eucalyptus pauciflora* on the summit of Mount Coree, down to c.1,300m asl
- below this, a band of Brown Barrel *Eucalyptus fastigata*, growing in association with Ribbon Gum *E. viminalis*. *E. fastigata* has very specific site requirements: in the Cotter valley it has a relatively narrow altitudinal range from 820 to 1,310m but is most commonly found from 1,070 to 1,160m on south-east aspects. It is favoured by soils derived from the volcanic rocks around Mount Coree, allowing it to replace Alpine Ash *E. delegatensis*, which would normally be found below the Snow Gum belt.
- a forest association which includes Narrow-leaved Peppermint *E. radiata*, Broad-leaved Peppermint *E. dives*, and Mountain Gum *E. dalrympleana*, with *E. dives* more common on drier sites and *E. radiata* on more sheltered sites. Brittle Gum *E. mannifera* tends to replace *E. radiata* in more exposed or lower sites, and *E. dalrympleana* may give way to *E. viminalis* in more sheltered or lower sites
- on flats of cold air drainage along watercourses, a forest or woodland of Black Sallee *E. stellulata* and Candlebark *E. rubida*, with Mountain Swamp Gum *E. camphora* recorded on flats that are waterlogged in winter months (RECG 1973).

All of these communities were burnt in the January 2003 wildfire, those in exposed, drier sites at high to very high intensity, and those in more sheltered sites at moderate to high intensity. Most eucalypt species have sprouted from lignotubers and some from epicormic buds. A few eucalypt species and several wattle species are regenerating strongly from seedlings.

The belt of *Euclayptus fastigata* (with *E. viminalis*) is of particular interest, because:

- it appears to be the largest single occurrence of this association in the ACT and clearly shows replacement of *E. delegatensis* on volcanic substrate (RECG 1973)
- this is the western range limit for *E. fastigata* in south-eastern Australia (Fraser 1988)
- this association and forest structure may be an important habitat for large arboreal mammals (NCPA 1989).

It also includes a wet gully along Fastigata Creek, from which several plants uncommon in the ACT have been recorded. These include the ferns *Asplenium bulbiferum*, *Pteris tremula* and *Dicksonia antarctica*. Other wet gullies in the area are found at Blue Range, Lees Creek and Blundells Creek (NCDC 1984). All these were burnt in the January 2003 wildfire. These gullies are likely to be of value for fungi (NCDC 1984) and may provide important feeding areas for up to a dozen bat species (Fraser 1989).

Steep rocky faces on Mount Coree, Devils Peak and Mount Blundell, and in the gorge between the latter two peaks, are fringed by a scrub or heath dominated by *Leptospermum brevipes*. Other associated species are *Calytrix tetragona*, *Kunzea parvifolia*, *Acrotriche serrulata* and *Phebalium lamprophyllum* (uncommon in the ACT) (NCPA 1989).

Mountain Swamp Gum *Eucalyptus camphora*

Mountain Swamp Gum *E. camphora* has specific requirements and is regionally uncommon. At one time Blundells Flat was the only recorded locality of *E. camphora* in the ACT (NCPA 1989). More recently, the species is considered to be restricted in the ACT to Shannons Flat (Carey et al 2003), downstream from Blundells Flat. This may be the same location described on Condor Creek in Fraser and McJannett (1991). Whatever the precise location, it was burnt in the January 2003 wildfire, and Carey et al. (2003) report lignotuber regrowth and possible seedling regeneration.

Other sites in the immediate region where the species has been recorded include Coree Flats (c.1,050m asl) and Dingo Dell Flats (c.950m asl), 4km and 10km respectively to the north in NSW (Burbidge & Gray 1979). Both of these sites were also burnt in the January 2003 wildfire.

Northern Corroboree Frog *Pseudophryne pengilleyi*

Blundells Flat in the late 1980's had a breeding population of the Northern Corroboree Frog *Pseudophryne pengilleyi* (Family Myobatrachidae), making this the lowest altitude record of the species in the ACT and one of the northernmost records (NCPA 1989).

This species is declared 'vulnerable' under the *Nature Conservation Act 1980*. It has a restricted distribution in high country of the ACT and adjacent NSW, in the Bimberi, Brindabella and Fiery Ranges and the Bogong Mountains, from 800m to over 1,800m asl (Carey et al. 2003).

The frog relies on autumn breeding habitats in moist to wet grass or bog, with shallow pools and seepages or sheltered depressions in wet heath, sedge and *Sphagnum* bogs. This must be complemented by non-breeding (over-wintering) habitat of moist forests, woodlands and heathlands with abundant ground litter, rocks, logs, and moist sheltered ground cover.

Although these characteristics have certainly been present at Blundells Flat, in recent years this species has not been abundant.

Will Osborne (*pers.comm.*) reports having heard the species calling in the upstream part of the wetland over a number of years, but to a maximum of three calling males. He considers that the Flat was at no time a particularly good breeding site and that the population there was probably an overflow from the much larger population in the Coree Flats area 4km to the north in NSW (and 300m higher in elevation).

All known over-wintering habitat and all known breeding sites in the ACT were burnt with moderate to high intensity in the January 2003 wildfire. Numbers of calling males detected at sites both pre- and post- fire were extremely low and offered no reliable comparison. Post-fire searches located 22 nests containing eggs, some of which were collected for captive husbandry (Carey et al. 2003). Blundells Flat was not included in this monitoring.

In NSW, the closest known locations for Northern Corroboree Frog are Coree Flats (burnt in January 2003) and in the Buccleuch State Forest towards Tumut (not burnt at that time).

Other frog species

Other frog species are noted here because of broad concern at the rate and extent of decline in frog populations in parts of Australia and internationally.

Nearly 20 species of frog are recorded in the ACT, with the highest densities frequently found in grassland associated with permanent water (NCDC 1984). Records held by Environment ACT (Peter Ormay *pers.comm.*) note the presence at Blundells Flat of the relatively widespread Common Eastern Froglet *Crinia signifera* in spring 1997, noting also larger numbers downstream from the Flat.

It is likely that the less common (and apparently declining) Southern Toadlet *Pseudophryne dendyi* would also have occurred there, since it is known from further down Condor Creek, with Thompsons Corner a key site for this species (Carey et al 2003).

During fieldwork for this report in late October 2003, a call was heard at the Flat which was most likely that of the widely distributed and common Eastern Banjo Frog (Pobblebonk) *Limnodynastes dumerii*, although it was early in the season for this species to be calling.

Burrowing land crayfish *Engaeus cymus*

Blundells Flat was noted as a habitat for the burrowing crayfish *Engaeus cymus* (Family Parastacidae) from at least the 1970's (DCT 1975):

'There is a good colony of land crayfishes at the old Blundell's Farm on Condor Creek, below Mount Coree, now recovered from the marked disturbance of its habitat brought about by the planting of pines. During wet periods they are known to move overland, and have been observed at the top of the range along the Two Sticks Road on the western boundary of the ACT on the slopes of Mount Coree. The mature specimens are distinctly red, even in life.'

This species was at one time distinguished as *Engaeus parvulus*, with 'Blundells, Condor Creek ACT' given as the type locality. It was also known from the Goodradigbee River and its tributaries (Riek 1969). In a later taxonomic review it was returned to *Engaeus cymus*, described on the basis of 14 males and 13 females from Condor Creek (Horwitz 1990).

This recombined species has one of the largest geographic ranges of all *Engaeus*, and is one of only three found above 1000m elevation. It exhibits considerable variation in some morphological characteristics, rarely attributable to geographic variation (Horwitz 1990).

Individual crayfish live in deep burrows that end in a lower water-holding chamber. Because it frequently constructs burrows some distance from permanent waters, it is considered to be a land crayfish, although some use swampy ground or tunnel in banks of small streams [the latter is the case at Blundells Flat]. Another unusual trait is that it lives in family communities, with a mature pair and offspring of two age groups. The juveniles leave the burrow at the end of two years to start their own burrow. These crayfishes continue to grow throughout their lifespan, and larger ones may be around 20 years old (DCT 1975).

While featured in a natural history of the ACT in 1975 (DCT 1975), and noted in later reports (NCDC 1984; NCPA 1989), this species appears to have received little

recognition in recent years. For example, it is noted in passing, but not described, in a recent field guide to freshwater animals of tablelands and high country of the ACT and NSW (Lintermans & Osborne 2002). Although a land crayfish, its habit of burrowing in stream banks at Condor Creek suggests that it has a place among the region's freshwater animals.

Apart from that at Blundells Flat, populations of the species are noted only at Piccadilly Circus and along Two Sticks Road (NCDC 1984). This suggests that the species is uncommon, if not rare, in the ACT. Seventeen other Australian *Engaeus* are listed as species of conservation significance, of which some are listed as threatened species (Yen & Butcher 1997) because of their limited distribution and their sensitivity to disturbances (e.g. PWS n.d.). There appears to be no listing for *Engaeus cymus*.

It is not known how the species was affected by the January 2003 wildfire in the ACT. It was not targeted by post-fire monitoring (Carey et al. 2003). All of its known locations were in severely burnt areas. Numerous burrow openings are visible in sections of Condor Creek, in lower parts of the bank. The extent to which these are active is uncertain, although they are likely to have been re-excavated since the fire.

Known from the ACT (but not recorded from Blundells Flat), the Burrowing Spiny Crayfish *Euastacus rieki* is another nocturnal forager which relies on a heath and shrub layer for cover. Post-fire monitoring of this species at Snowy Flats located remains of crayfish near burrows and in fox scats, indicating increased vulnerability of this species to predation after the fires (Carey et al. 2003).

No crayfish remains have been observed at Blundells Flat. This could mean that *Engaeus cymus* has not been subject to this sort of predation, or that much of the population did not survive the fires or subsequent habitat changes to become prey. Night observation may be needed to assess the status of this population.

Morabine grasshopper *Keyacris scurra*

Blundells Flat was at one time a site for the unusual morabine grasshopper *Keyacris scurra* (Family Eumastacidae). The Australian National Insect Collection at CSIRO lists a paratype collected at Condor Camp in October 1942 (K Key) and in April 1943 (K Key and L D Pryor). The next specimens noted came from Blundells Flat in May 1950, November 1953, June 1954, and August 1954 (all by M J D White). The nearest other sites noted were Paddys River [uncertain location] and Hall Cemetery (Rowell & Crawford 1995).

This wingless species is dependent on grassland and grassy woodland containing abundant Kangaroo Grass *Themeda australis* for 'shelter' and patches of the daisies *Chrysocephalum apiculatum* for food and *Chrysocephalum semipapposum* for both food and 'shelter' (these species were previously under *Helichrysum*). Other known food plants include native species *Scirpus* sp., *Acaena ovina*, *Plantago varia*, *Podolepis acuminata* and *Craspedia uniflora*; and introduced species *Acetosella vulgaris*, *Rosa rubiginosa*, *Lavandula stoechas*, *Salvia verbenacea* (Rowell & Crawford 1995). A number of these occur at Blundells Flat.

Unlike most grasshoppers, *Keyacris scurra* is a 'winter' species. Its eggs hatch in February, males are adult by May, and females over-winter as nymphs and mature in spring. Mating takes place in September-November, followed by egg-laying and the death of the adults. One generation is produced per year, with a maximum 21 eggs (under laboratory conditions) (Rowell & Crawford 1995).

Key could not locate the species at Blundells in 1992, nor was it found in any of the former localities in the area or in a *Themeda* area at Vanitys Crossing (Rowell & Crawford 1995). The original collection point at Blundells was a small patch of *Chrysocephalum semipapposum*, thought to have since been planted to pines (Mark Dunford pers. comm.)

CULTURAL HERITAGE VALUES

Cultural heritage values of the Blundells Flat area are derived from:

- evidence of use by Aboriginal people
- association with early exploration and development of economic routes
- association with settlement and notable families
- association with establishment and survey of the Federal Capital Territory
- arboreta, pine plantations and other plantings; and
- association with forestry activity, research, bush fire protection, and notable persons.

ABORIGINAL USE

The traditional Aboriginal owners of the area are the Ngunnawal. In the past, the local Aboriginal people have been referred to as the Kamberri or Kgamburry (Bluett 1954). The home territory of this group has been described as extending from Lake George (Weereewaa) and Gourcock Ranges in the east to the Goodradigbee River on the west, and from south of Yass to the headwaters of the Murrumbidgee (Jackson-Nakano 2001).

