INTERIM RECOVERY PLAN NO. 43

MALLEE BOX
(*EUCALYPTUS CUPREA*)

INTERIM RECOVERY PLAN

1999-2002

by

Rebecca Evans, Andrew Brown and Val English

Photograph: Andrew Brown

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Department of Conservation and Land Management
Western Australian Threatened Species and Communities Unit
PO Box 51, Wanneroo, WA 6946

Natural Heritage Trust
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Department of Conservation and Land Management

FOREWORD

Interim Recovery Plans (IRPs) are developed within the framework laid down in Department of Conservation and Land Management (CALM) Policy Statements Nos. 44 and 50.

IRPs outline the recovery actions that are required to urgently address those threatening processes most affecting the ongoing survival of threatened taxa or ecological communities, and begin the recovery process.

CALM is committed to ensuring that Critically Endangered taxa are conserved through the preparation and implementation of Recovery Plans or Interim Recovery Plans and by ensuring that conservation action commences as soon as possible and always within one year of endorsement of that rank by the Minister.

This Interim Recovery Plan will operate from August 1999 to July 2002 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still ranked Critically Endangered, this IRP will be replaced by a full Recovery Plan after three years.

This IRP was approved by the Director of Nature Conservation on 10 October 1999. The provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting CALM, as well as the need to address other priorities.

Information in this IRP was accurate at August 1999.

SUMMARY

Scientific Name: ***Eucalyptus cuprea***
Common Name: Mallee Box
Family: Myrtaceae
Flowering Period: August to November
CALM Region: Midwest
CALM District: Geraldton
Shires: Shark Bay and Northampton
Recovery Team: Geraldton District Threatened Flora Recovery Team (GDTFRT).

Illustrations and/or further information: Brown, A., Thomson-Dans, C. and Marchant, N. (Eds) (1998). *Western Australia's Threatened Flora*. Department of Conservation and Land Management, Western Australia; Brooker, M. I. H. and Hopper, S. D. (1993). New series, subseries species and subspecies of *Eucalyptus* (Myrtaceae) from Western Australia and from South Australia. *Nuytsia 9 (1)*: 1-68; Patrick, S. *Declared Rare and Poorly Known Flora in the Geraldton District.* Draft Western Australian Wildlife Management Program No. 26. CALM, Bentley.

Current status: *Eucalyptus cuprea* was declared as Rare Flora in September 1987 and was ranked in November 1998 as Critically Endangered (CR). It currently meets World Conservation Union (IUCN) Red List category 'CR' under criteria A2c and B1+2c (IUCN 1994) due to limited distribution, severe fragmentation of populations and continued decline in the quality of the habitat. The main threats are farming activities, grazing by sheep, weeds, clearing and firebreak maintenance, insect infestation, road maintenance activities, inappropriate fire regime, lack of habitat and the lack of genetic diversity.

Habitat requirements: *Eucalyptus cuprea* is endemic to Western Australia where it is apparently confined to the Northampton area. It is known from five populations, with an indeterminate number of individuals. The species' distribution ranges from north of Galena to south of Northampton, on rises in brown sandy loam with sandstone or with granite, and more rarely in red-brown clayey loam with laterite. It has also been recorded on a clay flat, however. *E. cuprea* grows in low heath with other emergent species such as the Christmas tree (*Nuytsia floribunda*), or in tall shrubland with York gum (*Eucalyptus loxophleba*), jam (*Acacia acuminata*), unequal-leaf hop bush (*Dodonaea inaequifolia*) and sheoak (*Allocasuarina* species).

Existing Recovery Actions: The following recovery actions have been or are currently being implemented:
1. All appropriate land managers have been informed of the species' locations and associated obligations.
2. A fence has been erected at Population 4.
3. Kings Park and Botanic Garden (KPBG) collected seven specimens of *Eucalyptus cuprea* between 1995 and 1998.
4. The species has been included in research on the production of non-trypaniode esters in *Eucalyptus* species, and a revision of the genus *Eucalyptus.*
5. Staff from CALM's Geraldton Region regularly monitor each population.
6. CALM staff have recently conducted several surveys for the species.

