Government of **Western Australia**
Department of **Environment and Conservation**

INTERIM RECOVERY PLAN NO. 301

Latrobea colophona

INTERIM RECOVERY PLAN

2010-2015

June 2010
Department of Environment and Conservation
Kensington

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. Note: CALM formally became the Department of Environment and Conservation (DEC) in July 2006. DEC will continue to adhere to these Policy Statements until they are revised and reissued.

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.

DEC is committed to ensuring that Threatened taxa are conserved through the preparation and implementation of IRPs and by ensuring that conservation action commences as soon as possible and, in the case of Critically Endangered (CR) taxa, always within one year of endorsement of that rank by the Minister.

This IRP, which was prepared using Specific Nature Conservation Project funding, will operate from June 2010 to May 2015 but will remain in force until withdrawn or replaced. It is intended that, if the species is still ranked as Critically Endangered (CR), this IRP will be reviewed after five years and the need for further recovery actions assessed.

This IRP was given regional approval in June 2010 and was approved by the Director of Nature Conservation in July 2010. The provision of funds identified in this IRP is dependent on budgetary and other constraints affecting DEC, as well as the need to address other priorities.

Information in this IRP was accurate at June 2010.

IRP PREPARATION

This IRP was prepared by Robyn Luu[1] and Andrew Brown[2].

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ACKNOWLEDGMENTS

The following people provided assistance and advice in the preparation of this plan:

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Andrew Crawford	Principal Technical Officer, Threatened Flora Seed Centre, DEC Science Division
Rebecca Dillon	Research Scientist, DEC Science Division
Leonie Monks	Research Scientist, DEC Science Division
Nicole Moore	Previously Dieback Conservation Officer
Amanda Shade	Assistant Curator (Nursery) Botanic Gardens and Parks Authority

Thanks also to the staff of the W.A. Herbarium for providing access to Herbarium databases and specimen information, and DEC's Species and Communities Branch for assistance.

Cover photograph by Sarah Barrett.

CITATION

This IRP should be cited as:

Department of Environment and Conservation (2010) *Latrobea colophona* Interim Recovery Plan 2010-2015. Interim Recovery Plan No. 301. Department of Environment and Conservation, Western Australia.

SUMMARY

		Common Name:	None
Scientific Name:	***Latrobea colophona***		
Family:	Papilionaceae	**Flowering Period:**	November to January
DEC Region:	South Coast	**DEC District:**	Albany District
Shire:	Gnowangerup	**NRM Region:**	South Coast
Recovery Team:	Albany District Threatened Flora and Communities Recovery Team (ADTFCRT)		

Illustrations and/or further information: Western Australian Herbarium (1998−) *FloraBase − The Western Australian Flora*. Department of Environment and Conservation. http://florabase.dec.wa.gov.au/; Wilkins, C.F. and Chappill, J.A. (2007) Three new species of *Latrobea* (Leguminosae:Mirbelieae) from south-western Australia. *Nuytsia*, 17, 483-492.

Current status: *Latrobea colophona* was declared as Rare Flora under the Western Australian *Wildlife Conservation Act 1950* on 22 January 2008 and is ranked as Critically Endangered (CR) under World Conservation Union (IUCN 2001) criteria C1+C2a(i); D due to a continuing decline in the number of mature individuals and its population size estimated at the time of ranking to be less than 50 mature individuals. The species is not currently listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). The main threats to the species are Phytophthora dieback, grazing and inappropriate fire regimes.

Description: *Latrobea colophona* is an erect shrub to 0.25 to 1 m high by 0.5 m wide. The stems are grey-green or red with green, flat spots or tubercules, present or absent. The flowers are red or yellow, one to three and axillary.

Habitat requirements: *Latrobea colophona* is confined to the Stirling Range National Park where it grows amongst dense scrub in sandy clay over quartzite or sandstone shale.

Habitat critical to the survival of the species, and important populations: Given that *Latrobea colophona* is ranked as CR, it is considered that all known habitat for wild populations is critical to the survival of the species, and that all wild populations are important populations. Habitat critical to the survival of *L. colophona* includes the area of occupancy of populations, areas of similar habitat surrounding and linking populations (these providing potential habitat for population expansion and for pollinators), additional occurrences of similar habitat that may contain undiscovered populations of the species or be suitable for future translocations, and the local catchment for the surface and/or groundwater that maintains the habitat of the species.