When the first European settlers arrived at Canberra, the Aboriginal population was estimated by Bluett at about 500, in bands of 20 to 30. His major informant on the Aboriginal people of the district was John Blundell, who had been fishing and possum hunting with native boys as a child in the 1840's and had learned to speak some of their language (Bluett 1954).

There are traces of past use of the Flat by Aboriginal people, with a large surface campsite recorded here (Flood 1980). Since the January 2003 wildfires a number of additional surface scatters of artefacts have been located in the area.

All Aboriginal places in the ACT are protected under the *Land (Planning and Environment) Act 1991*, providing for: registration of places; compulsory reporting of discovery of an unregistered place; consultation with Indigenous groups and other parties; offences relating to the damage or disturbance of a place; and possible restrictions on publication of information about the location or nature of

a place in accordance with Aboriginal tradition (Rawson 2003).

The Register of the National Estate notes that the Northern Brindabellas area has significant Indigenous values. However, the amount of information placed on public record will be determined after consultation with relevant Aboriginal communities (AHC 2003).

There are sensitivities in discussing and interpreting the cultural heritage of Aboriginal people from a non-Aboriginal perspective. The only previously published description of a site at Blundells Flat (Flood 1980) interpreted this as a montane valley camp associated with seasonal exploitation of Bogong Moths (*Agrotis infusa*) as a food source.

These moths make an unusual annual two-way migration. They breed across wide areas of NSW and southern Queensland and migrate in spring to early summer to higher elevations in southern NSW and Victoria. This may be related to seasonal domination of breeding grounds by plants unpalatable to the larvae, but may equally be a response to seasonal heat. The moths return northwards in late summer and early autumn, to begin their breeding cycle (Flood 1980).

Very large populations of the moths descend on the mountains of the ACT from September to November, occupying temporary 'camps' in the Brindabella Range before moving to higher altitude camps above 1,300m asl. In these temporary 'camps' the moths cluster among rocks of scree slopes and on the underside of logs, whereas permanent 'camps' are made generally in clefts and small caves in rocks on peaks. The moths mass in compact formations, tucked underneath each other and going without food for several weeks (Flood 1980).

Blundells Flat lies about 700 metres below Mount Coree, which is recorded as a regular temporary moth 'camp'. This is reached after a climb of about two hours from the Flat, and another surface campsite is noted about halfway to the summit (Flood 1980).

Bulls Head ('Brindabella Mountain' in Flood) is also noted as an occasional moth 'camp', as are the peak above Bendora arboretum (c.1,550m asl) and Mount Franklin (1,644m asl), further south along the Brindabella Range. Regular moth 'camps' are recorded at Mount Ginini (at nearly 1,800m asl) and Mount Gingera (about 1,850m asl) (Flood 1980).

Uriarra has been documented as the site of Aboriginal Bogong moth 'feasts' in the period following European settlement. The name of the property and district is Aboriginal in origin, recorded as 'Urayarra'. This spelling was retained for the Parish but rejected for the district by postal authorities because of potential confusion with another place (Gale 1927).

The McDonald family, who established the property, referred to a large flat rock out by the stables, known to Aboriginal people as Urayarra, meaning 'running to the feast'. Bogong moths were brought here and cooked on the rock which had been heated by fires built on it (Gale 1927).

Mount Coree is the closest moth 'camp' to Uriarra. There is an easy grade for access by foot between the two. From Uriarra to Condor Creek, the terrain rises only 50m to 650m asl over about 6km. A surface campsite is noted near Thompsons Corner where the route from Uriarra intersects with Condor Creek (Fraser 1988). The route alongside Condor Creek up to Blundells Flat similarly rises only about 70m in elevation over about 4km. A 10km walk involving a climb of only about 120m in elevation would be manageable for many people.

More challenging would be a two hour climb of 650 to 700 metres from Blundells Flat to Mount Coree, even via a reported intermediate campsite 300 to 400m above the Flat to the north. It is possible that a fairly steep spur south of the Flat was also used to gain elevation, rising about 300m to the site of Blundell Trig. Following the ridge westward to what is now called Piccadilly Circus gained another 200m elevation over about 4km.

Another surface campsite is recorded close to this point at Lees Springs (Flood 1980), which was the only reliable

source of water after leaving Blundells Flat (Gale 1903a), and lies below one of the lowest points in a 40km length of the range. Just 4km to the south, at a similar elevation, was an occasional moth 'camp' at Bulls Head (labelled 'Brindabella Mountain' in Flood (1980).

Whichever path was used, once the crest of the range was reached, several moth 'camps' were available.

Although opinions may differ on the relative importance of Bogong Moths to historic patterns of use of the landscape by Aboriginal people, there is ample evidence that moths were a seasonal food source exploited by Aboriginal people. This has inspired installation of large Bogong Moth sculptures between the National Museum of Australia and the Institute of Aboriginal & Torres Strait Islander Studies. And it is clear that Coree and Uriarra were associated with moth aestivation and consumption respectively.

The Blundells Flat Aboriginal site was considered notable for its extent and large number of artefacts, which suggested occupation by larger groups of people (Flood 1980). But the proximity of the Flat to more than one source of Bogong Moths may have been just a bonus. It is a rarely encountered environment, an upland wetland below the sub-alpine, sheltered in the lee of the Brindabella Range, of low relief among steep terrain, with an easy and well-watered grade connecting it to the Murrumbidgee and the plains beyond.

Relatively open flats with diverse vegetation and tall wet forest adjacent would have offered an abundance and variety of food sources throughout the year (Flood 1980).

Animals probably included kangaroos, wallabies, wombats, possums, parrots, waterbirds, reptiles, fish and crayfish. Plants probably made up most of the daily diet, including tubers of orchids, lilies, and yam daisy *Microseris scapigera*, bulrushes, fern roots, tree ferns, geranium, wattle seeds, and berries, supplemented by native bee honey collected from hollows in tree branches (ACT Government n.d.; Flood 1980; Fraser & McJannett 1991).

EARLY EXPLORATION AND DEVELOPMENT OF ROUTES

The first feature in the area to appear on an official map was what we now call Mount Coree. A recognisable landmark from several directions, it was referred to by Surveyor-General **Thomas Mitchell** as the peak of Pabral in 1829 (Andrews 1992). In 1834 Mitchell published the first map of the Colony of New South Wales compiled by trigonometrical survey. In the south-west, hachures showed Pabral as an isolated peak between the Murrumbidgee and Goodradigbee Rivers, beyond the Nineteen Counties and limits of settlement.

The earliest written description of what we now call Blundells Flat and its environs was in accounts of early exploration of the area by **Terence Aubrey Murray** of Yarralumla, which Murray had acquired in 1837 with Thomas Walker (Wilson 1968).

Murray's first land holding was near the north-west corner of Lake George where he quickly learned to speak fluently with the local Aborigines, a skill extended at Yarralumla (Wilson 1968). Both Murray and his friend **Stewart Mowle** formed close friendships with Aboriginal people and learned the language local to their properties and outstations (Jackson-Nakano 2001). This would have served them well in exploring the region.

Murray records that in 1838 he followed the bed of the Cotter and the steep, winding, narrow course of Condor Creek to the crest of the mountain range. He would have passed through the area now known as Blundells Flat and almost certainly followed the route taken for many generations by Aboriginal people. From the crest of what we now call the Brindabella Range (near Piccadilly Circus), Murray made the extremely steep descent to his outstation at 'Berindabella' on the Goodradigbee River, and then returned to Yarralumla (Wilson 1968).

On New Years Day 1839 Murray set out from Yarralumla to locate alpine pastures for his stock. His party headed to Brindabella, following 'the marked tree line' (Wilson 1968).

Again this would have led them along Condor Creek and through what is now Blundells Flat. They travelled up the Goodradigbee River to Cooleman, along the Fiery Range, down Mount Talbingo to the Tumut River, and back up again. Murray let his horses go at Cooleman, where he decided to establish an outstation, and set off on foot with local Aboriginal people heading for Uriarra (Wilson 1968), probably via Condor Creek.

Murray and Mowle went to the mountains again in April 1839 (Wilson 1968), probably following the same route as on their previous journeys. This is reinforced by a letter from Murray in November 1839 (among Mowle's papers) referring to the fact that he 'went up to Condore, Berindabella, Coolalamine with Lowe' (Jackson-Nakano 2001).

On 4 February 1841 Murray departed Yarralumla to travel to Melbourne on business. Murray records his route up the Cotter and up the course of Condor Creek, reaching the crest of the range after 9 or 10 hours in the saddle. They rested at Haunted Springs (later Lees Springs after one of Murray's overseers) and began the descent to Brindabella. After leaving the Goodradigbee River, they pushed on to Cooleman Plain, and down Long Plain to near Lobs Hole. Murray then proceeded to Mannus and Melbourne (Wilson 1968). This saved a few days on the route which had been opened in 1824 by Hume and Hovell (Jackson-Nakano 2001).

On 7 March 1841 (two days after the Census) Murray set out again, this time to climb the peak of Pabral. He records that they camped at Condor [now Blundells] Flat. On the next day the party reached the peak, and Murray wrote that he looked over the steep northern side:

'with a strong feeling of pleasure, which was excited by the thoughts suggested by the scene. Then for the first time the eye of civilized man looked upon the spot.'

The ascent took place three days before the foundation stone was to be laid for St John's Anglican Church on Canberry Plain (Wilson 1968).

Most of Murray's explorations probably included local Aboriginal people, although they appear to be mentioned specifically only for the journeys of January 1839 and March 1841 (Wilson 1968).

Having ascended Pabral peak, Murray was to go even higher, becoming a Member of the NSW Legislative Council in 1843; Member of the Legislative Assembly from 1856 (including Speaker 1860-62); and President of the Legislative Council 1863-73. He was knighted in 1869 and died in 1873 (Fletcher 1993).

Stewart Mowle had joined Murray at Yarralumla in 1838 (when he was about 16) and lived on related properties until moving to Eden in 1852 where he was Collector of Customs. He was in Sydney by 1857, becoming a Clerk in the Legislative Council after Murray became the President in 1863; he served also as Usher of the Black Rod (Fletcher 1993). Mowle was an active campaigner for Canberra as the site for the Federal Capital and lived to see his wish fulfilled when the Yass/Canberra area was selected (Knowles 1990). He died just two weeks later, on 20 Nov 1908 aged 88 (Fletcher 1993).

Five years before Canberra's selection and Mowle's death, journalist **John Gale** published a notable early 20th century account of the area, although part of this referred back to a journey undertaken in 1875 from the McDonald homestead at Urayarra (his preferred spelling) to Brindabella, in the company of others. Gale writes that after leaving Urayarra:

'we pursued our way through a tortuous glen, in the course of half a mile crossing a mountain stream four or five times...we wended our way along slippery sidelings, and through deep gullies, till another hour's ride brought us to the mountain homestead of Mr. John Blundell.'

The homestead lay at the foot of one of the spurs of Mount Coree (Gale 1903a).

The mountain stream with many crossings is almost certainly Condor Creek, the reach above Thompsons Corner long being referred to as Five Fords or Five Crossings.

Gale notes that after departing from the Blundell home, the road lay up a mountain

track, probably roughly along the line of the current access road to the un-named range and what is now Blundell Hill. He also notes that the track was

'originally cleared by Mr John McDonald [of Uriarra]...as the most direct route to Kiandra, in the days when the auri sacra fames ['cursed hunger for gold' - Virgil] of the Alpine regions and the Snowy River had reached its highest pitch' (Gale 1903a).

A travelling stock route was defined in 1887 along the un-named ridge from Condor Creek (west of Thompsons Corner) via Blundell Trig, to cross the Brindabella Range just north of what is now Piccadilly Circus. Parts of these routes would have been used in association with mining at the Brindabella alluvial gold workings which began in 1881 and continued intermittently until 1914, and at the Mount Blundell base metal prospect (lead-zinc-silver-gold) which operated in the late 1890's and again in the 1920's (Owen & Wyborn 1979).

This suggests repeated use of the original Aboriginal route between the plains and the mountains. It was adopted by Murray in the 1830's-40's and became a marked tree line; was cleared by McDonald for gold seekers in the 1860's; and was used by settlers, miners and other travellers into the final quarter of the 19th century.