IRP Objective: The objective of this Interim Recovery Plan (IRP) is to abate identified threats and maintain viable *in situ* populations to ensure the long-term preservation of the species in the wild.

Recovery Criteria
Criterion for success: The number of individuals within populations and/or the number of populations have increased.
Criterion for failure: The number of individuals within populations and/or the number of populations have decreased.

Recovery actions

1. Coordinate recovery actions.
2. Conduct further surveys.
3. Collect seed and cutting material.
4. Install fencing.
5. Notify and liaise with all relevant land managers.
6. Undertake weed control.
7. Develop and implement a fire management strategy.
8. Control insect infestation.
9. Obtain biological and ecological information.
10. Monitor populations.
11. Negotiate to acquire land at Population 4.
12. Promote awareness.
13. Write full Recovery Plan.

1. BACKGROUND

History

Eucalyptus cuprea is currently the only eucalypt ranked as Critically Endangered in Western Australian. The known populations are highly threatened, growing either on road reserves or in paddocks. A feature of the species is its similarity to the local York gum (*Eucalyptus loxophleba*) and difficulties associated with identification may be one reason that the species has not been located elsewhere.

The type specimen was collected on the North Western Highway by I. Brooker in 1984. For some years it was known as *Eucalyptus* sp. Northampton, until 1993 when S. Hopper and I. Brooker named the species *Eucalyptus cuprea* because of its coppery bark. There were five populations of *E. cuprea* known over a range of approx. 80 km. One was subsequently destroyed. The species' known distribution is from the Murchison River, east to Hutt River and south to Nanson.

G.E. Brockway made the first collection of the species in 1952, from between Northampton and Lynton, the second collection was by C.A. Gardner and was taken near the Hutt River in 1959. Neither of these populations has since been relocated but collections are held at the W.A. Herbarium. Various other collections were taken between 1970 and 1986, including the type collection made in 1984. The four other populations were found further south, however, only three are now extant. Population 3 was destroyed in 1990 or 1991, before the land manager was officially notified of its location. One plant has also been removed illegally from Subpopulation 1a.

Description

Eucalyptus cuprea is an erect mallee, rarely a tree, 4 to 6 m tall, and has a stocking of thin, flaky and fibrous grey bark. Above this stocking, the bark is smooth and grey or coppery. The juvenile leaves are light green and oval-shaped. The adult leaves are narrow, 11 cm long and 2.3 cm wide, and a glossy dark green. The juvenile buds are club-shaped, with a distinct scar from the early loss of the outer operculum. The inflorescence is terminal and has small white flowers, 6 mm long and 4 mm wide, with inner stamens that are inflected, and with outer stamens that lack anthers. This lack of anthers distinguishes the species from other similar eucalypts. The valves of the stalked cup-shaped fruits, up to 5 mm long and 4 mm wide, are positioned below the rim, and hold greyish-brown seeds.

The species can be confused with York gum, which has heart-shaped, smoky-grey juvenile leaves, as distinct from the light green oval or egg shape leaves of *E. cuprea*. The venation of *E. loxophleba* is sparse compared to the dense venation of *E. cuprea*. The York gum also has an outer ring of stamens with anthers. The seed of *E. loxophleba* is paler in colour than *E. cuprea,* which is described as greyish-brown.

Eucalyptus cuprea is related to, but differs from the Badgingarra box (*E. absita*) in the light green, oval-shaped juvenile leaves and a less prominent disc. Granite rock box (*E. petraea*) is also related to *E. cuprea* but has larger buds and fruits.

