CUNNINGHAM'S JUTE

CONSERVATION ACTION STATEMENT

June 2005

BRISBANE CITY

Dedicated to a better Brisbane

CUNNINGHAM'S JUTE

Contents

Tables

Maps

1.0 Introduction

Brisbane is recognised as one of the most biologically diverse capital cities in Australia, supporting some 1500 plant species, 523 vertebrate animal species and innumerable invertebrate species.

Brisbane is also part of one of the fastest growing urban regions in Australia. This growth is placing significant pressure on the ecosystems and wildlife of the city. Population pressures and urban development, resulting in the loss and fragmentation of habitat, continue to be the greatest threats to the protection of biodiversity (Brisbane SOE 2001). Since 1990 the rate of clearing has decreased markedly. However, even with no further loss of habitat, some existing flora populations within the city are at risk of local extinction because the small, isolated, remaining habitat areas cannot support them. Other significant threats include pest animals and plants and inappropriate fire regimes. The challenge is to maintain and restore the city's biodiversity while accommodating urban growth.

Brisbane City Council has responded to this challenge with the Brisbane City Biodiversity Strategy, an important part of Council's *Living in Brisbane 2010* vision for a clean and green city. The strategy outlines a range of initiatives designed to secure the long-term conservation of the city's outstanding biodiversity values using available public, community and industry resources. Conservation Action Statements are among these initiatives.

Conservation Action Statements clearly state Council's management intent for the city's most threatened species, and outline key strategies and actions for their management in Brisbane.

This Conservation Action Statement addresses Cunningham's jute *(Corchorus cunninghamii)*, which is identified as a significant species within Brisbane as per Council's Natural Assets Planning Scheme Policy (Brisbane City Council 2000, *Brisbane City Plan*, vol 2, schedule 3).

This Conservation Action Statement will be updated every two to five years to reflect new information and progress on conservation actions. For more information about this or any other Conservation Action Statement, visit Council's website at www.brisbane.qld.gov.au or phone Council on 3403 8888.

1.0 Introduction continued...

Aims

This Conservation Action Statement clearly defines Council's management intent for long-term protection and conservation of Cunningham's jute within Brisbane by:

- collating **existing information** on the distribution, ecology and management requirements of this species within Brisbane and surrounds
- identifying **key threats** that significantly impact upon this species within Brisbane
- identifying **gaps in existing knowledge** of the habitat and management requirements of this species and research priorities
- detailing **practical and affordable strategies and actions** that support the long-term protection and conservation of this species within Brisbane.

2.0 Conservation Status

The conservation status of a species will influence how it is managed. 'Threatened' species are typically accorded a more stringent management regime than 'common' species. Various conservation registers identify the status of flora species at local, state and national levels. The current conservation status of Cunningham's jute is provided in **Table 1**.

Table 1: Official Conservation Status of Brisbane City's Cunningham's Jute

Species	Brisbane City[1]	Queensland[2]	National[3]
Cunningham's Jute	Significant	Endangered	Endangered

1 Brisbane City Council 2000, *Brisbane City Plan 2000*, Natural Assets Planning Scheme Policy, vol. 2
2 *Queensland Nature Conservation (Wildlife) Regulations 1994* under the *Nature Conservation Act 1992*
3 *Environment Protection Biodiversity Conservation Act 1999*

3.0 Distribution[1]

National/State

- In 2001 there were ten verified populations in south-east Queensland: three at Wongawallan, four at Brisbane Forest Park (sites 6-9), two at Ormeau and one at Mount Cotton.
- In 2002, an additional two populations were identified at Brisbane Forest Park (sites 10-11).
- Previously, the species has been recorded at Brookfield, Pullenvale, Ithaca Creek, Peechey's Scrub and Enoggera in Queensland, and at Toonumbar and Kyogle in NSW (Halford 1995; Forster et al. 1991).
- Existing populations in NSW are listed in the NSW recovery plan for Cunningham's jute (NSW National Parks and Wildlife Service 1999) and in Stewart (2000).

Local

Brisbane Forest Park is a known habitat for the species, which is found at six sites within the park. These sites are listed in **Table 2**, together with the number of individuals found at each site in 1998, 2000 2001 and 2002.