This is reflected in dotted routes on early portion plans, county and parish maps, with subsequent editions marking the shift of increasing traffic to avoid a flood-prone creek in favour of a drier ridge-top, or to avoid passing too close to a farmhouse. For example, on the plan for portion 2 (1871) a route parallel to Condor Creek past the Blundell farmhouse is labelled 'track not used now'.

The current Brindabella Road uses bench-and-batter engineering to provide a more gentle grade than would have been the case in much of the 19th century. A number of lengths of earlier constructed routes are still visible, as are ridge-top routes now used as forest tracks.

EARLY SETTLEMENT

Through a series of legislative reforms in the 1860's ('the Robertson Land Acts'), extensive areas of land which had been the exclusive domain of wealthy squatters were made available to small settlers for selection.

The earliest map located for County Cowley (1871) shows one portion in Parish Tidbinbilla, situated at the end of a spur from Pabral (or Coree), and at the end of a dotted track from Uriarra. By the 1881 version, a second and larger portion was added but these small squares remained isolated in the mountains. Portion 1 (40 acres) was held by **John McDonald** of Uriarra. Portion 2 (100 acres) was the earliest holding of **John Blundell**, centred on the wetland. He later also had portion 3 (40 acres) and portion 5 (420 acres), the last dated 1886.

Blundell's selections were geographically separated from the rest of the Uriarra area, where his neighbours included Joseph Webb, William Webb and John McDonald, who between them held most of the land in Parish Urayarra, as well as Henry Phillips at Sherwood and David Perrott at Vanitys Crossing (Moore 1999).

John was the eldest of eleven children born to Joseph and Susan Blundell. He was born in 1843 at the Liverpool Plains in NSW but in December 1844 his sister Susan was born at 'Canbury' (Hawke). Joseph joined the Duntroon estate in 1845 as a stock handler and bullock driver. He had a cottage close to the boundary between Duntroon and Canberry station, known for a time as Blundells Hill, now Regatta Point (Knowles 1990).

How John Blundell came to select such a remote place is unclear. It is recorded that in his early years he had a lot to do with local Aboriginal children, fishing and hunting possums with them and learning some of their language (Bluett 1954). It is possible that Aboriginal people showed him the way to the area that he would later select. His childhood pursuits also seem to have equipped him with useful skills, as he became a noted bushman and was much sought after as a tourist guide (newspaper clipping, Tumut 1927).

By the time he made his selection, John had been married (in 1862 at St John's, Canberra) to **Sarah Ann McKenzie**. They were both 19 years old. Sarah was the eldest child born to Alexander and Elizabeth McKenzie, who were married at Lanyon in 1842. Alexander was the trusted house servant and 'Man Friday' to James Wright of Lanyon, while Elizabeth was engaged from 1841 as nurse to the two children of James Wright (Moore 1982).

After Wright left the district in 1856, Alexander McKenzie worked with George Campbell at Duntroon (Moore 1982). This brought Sarah into proximity with John Blundell. After their marriage they had seven daughters and four sons. The first two were born in Canberra, but by September 1866 the Blundells had moved to Condor, Uriarra, where the birth of their third child and those of eight subsequent children were registered (Hawke).

The plan for portion 2 (1871) shows Blundells Farm as a 'hut' on the eastern edge of the wetland. This is near the current picnic ground, where two heaps of debris have been supplemented with the rubbish of visitors. The piles contain rocks of limestone, which does not occur in this vicinity. These are not dressed stone, so are most likely to have been used as decoration such as in a garden. It is possible that the limestone may have been brought from Canberra, where the Blundell family first lived, or from the north-west near Nottingham (Limestone Creek), where some of John's sons later held land.

Increased ground visibility since the January 2003 wildfire revealed a wide spread of small items not far from the piles of debris, including pieces of iron (as of a bedstead), and fragments of decorated china and glass.

Another 'hut' is shown on portion 11, on a spur south-west of the junction of Musk and Condor Creeks. This portion was the earliest holding (1893) of **John Blundell jnr (Jack)**. This site has been extensively disturbed by pine planting and earthworks such as banks and excavations, and no traces of occupancy have been located.

L D Pryor did not recall seeing remains of a farmhouse or buildings during his visits to the Flat in the 1930's (Higgins 1995). However, there was at least one building remaining on the eastern side in 1955, when it fell victim to a clearing fire which burned through the Flat (Alan Brown *pers.comm.*). The adjacent orchard of apples, cherries and pears was visible until the 1980's, when it too was 'cleaned up' (Fraser & McJannett 1991).

Gale notes that John Blundell was supplementing his farm income with work as a carrier, which also involved his eldest son (Gale 1903a), making use of skills likely learned by all the Blundell boys from their father Joseph. Bullock and horse teams played key roles in transport in the district during the 19th century, with the railway not reaching Bungendore until 1885 and Queanbeyan until 1887 (Lea-Scarlett 1968). It would later be said of John Blundell that he '*could take a wagon where many others could not*' (newspaper clipping, Tumut 1927).

Gale also comments on the remoteness of the property. He records that on one of his journeys from Urayarra to the mountains the party included the Rev. P G Smith of St John's, who wished to make a pastoral call on the Blundell family at their 'solitary homestead'. He notes that Mrs Blundell and the children '*seldom saw or travelled beyond the circumscribed horizon which girts their home in the quiet and lonely glen*' (Gale 1903a).

The property was to remain remote for decades. A punt operated at Uriarra, at the junction of the Molonglo and Murrumbidgee from around 1858. It carried foot passengers, horses and drays en route to Kiandra through Brindabella, saving about 100km on the route via Cooma. Gale would have used this punt in 1875, but it apparently ceased for a time in the 1880's. A new punt was in place in 1890 but was wrecked in a flood, and re-launched in 1897 (Lea-Scarlett 1968).

There was no bridge over the Murrumbidgee until Tharwa Bridge was opened in 1894-5 (Lea-Scarlett 1968). The first low level bridge at Uriarra was opened (upstream of the Molonglo confluence) in 1901 by Mrs John

McDonald, a fitting choice since she had lived west of the Murrumbidgee since 1834. The road around the foot of Mount McDonald to the high level bridge at the Cotter pumping station was built in 1913 (Moore 1999).

The last birth to John and Sarah was registered in August 1884. Two months before this, John's brother Abraham had died at Weetangera where he was living with his wife **Phoebe Anna**, (née **Shumack**) the daughter of Richard and Anna Shumack, together with their four daughters (Hawke).

Although the circumstances are unclear, John Blundell appears to have fathered two sons and four daughters by his brother's widow. At some stage his wife Sarah left the Flat to go and live in Sydney, where she died in 1920 aged 77.

The first four children to John and Phoebe were born at Weetangera and the remaining two were born at Condor, the earliest in January 1899. John and Phoebe remained at Condor until at least April 1916, when the death occurred of a 17 year old daughter, the only child for whom John was registered as the father (Hawke).

From the 1890's John Blundell jr (Jack) had begun to hold portions next to those of his father below Mount Coree. His 320 acres brought the total holdings of Blundells at the Flat to 880 acres.

The family's view began to turn to the west shortly afterwards, when some of John's sons acquired land west of the Goodradigbee in the Nottingham Creek area, in 1902, 1903 and 1907. John jr (Jack) and Joseph between them held about 10,000 acres, south of High Cone and north of Limestone Creek (Parishes Wee Jasper & Clive, County Buccleuch).

In 1900 **Samuel Adolphus Shannon** officially took up portions 16 and 17 Parish Tidbinbilla (103 acres in total) on Condor Creek immediately downstream from John Blundell jr. In the year before he acquired his holding, Samuel had married **Martha Southwell**, born in 1878 at Yarralumla to Thomas Southwell and Mary Ann (née Cooper) (Fletcher 1993).

Their holding became known as Shannons Flat and the creek draining from Blundell Trig to join Condor Creek was for a time known as Shannons Creek (later Wombat Creek).

Samuel had been born in 1875, the eldest child of Abraham Shannon and Emily Kate (née Allen) (married 1872 at Cooma). Abraham in 1890 took up 'The Valley', 200 acres in Parish Urayarra (surrounded by, and later subsumed within, McDonald holdings). Abraham in turn was the son of Samuel, a pioneer of the Monaro district (Fletcher 1993).

It is not clear whether this is the same family for whom the Shannons Flat near Adaminaby is named.

In June 1913 all the land in the vicinity of Blundells Flat was acquired to become part of the Federal Capital Territory. Shortly after this, between 1915 and 1924, John Blundell sr secured 160 acres near Tumorrana and 160 acres near Wee Jasper (Parishes Tumorrana and Cowrajago, County Buccleuch).

The senior Blundells retired to 'Forest Lodge' at Tumorrana where John died in 1927 aged 84, although he was described as having died aged 90 (newspaper clipping, Tumut 1927).

Phoebe died aged 85 in 1943, a century after John and his first wife had been born. She was buried with John at Tumut, along with their son who had died in 1920 as a result of exposure to mustard gas during the First World War (Hawke).

Other Blundell names

Blundells Flat, Mount Blundell and Blundell Hill (and nearby Blundells Creek) are associated with John Blundell. Other locations in the region are named for related members of the family:

The best known is **Blundells Cottage**. This building was erected in 1858 by George Campbell of 'Duntroon' for his head ploughman William Ginn (National Trust 1982). He lived there until he moved to his own holding in 1874, at which point newlyweds George Blundell (brother of John) and Flora (née McLennan) took over the cottage (National Trust). They called it 'Poplar Grove', and five sons and four daughters were all born there, as were some grandchildren (Dept of Interior n.d.).

In 1927 when the first sitting of Parliament had taken place, descendants of pioneer families were among those invited to a reception held at Government House. The list included George Blundell (then aged 84), who had lived for half a century in the cottage across the river (Fitzgerald 1987).

Other commemorations of the name include **Blundell Street** and **Blundell Park** in Queanbeyan. These relate to the arm of the family from Joseph Blundell via Jacob (brother to John of the Flat and George of the cottage).

Jacob's son Richard (Dick or Galloping Dick) was born at 'The Oaks' in 1877. He was a well-known carrier who had worked with bullock teams in his youth, later horse teams, and in around 1918-20 purchased a Dennis truck with iron wheels and solid tyres. He recorded in 1910 that he had carried 'the first telephone line and the first building to the Federal Capital site'. He later moved to Wickerslack, south of Queanbeyan (Williams 1997). His granddaughter Heather Mackay (née Blundell) became a champion squash player (Cross & Sheedy 1983).

The home of his son (Richard or Dick jnr) and Mary (née Warner) still stands in Mountain Road, Oaks Estate, a sandstock brick house known as 'Alabama' (and later 'Cooee') built in 1912 to the same design as the house at 11 Blundell Street. (Williams 1997).

Local Aboriginal names

The origins of the name **Pabral** are not known. This name is today found in reference to Pabral Road, a forest track linking Blundells Flat with Two Sticks Road and Coree, and to Parish Pabral immediately to the north of Parish Coree, both in County Cowley.

Early portion and parish plans show that what is now Coree Creek was at one time alternatively called Pabral Mountain Creek. On some early maps, Condor Creek is drawn as a tributary of Musk Creek, which then flowed to Coree Creek, which in turn flowed to the Cotter River. Today Musk and Coree Creeks are tributaries of Condor Creek.

It is uncertain when or why Pabral peak came to be also called **Coree**. A gazetteer of 1848 (Wells 1970) lists only Pabral Peak, while both names are shown on early published maps e.g. the 1871 map for County Cowley. The dual naming appears to have ceased once the Federal Capital Territory was acquired, in favour of Coree, the name ascribed to the trig station gazetted in 1899. Gale refers only to Mount Coree (Gale 1903a).

Coree may be derived from 'cori', said to be a southern (Omeo) Aboriginal name for the moth called 'Bogong' by the Yass group. This attribution then goes on to refer to Aboriginal people exploiting '*the grubs of this moth*' as they hatch out in the mountains (Wilson 1968).

This is confused natural history – the moth is in its larval stages in northern NSW and Queensland, and flies to the mountains in its adult (sexually immature) stage. Such confusion has led some to disregard Wilson's attribution of the name Coree (e.g. Fraser & McJannett 1991).