Distribution and habitat

Eucalyptus cuprea is endemic to Western Australia where it is apparently confined to the Northampton area. It is known from five populations, with an indeterminate number of individuals. The species occurs from north of Galena to south of Northampton, and is found on rises in brown sandy loam with sandstone or with granite, and more rarely in red-brown clayey loam with laterite. It has also been recorded on a clay flat, however. *E. cuprea* grows in low heath with other emergent trees such as the Christmas tree (*Nuytsia floribunda*), or in tall shrubland with York gum (*Eucalyptus loxophleba*), jam (*Acacia acuminata*), unequal-leaf hop bush (*Dodonaea inaequifolia*) and sheoak (*Allocasuarina* species).

Biology and ecology

Eucalyptus species have adapted to fire in many different ways. The development of a lignotuber allows the regeneration of vegetative growth after the above ground parts of the plant have been destroyed. There is currently no field evidence that indicates *Eucalyptus cuprea* responds favourably to fire or disturbance, however.

As *Eucalyptus cuprea* is typically a mallee-form, there is some contention about the total number of individual plants in known populations. It is possible that each 'clump' within a population is a single clone, a feature that is not uncommon with mallee *Eucalyptus.*

Field and anecdotal evidence suggest that the species is not easily killed during clearing due to persistent lignotuber development. Populations 2, 4 and 5 have survived repeated 'stumping' and have subsequently regenerated, resulting in several populations that exist as single stands in the middle of paddocks. As these stands continued to regenerate, property owners left them as shade for stock. Populations 2-5 are or were isolated stands within paddocks that are otherwise cropped.

Despite abundant flower production, field evidence shows very low fruit production and apparent lack of seedling regeneration. This absence of sexual regenerative material is increasingly becoming a major threat as individuals within these populations age. It is not known how long individuals of the species survive, however, it is expected that *Eucalyptus cuprea* is long lived. Asexual regeneration may in itself prolong the life of these populations, however, the limited genetic variation may limit the survival of the species in the long term.

Threats

Eucalyptus cuprea was declared as Rare Flora in September 1987 and was ranked in November 1998 as Critically Endangered. It currently meets IUCN Red List category 'CR' under criteria A2c and B1+2c (IUCN 1994) due to the limited distribution, severe fragmentation of populations and continuing decline in the quality of the habitat. The main threats are farming activities, grazing by sheep, weeds, competition from local species, clearing and firebreak maintenance, insect infestation, road maintenance activities, inappropriate fire regimes, lack of habitat and lack of genetic diversity.

- **Farming activities** are a major threat to four of the known populations. Crops with little or no native vegetation surround populations 2, 3 and 5 and Population 4 is within five metres of a cropped paddock. Threats include fertiliser and chemical drift, competition with seedlings for water and light from crops, weed encroachment and a number of other factors.

- **Grazing** by sheep is an immediate threat to any seedling recruitment at Populations 2 and 5. These stands of *Eucalyptus cuprea* act as a shelter for sheep. This results in increased nutrient content of the soil from droppings, continued root and branch pruning, soil compaction and elimination of any seedling recruitment.

- **Weed** invasion has occurred at all populations, and weeds compete with seedlings and other local species for light, nutrients, and space. These introduced species respond more favourably to the increased level of fertiliser and soil disturbance and are therefore out-competing *Eucalyptus cuprea* and other local species. Grassy weeds also increase the risk of fire.

- **Competition** from a local climbing vine *Dioscorea* sp. is a threat to Populations 1a and 4. Up to 50% of the mature *Eucalyptus cuprea* trees are covered by these vines. The vines not only compete for light, nutrients and possibly pollinators but also physically restrict the host. As the vines age and senesce the stems harden and become tort, restricting girth growth of the trees. Several trees are completely covered with this *Dioscorea* sp. and the vines therefore pose a very immediate threat to the longevity of this species.

- **Clearing and firebreak maintenance** threaten all populations. The two incidents where the species was removed illegally have arisen from clearing for firebreaks and crop production. Due to the ability of the species to recruit after clearing it is imperative that extant, destroyed and newly recorded populations are carefully monitored and that owners are made aware of the importance of the preservation of the species.