Table 2: Species Distribution

Brisbane Forest Park Site	Year			
	1998	2000	2001	2002
Fursman's Scrub/Peninsula	100s	604	50	5
McDonald's Scrub	0	17	153	111
Lake Manchester	100s	91	9	28
Mount Aurum Scrub	0	1	1	0
Forest Reserve	-	-	-	130
Forest Reserve	-	-	-	1
Total	**-**	**713**	**213**	**275**

Source: Adapted from RERT 2002

In 2000, Brisbane Forest Park supported 713 individuals, or 69%, of the south-east Queensland population, but by 2001 there were only 213 individuals or 4% of the region's population (RERT 2001b). In 2002, the 275 individuals represented 7.2% of the regions population (RERT 2002). The Mount Aurum Scrub population is subject to extinction. It was represented by a sole individual and in the two years to 2001, unsuitable weather conditions resulted in planned fire management being deferred (RERT 2001b). Surveys in 2002 recorded no Cunningham's jute at this site, however there are indications that a viable seed pool still remains (RERT 2002). The extent of this seed pool is unknown.

Historical records also indicate the presence of a single Cunningham's jute recorded at Brookfield on private land.

Map 1 shows the records of Cunningham's jute in Brisbane.

Footnote:
1 Unless otherwise stated, the information in this section is from RERT (2001a).

3.0 Distribution[1] continued...

Potential

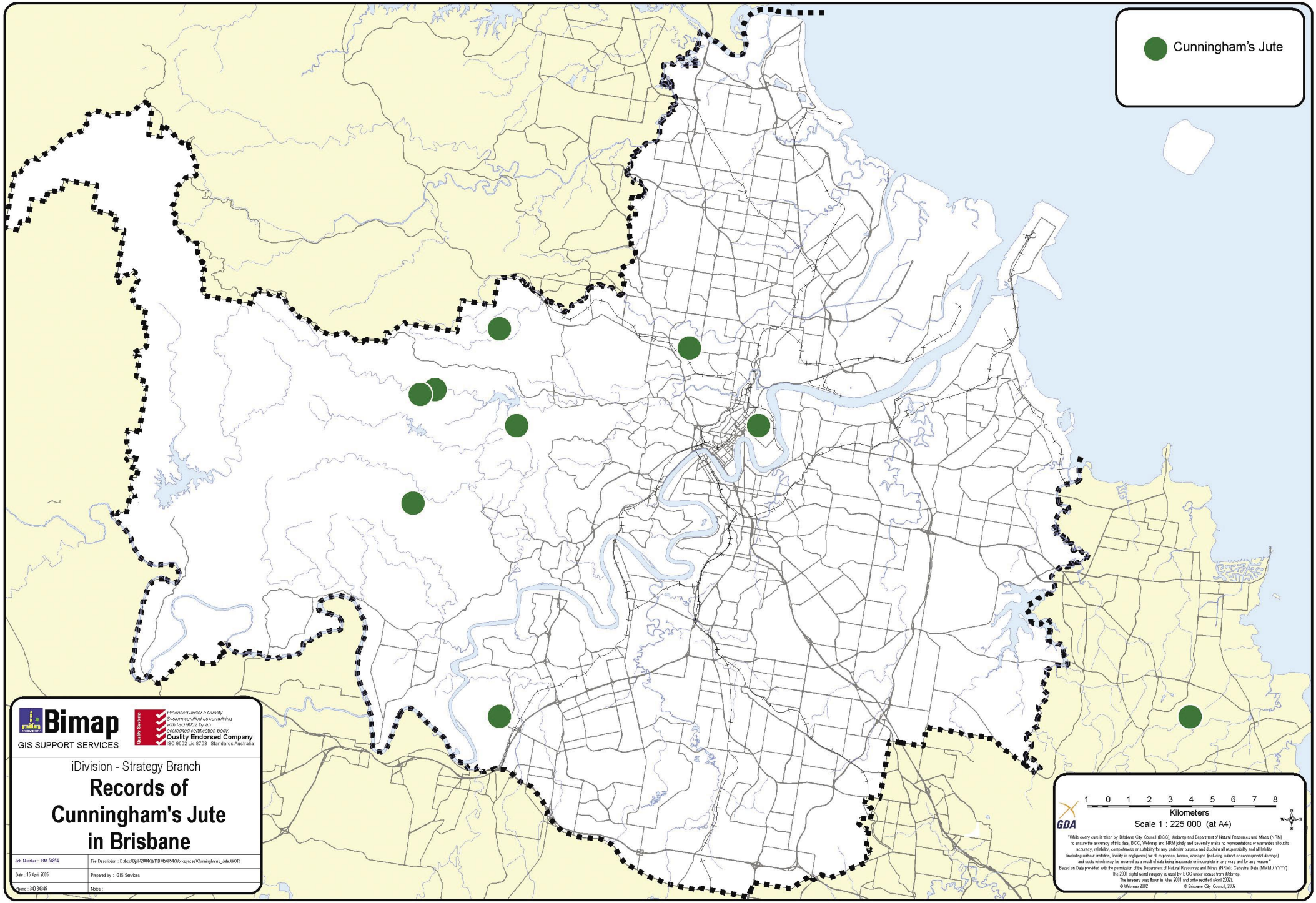
Regional ecosystems that have the potential to support Cunningham's jute within Brisbane have been identified based on the ecotones where the species currently occur. These communities are listed below in **Table 3**.