However, even the learned John Gale referred to Aboriginal people feasting on '*the grubs (before they matured into the pupa stage)*' (Gale 1927). Although clearly incorrect as entomology, there is no doubt that Aboriginal people ate the moths. Similar confusion relating to the story of the name of the peak need not imply that the suggested Aboriginal origin is incorrect.

The name **Condor** is almost certainly of Aboriginal origin, but it appears as 'Condore' in a letter from Murray to Mowle in November 1839 referring to his travels 'to Condore, Berindabella, Coolalamine' (Jackson-Nakano 2001), and also as 'Condore Creek' on the plans for portions 5 (1886) and 16 (1900) Parish Tidbinbilla, and later parish plans and county maps.

Mowle records that 'Condore' should be pronounced 'Condhoware' (Jackson-Nakano 2001), while on an early plan for Parish Tidbinbilla (1885) portion 1 is labelled 'Corndoo Flat' (presumably an attempt at phonetics).

Gale (a stickler for orthography of Aboriginal names) uses this spelling in referring to 'Condore Creek' as a trout stream (Gale 1903b) and describing 'Mount Condore' in the view from Brindabella Mountain ('the highest peak over which our road lay' before their descent to Brindabella) (Gale 1903b). This is likely to refer to Mount Blundell or (less likely) to Devil's Peak.

He also says Lees Spring is 'the first water the traveller comes to after leaving Condore' (Gale 1903a) – this probably refers to the Flat, noting early reference to 'Corndoo Flat' and the Features Map of ?1915 which labels the spur east of Coree as 'main ridge to Condor Flats'.

The spelling appears to have altered to 'Condor' after responsibility for mapping this area moved to the Commonwealth in about 1913.

However, it should be noted that this same spelling was common in 19th century records such as birth/death records for Blundells, where it was probably phonetic. This continued into the 20th century - the residence of Joseph Blundell (son of John and Sarah) was recorded as 'Condor', Shaw Street, Yass (Procter 2001).

Additionally, transcription errors almost certainly play a role, with one reference to John Blundell having selected land at 'Condon', and living at 'Condon House' (newspaper clipping Tumut 1927).

ACQUISITION AND SURVEY OF THE FEDERAL TERRITORY

Following Federation of the Australian colonies in 1901, the decision to build the Federal capital at Yass/Canberra came in November 1908. The land was formally ceded by NSW in 1910, and Canberra was announced as the name for the capital in March 1913.

Three months after this latter event, lands in the vicinity of Coree were acquired as part of the Federal Capital Territory. This included holdings of J Blundell jr. (320 ac.) and J Blundell sr (560ac), W C McDonald (40 acres) and S A Shannon (103 acres), and an area north of these which was being grazed under licence by M & A J McDonald (2,352 acres) (ms - ACTPLA).

The Blundells appear to have moved from Condor shortly after the acquisition, situated as they were in the catchment of the first water supply dam at Cotter, completed in 1915. The 'Federal Territory Features Map' of c.1915 shows no improvements in the vicinity of the Flat.

The first part of the Territory border to be surveyed was the straight line from Coree to the Murrumbidgee River. While carrying out this survey in 1910, Surveyor Sheaffe was surprised to find that not all of the Cotter catchment was within the straight line boundary set by the *Seat of Government Acceptance Act*. He found a small stream running from left to right (probably the upper part of Musk Creek), and then came across the considerably larger Coree Creek (Higgins 1996).

Some maps were vague on detail around Coree and had suggested that Coree Creek was sourced on the east of that peak. If this had been correct, the straight line would have taken in all of the catchment of the city's water supply. However, as early as 1871 the map of County Cowley clearly shows this is in error, since Coree Creek has its origins some 4km to the north on the western and eastern flanks of Devils Peak, the western head passing through Coree Flat.

Because of this oversight, the part of the Cotter catchment lying outside the Territory was reserved from sale or occupancy in 1917. Surveyor Pulver was asked in 1926 to survey the line of the catchment from Coree to the straight line border, about 12 miles (20km) of mountain ridge. His gear was trucked to Uriarra station, and then carried by packhorse to higher elevations, where they set up their camp. Pulver's manuscript includes a photograph of him on the peak of Coree dated 1926 (Pulver 1981).

Pulver records that one night their cook went missing after trying to climb Coree. He was found the next day by Mr Blundell, who was bringing up their weekly supplies. Blundell also assisted the surveyors to bring their gear down from the mountains, along about 3 miles (5km) of rough track, dropping about 2,000 feet (600 metres) (Pulver 1981). This is likely to have been Norman Blundell who acquired the 'Brookvale' property north of Uriarra in the late 1920's, having previously leased it (Welch 1986).

After the survey, the Commonwealth acquired the area of 2,561 acres 1 rood 20 perches for Federal Capital Purposes, gazetted in October 1927 (Higgins 1996).

ACT border survey markers have been comprehensively recorded (Higgins 1996) but it is likely that most or all of the wooden markers on the western and north-western borders were destroyed in the January 2003 wildfire (Higgins 2003).

COMMERCIAL FORESTRY

Logging of **native forests** below Mount Coree is recorded in the 1940's and continuing until the early 1960's. This involved selective felling of mainly Brown Barrel *E. fastigata*, but also Alpine Ash *E. delegatensis*, Mountain Gum *E. dalrympleana* and Ribbon Gum *E. viminalis* in the area from Two Sticks Road in the north to about 10km south of Mount Coree. This was carried out by Colless Bros. (of Victoria), with the timber taken to the Colless mill at Weston Creek and the government mill at Kingston (Higgins 1995).

Commercial **softwood forestry** in the ACT grew out of the establishment of the Federal Capital at Canberra and an associated program of landscape enhancement by planting of trees, including conifers at Stromlo and Green Hills (RECG 1973).

By the 1920's trees were being used to control soil erosion in some areas. Pines were planted on slopes near the Cotter water supply reservoir where the combined effects of over-clearing, over-grazing and rabbits had accelerated erosion. This was completed by 1931 and encouraged further plantation establishment using conifers. By the 1930's *Pinus radiata* was clearly the most successful species, and plantations were begun at Kowen in 1927, Pierces Creek in 1932 and Uriarra in 1933. By 1940 more than 400ha per annum were being planted, although this slowed during World War II (RECG 1973).

Prior to the 1950's, most planting had been undertaken in dry forest types but this was later extended to wet forest types in the Cotter catchment. Concern at increased turbidity in the water supply due to forestry operations led to a cessation of new planting in the catchment on Pierces Creek Forest in 1958 and Uriarra Forest in 1961, and later plantings were concentrated on Stromlo and Kowen. As a result, by the end of 1972 about one third of the area planted to *Pinus radiata* was in the Cotter catchment (RECG 1973).

Williams, J. (n.d.) lists a number of camps housing forestry workers near Uriarra:

- **Blundell's Camp** - on Condor Creek; in use 1936
- **Uriarra** - 'approximately 40 yards off Condor Stream [*sic*]'; in use 1923 by men engaged in clearing and digging up rabbit burrows; later moved closer to Uriarra Homestead
- **Bullock Paddock Camp** - 'approximately one and half miles from Cotter River...near the Brindabella Road approximately one mile from the Uriarra Homestead and two point one miles from Conder River [*sic*] and edge of fall to Cotter River'; in use 1929 and 1932
- **Condor Creek** [also known as **Perret's Camp** so most likely on Perrott family land between Thompsons Corner and Vanitys Crossing] - in use 1927, 1929, 1932; moved June 1932 'to the right side [?] of the Brindabella Road'.

It is unclear whether the last relates to **Condor Hut** (or **Condor Camp**), recorded as being used as a forestry camp in the early 1930s and for immigrants in the later 1940s (Mortlock & Hueneke 1979). This was destroyed by the January 2003 fire.

Williams' list does not include **Blue Range Camp** east of Mount Blundell, established in 1943 to house Italian men during World War II. These 'persons of enemy origin' were required to engage in forestry operations that would otherwise have been starved of 'manpower' (Fraser & McJannett 1991). The former galley remaining from this period survived the January 2003 wildfire and this area is the subject of a separate study.

Australian Archives has an image of tents and huts at 'Forestry Camp, **Mount Coree**' dated October 1927 (Sam McKay *pers.comm.*), but the location is uncertain. It does not seem to be **Peter's Camp**, located in a saddle on the range about halfway between Coree and Piccadilly Circus (L D Pryor in Higgins 1995).

FORESTRY RESEARCH AND EDUCATION

The Australian Forestry School was formally created in 1925 by Federal legislation and opened in Adelaide the following year. It moved in 1927 to temporary premises in Yarralumla (then called Westridge). The first director chose to stay in Adelaide, and was succeeded by C E (Charles Edward) Lane-Poole, who was encouraged to move to Canberra by erection of a substantial residence next to the school (Gibbney 1988).

Lane-Poole served as Principal of the Australian Forestry School from 1927 to 1944, being succeeded by M R (Max) Jacobs from 1945 to 1959. The school transferred to ANU in 1965 (Carron 2000).

Lane-Poole was also appointed Forest Advisor to the Commonwealth in 1925, and Inspector-General of Forests in the Commonwealth Forestry Bureau from 1927 to 1945, (ACT Government 1992).

One of the functions of the Bureau was to establish experimental stations for the study of silviculture, forest management and forest protection (Carron 1985).

To this end, 34 arboreta were established in and near the ACT in the period 1928 to 1969, to test various species for possible introduction into Australia for timber production, to reduce imports of timber, particularly softwood. Most of the species planted were conifers and most were sited to the west and south-west of Canberra on the Brindabella Range at elevations ranging from 640 to 1,700 metres asl. The higher elevations were tested because it was felt that lowland areas would not be available for forestry or would be less suitable climatically.

Although these arboreta demonstrated the clear superiority of *Pinus radiata*, this species had already been planted widely since the 19th century. There was concern, however, that a high degree of dependence on one species made the emerging softwood industry vulnerable to a pest or disease which could affect that species. It was prudent to seek alternative species, and the arboreta were part of such an 'insurance policy' (Turnbull in Higgins 1995).

C E Lane-Poole was the driving force behind these arboreta (Fielding in Higgins 1995). The first rural arboretum was established at Laurel Camp in 1928 (Chapman & Varcoe 1984), but this was a rather poor site based on granite (Pryor in Higgins 1995). The next to be established was at Blundells Flat, 6.1ha in area.

It is variously referred to as 'Blundell's Flat Arboretum' (National Trust 1982), 'Coree (Blundell) Arboretum' (Forestry & Timber Bureau), 'Blundell Farm Arboretum' (Chapman & Varcoe 1984) or 'Condor Farm Arboretum' (NCPA 1989), but most commonly as 'Blundells'.

By the time the arboreta were numbered, Laurel Camp had slipped to No.17 and Blundells became No.1. It remained as the largest and most diverse of the arboreta to be established by the Bureau.

The first plots were planted there in 1929, with much of the work carried out by students from the newly established Australian Forestry School (Fielding; Hamilton; Pryor in Higgins 1995). Many of the original plots were destroyed in a wildfire in January 1939 (Turnbull in Higgins 1995), and were subsequently replanted, mostly with different species.

At February 2000, the arboretum was said to contain 76 species from 18 different genera, in 97 plots. Some of the conifers were rare, uncommon or unusual in Australia. These included two pines from China (*Pinus tabulaeformis* and *P. massoniana*), Atlantic cedar (*Cedrus libani* var. *atlantica*) and incense cedar (*Calocedrus decurrens*), spruces (*Picea* sp.) and Spanish fir (*Abies pinsapo*), several white pines from North America and the Himalayas, Lawson's cypress (*Chamaecyparis lawsoniana*), Durango pine (*Pinus durangensis*), scots pine (*Pinus sylvestris*), juniper (*Juniperus communis*), several hybrids bred by the world's leading forest geneticists of the time, some Mexican species and black pine (*Pinus nigra*) from different provenances. One plot was re-planted with Tasmanian blue gum (*Eucalyptus globulus*) (Fearnside 2002).

From 1955, the arboretum was extended to the east with other experimental plantings of conifers, as well as some pinoak *Quercus palustris*, a claret ash *Fraxinus oxycarpa* variety and some poplar and aspen *Populus* varieties. From 1958, trial plantings of a few conifer species were established on the eastern side of Condor Creek (Forestry & Timber Bureau n.d.), presumably to test their performance in a wetter site.