- **Insect infestation** is a threat at Subpopulation 1a and to a lesser extent at Subpopulation 1b. An unidentified leaf mite occurs in high numbers, covering up to 70% of the leaf surface on up to 80% of the mature trees. An unidentified moth has produced nests that appear more prevalent on *Eucalyptus cuprea* than other species in the area. The degree of infestation appears to be as a consequence of the low general health of these plants rather than the cause of possible health decline. The impacts of the infestation probably include reduced photosynthetic capacity in these plants.

- **Road maintenance activities** have threatened Subpopulation 1a in the past. Spraying, mowing and grading need to be excluded from relevant sections of the road reserve to ensure the preservation of the subpopulation. It is also necessary to ensure that Main Roads WA is kept informed of newly discovered road reserve populations so that appropriate protective measures are implemented. The managers of land adjacent to the populations and the shires also need to be informed of the species presence, to prevent possible damage from grazing, crop maintenance or shire operations.

- **Inappropriate fire regimes** would impact the viability of populations, as seeds of *E. cuprea* probably germinate following fire, and the mature plants respond to fire by resprouting from lignotubers. However, frequent fire would deplete the soil seed store, and would also deplete lignotuber reserves.

- Due to the **lack of supportive habitat**, the long-term survival of the species is in question. There is no natural vegetation to provide a buffer from the impacts of farming or other activities for the species.

- The **lack of genetic diversity** within populations is likely to be a threat to the long-term survival of *Eucalyptus cuprea.* The species is most commonly found in the mallee form, and it is possible that there is very little genetic diversity within each population due to their clonal nature. Most *Eucalyptus* species do not form viable seed from self pollination, and cross pollination between individuals is limited due to low plant numbers and the distance between populations. Limited genetic diversity can restrict a species' ability to adapt to change.

Summary of population information and threats

Pop. No & Location.	Land Status	Clump no. and year	Condition	Threats
1A. N of Galena Bridge	MRWA road reserve	30+ 1994 36+ 1998	Healthy Moderate	Weeds, firebreak maintenance, insect infestation, road maintenance activities, inappropriate fire regimes, and lack of supportive habitat.
1B. N of Galena Bridge	Private	36+ 1994 36+ 1998	Healthy Healthy	Weeds, firebreak maintenance, insect infestation, clearing and inappropriate fire regimes.
2. W of Ogilvie	Private - in an open paddock	30+ 1994 30+ 1998	Plants healthy Plants healthy Habitat destroyed	Farming activities, grazing by sheep, weeds, clearing and firebreak maintenance, inappropriate fire regimes, lack of supportive habitat and lack of genetic diversity.
3. N of Northampton	Private	1 pre 1990	Destroyed	Farming activities, grazing by sheep, Weeds, clearing and firebreak maintenance, inappropriate fire regimes, lack of supportive habitat and lack of genetic diversity.
4. W of Nanson	Private	3 1996 3 1998	Healthy Healthy	Farming activities, weeds, inappropriate fire regimes, lack of genetic diversity and competition from local species.
5. W of Ogilvie	Private - in an open paddock	1 clump 1995 1 clump 1998	Plants healthy Plants healthy Habitat destroyed	Farming activities, grazing by sheep, weeds, clearing and firebreak maintenance, inappropriate fire regimes, lack of supportive habitat and lack of genetic diversity.

2. RECOVERY OBJECTIVE AND CRITERIA

Objective

The objective of this Interim Recovery Plan is to abate identified threats and maintain viable *in situ* populations to ensure the long-term preservation of the species in the wild.

Criterion for success: The number of individuals within populations and/or the number of populations have increased.

Criterion for failure: The number of individuals within populations and/or the number of populations have decreased.

3. RECOVERY ACTIONS

Existing recovery actions

All appropriate authorities and land managers have been made aware of the existence of known populations, their locations, and the need to conserve them.