Table 3: Supporting Vegetation Regional Ecosystems

Regional Ecosystem	Description[2]	Conservation Status[3]
12.8.13	Araucarian complex microphyll vine forest on Cainozoic igneous rocks	Of Concern
12.3.2	*Eucalyptus grandis* tall open forest on alluvial plains	Not of Concern
12.8.9	*Lophostemon confertus* tall open forest on Cainozoic igneous rocks	Of Concern
12.9-10.2	*Corymbia citriodora*, *Eucalyptus crebra* open forest on sedimentary rocks	Not of Concern
12.9-10.17	Open forest complex often with *Eucalyptus acmenoides*, *E. major*, *E. siderophloia* with or without *Corymbia citriodora* on sedimentary rocks	Not of Concern
12.9-10.3	*Eucalyptus moluccana* on sedimentary rocks	Of Concern
12.8.9	*Lophostemon confertus* tall open forest on Cainozoic igneous rocks	Of Concern
12.11.3	Tall open forest generally with *Eucalyptus siderophloia*, *E. propinqua* on metamorphics with or without interbedded volcanics	Not of Concern
12.11.11	Araucarian microphyll vine forest on metamorphics with or without interbedded volcanics; southern half of bioregion	Not of Concern
Non-remnant vegetation	Scattered remnant riparian vegetation of one or more trees, generally overgrown with para grass with or without exotic and endemic species lining the banks	
Non-remnant vegetation	Closed forest altered in structure and composition by logging	

2 Sattler and Williams (1999)
3 *Vegetation Management Act 1999*

Footnote:
1 Unless otherwise stated, the information in this section is from RERT (2001a).


Cunningham's Jute
Bimap
GIS SUPPORT SERVICES
Produced under a Quality System certified as complying with ISO 9002 by an accredited certification body.
Quality Endorsed Company
ISO 9002 Lic 8703 Standards Australia
iDivision - Strategy Branch
Records of Cunningham's Jute in Brisbane
Job Number : BM 54854
File Description : D:\bcc\Bjob\2004Qtr1\BM54854\Workspaces\Cunninghams_Jute.WOR
Date : 15 April 2005
Prepared by : GIS Services
Phone : 340 34345
Notes :
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Kilometers
Scale 1 : 225 000 (at A4)
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"While every care is taken by Brisbane City Council (BCC), Webmap and Department of Natural Resources and Mines (NRM) to ensure the accuracy of this data, BCC, Webmap and NRM jointly and severally make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate or incomplete in any way and for any reason."
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The 2001 digital aerial imagery is used by BCC under licence from Webmap.
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4.0 Ecology[4]

Habitat

- Found in open forest/dry rainforest and open forest/wet sclerophyll forest ecotones within Brisbane.
- Outside Brisbane can be found in hoop pine plantations, open forest and dry rainforest/wet sclerophyll forest.
- Recorded in areas with altitudes of 110-430 metres.
- Usually occurs on upper hill slopes or hill crests with a south-easterly or easterly aspect (Halford 1995a; Simmonds 2000; Stewart 2000). This aspect is moister, cooler and less exposed to solar radiation than other aspects.
- Common companion species include grey gum *(Eucalyptus propinqua)*, brush box *(Lophostemon confertus)* and grey ironbark *(Eucalyptus siderophloia)* in the canopy. Weed species lantana *(Lantana camara)*, coral berry *(Rivina humilis)* and crofton weed *(Ageratina adenophora)* frequently occur in the shrub layer, and have been identified as a threat to population viability.
- Also associated with rare and threatened plants: giant ironwood *(Choricarpia subargentea)*, *Endiandra floydii*, *Macadamia integrifolia*, black plum *(Pouteria eerwah)*, brush sophora *(Sophora fraseri)* and spiny gardenia *(Randia moorei)*.
- No association with a particular elevation or geology, although soils are shallow, stony and well drained with a loam or clay consistency.