Also established at this time was an arboretum dedicated to poplars, about 70m square. The south-eastern half was planted in 1959, and the remainder by 1963. Sources of material include the USA, Canada, New Zealand, UK, South Africa and local cultivars (Forestry & Timber Bureau n.d.).

These poplars were trialled by L D Pryor as part of an extensive research program to improve availability of matchsticks (splints). Associated with this research, plantations were established near Tumut, in northern NSW, and in northern Victoria (John Banks *pers.comm.*).

Demand for match splints (and consequently funds for research) waned over later decades, which may help to explain why this trial has tended to receive less attention than the conifer arboretum.

Potential new niche markets for poplar timber as veneer are emerging, and varieties established at Blundells Flat may yet prove to be of economic value. Fortunately, material from the best performing clones was gathered in the 1990's, and grown on at the ANU. However, an alternative site will soon be required (John Banks *pers.comm.*).

Facilities were established at the arboretum to assist interpretation and education. Plots were labelled, and a marked trail led through the arboretum and by a footbridge over Condor Creek to the site of Blundell's farmhouse and the picnic area (Fearnside 2002).

A detailed draft citation was prepared for entry on the ACT interim Heritage Register of Blundells Arboretum plots 1-82, 101-106 and 117-122 (Fearnside 2002).

Dating from a later period again, and more related to education than research, a sign on site records a planting of eucalypts undertaken north of the picnic area, by ACT Forests with students of Uriarra Primary School.

This was a natural choice for a 'planting partner'. First located on 'Uriarra', north of the homestead, the school existed sporadically from 1897 to 1936. After its move to the Uriarra Forestry Settlement in 1937 it became intimately linked with ACT forestry, and had numerous Blundell descendants on its rolls. It became a public school in 1940 (Welch 1986).

The planting commemorates a school which no longer exists in its own right, having been amalgamated with Weston to form Weston Creek Primary School at the end of 2000 (Dave Jamieson *pers.comm.*).

As a result of the January 2003 wildfire:

- all *Pinus radiata* in the pine plantations were killed
- most trees in the conifer arboretum were killed, although *P. canariensis* and two other species were observed to be re-sprouting from the trunk and numerous seedlings were germinated following the fire
- all trees in the poplar arboretum were killed, but numerous suckers have arisen following the fire
- eucalypts planted by Uriarra Primary School students have sprouted from lignotubers
- fence posts associated with the pine arboretum are gone, although some associated with the poplar arboretum survived (with wire largely intact); and
- facilities for interpretation and visitor management were destroyed or rendered unsafe, including log barriers, the footbridge over Condor Creek, picnic tables, and interpretive signs in arboretum plots.

Increased ground visibility for a time enabled location of some traces associated with forestry research use, such as remains of rabbit proof fencing and terra cotta potsherds.

BUSH FIRE PROTECTION

As commercial forestry activity and forestry research increased in the lower Cotter area, greater attention turned to protection of assets from fire.

Documented fire history (RECG 1973) shows repeated burning of this area by wildfire in the first half of the 20th century. This included at least the following (areas cited are within Cotter catchment):

- 1906 – Coree Flats to ‘Mountain View’, with 700ha burnt
- 1915 – Devils Peak gorge to north-east Uriarra, with 850ha burnt
- 1917 – from Coree Flats to Uriarra Forest via Mt Blundell, 450ha burnt
- 1918 – Mount Coree to Bulgar Creek, with 2,600ha burnt
- 1926 - three large fires in the Cotter, including Condor Creek, the Coree area and the Bulls Head –Tidbinbilla area, with 25,000ha burnt (due to careless use of fire)
- 1929 - Mount Coree via Blue Range to Swamp Creek, north of catchment; and
- 1939 - three fires in extreme weather, spotting up to 24km, with about 14,000ha of bush and 1,200ha of pine plantation burnt (careless use of fire).

This records that Blundells Flat was burnt by wildfire on at least three occasions following the departure of the Blundell family from the area - in 1918, 1926 and 1939.

Note that this record is much more detailed than that included in Carey et al (2003) which might suggest that the area has not experienced a major fire since 1920, with particular variance evident in the mapped extent of the 1926 fires.

Following the extensive 1939 wildfires, measures were taken by the Commonwealth to provide greater protection for the Cotter catchment and associated pine plantations from fires entering the Territory from NSW. Some of these had been recommended following fires in 1920 and 1926, but had not been implemented.

The response after the 1939 fires included:

- formation of the Bush Fire Council (August 1939) to coordinate resources
- improved vehicle access
- construction of water storage dams
- a program of control burning
- grazing in pine plantations
- construction of fire lookouts
- cooperation with NSW fire authorities to stop fires before they entered the Territory; and
- leasing of a large area in NSW adjoining the border for systematic control burning.

(RECG 1973).

The lease for bush fire protection was not effected until 1944, but the other measures appear to have commenced prior to this. Forest rangers Maxwell and Oldfield were based at Bulls Head from 1939 to about 1950, carrying out fuel reduction across the area and watching for fires from lookouts established in trees on the Brindabella Range.

Few tangible traces remain of this period. The fire lookout trees have not survived and only one of the huts used by forestry rangers in the bush fire lease area remains. The closest hut to Blundells Flat was **Coree Hut**, just north of Coree Flats in NSW, originally built in about 1945 for the use of forestry rangers. It was later renewed as a weatherboard hut, removed in the 1980's following vandalism.

Bag Range Hut, further to the north, was also used by rangers as a fire lookout (Maxwell in Higgins 1995), and still stands.

From about the 1970's a system of fire towers was established in the ACT, at Mount Coree, Mount Tennent near Tharwa, and Kowen to the east, supplemented later by Mount Stromlo and Mount McDonald. While these were focused on forest protection, a new tower was established in 1994 on One Tree Hill near Hall to monitor the rural-urban interface and areas north-west of the Territory. The Coree tower was destroyed in the January 2003 wildfire, but has since been rebuilt.

ASSESSMENT OF HERITAGE SIGNIFICANCE

Although still recovering from the January 2003 wildfire, Blundells Flat and environs exhibits a wide range of values:

Natural heritage

- The area has high aesthetic value derived from its landform diversity, setting enclosed by hills, reliable water in a complex stream, and proximity to valleys, cliffs and waterfalls, which have long been used for nature-based recreation from Canberra.
- Its diverse vegetation types include:
 - a complex wetland area with extensive ecotones (this and all nearby wetlands affected by fire)
 - significant areas of native grassland in open areas flanking the wetland
 - between the Flat and Mount Coree, a large stand of *Eucalyptus fastigata* Brown Barrel near the limit of its range (nearby stands affected by fire)
 - upstream of the wetland, a wet gully with ferns uncommon in the ACT (this and all nearby wet gullies affected by fire).
- It has in the recent past supported the locally rare *Eucalyptus camphora* Mountain Swamp Gum (all nearby localities affected by fire) and offers potential habitat for this species.
- It has in the recent past supported the threatened *Pseudophryne pengilleyi* Northern Corroboree Frog (severely impacted by fire), and offers potential (although marginal) habitat.
- It appears to support an extant population of the unusual burrowing land crayfish *Engaeus cymus* which is uncommon in the ACT (all nearby habitat affected by fire).
- It has in the past supported the uncommon morabine grasshopper *Keyacris scurra*, although potential habitat may no longer be extant; and
- It plays a role in regulating water yield and quality in the upper reaches of an increasingly important sub-catchment of the Lower Cotter water supply.

Cultural heritage

- The area contains significant Aboriginal sites that may assist our understanding of past use of the landscape, including (but not confined to) association with Bogong moth exploitation on the Brindabella Range and moth consumption at Uriarra.
 - It has association with Aboriginal people guiding settlers to resources and routes, and subsequent layers of historic use of these routes, particularly from Uriarra and Yarralumla to Brindabella and Cooleman.
 - It has association with early settler families (Blundell; McKenzie; Shumack; McDonald), and in turn with pioneer landholders of Canberra (Campbell at Duntroon; Davis & Wright at Lanyon; Murray at Yarralumla); some of these families were associated in turn with to development of mountain pastures and outstations.
 - It has association with 19th century accounts of travel in mountains west of Canberra (Murray; Mowle; Gale).
 - It has association with establishment of the Federal Capital Territory, relating to water catchment (Cotter) and border survey (Sheaffe; Pulver); and
 - It has significant value for forestry heritage, including remains of the largest and most diverse arboretum established by the Commonwealth Forestry Bureau. It also has association with: planting trials of softwood species (conifers and poplars); development of an Australian and local softwood industry; notable foresters (e.g. Lane-Poole; Pryor) and noted international plant breeders and geneticists; and the Australian Forestry School following its move to Canberra.
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KNOWLEDGE GAPS

Values	Potential sources/approaches
Natural heritage	
Detailed vegetation record of the wetland and larger Flat, including native grassland areas	<ul style="list-style-type: none"> ▪ Search herbarium records - Australian National Botanic Gardens ▪ Seek grant to document and monitor post-fire vegetation at Blundells; liaise with Environment ACT, ANU (SRES) and ANBG
Presence or otherwise of peat or other organic deposits which may offer evidence of environmental change	<ul style="list-style-type: none"> ▪ Explore likelihood/feasibility with ANU (SRES) - possible postgraduate study
Significance of wetland in relation to those at higher and lower elevations in the region	<ul style="list-style-type: none"> ▪ Carry out review in liaison with Environment ACT and NSW 'National Parks' - possibly involving ANU or University of Canberra
Post-fire response of <i>Eucalyptus camphora</i> Mountain Swamp Gum at Blundells Flat and other known sites (Shannons Flat, Coree Flats and Dingo Dell Flats)	<ul style="list-style-type: none"> ▪ Target species in post-fire vegetation monitoring at Blundells Flat ▪ Liaise with Environment ACT and NSW NPWS to monitor known sites
Possible source of local provenance seed for <i>Eucalyptus camphora</i> to enable reintroduction to Blundells Flat	<ul style="list-style-type: none"> ▪ Liaise with Australian National Botanic Gardens, Environment ACT and NSW 'National Parks'
More detailed fauna inventory of the wetland and larger Flat	<ul style="list-style-type: none"> ▪ Seek grant to document and monitor post-fire fauna at Blundells; with community groups eg COG for birds, FrogWatch ▪ Liaise with Environment ACT, CSIRO on existing data and post-fire documentation
Post-fire status of <i>Pseudophryne pengilleyi</i> Northern Corroboree Frog at Blundells Flat	<ul style="list-style-type: none"> ▪ Liaise with University of Canberra and Environment ACT on existing data and post-fire documentation
Post-fire status of <i>Engaeus cymus</i> at Blundells Flat	<ul style="list-style-type: none"> ▪ Liaise with Environment ACT on existing data and post-fire documentation
Cultural heritage	
Significance of the Blundells Flat-Coree area to local Aboriginal people	<ul style="list-style-type: none"> ▪ Liaise with local Aboriginal people through ACT Heritage Unit
Views of local Aboriginal people on publication of information on cultural sites	<ul style="list-style-type: none"> ▪ Liaise with local Aboriginal people through ACT Heritage Unit
Improved detail on farming practice and landscape management by Blundells	<ul style="list-style-type: none"> ▪ Compile further information from all known maps and photographic sources
Precise location of the second Blundell farmhouse	<ul style="list-style-type: none"> ▪ Re-visit site and check for traces
Presence of useful material from the Blundell Farm period	<ul style="list-style-type: none"> ▪ Liaise with ACT Heritage Unit on possible salvage/collection (possibly with Canberra Archaeological Society) from homestead sites
Appropriate form of restoration/retention of pine and poplar arboreta [not in this study]	<ul style="list-style-type: none"> ▪ Liaise with ANU (SRES), CSIRO ▪ Consider salvage of poplar clones from ANU

HISTORIC THEMES

The Australian Historic Themes Framework has been developed by the Australian Heritage Commission as a tool to assist in:

- emphasising historical processes and connections in assessing places
- emphasising historical values of places rather than a fabric based assessment
- structuring research and preparing interpretive texts
- explaining how particular elements of a place are significant because of their ability to illustrate important aspects of its history.