Materials were made available and agreements signed in March 1990 for the fencing of Populations 4 and 5. The fence for Population 4 has been erected and the habitat is regenerating naturally. A fence has not yet been erected around Population 5.

CALM's Threatened Flora Seed Centre has no collections taken from *Eucalyptus cuprea*. Kings Park and Botanic Garden (KPBG) has made seven collections of the species. The first collection was in 1995, the second on an unknown date, and five occurred between May and September 1998. In total 4.95 g of seed are now stored at -20°C. Sixteen healthy plants were propagated from the first collection (of which no seed remains) and these plants are held in the KPBG nursery.

Eucalyptus cuprea was included in a study on the production of non-trypaniode esters in *Eucalyptus* species. Other research includes an ongoing study and revision of the genus *Eucalyptus* by D. Nicolle, Adelaide. This work includes germination, seedling and cultivation trials to determine the genetic relationship between species. The outcome of this research is not yet published.

There have been two recent surveys by CALM Staff. The first by CALMScience and WATSCU staff in 1996 confirmed the location of known populations. The second by WATSCU staff in August 1998 was successful in locating several new populations of *Eucalyptus cuprea* on the same property as Population 2. These populations will be reconfirmed by further survey.

The Geraldton District Threatened Flora Recovery Team (GDTFRT) is overseeing the implementation of this IRP and will include information on progress in its annual report to CALM's Corporate Executive and funding bodies.

Staff from CALM's Geraldton District office regularly monitor the populations of *Eucalyptus cuprea*. Populations have not changed dramatically over time. Two exceptions are the habitat regeneration that has resulted from the fencing of Population 4 in 1990, and the destruction of Population 3.

Future recovery actions

Note 1: The responsible authority is frequently listed as the relevant CALM District. This refers largely to implementing recovery actions as directed by the Recovery Team.

Note 2: In general, the relevant CALM District, WATSCU and the Recovery Team share the primary responsibility for identifying funding sources and securing funds for recovery actions.

Note 3: Where appropriate, the completion date for actions is given as year 1, year 2 or year 3, meaning the years for which this IRP operates.

Note 4: Where populations occur on lands other than those managed by CALM, permission has been or will be sought from the appropriate land managers prior to recovery actions being undertaken.

1. Coordinate recovery actions

The GDTFRT will continue to oversee the implementation of recovery actions for *Eucalyptus cuprea.*

Action: Coordinate recovery actions
Responsibility: CALM (Geraldton District) through the GDTFRT
Cost: $6,400 per year.

2. Conduct further surveys

The most recent survey for the species identified several new populations of *Eucalyptus cuprea* on private land near Population 2, and future surveys will include further searches in this area. Similarly, the area around Population 1 will be surveyed for further populations. Other likely survey sites will include areas in the vicinity of Lyndon Rd, Hutt River and the Moresby Range. Historical collections of the species were made from these areas but populations have not recently been relocated.

As the species can be confused with York gum, survey will be conducted during flowering (August - November). Volunteers from the local community, Wildflower Societies, Naturalist Clubs and other community-based groups will be encouraged to be involved in surveys supervised by CALM staff.

Action: Conduct further surveys
Responsibility: CALM (Geraldton District) through the GDTFRT
Cost: $5,300 in the first year and $4,300 in the second and third years.

3. Collect seed and cutting material

No seed has as yet been collected from *Eucalyptus cuprea* by the TFSC, therefore, the collection of seed is a high priority. CALM staff will collect seed from as many populations as possible, to ensure the storage of the full range of genetic diversity. This genetic diversity may be limited if plants within populations are clonal.

Action: Collect seed and cutting material
Responsibility: CALM (Geraldton District, TFSC) and KPBG, through the GDTFRT
Cost: $2,800 in the first and third years.