Reproduction

General

- A perennial, herbaceous plant with a short lifespan of approximately three to four years (Halford 1995a).
- Species is self-incompatible (Halford 1995a; Simmonds 2000), which is a problem for populations that are small and isolated.
- Reproduction appears to rely on pollination by insects such as the introduced honey bee *(Apis mellifera)*, native honey bees or stingless bees *(Trigona sp.)*, sand wasps *(Bembix sp.)* and possibly ants (Halford 1995; Simmonds 2000).
- Incapable of vegetative reproduction; propagation is by seed. Seeds are dormant on release and require a factor such as heat or mechanical disturbance to facilitate germination (Halford 1995; Cameron 1997; Simmonds 2000).
- Species appears capable of reproducing within a year of germinating. Halford (1995) found that of individuals that had germinated between March and May, 29% flowered and 12.5% had produced fruit in December of that year.

Flowering and Fruiting

- Produces small yellow flowers primarily between the months of October and May, although some individuals appear to flower throughout the year (Halford 1995; Cameron 1997). Plants in cultivation tend to flower for about two months at a time, and individual flowers remain open for only one day (Halford 1995).
- Green, narrow, ellipsoid-shaped fruiting capsules appear on the plant primarily between the months of December and May. As the capsule matures it darkens to a dark brown/black colour and splits longitudinally to release its seeds.

Footnote:
4 Unless otherwise stated, the information in this section is from RERT (2001a).

4.0 Ecology[4] continued...

Reproduction continued...

Seed Dispersal and Germination

- Seeds drop to the ground from a fruiting capsule and dispersal distances are generally short. Some seed may be transported by birds or animals, soil trapped in tyres of vehicles or on the soles of shoes (Stewart 2000).
- Species is likely to accumulate a persistent soil seed bank due to low seedling recruitment.
- Germination studies have indicated that collected seeds remain viable for at least three years (Simmonds 2000) but the longevity of soil-stored seed is unknown.
- Trials and field observations indicate that disturbance from heat/fire or mechanical disturbance is necessary to promote the germination of seeds. Benefits depend on the type, intensity and frequency of disturbance.

5.0 Threats[5]

Habitat Loss and Clearing

- Clearing and habitat modification are likely to have been responsible for extinction of the species at Pullenvale and other locations in Queensland and NSW. The Pullenvale area has been subdivided into residential blocks and vegetation has been cleared or substantially modified through the introduction of non-native plants by landowners.

Genetic Isolation

- Genetic diversity of the species is low and the distance between populations prevents migratations. The viability of Cunningham's jute is threatened by limited genetic variability within populations and genetic isolation of the populations.

Weed Invasion

- At all locations weeds such as lantana *(Lantana camara)*, crofton weed *(Ageratina adenophora)* and coral berry *(Rivina humilis)* pose a threat to Cunningham's jute through competition and habitat alteration.
- Relatively high temperatures are beneficial for the germination of Cunningham's jute seeds. Tall dense thickets of lantana may reduce fire intensity and frequency which may have a detrimental impact on the long-term survival of the species.

Inappropriate Disturbance Regimes

- Cunningham's jute is a disturbance dependent species occurring only within the ecotones of closed and open forest communities. As some disturbance is beneficial, the impacts of processes such as fire, grazing and recreation need to be assessed on a site-by-site basis (RERT 2001b).

Footnote:
4 and **5** Unless otherwise stated, the information in this section is from RERT (2001a).

6.0 Conservation

Under State and Commonwealth law it is an offence to gather, pluck, cut, pull up, destroy, dig up, fell, remove or injure Cunningham's jute or any part of it, or to attempt to do the former, other than when excepted by the respective Acts.

Most of the known populations of Cunningham's jute in Brisbane occur in protected areas, or on land secured by conservation agreements, ownership or tenure. In Queensland, sites at Wongawallan and Ormeau have been secured since the original Cunningham's jute conservation statement and draft recovery plan were written in 1995 (Halford 1995). However, the species is far from secure until sustainable land management strategies with respect to fire and disturbance regimes are implemented. Specific protective mechanisms with respect to fire and weed disturbance will be determined through recovery plan trials. Local government authorities are encouraged to activate the current recovery plan for the species (2001-2006) (RERT 2001a) and implement the recommended recovery actions outlined in RERT (2001b). Queensland Parks and Wildlife Service - Brisbane Forest Park is working with Council on the management of populations at the park.

7.0 Research

Stewart (2000) undertook a staged three-year research project. The project collated background information on Cunningham's jute, assessed population sizes and changes in the population over the three years and experimentally determined the appropriate disturbance regime to ensure continued recruitment of seedlings in existing populations.

NSW National Parks and Wildlife Service has also prepared a draft recovery plan for Cunningham's jute and is conducting research into the life history, population dynamics and the role of fire and mechanical disturbance in the long-term management of the species. A shared interest in conserving *in situ* populations of Cunningham's jute and exchange of information between Queensland and New South Wales is likely to benefit the conservation of the species in the long-term.