In particular, themes assist building of storylines on layers of history, some of which may no longer be evident in the places themselves. Some relevant themes for Blundells Flat include:

Peopling Australia	
Living as Australia's earliest inhabitants Adapting to diverse environments	Evidence of use by Indigenous people for camping Association with harvesting of Bogong moths, linked to 'moth feasts' at Uriarra Association of local Aboriginal people showing pathways to European settlers
Promoting settlement	Name association with early families (Blundell, McKenzie, Shumack), in turn with notable landholders (Campbell of Duntroon, Davis & Wright of Lanyon) Noted in early recorded journeys of exploration and trade (Murray and Mowle)
Developing local, regional and national economies	
Surveying the continent Looking for overland stock routes Prospecting for precious metals Looking for land with agricultural potential Laying out boundaries	Association with Coree (Pabral) and Mitchell map 1834 Associations with development of routes from Uriarra/Yarralumla to Brindabella and mountain outstations (e.g. Cooleman) Associations with goldseeker routes to Kiandra 1860s and Brindabella 1880s-90s
Utilising natural resources Mining Making forests into a saleable resource	Base metal prospect at Mt Blundell (1890s; 1920s) Hardwood logging (1940s to 60s) Commonwealth Forestry – first upland arboretum and most diverse; association with pine production trials (Forestry & Timber Bureau) and poplar clone trials; association with choice of <i>P. radiata</i> ; association with notable foresters (e.g. Lane-Poole, Pryor)
Establishing communications Establishing postal services	Association with mail route Uriarra to Brindabella (and from Queanbeyan via Uriarra punt)
Moving goods and people Moving goods and people on land Building and maintaining roads	Blundell family notable in district as carriers through several generations Successive changes to grade/route of Brindabella Rd
Struggling with remoteness, hardship and failure Dealing with hazards and disasters	Noted in descriptions 1875 (Gale) for remoteness as a place to live, including pastoral visits (P G Smith) History of bushfire up to January 2003
Altering the environment	Protection of Condor Creek as part of Cotter catchment
Educating	
Establishing schools Training people for the workplace	Association with Australian Forestry School late 1920s Use of arboreta for forestry education
Governing	
Federating Australia	Federal Territory border survey (Sheaffe; Pulver)
Developing Australia's cultural life	
Organising recreation Enjoying the natural environment	Early bushwalking and rock climbing from Canberra Established pattern of nature-based recreation, continuing to diversify

MANAGEMENT ISSUES

THREATENING PROCESSES AND CURRENT CONDITION

Threats to the values of the Blundells Flat area are considered below in relation to:

- Wildfire (January 2003 specifically)
- Fire management – past practice (inferred only)
- Weeds
- Erosion
- Feral animals; and
- Vandalism and rubbish (arising from uncontrolled or unsupervised access)

Potentially threats in post-fire clean-up and re-establishment are addressed within Recommendations.

Relevant references relating to threats include:

- ACT Government 1997 (Corroboree frog)
- ACT Government 2003d (catchment)
- Carey et al 2003 (plants and animals)
- FACTA 2003 (weeds and native regeneration)
- Fearnside & Wells 2003 (arboreta)
- Higgins 2003 (cultural heritage)
- Lintermans & Osborne 2002 (freshwater animals)
- NCPA 1989 (natural and cultural heritage)
- PWS [Parks and Wildlife Service, Tasmania] n.d. (burrowing crayfish)
- Rowell & Crawford 1995 (*Keyacris scurra*)
- Wallis, Argue & Pearson 2003 (cultural heritage)

Values	Threats	Current Condition (Oct-Nov 2003)
Aesthetic	Wildfire	<ul style="list-style-type: none"> ▪ Whole area affected by Jan 03 fires. ▪ Increased visibility of landscape features a positive ▪ Blackened vegetation, damaged signs, structures and facilities a negative
	Weeds	<ul style="list-style-type: none"> ▪ Removal of canopy by fire encouraging growth of weeds, esp. blackberry, thistles, St Johns Wort
	Erosion	<ul style="list-style-type: none"> ▪ Active slope erosion conspicuous in places
	Vandalism and rubbish	<ul style="list-style-type: none"> ▪ Dumped cars and other rubbish evident and increasing
Catchment	Wildfire	<ul style="list-style-type: none"> ▪ Riparian and slope soils denuded and prone to transport ▪ Water yield likely to increase for some years, with increased stream flow ▪ Water retention in wetland reduced for a time
	Erosion	<ul style="list-style-type: none"> ▪ Active erosion from denuded slopes, roads and illegal tracks filling drains and entering wetland ▪ Increased stream flow actively undercutting banks and cutting off meanders, transporting riparian soil ▪ Significant woody debris obstructing stream, slowing flow but increasing bank undercutting
	Feral animals	<ul style="list-style-type: none"> ▪ No damage to soil surfaces from these evident; potential disturbance e.g. pigs
	Vandalism and rubbish	<ul style="list-style-type: none"> ▪ Dumped cars and other rubbish in wetland and stream bed

Values	Threats	Current Condition (Oct-Nov 2003)
Ecological		
Wetland community	Wildfire	<ul style="list-style-type: none"> ▪ Vegetation cover reduced for a time by burning ▪ Burning of <i>Sphagnum</i> areas and forest/woodland cover reduces Corroboree Frog habitat ▪ Significant vegetation recovery (but may not include all species and at different rates) ▪ Increased water yield likely to expand potential Corroboree Frog habitat in shallow soaks for a time
	Fire management	<ul style="list-style-type: none"> ▪ Past burning may have altered vegetation structure and diversity (this is uncertain)
	Weeds	<ul style="list-style-type: none"> ▪ Significant weed growth including mints, docks, willows, blackberry
	Erosion	<ul style="list-style-type: none"> ▪ Siltation due to erosion from slopes, roads & tracks ▪ Sediment load may increase stream velocity/incision and may lower water level in wetland areas
	Feral animals	<ul style="list-style-type: none"> ▪ No impacts evident; potential disturbance e.g. pig rootings, horses
<i>Pseudophryne pengilleyi</i> Northern Corroboree Frog	Wildfire	<ul style="list-style-type: none"> ▪ May no longer be extant in the area ▪ Likely high direct mortality ▪ Fire during 2003 breeding season, reduced recruitment to population ▪ Reduced over-winter survival due to loss of woodland ground cover adjacent to bogs ▪ Damage to bogs, reduced breeding sites ▪ Increased water yield may expand habitat in shallow soaks for some years
	Fire management	<ul style="list-style-type: none"> ▪ Past burning may have reduced habitat e.g. <i>Sphagnum</i> areas, forest/woodland cover
	Weeds	<ul style="list-style-type: none"> ▪ Vulnerable to pesticides & herbicides in catchment
	Erosion	<ul style="list-style-type: none"> ▪ Some shallow areas (potential Corroboree frog habitat) may be adversely affected by infilling
	Feral animals	<ul style="list-style-type: none"> ▪ No impacts evident; potential disturbance to wet habitat e.g. pig rootings, horses
Other frogs	Wildfire	<ul style="list-style-type: none"> ▪ Likely high direct mortality ▪ Most ground cover (logs, leaf litter) removed ▪ Vulnerable in short term to reduced food (small invertebrates) and shelter, increased predation, loss of breeding habitat ▪ Increased water yield may expand habitat in shallow soaks for some years
	Fire management	<ul style="list-style-type: none"> ▪ Past burning may have reduced shelter, food and breeding habitat
	Weeds	<ul style="list-style-type: none"> ▪ Vulnerable to pesticides and herbicides
	Erosion	<ul style="list-style-type: none"> ▪ Some potential habitat may be adversely affected by infilling
	Feral animals	<ul style="list-style-type: none"> ▪ No impacts evident; potential disturbance to wet habitat e.g. pig rootings, horses

Values	Threats	Current Condition (Oct-Nov 2003)
<i>Engaeus cymus</i> burrowing crayfish	Wildfire	<ul style="list-style-type: none"> Impacts on populations of reduced vegetation cover for shelter and food not known; very susceptible to alteration of environment during mating, moulting, nurturing young and at times when on the surface; susceptible to changes in water quality/quantity
	Fire management	<ul style="list-style-type: none"> Past burning impacts on populations of reduced shelter and plant foods not known
	Erosion	<ul style="list-style-type: none"> Impacts on populations of bank undercutting not known; susceptible to degraded bank integrity and increased erosion; sediment may fill spaces between rocks and pebbles on the stream bed, removing shelter and refuges
	Feral animals	<ul style="list-style-type: none"> No impacts evident; potential predation e.g. foxes; nocturnal forager that cannot move rapidly in terrestrial environments, becomes easy target
<i>Keyacris scurra</i> morabine grasshopper	Wildfire	<ul style="list-style-type: none"> May have removed any remaining habitat; adults would have still been active at time of fire, with limited mobility; some native grassland areas regenerating strongly
	Fire management	<ul style="list-style-type: none"> Past burning may have removed habitat; vulnerable to fire at most times of year; very sensitive to changes in native vegetation structure; limited ability to recolonise due to limited mobility and fragmentation
	Weeds	<ul style="list-style-type: none"> May have dominated habitat or may inhibit regeneration; control needed with great care
	Feral animals	<ul style="list-style-type: none"> No impacts evident; potential disturbance e.g. pigs or horses; very sensitive to changes in native vegetation structure from physical damage
Tall wet forest and wet gullies	Wildfire	<ul style="list-style-type: none"> Extensive removal of understorey and ground cover Extensive death of standing timber; many stags & branches falling; in time may expand hollows for arboreal mammals & habitat for ground dwellers Extensive lignotuber or epicormic regrowth and seedling regeneration
	Vandalism and rubbish	<ul style="list-style-type: none"> No impacts evident; potential for illegal collection of ferns from wet gullies
Fringing woodland (including Mountain Swamp Gum <i>E. camphora</i>)	Wildfire	<ul style="list-style-type: none"> Extensive death of standing timber, many stags and branches falling; affecting stream dynamic Extensive lignotuber or epicormic regrowth and seedling regeneration <i>E. camphora</i> may no longer be viable in the area
	Fire management	<ul style="list-style-type: none"> Past burning may have caused retreat of <i>E. camphora</i> from Flat to downstream Condor Ck
	Weeds	<ul style="list-style-type: none"> Significant weed growth including willows and blackberry may out-compete regeneration
	Erosion	<ul style="list-style-type: none"> Undercutting of banks and slumping may cause fringing trees to collapse into stream course

Values	Threats	Current Condition (Oct-Nov 2003)
Historic		
Aboriginal sites	Erosion	<ul style="list-style-type: none"> ▪ Removal of surface layers post-fire (evident from soil pedestals under stones); increased exposure
	Feral animals	<ul style="list-style-type: none"> ▪ No impacts from these evident; potential disturbance e.g. pigs
Historic Routes	Weeds	<ul style="list-style-type: none"> ▪ Extensive growth of blackberry likely to inhibit access in some areas
Former farm sites	Vandalism and rubbish	<ul style="list-style-type: none"> ▪ Dumped cars and rubbish evident ▪ Dozer heaps from past 'clean-up' attract rubbish
Pine and poplar arboreta	Wildfire	<ul style="list-style-type: none"> ▪ Most trees killed; seedling and sucker regeneration ▪ Interpretive signs, barriers and bridge destroyed ▪ Removal of ground cover exposed artefacts e.g. terra cotta potsherds, bottles
	Weeds	<ul style="list-style-type: none"> ▪ Significant weed growth including blackberry
Pine plantation	Wildfire	<ul style="list-style-type: none"> ▪ All trees killed; seedling regeneration
	Weeds	<ul style="list-style-type: none"> ▪ Significant weed growth including blackberry
Native plantings (Uriarra Primary)	Wildfire	<ul style="list-style-type: none"> ▪ Extensive death of standing timber (still young) ▪ Extensive lignotuber or epicormic regrowth
Education	Wildfire	<ul style="list-style-type: none"> ▪ Interpretive signs, barriers and footbridge destroyed
	Vandalism and rubbish	<ul style="list-style-type: none"> ▪ Dumped cars and rubbish evident in public use areas
Recreation	Wildfire	<ul style="list-style-type: none"> ▪ Signs, barriers and footbridge destroyed
	Weeds	<ul style="list-style-type: none"> ▪ Extensive growth of blackberry likely to inhibit access to some areas
	Vandalism and rubbish	<ul style="list-style-type: none"> ▪ Dumped cars and rubbish evident in public use areas ▪ Uncontrolled access leading to erosion

SOME CURRENT TRENDS AND EMERGING ISSUES

ACT Non-Urban Study

The ACT Government undertook a study of future uses of non-urban areas following the January 2003 wildfire. The draft report (ACT Government 2003a):

- recommends that former (burnt) pine areas adjacent to Namadgi National Park but not essential for maintaining viability of the commercial softwood industry be considered for revegetation with native species and incorporation into the reserve system [p.43]
- notes the high landscape values of the eastern face of the Blue Range within the ACT Forests estate [p.132]
- notes the need for a manageable interface between pines and native forests [p.136]
- notes that the National Capital Plan contains special requirements for Namadgi National Park and Adjacent Areas, with the key objective to protect the resources and environmental qualities of the Park and adjacent areas of the Cotter Catchment in the interests of water supply and nature conservation, with plantation timber production, recreation and scientific study as secondary objectives [p.152-3]; and
- notes that there may be scope to refine the boundaries of Namadgi National Park in some locations and that the upgrading of the Brindabella Road as a link to Tumut is a long-term prospect that could improve recreational access into the Brindabellas [p.153].