Benefits to other species or ecological communities: Recovery actions implemented to improve the quality or security of the habitat of *Latrobea colophona* will also improve the status of associated Declared Rare and Priority flora, and Priority and Threatened Ecological Communities.

International obligations: This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity, ratified by Australia in June 1993, and will assist in implementing Australia's responsibilities under that convention. *Latrobea colophona* is not listed under any specific international treaty however, and this IRP does not affect Australia's obligations under any other international agreements.

Indigenous Consultation: The Aboriginal Sites Register maintained by the Department of Indigenous Affairs does not list any significant sites in the vicinity of populations of *Latrobea colophona*. However, as the species occurs within the Stirling Range National Park and the area is known to be a culturally significant site to Indigenous people, input and involvement is being sought through the South West Aboriginal Land and Sea Council (SWALSC) and Department of Indigenous Affairs to determine if there are any issues or interests. As this is not expected to be completed before the approval of the IRP, further consultation has been included as a recovery action to ensure there has been Indigenous engagement in relation to the recovery actions posed in this plan.

Social and economic impacts: The implementation of this recovery plan is unlikely to cause significant adverse social and economic impact as the known populations of *Latrobea colophona* occur in a National Park.

Affected interests: There are no significant stakeholders likely to be affected by implementation of this plan. All known populations occur in a National Park.

Evaluation of the Plan's Performance: The DEC in conjunction with the Albany District Threatened Flora and Communities Recovery Team (ADTFCRT) will evaluate the performance of this IRP. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed following four years of implementation.

Existing Recovery Actions: The following recovery actions have been or are currently being implemented:

1. The habitat of *Latrobea colophona* is searched annually during monitoring of it and other threatened flora species.
2. Phosphite has been applied to the habitat containing all three populations of *Latrobea colophona* since 1997.
3. Cuttings from 34 *Latrobea colophona* plants were taken in January and February 2007 and forwarded to BGPA for propagation.
4. In May 2008, cuttings were taken from 12 plants propagated in 2007.
5. A translocation proposal has been drafted for *Latrobea colophona* (Barrett *et al*. 2009).
6. In 2007, following continued heavy grazing at Population 1, three *Latrobea colophona* plants were caged to prevent access by herbivores.
7. In 2008, scatter baiting with 1080 oats was undertaken near *Latrobea colophona* plants in Population 1.
8. DEC staff from the Albany District monitor populations annually.
9. The ADTFCRT are overseeing the implementation of this IRP and will include information on progress in their annual report to DEC's Corporate Executive and funding bodies.

IRP Objective: The objective of this IRP is to abate identified threats and maintain or enhance *in situ* populations to ensure the long-term preservation of the species in the wild.

Recovery Criteria
Criteria for success: The number of populations have increased and/or the number of mature individuals have increased by ten percent or more over the term of the plan.
Criteria for failure: The number of populations have decreased and/or the number of mature individuals have decreased by ten percent or more over the term of the plan.

Recovery actions

1. Coordinate recovery actions
2. Nominate *Latrobea colophona* for listing under the Commonwealth EPBC Act
3. Map habitat critical to the survival of *Latrobea colophona*
4. Apply phosphite
5. Determine the susceptibility of *Latrobea colophona* to *Phytophthora cinnamomi*
6. Collect seed and other material to preserve genetic diversity
7. Monitor populations
8. Implement grazing control
9. Conduct further surveys
10. Develop and implement a fire management strategy
11. Undertake and monitor translocations
12. Liaise with Indigenous groups
13. Promote awareness
14. Obtain biological and ecological information
15. Propose ranking criteria change for *Latrobea colophona*
16. Review this IRP and assess the need for further recovery actions

1. BACKGROUND

History

Latrobea colophona was originally known as *Latrobea obovata* ms. However, Wilkins and Chappill (2007) noted that the name had already been used for another species and it was formally named *Latrobea colophona* in 2007 (Wilkins and Chappill 2007).