4. Install fencing

Fencing is desirable around Populations 2, 3, and 5 to alleviate grazing pressure and the impact of farming activities. With the agreement of land managers, stock proof fences will be erected around each population and a suitable buffer area to allow for regeneration of *Eucalyptus cuprea* and its habitat. The fences will be erected in liaison with land managers and relevant CALM staff to ensure sufficient area for firebreaks to be maintained. This recovery action will take place in conjunction with weed control.

Action: Install fencing at Populations 2, 3 and 5
Responsibility: CALM (Geraldton District), relevant landowners, through the GDTFRT
Cost: $4,400 in the first year.

5. Notify and liaise with all relevant land managers

Relevant land managers will be provided information about Declared Rare Flora and the associated legal obligations if the location of new populations near Population 2 is clarified through resurvey, or in the event of other new populations being located. Staff from CALM's Geraldton District will also continue to liaise with the relevant landowners and managers, including Main Roads WA and relevant Shires, to ensure populations are not accidentally damaged or destroyed.

Action: Notify and liaise with all relevant land managers
Responsibility: CALM (Endangered Flora Clerk, Geraldton District) through the GDTFRT
Cost: $1,500 in the first year, $800 in the second and third years.

6. Undertake weed control

Weeds are a major threat to Subpopulation 1b which is located on road reserves, Populations 2 3, 4 and 5, located close to weed sources, and to a lesser extent to Subpopulation 1a that occurs on private property. The following actions will be implemented:

1. Selection of appropriate herbicides after determining which weeds are present.
2. Controlling invasive weeds by hand removal or spot spraying around *Eucalyptus cuprea* plants when weeds first emerge.
3. Scheduling weed control to include spraying at other threatened flora populations within the district.

The tolerance of associated native plant species to herbicides at the site of *Eucalyptus cuprea* is not known and weed control programs will be undertaken in conjunction with research.

Action: Undertake weed control
Responsibility: CALM (Geraldton District, CALMScience) through the GDTFRT
Cost: $5,000 per year.

7. Develop and implement a fire management strategy

Eucalyptus cuprea is known to regenerate from lignotubers, and may regenerate from seed after fire. However, frequent fire may prevent the accumulation of sufficient soil stored seed to allow regeneration of the population. A fire management strategy will be developed to determine fire control measures and fire frequency.

Action: Develop and implement a fire management strategy
Responsibility: CALM (Geraldton District) through the GDTFRT
Cost: $1,800 in the first year, and $200 in subsequent years.

8. Control insect infestation

Subpopulations 1a and 1b are infested with unidentified leaf mite and moth larvae. When infestations are heavy, both insects appear to reduce the vigour and health of the adult plants. This may, however, be a symptom of poor health of *Eucalyptus cuprea* rather than the cause. Suitable insect control measures will be investigated in conjunction with research.

As there are only a few *Eucalyptus cuprea* plants with the moth infestation these nests will be removed by hand from the infected trees and surrounding vegetation.

Action: Control insect infestation
Responsibility: CALM (Geraldton District, CALMScience) through the GDTFRT.
Cost: $1,400 in the first and third years.

9. Obtain biological and ecological information

Increased knowledge of the biology and ecology of the species will provide a scientific basis for management of *Eucalyptus cuprea* in the wild. Investigations will ideally include:

1. The impact of changes in the level of salinity in the habitat.
2. Investigation of population genetic structure, levels of genetic diversity and minimum viable population size.
3. Study of the soil seed bank dynamics and the role of various factors including disturbance, competition, rainfall, and grazing in recruitment and seedling survival.
4. Determination of reproductive strategies, phenology and seasonal growth.
5. Investigation of the mating system and pollination biology.

Action: Obtain biological and ecological information
Responsibility: CALM (CALMScience, Geraldton District) through the GDTFRT
Cost: $17,000 per year.

10. Monitor populations

Monitoring of factors such as weed invasion, habitat degradation, salinity levels and population stability (expansion or decline), pollinator activity, seed production, recruitment, and longevity is essential. The populations will be inspected annually.