Public comment was sought on the draft report. Some submissions included suggestions that Blundells Flat and Condor Creek upstream of Thompsons Corner be added to Namadgi National Park (ACT Government 2003b). This echoes an earlier suggestion (Fraser 1988) that pines not be replaced in 'the peninsula of pines north of Blundells Hill, surrounding Blundells Flat' on the basis of reducing the boundary of plantation areas and 'for the intrinsic values of the Blundells Flat area'.

The final report (ACT Government 2003b):

- recommends that native vegetation be re-established in all riparian areas (including areas within ACT forests land) [p.43], as a first priority [p.75]
- notes that turbidity in the lower Cotter Catchment is largely derived from roads, gullies and streambanks between Cotter and Bendora Dams [p.62]
- recommends that the forest road network be rationalised and upgraded to prevent sediment flow into streams and the Cotter Dam, as a first priority [p.75]
- notes that one of the more likely options for improving security of water supply for Canberra is enlargement of the capacity of the Cotter Dam [p.34-5], implying the need for increased protection of the Lower Cotter catchment (including Condor Creek)
- notes that 475ha of former pine plantation in Uriarra Forest is not proposed by ACT Forests for re-planting due to excessive slope, creation of riparian buffers, wildlife corridors, biodiversity and water catchment needs, and straightening of boundaries near national parks [p.67]
- includes maps from ACT Forests showing excision of steep areas in the vicinity of Fastigata Creek south of Coree, together with a riparian strip on Condor Creek upstream from Blundells Flat [pp.63; 68]
- recommends that Blundells Arboretum be re-established [p.76] but maps it in the wrong location east of Blue Range [p.148] and incorrectly includes it within the Namadgi area [p.167]; and
- concludes that areas within pine forest which are identified as important for water quality and ecology should be considered for return to native vegetation [p.152].

ACT Water Resources Strategy

The ACT Government has recently prepared a water resources study in three volumes. Together these approach future water resource management in terms of supply (quantity and quality) and demand. Only the provisions most relevant to this report are summarised below.

The draft State of the ACT's Water Resources and Catchments (ACT Government 2003e):

- notes the Lower Cotter catchment includes some localised soil erosion from logged areas, tracks and firebreaks, with 70% managed for 'conservation', 30% for 'forestry' [p.34]
- describes this sub-catchment as 'of lesser value ecologically than the Corin and Bendora sub-catchments', while providing 'a more diverse range of recreational activities' [p.34].

The draft Explanatory Document (ACT Government 2003d):

- outlines most likely options for increasing storage, including greater use of Cotter Dam (enabled by new treatment facilities) and an enlarged wall for this dam (increasing capacity from 4.7GL to 75GL) [p.15]
- emphasises the importance of riparian management and defines the riparian zone [p.30], outlining ecological functions, roles in bank stability, erosion control/buffering, recreation, amenity and production [pp.44-45]
- notes the need to protect ecological functions in a corridor of minimum 30 metres on both sides of streams, with maximum connection with vegetated areas upstream and downstream, with the choice of species and structure related to ecological goals [p.43]
- notes the need for a range of management actions in riparian zones, including bank stabilisation, removal of exotic species (e.g. willows), restoring in-stream and riparian habitat and connecting with habitat, excluding forestry activities [pp.50-51]
- proposes community partnership in developing and implementing sub-catchment management plans [pp.35-36]

- notes that only a quarter of water resource monitoring sites in the ACT have high quality data and that in-stream habitat and riparian zone condition are not well sampled [p.41]
- notes the need for riparian sampling along the length of a stream rather than at spot localities [p.41]
- identifies the riparian values of Condor Creek (12km) as a mix of ECOL 1 (largely unmodified) and BUFFER (pollutant interception), managed partly by Environment ACT and partly by ACT Forests [p.53].

The draft Strategy (ACT Government 2003c) encourages:

- improved and formalised coordination between land management agencies in meeting water supply catchment management objectives [p.18]
- active engagement of communities in management planning at sub-catchment level [pp.18-19]; this currently emphasises local communities, and does not give consideration to community engagement in non-urban areas
- development of an effective community partnership program to meet strategic targets [pp.30-31]

Comments: The current draft Strategy perpetuates the under-valuing of the ecological heritage of the Blundells Flat-Condor Creek area.

It also focuses community information and awareness on acceptance of change, rather than on skills for participation.

Thus it overlooks the potential of developing an area such as Blundells Flat as a demonstration site of riparian restoration to meet catchment and biodiversity goals, which includes active engagement of the community beyond their local area interests.

This background report draws attention to the natural values of the area and to its potential as both a demonstration site and focus for community participation.

CONCLUSIONS

- The Blundells Flat area is an unusual environment with many natural and cultural heritage values and attributes.
- The area appears to have been undervalued and disregarded to some extent because of its modified condition. Many of the natural heritage attributes of the area have not been consistently acknowledged or adequately protected.
- Most cultural heritage values (other than the pine arboretum) have received very limited acknowledgment or attention in management and interpretation/ education.
- The aftermath of the January 2003 wildfire provides an opportunity to re-think the landscape desired, and to manage for a wider range of heritage values and community benefits.
- However, some of the area's values are being degraded in the post-fire period, and urgent action is required to restore effective management and to educate people about its values.
- The area has the potential to be a showpiece of wetland/riparian restoration and plantation reconfiguration for biodiversity and catchment objectives, with active community participation.
- With ready accessibility from Canberra, the area has the potential to be a significant node for recreation and interpretation close to the periphery of both Namadgi and Brindabella National Parks, at the northern extremity of the Australian Alps National Parks system.

RECOMMENDATIONS

Management approach

- 1) ***Manage the Blundells Flat area and environs through a sub-catchment management plan:***
 - *as an integrated system rather than as separate components*
 - *for its complete range of natural and cultural heritage values and attributes*
 - *with priority objectives to be protection of natural and cultural heritage and catchment values; and*
 - *as a teaching example and model of good practice in wetland/riparian restoration and plantation reconfiguration.*
- 2) ***Apply the precautionary principle by managing the area for values which were present in the past, even where these may not yet have been proven to be extant, to avoid foreclosing on options for future restoration of these values***
- 3) ***Encourage close formal coordination between ACT Forests and Environment ACT, and with the Department of Environment & Conservation NSW***
- 4) ***Facilitate active community participation in planning, landscape renewal and monitoring.***

A sub-catchment management plan would address the catchment of Condor Creek above Thompsons Corner, including Fastigata, Musk and Coree Creeks (and parts of the latter two in NSW).

This may favour a formal management agreement between Environment ACT and ACT Forests, with NPWS engaged through a cross-border working party, which could also include (or co-opt as necessary):

- Aboriginal interests
- utilities such as ACTEW (water) and TransGrid (energy)
- educational/research institutions such as ANU and University of Canberra
- professional bodies such as Institute of Foresters of Australia and Environment Institute of Australia & New Zealand
- community organisations engaged in management e.g. Friends of ACT Arboreta, Greening Australia, FrogWatch, Waterwatch, Canberra Ornithologists Group, Friends of Grasslands.

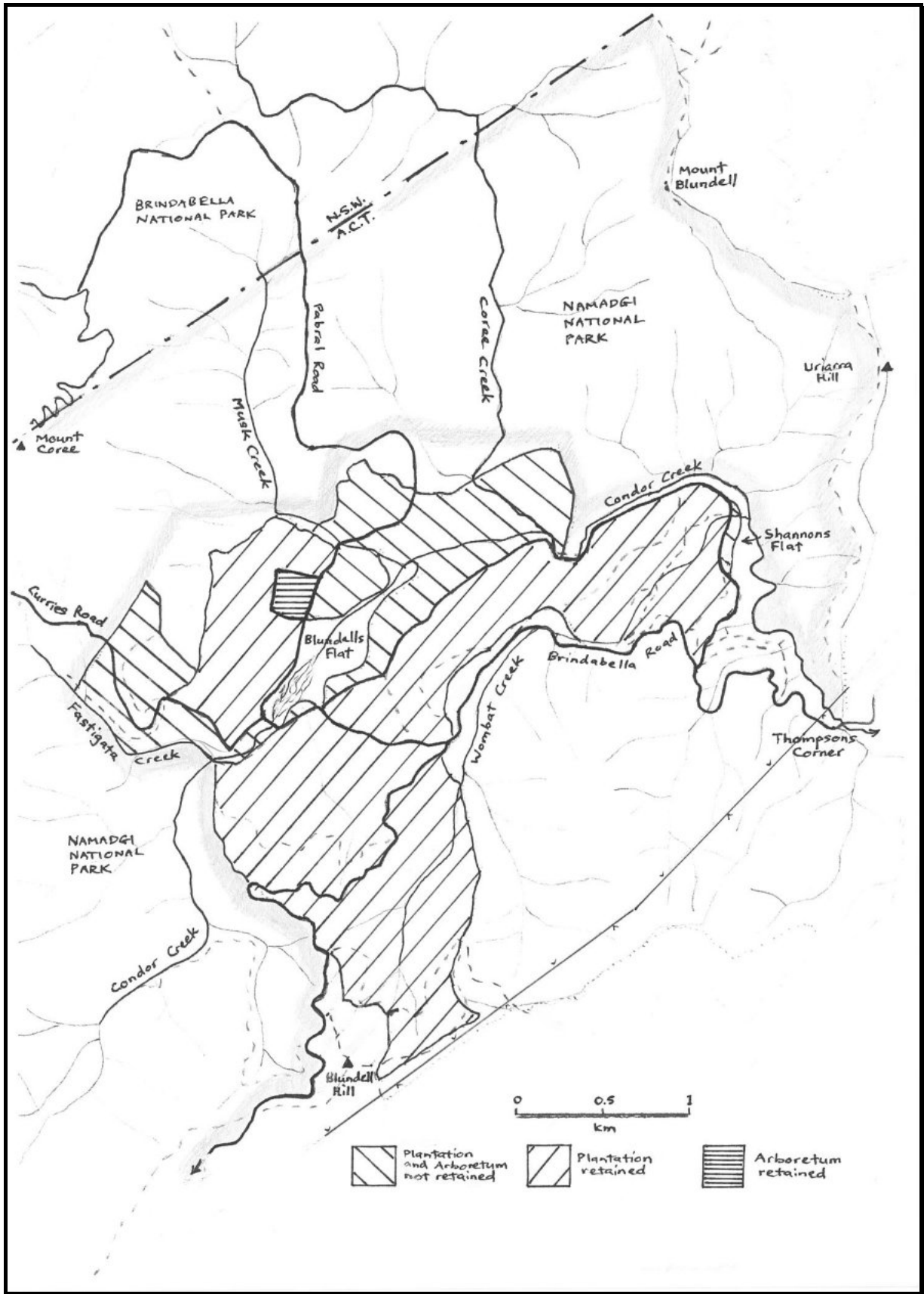


Figure 3 Sketch map of suggested landscape use changes

High priority actions

5) **Restore controls on vehicular access to steeper areas and the picnic area**

This aims to limit illegal trail bike access, vandalism and dumping.