Latrobea colophona was collected from the Stirling Range National Park by A. Strid in 1982 and by E. and S. Pignatti in 1985. It was then 18 yerars before the species was collected again when S. Barrett found it on Isongerup Peak. Further specimens were collected from Mount Success in 2004 and Bluff Knoll in 2005. The species is currently known from three populations, together containing approximately 1300 mature individuals and occupying an area of less than four hectares.

Description

Latrobea colophona is an erect shrub to 0.25 to 1 m high by 0.5 m wide. The stems are grey-green or red with green, flat spots or tubercules, present or absent. The flowers are red or yellow, one to three and axillary. The name *colophona* is derived from the Greek *kolophon* meaning peak, referring to the area in which this species occurs (Wilkins and Chappill 2007).

Latrobea colophona is similar to *L. recurva* but differs in its denser, straight leaves with a concave apex, and longer calyx lobes which are 4 to 4.8 mm long rather than 2.5 to 3.5 mm long (Wilkins and Chappill 2007).

Distribution and habitat

Latrobea colophona is endemic to Western Australia where it is confined to the Stirling Range National Park. The species grows in amongst dense scrub in sandy clay over quartzite or sandstone shale. Associated species include *Adenanthos filifolius*, *Allocasuarina* sp., *Andersonia axilliflora*, *A. echinocephala*, *Aotus genistoides*, *Banksia hirta*, *B. plumosa* subsp. *denticulata*, *B. sphaerocarpa*, *Beaufortia decussata*, *Calothamnus crassus*, *Darwinia squarrosa*, *Daviesia mesophylla*, *D. obovata*, *Eucalyptus marginata*, *Gastrolobium leakeanum*, *Gompholobium villosum*, *Grevillea fasciculata*, *Isopogon longifolius*, *Kunzea montana*, *Lambertia ericifolia*, *L. fairallii*, *Leucopogon gnaphalioides*, *Persoonia micrantha*, *Petrophile longifolia* and *Sphaerolobium* sp..

Table 1. Summary of population land vesting, purpose and manager

Pop. No. & Location	DEC District	Shire	Vesting	Purpose	Manager
1. Bluff Knoll	Albany District	Gnowangerup	Conservation Commission of Western Australia	National Park and Recreation	DEC
2. Isongerup Peak	Albany District	Gnowangerup	Conservation Commission of Western Australia	National Park and Recreation	DEC
3. Mount Success	Albany District	Gnowangerup	Conservation Commission of Western Australia	National Park and Recreation	DEC

Populations in **bold text** are considered to be important populations.

Biology and ecology

Latrobea colophona is an obligate re-seeder which is killed by fire and relies on soil-stored seed for regeneration. The species has a moderate primary juvenile period, with plants observed flowering four to five years after a fire on Mount Success. The persistence of the soil seed bank is unknown (Barrett *et al*. 2009).

Latrobea colophona flowers from November to January and produces fruits (pods) borne in late February. Pollinators have not been observed to date (Barrett *et al*. 2009).

Threats

Latrobea colophona was declared as Rare Flora under the Western Australian *Wildlife Conservation Act 1950* on 22 January 2008 and is ranked as Critically Endangered (CR) under World Conservation Union (IUCN 2001) criteria C1+C2a(i); D due to a continuing decline in the number of mature individuals and its population size at the time of ranking estimated to be less than 50 mature individuals. The species is not currently listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). The main threats to the species are Phytophthora dieback, grazing and inappropriate fire regimes.

All populations of *Latrobea colophona* are infected by dieback disease caused by *Phytophthora cinnamomi*. Dead plants sampled from the Mt Success (2006) and Isongerup (2008) were sent to Vegetation Health Services where they tested positive for *P. cinnamomi*, although it is not known the level of susceptibility. Phosphite has been applied to all populations since 1997. Good rates of survival have been observed, although heavy grazing has impacted on population health and has probably caused a decline at Population 1 in this period (Barrett *et al*. 2009).

- **Phytophthora dieback** caused by *Phytophthora cinnamomi*, a pathogen that causes root rot resulting in susceptible plants dying of drought stress, is a serious threat to the populations of *Latrobea colophona* with many deaths already occurring. Population 3 (< 1 ha) is encircled by the disease and Populations 1 and 2 are infested.