Action: Monitor populations
Responsibility: CALM (Geraldton District) through the GDTFRT
Cost: $1,100 per year.

11. Negotiate to acquire land at Population 4

The installation of a fence around Population 4 resulted in the natural regeneration of habitat. A band of associated vegetation has also regenerated outside the fence in an area that has not been cropped, possibly because of the rocky nature of the soil. The corridor of vegetation therefore runs along the fence line, includes the *Eucalyptus cuprea* population, and also adjoins a conservation reserve. The population of *E. cuprea* is less than 25 m from the reserve. The possibility of purchase of the land that contains Population 4 and the addition of this area to the reserve will be investigated.

Action: Negotiate to acquire land at Population 4
Responsibility: CALM (Geraldton District, WATSCU) through the GDTFRT
Cost: $5,500 once in the second year.

12. Promote awareness

The importance of biodiversity conservation and the protection of the Critically Endangered *Eucalyptus cuprea* will be promoted to the public. An information sheet that includes a description of the plant, its habitat type, threats, management actions, and photos will be produced. Formal links with local naturalist groups and interested individuals will also be encouraged.

Action: Promote awareness
Responsibility: CALM (Geraldton District, Corporate Relations) through the GDTFRT
Cost: $500 once in the second year.

13. Write full Recovery Plan

At the end of the three year term of this Interim Recovery Plan, the need for further recovery will be assessed. If the species is still ranked Critically Endangered, a full Recovery Plan will be developed to describe action required for long-term maintenance.

Action: Write full Recovery Plan
Responsibility: CALM (WATSCU, Geraldton District) through the GDTFRT
Cost: $19,000 once in the final year.

4. TERM OF PLAN

This Interim Recovery Plan will operate from August 1999 to July 2002 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still ranked Critically Endangered, this IRP will be replaced by a full Recovery Plan after three years.

5. ACKNOWLEDGMENTS

The following people have provided assistance and advice in the preparation of this Interim Recovery Plan:

Kingsley Dixon	Assistant Director, Kings Park and Botanic Garden
Steve Hopper	Director, Kings Park and Botanic Garden
Duanne Ginger	Research Officer, Kings Park and Botanic Garden
Phil Roberts	Wildlife Officer, CALM Geraldton District Office
Luke Sweedman	Seed Collector, Kings Park and Botanic Garden

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6. REFERENCES

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7. TAXONOMIC DESCRIPTION

Brooker and Hopper (1993)

Eucalyptus cuprea is a m*allee* to 4 m tall with rough flaky or fibrous grey bark on lower half of stems, smooth coppery or grey above. Forming *lignotubers*. *Seeding leaves* decussate, remaining opposite for 3-4 pairs, petiolate, ovate, to 6 x 3 cm, blue-green, dull. *Juvenile leaves* alternating, petiolate, ovate, to 10 x 6 cm. *Adult leaves* alternating, petiolate, lanceolate, to 14 x 2 cm, concolorous, glossy, green; reticulation dense, incomplete, with scattered to very sparse intersectional or island oil glands. *Inflorescences* apparently terminal. *Peduncles* slender, to 1 cm long. *Immature buds* apparently sessile, cylindrical, with prominent scar caused by very early loss of outer operculum; mature buds distinctly pedicellate, clavate, to 0.6 x 0.4 cm; inner operculum conical to hemispherical. *Stamens* strongly inflexed, outer ones without anthers. Fertile *anthers* sub-versatile to adnate, cuboid to irregular in shape, opening by lateral pores; *flowers* white. *Ovary* (4) 5-locular; ovules in 4 vertical rows. *Fruits* distinctly pedicellate, cupular, to 0.5 x 0.4 cm; valves below rim level. *Seed* compressed-ovoid, grey-brown, with distinct shallow reticulum.

Distribution: From the Moresby Range to North of the Murchison River, Western Australia.

Flowering Period: October.

Etymology: The name refers to the seasonal colour of the smooth bark, Latin *cupreus* - coppery.