6) **Convert some former plantation and arboretum areas to buffers of native vegetation adjacent to the wetland, Condor Creek and key tributaries, with linkage to surrounding native forests**

It appears that some 'dual habitat' species (e.g. Northern Corroboree Frog) can make use of pine plantations adjacent to wetland areas (as at Micalong Swamp in NSW). However, this is little studied, and there is even less information for species such as burrowing crayfish *Engaeus cymus*.

A precautionary approach suggests that native vegetation management may be more likely to enhance the prospects of such species than plantation management practices. In either case, fire and weeds need to be managed judiciously.

No pines should be re-planted, and wildings and weeds need to be controlled, in an area of up to 100ha, defined as follows [see Figure 3]:

- the area to the west between Condor Creek and Pabral Road
- a corridor of 50 metres south of Musk Creek west of Pabral Road
- the area north of Condor Creek from its junction with Musk Creek, including Coree Creek catchment and the foothills of Mount Blundell
- the area to the east between Condor Creek and the track from the main ford, past Shannons Flat; and
- upstream of the wetland along Condor Creek and Fastigata Creek.

As well as meeting catchment and biodiversity objectives, these suggested buffers would contribute to a more manageable interface between pines and native forests.

In creating a native buffer adjacent to Condor Creek, the conifer arboretum (in whatever form it is retained) should be confined within 'the square' defined by the perimeter road (plots 1 to 75).

Whatever is retained of the poplar arboretum should be similarly confined in the original 70 m square plot, which is already buffered from Condor Creek.

Some submissions to the Non-Urban Study proposed that Blundells Flat be added to Namadgi National Park, and previous proposals have sought removal of all pines in this catchment.

In current debate about the future of the plantation estate, ACT Forests have already agreed to not re-plant pines in some very steep areas and some riparian areas of this catchment.

This report recommends going further than those particular concessions.

However, it recognises value in retaining a plantation setting for the arboreta, to make direct connections between themes of scientific enquiry and evolving production forestry which takes into account biodiversity and catchment objectives.

Some of the areas proposed for return to native vegetation might be suitable small additions to Namadgi National Park, so that a new boundary north of the Flat would be marked by Condor and Musk Creeks and in the west by Curries Road (to take in all wet gullies of Fastigata Creek), and the track on the north-west edge of the plantation.

7) **Commence an on-going program of comprehensive biological survey and monitoring**

This requires the cooperation of Environment ACT, with possible involvement of University of Canberra and/or ANU (SRES) and/or ANBG.

Particular attention should be paid in survey and monitoring to riparian, wetland and wet gully communities, and areas being returned to native vegetation.

Particular note should be taken of *Sphagnum* and sedge areas, *Eucalyptus camphora*, uncommon ferns, Northern Corroboree Frog, burrowing crayfish *Engaeus cymus*, food and shelter species for the morabine grasshopper *Keyacris scurra*, and native grassland communities.

Wherever possible, engage community groups in monitoring e.g. Frogwatch, Canberra Ornithologists Group, Friends of Grasslands. This should be part of an effort coordinated with the NPWS.

8) *Ensure that native species regeneration is not compromised by use of machinery or fire*

Some of the area proposed for reversion to native vegetation exhibits extensive eucalypt and wattle seedling regeneration. Although highly variable, the extent of natural regeneration is indicated by counts in the arboretum, which show about 14,000 wattles/ha (some from suckers) and about 1,400 eucalypts/ha (FACTA 2003). This offers hope for a return to native vegetation at minimal establishment cost (provided weeds are controlled).

The extent of this regeneration may represent a near-complete use of existing seed resource, which will not be replenished for some years, perhaps decades for eucalypts.

In view of this, every effort should be made to avoid compromising natural regeneration by injudicious use of machinery to salvage or fell burnt pines or by use of fire to reduce debris. This suggests a more labour intensive and carefully supervised approach.

On the other hand, intervention in the form of manual thinning may be required if native regeneration is too dense to produce a long-term landscape of open forest and woodland with grassy understorey and extensive ecotones with open grassland, meadow and wetland areas.

9) *Undertake weed control, willow removal and other post-fire clean-up along Condor Creek, ensuring balanced protection of stream form, riparian zone and in-stream habitat*

Willow removal from the wetland and creek should be accorded a high priority for stream protection, consistent with the ACT Water resources strategy (ACT Government 2003d).

Blackberry regrowth is particularly significant in the riparian zone and adjoining plantation and arboretum areas, with estimates in the Blundells Arboretum of 12,500 plants/ha (FACTA 2003).

Concern for biodiversity and catchment objectives suggests control methods that are more labour intensive and better supervised than some of the broadacre methods currently employed nearby.

It may also require specialist expertise in both fluvial geomorphology and ecology to balance stabilisation of creek form with biodiversity needs. For example, the role of woody debris in exacerbating meander breaches and bank undercutting needs to be weighed against its value for providing habitat and shelter in the riparian zone and in the creek itself.

Similarly, subsequent fire management practices need to be carefully considered in relation to requirements of dual-habitat species such as the Northern Corroboree frog and burrowing crayfish *Engaeus cymus*.

These aspects may require close coordination between all land management agencies.

10) *Monitor feral animal activity and address impacts promptly*

Although no significant impact from feral animal activity has yet been reported (Nov 2003), there is potential for species of concern to be adversely affected. Monitoring and prompt attention requires coordination between all agencies in the ACT and NSW.

11) *Control active erosion to minimise sediment inputs to the wetland and creek system*

This requires prompt attention to the design and placement of forestry tracks and drains, and the control of erosion from illegal trail bike tracks on steep slopes.

Strategic actions and further enquiry

12) Consult with local Aboriginal people on their interests in the area and their views on publication of information about the area's Aboriginal heritage

Consultation with Aboriginal people in the ACT should be carried out through the Heritage Unit of Environment ACT. This may also have implications for NSW, and requires close liaison.

13) Re-orient recreational/educational opportunities to emphasise passive activities and appreciation of natural and cultural heritage, possibly including more extensive interpretive and recreational trails

This approach:

- requires redesign of facilities to address the full range of natural and cultural heritage values and themes, to enrich recreational and educational experiences
- raises public perceptions of the value of the area beyond it being a good picnic site or jumping off point for active (at times destructive) recreational activities
- complements key objectives for catchment protection and biodiversity conservation
- offers a site readily accessible from Canberra, at the periphery of large national parks, to enhance public understanding of the need for, and approaches to, both of these
- offers a timely new dimension to educational value of the area as a teaching example/demonstration site of wetland/riparian restoration and plantation reconfiguration for catchment and biodiversity goals; and
- offers many opportunities for active community participation in planning, on-ground actions and monitoring, beyond local area interest.

This approach also offers opportunities to link to larger interpretive and recreational routes.

Short-term:

In the past a self-guided loop trail has taken in the arboreta and the farmhouse site. It crossed Condor Creek with a footbridge (now burnt) which was prone to bank undercutting. Once restored, This could be linked to further easy wetland and wet gully walks, and to more ambitious walks to Mount Coree, Coree Falls and Mount Blundell.

The area has the potential to become a very significant node for visitors going beyond ACT Forests areas to either (or both) Namadgi National Park and Brindabella National Park. This would have resource implications for, and require close coordination between, agencies in the ACT and NSW from an early stage of planning.

Medium term:

A 10km interpretive trail could retrace the historic route from Uriarra to Blundells Flat along the easy gradient of Condor Creek, with a further 8km to the summit of Coree and a potential 5km return loop via Fastigata Creek.

This may link to a heritage trail concept being advanced by Billabong Aboriginal Corporation, to run from Uriarra to the National Museum.

Longer term:

It may be feasible to link Blundells Flat to the Australian Alps Walking Trail, which currently crosses the ACT border at Murrays Gap and links to Tharwa. By using about 50km of existing tracks from Cotter Flats to Mount Coree, this could bring the trail to the northern extremity of the Australian Alps National Parks.

This would take in areas such as Snowy Flats, Pryors Hut, Ginini Flats (Ramsar wetland), Bendora Arboretum, Bulls Head and Lees Springs, as well as Coree and Blundells Flat, and offer an alternative link to Canberra via Uriarra.

A major consideration is the need for any overnight camping sites to be located outside the Cotter Catchment.

Most of these possible routes make use of existing forest tracks, although they may require new access in or across the wetland area, and some new short, low impact sections to link existing trails, reduce impact on stream banks, or provide a 'dry-foot' alternative where vehicle tracks ford the creek. Some resources would be required for consistent signage, limited facilities, and promotion.

14) Determine values of wetland areas at Blundells Flat in relation to others in the region and consider listing in the directory of nationally important wetlands

This requires the cooperation of Environment ACT and Department of Environment & Conservation NSW.

It should include investigation of organic deposits and possibly peat at Blundells Flat, with possible involvement of ANU (SRES).

Depending on the values revealed by this (and by survey/monitoring), consideration should be given to a wetland restoration and management plan, and listing Blundells Flat in the directory of nationally important wetlands.

15) Consider listing of the area on ACT and NSW heritage registers

The Register of the National Estate (Australian Heritage Commission) includes the Northern Brindabellas, ACT (Place ID 13400; registered 27.03.1984). This relates to the area within the ACT north of Bulls Head.

This register is to be retained under new Commonwealth heritage legislation coming into effect in 2004. However, there is increased emphasis on listing in State and Territory registers and protection under State and Territory legislation, with a Commonwealth heritage list also coming into existence in 2004.

In 2002 a draft citation was prepared for listing of most of the Blundells Arboretum on the ACT interim heritage register. This will need revision following the January 2003 wildfire, because of damage to trees and infrastructure and because some plots included in the citation may be returned to native vegetation because they lie adjacent to Condor Creek or the wetland (plots 101 to 106 and 117 to 122).

There is no barrier to overlapping (nested) listing, so consideration should be given to nomination of the whole upper Condor Creek catchment (ACT) in tandem with nomination of particular localities such as the wetland, wet gullies (Fastigata Creek and Blue Range), *E. camphora* locality, arboreta, and so on. To some extent this depends on the outcome of surveys and monitoring recommended above.

To emphasise the inter-relationship of values across the border, close liaison is suggested regarding complementary approaches to listing on the NSW heritage register.

16) Consider salvage of physical materials from the sites of old Blundell farmhouses

This requires consultation with the Heritage Unit of Environment ACT. Any salvage may involve Canberra Archaeological Society and any attempt to identify the origin of limestone in debris heaps may require further specialist assistance.

Following this, removal of debris heaps from the older homestead site is advised to deter further rubbish dumping.

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Maps

Federal Territory Features Map - Sheet 9 – 20 chains to the inch [1:15,840] ?1915 [NLA]

NSW Tenures. Federal Capital Territory. Leases, Licences and Road Permits [ACTPLA]

County Cowley NSW – 1871; 8 June 1881; 18 April 1923 [NLA]

Parish Urayarra, County Cowley NSW – 2 July 1912; 10 November 1965 [NLA]

Parish Tidbinbilla, County Cowley NSW – 19 September 1904 [LPINSW];
9 February 1912 [NLA]

Portion plans, Parish Tidbinbilla, County Cowley NSW – pors. 2 (1871), 3 (1883), 5 (1886),
11 (1893), 12 (1894), 14 (1899), 15 (1899), 16 (1900), 17 (1900) [ACTPLA]

Pastoral map NSW – Urayarra Run No.241 (1885) [LPINSW]


Pastoral map NSW – Middle Cotter North Run No.50 (post 1882) [LPINSW]

Topographic - Brindabella 8627 [1:100,000] 1974

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Until it bore the brunt of the wildfires which struck Canberra in January 2003, the Blundells Flat area in the north-western corner of the ACT had received little attention other than for open space recreation.

Certainly there had been some appreciation of the area's forestry heritage, including arboreta associated with development of a local softwood industry, notable foresters and plant breeders, and the fledgling Australian Forestry School.

This report was prepared to assist in considering options for restoration of the Blundells Flat Arboretum by examining its broader context.

Although only a preliminary study, it has revealed a diverse range of documented heritage values, some of which had been forgotten or gone unrecognised. These include rare and uncommon plant and animal species, and wetland communities.

It has also begun to examine additional layers of cultural association, with Aboriginal exploitation of Bogong moths, repeated use of old pathways, activities of notable pioneers of Canberra and high country outstations, and establishment of the Federal Capital Territory.

This report has begun to cast new light on a previously neglected corner of the ACT.