- **Grazing** by rabbits (*Oryctolagus cuniculus*) and native fauna, possibly quokkas (*Setonix brachyurus*), is a major threat to Populations 1 and 2. Grazing of juvenile plants has been heavy and flowering has not occurred at Population 1 for this reason, while growth has been reduced at Population 2.

- **Inappropriate fire regimes** may affect the long-term viability of populations. Seeds of *Latrobea colophona* germinate following fire. The species has a moderate primary juvenile period, with plants observed flowering four to five years after a fire on Mount Success. If fire frequency is increased the soil seed bank could be depleted before juvenile plants have reached maturity. However, it is likely that occasional fires are needed for recruitment.

The intent of this plan is to provide actions that will deal with immediate threats to *Latrobea colophona*. Although climate change may have a long-term effect on the species, actions taken directly to prevent the impact of climate change are beyond the scope of this plan.

Table 2. Summary of population information and threats

Pop. No. & Location	Land Status	Year / No. of plants	Current Condition	Threats
1. Bluff Knoll	National Park	2005 0 (200+) 2006 0 (3) 2007 0 (3) 2008 0 (4)	Poor	Phytophthora dieback, grazing, inappropriate fire regimes
2. Isongerup Peak	National Park	2005 (100+) 2007 150+ (150+) [10+] 2008 500+ [125+] 2009 1000 (500)	Moderate	Phytophthora dieback, grazing, inappropriate fire regimes
3. Mount Success	National Park	2004 10+ 2006 60+ [10+] 2007 330+ [82+] 2008 300 [15 dead]	Moderate	Phytophthora dieback, inappropriate fire regimes

Note: ( ) = number of juveniles; [ ] = approximate number of dead plants.

Guide for decision-makers

Section 1 provides details of current and possible future threats. Developments and/or land clearing in the immediate vicinity of *Latrobea colophona* populations require assessment. Developments or clearing should not be approved unless the proponents can demonstrate that their actions will have no significant impact on the

species, its habitat or potential habitat, the local surface hydrology, such that drainage in the habitat of the species would be altered, or have the potential to spread or amplify dieback disease caused by the plant pathogen *Phytophthora cinnamomi*.

Habitat critical to the survival of the species, and important populations

Given that *Latrobea colophona* is ranked as CR, it is considered that all known habitat for wild populations is critical to the survival of the species and that all wild populations are important populations. Habitat critical to the survival of *L. colophona* includes the area of occupancy of populations, areas of similar habitat surrounding and linking populations (these providing potential habitat for population expansion and for pollinators), additional occurrences of similar habitat that may contain undiscovered populations of the species or be suitable for future translocations, and the local catchment for the surface and/or groundwater that maintains the habitat of the species.

Benefits to other species or ecological communities

Recovery actions implemented to improve the quality or security of the habitat of *Latrobea colophona* will also improve the status of a number of Declared Rare and Priority flora. These taxa are listed in the table below:

Table 3. Conservation–listed flora species occurring in habitat of *Latrobea colophona*

Species name	Conservation Status (WA)	Conservation Status (EPBC Act 1999)
Andersonia axilliflora	Critically Endangered	Endangered
Banksia brownii	Critically Endangered	Endangered
Dryandra montana	Critically Endangered	Endangered
Lambertia fairellii	Critically Endangered	Endangered
Leucopogon gnaphalioides	Critically Endangered	Endangered
Persoonia micrantha	Critically Endangered	Endangered
Darwinia collina	Endangered	Endangered
Darwinia sp. Stirling Range	Endangered	Vulnerable
Daviesia obovata	Endangered	Endangered
Sphenotoma drummondii	Endangered	Endangered
Xyris exilis	Endangered	Vulnerable
Darwinia squarrosa	Vulnerable	Vulnerable
Deyeuxia drummondii	Vulnerable	Endangered
Banksia plumosa subsp. *denticulata*	Priority 2	
Daviesia mesophylla	Priority 2	
Adenanthos filifolius	Priority 3	
Andersonia echinocephala	Priority 3	
Banksia hirta	Priority 3	
Petrophile longifolia	Priority 3	
Calothamnus crassus	Priority 4	

For a description of the Priority categories see Atkins (2008).