8.0 Management Intent

Strategies

Brisbane City Council intends to contribute to the long-term conservation of Cunningham's jute by:

- adopting and encouraging innovative voluntary and statutory mechanisms that protect important habitats and corridors
- ensuring appropriate ecological assessment, reporting and survey procedures are adopted in the development, planning and management activities
- encouraging land management practices that avoid, or minimise, direct and indirect impacts on Cunningham's jute and its habitat on both public and private lands
- ensuring the timely availability of accurate, adequate and contemporary information for policy, planning and management decisions
- facilitating research that targets priority information gaps and contributes positively to the conservation of Brisbane's Cunningham's jute and its habitat
- providing the Brisbane community with appropriate information and opportunities to contribute in a practical way to better understanding and protecting Cunningham's jute in Brisbane.

Actions

Table 4 describes priority conservation actions that Brisbane City Council will pursue with its partners to address the stated strategies. These priority actions have been drawn from studies undertaken for Council by recognised botanists and ecologists and consultation with a range of stakeholders. Actions will be undertaken as funds become available through Council's budgetary process. It should be recognised that Council must consider the timing of these actions against other priorities across the whole of the city.

Table 4: Management Actions

Management Aspect	Action	Timing	Lead Agent and Key Stakeholders
Habitat Protection	Conserve and protect important Cunningham's jute habitat on privately owned land within Brisbane, through Council acquisition of significant habitat (Bushland Acquisition Program) and conservation partnerships (Voluntary Conservation Agreements and Land for Wildlife).	Ongoing	Brisbane City Council (BCC)
Habitat Management	Investigate the role of fire, soil and weed disturbance on Cunningham's jute	Commence 2005	BCC; Local Asset Services (LAS); Redland Shire Council
Information Management	Undertake a targeted systematic survey of potential habitat to establish distribution of Cunningham's jute.	Commence 2006	BCC; Queensland Parks and Wildlife Service (QPWS); Universities
Community Involvement	Support and facilitate community surveys of Cunningham's jute.	Commence 2005	BCC; QPWS; Universities

8.0 Management Intent continued...

Guidelines

The habitat protection and management guidelines detailed in **Table 5** are provided to better assist land owners, land managers, the development industry and the broader community in planning and undertaking land use activities that may otherwise disturb Cunningham's jute and/or its habitat. These guidelines are preliminary and will be refined as more information about this species and its habitat requirements becomes available.

Table 5: Habitat Management Guidelines

Issue	Guideline	Explanatory Notes
Site Disturbance	A known site should be protected to minimise excessive disturbance.	Identified sites should be protected by planning recreation or management activities so as not to negatively impact on Cunningham's jute populations.
	Works within the vicinity of known sites should undergo impact assessment.	The degree of disturbance that may be beneficial or detrimental to Cunningham's jute is not currently known and varies on a site-by-site basis. Impact assessment should be undertaken to ensure that any works in the vicinity of known populations do not affect the plants. For example, any works undertaken above Cunningham's jute plants have the potential to impact the species during runoff events.
	Protective zones may need to be established on a site-by-site basis. They should be registered under the appropriate Natural Assets Local Law category.	The size of any required protective zones should be specified through recovery planning research and monitoring of outcomes.
Weed Management	Sites at which Cunningham's jute occurs require a weed species management plan.	Recovery planning research and monitoring of outcomes will guide a specific weed management plan. Weeds that are currently identified as threats to Cunningham's jute are listed in **Section 5.0**.
Fire Management	Controlled burns to incorporate the fire regime required by Cunningham's jute and other species of conservation significance.	The fire regime required to maintain the ecotonal areas between subtropical rainforest and open eucalypt forest supporting Cunningham's jute must be consistent with the overall requirements of species that naturally occur at these sites. Cunningham's jute is one of several species of conservation significance whose ecological requirements with respect to fire must be addressed.

9.0 Further Information

Agencies

- Brisbane City Council (www.brisbane.qld.gov.au)
- Brisbane Forest Park (www.brisbaneforestpark.qld.gov.au)
- Department of Environment and Heritage (www.deh.gov.au)
- Environmental Protection Agency/Queensland Parks and Wildlife Service (www.epa.qld.gov.au)
- Natural Heritage Trust (www.nht.gov.au)
- Queensland Herbarium (www.epa.qld.gov.au/nature_conservation/plants/queensland_herbarium)
- Queensland Museum (www.qmuseum.qld.gov.au)

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Cunninghams Jute, *Corchorus cunninghamii*, Glen Leiper