Latrobea colophona occurs within the Threatened Ecological Community (TEC) 'Montane Thicket of the eastern Stirling Range: dense heath, thicket and, on skeletal soils, scrub vegetation found only in the eastern Stirling'. The TEC Interim Recovery Plan (IRP) (Barrett 2000) outlines recovery actions for many of the same processes that are threatening *L. colophona* and both IRPs should be taken into account when management actions are implemented.

The species also occurs adjacent to the Priority Ecological Communities (PECs) 'Coyanarup Wetland Suite: microscale paluslopes associated with seepage and creeks in the area between Coyanarup Peak and Bluff Knoll in the Stirling Ranges' and 'Montane mallee thicket community of the Stirling Range: thicket, mallee-thicket and heath community on mid to upper slopes of Stirling Range mountains and hills east of Red Gum Pass'.

Table 4: Threatened and Priority Ecological Communities (TECs, PECs) in which *Latrobea colophona* occurs in or is adjacent to

Community Name	Conservation status (WA)	Conservation Status (EPBC Act 1999)
Montane thicket of the eastern Stirling Range	Critically Endangered	Endangered
Montane mallee thicket community of the Stirling	Priority 1 (awaiting endorsement as	

Range	Endangered)	
Coyanarup Wetland Suite	Priority 1 (awaiting endorsement as Vulnerable)	

For a description of the TEC and PEC categories see DEC (2007)

International obligations

This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity, ratified by Australia in June 1993, and will assist in implementing Australia's responsibilities under that convention. However, as *Latrobea colophona* is not listed under any specific international treaty this IRP does not affect Australia's obligations under any other international agreements.

Indigenous Consultation

The Aboriginal Sites Register maintained by the Department of Indigenous Affairs does not list any significant sites in the vicinity of populations of *Latrobea colophona*. However, the species occurs within the Stirling Range National Park and this is known to be a culturally significant site to Indigenous people. Input and involvement is therefore being sought through the South West Aboriginal Land and Sea Council (SWALSC) and Department of Indigenous Affairs to determine if there are any issues or interests. As this is not expected to be completed before the approval of the IRP, further consultation has been included as a recovery action (see recovery action 12) to ensure there has been Indigenous engagement in relation to the recovery actions posed in this plan.

Social and economic impacts

The implementation of this recovery plan is unlikely to cause significant adverse social and economic impact as all known populations of *Latrobea colophona* occur in a National Park.

Affected interests

There are no significant stakeholders likely to be affected by implementation of this plan, as all known populations occur in a National Park.

Evaluation of the Plans Performance

The DEC in conjunction with the Albany District Threatened Flora and Communities Recovery Team (ADTFCRT) will evaluate the performance of this IRP. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed following five years of implementation.

2. RECOVERY OBJECTIVE AND CRITERIA

Objective

The objective of this IRP is to abate identified threats and maintain or enhance *in situ* populations to ensure the long-term preservation of the species in the wild.

Criterion for success: The number of populations have increased and/or the number of mature individuals have increased by ten percent or more over the term of the plan.
Criterion for failure: The number of populations have decreased and/or the number of mature individuals have decreased by ten percent or more over the term of the plan.

3. RECOVERY ACTIONS

Existing recovery actions

The habitat of *Latrobea colophona* is checked annually during monitoring of other threatened species (*Dryandra montana*, *Andersonia axilliflora*, *Persoonia micrantha*, *Dryandra anatona*, *Lambertia fairallii* and *Banksia brownii*).

Phosphite has been applied to the vegetation communities containing all three populations of *Latrobea colophona* since 1997. Good rates of survival have been observed, although heavy grazing has affected population health and is likely to have caused a decline in Population 1.

Cuttings from 20 *Latrobea colophona* individuals taken in January 2007 were forwarded to BGPA for propagation. The strike rate was variable, ranging from 20% to 93%. It is not known why there was such a large range as all the other variables such as media, pre-treatment and hormone etc, were the same for each clone. Cuttings from a further 14 *Latrobea colophona* individuals taken in February 2007 and forwarded to BGPA had a very poor strike rate with six of the clones having zero success, and the strike rate of the remaining eight clones ranging from 6% to 40%.

In May 2008, cuttings were taken from 12 plants propagated in 2007. Generally higher strike rates were observed, ranging from 38% to 82%. It is not certain as to why the cuttings from cultivated stock produced a higher strike rate than wild sourced material. For four of the clones however, the strike rate from the wild material was substantially better than from cultivated material.

A translocation proposal has been drafted for *Latrobea colophona* (Barrett *et al*. 2009). The aim of the proposal is to conserve the wild genetic stock of the species by translocating it to a secure site with the goal of maximising seed production. This will be achieved by establishing the species at a new, secure site. The translocation design will consist of planting in rows approximately 1m apart, irrigating over the first two summers, and protection from grazing by caging the individual plants. Monitoring of the translocated population will be undertaken within the first month after planting and then every six months for the first year and then annually thereafter. Monitoring will include counting the number of surviving seedlings, height of the surviving seedlings, width of the crown of the surviving seedlings in two directions, reproductive state, number of flowers, number of pods, presence of second generation plants and general health of the plants. Monitoring of the original populations will also occur in conjunction with monitoring of the translocated populations. This will provide essential baseline data for assessing the performance of the translocated population. Seed will be harvested for the TFSC when plants are reproductive.

Following continued heavy grazing at Population 1 in 2007, three *Latrobea colophona* plants were caged to prevent access by herbivores. Monitoring in 2008 revealed that the plants within the cages had regenerated well.

Scatter baiting with 1080 oats near *Latrobea colophona* plants in Population 1 was undertaken in 2008.

Staff from DEC's Albany District monitor populations annually.

The Albany District Threatened Flora and Communities Recovery Team (ADTFCRT) are overseeing the implementation of this IRP and will include information on progress in their annual report to DEC's Corporate Executive and funding bodies.

Future recovery actions

Where recovery actions occur on lands other than those managed by DEC, permission has been or will be sought from appropriate owners/land managers prior to recovery actions being undertaken. The following recovery actions are generally in order of descending priority, influenced by their timing over the life of the plan. However this should not constrain addressing any of the actions if funding is available and other opportunities arise.

1. Coordinate recovery actions

The ADTFCRT will continue to oversee the implementation of the recovery actions for *Latrobea colophona* and will include information on progress in their annual report to DEC's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: DEC (Albany District) through the ADTFCRT
Cost: $3,000 per year

2. Nominate *Latrobea colophona* for listing under the Commonwealth EPBC Act

Staff from DEC's Species and Communities Branch (SCB) will develop a Species Profile and Threats (SPRAT) nomination form for this species. The nomination will be forwarded to the Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA) for referral to the Threatened Species Scientific Committee (TSSC) for endorsement under the EPBC Act.

Action: Nominate *Latrobea colophona* for listing under the Commonwealth EPBC Act
Responsibility: DEC (SCB)
Cost: $1,400 in year 1

3. Map habitat critical to the survival of *Latrobea colophona*

Although habitat critical to the survival of the species is alluded to in Section 1, it has not yet been mapped and will be addressed under this action. If additional populations are located, then habitat critical to the survival of those populations will be determined and mapped also.

Action: Map habitat critical to the survival of *Latrobea colophona*
Responsibility: DEC (SCB, Albany District) through the ADTFCRT
Cost: $3,000 in year 2

4. Apply phosphite

As *Latrobea colophona* and the community in which it grows are infected with *Phytophthora cinnamomi*, DEC will continue to apply Phosphite as a protective measure. Phosphite application will also protect other threatened plant species that occur in the area as well as occurrences of the Montane thicket TEC and Montane mallee thicket PEC.

Action: Apply phosphite
Responsibility: DEC (Albany District, Dieback Disease Coordinator) through the AWCTFRT
Cost: $18,000 per year for phosphite application; and $2,000 per year for monitoring

5. Determine *Latrobea colophona*'s susceptibility to *Phytophthora cinnamomi*

Samples of dead *Latrobea colophona* plants sent to Vegetation Health Services have tested positive for *Phytophthora cinnamomi*. However the species level of susceptibility to the pathogen is not known. Plants raised from cuttings at BGPA will be forwarded to Science Division for testing.

Action: Determine the susceptibility of *Latrobea colophona* to *Phytophthora cinnamomi*
Responsibility: DEC (Albany District, Science Division) through the ADTFCRT
Cost: $2,000 in year 1

6. Collect seed and other material to preserve genetic diversity

Seed collections by DEC's TFSC are required to ensure the genetic diversity of the species is captured. Cuttings will also be collected to establish a living collection of genetic material.

Action: Collect seed and other material to preserve genetic diversity
Responsibility: DEC (Albany District, TFSC), BGPA through the ADTFCRT
Cost: $2,500 per year

7. Monitor populations

Annual monitoring of factors such as habitat degradation (including the impact of dieback), population stability (expansion or decline), pollinator activity, seed production, recruitment, longevity, predation and the impact of phosphite application on *Latrobea colophona* and the control of *Phytophthora cinnamomi* is essential.

Action: Monitor populations
Responsibility: DEC (Albany District) through the ADTFCRT
Cost: $3,500 per year

8. Implement grazing control

The level of threat posed by rabbits and native fauna may vary from year to year. When monitoring ascertains the threat is high, control measures may be required. Previous methods, including caging of individual plants and scatter baiting of 1080 oats have proven to be effective.

Action: Implement grazing control
Responsibility: DEC (Albany District) through the ADTFCRT
Cost: $3,000 in first, third and fifth years

9. Conduct further surveys

It is recommended that potential suitable habitat be surveyed for *Latrobea colophona* during its flowering period between November and January.

All surveyed areas will be recorded and the presence or absence of the species documented to increase survey efficiency and reduce unnecessary duplicate surveys.

Action: Conduct further surveys
Responsibility: DEC (Albany District) through the SRTFCRT
Cost: $3,000 in years 1, 3 and 5

10. Develop and implement a fire management strategy

Fire is known to kill adult *Latrobea colophona* plants and could be detrimental to the species' long-term survival if it occurs before soil seed stores have been replenished. Fire should therefore be prevented from occurring in the area of populations, except where it is being used as a recovery tool. The species has been listed as requiring fire exclusion in the draft Fire Management Strategy for the Stirling Range National Park (Barrett *et al*. 2006).

Action: Develop and implement a fire management strategy
Responsibility: DEC (Albany District) through the ADTFCRT
Cost: $2,500 in first year and $1,000 in subsequent years

11. Undertake and monitor translocations

Translocation is essential for the conservation of *Latrobea colophona*, as the number of natural extant plants is low and known populations are threatened by grazing and dieback disease. Information on the translocation of threatened plants and animals in the wild is provided in the Department's Policy Statement No. 29 *Translocation of Threatened Flora and Fauna*, and translocation should meet the standards set in Guidelines for the Translocation of Threatened Australian Plants (Vallee *et al* 2004).

Monitoring of the translocation is essential and will be undertaken according to the timetable developed for the Translocation Proposal.

Action: Undertake and monitor translocations
Responsibility: DEC (Science Division, Albany District) through the ADTFCRT
Cost: $36,000 in the first, second and third years, and $3,500 in other years

12. Liaise with Indigenous groups

As *Latrobea colophona* occurs in an area that may be culturally sensitive, indigenous consultation will determine if there are any issues or interests.

Action: Liaise with Indigenous groups
Responsibility: DEC (Albany District) through the ADTFCRT
Cost: $500 per year

13. Promote awareness

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

Due to the susceptibility of the habitat of this species to dieback, the need for hygiene procedures will be included in information provided to visitors to the area. This will stress the need to restrict the movement of soil into the habitat of the population.

Action: Promote awareness
Responsibility: DEC (Albany District, SCB, Strategic Development and Corporate Affairs Division) through the ADTFCRT
Cost: $1,600 in year 1 and $1,000 in years 2-5

14. Obtain biological and ecological information

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

1. Study of the soil seed bank dynamics and the role of disturbance, competition, drought, inundation and grazing in recruitment and seedling survival.
2. Determination of reproductive strategies, phenology and seasonal growth.
3. Investigation of the reproductive system and pollination biology.
4. Investigation of population genetic structure, levels of genetic diversity and minimum viable population size.
5. The impact of changes in hydrology in the habitat.
6. Impacts of dieback disease and phosphite application on *Latrobea colophona* and its habitat.

Action: Obtain biological and ecological information
Responsibility: DEC (Science Division, Albany District) through the ADTFCRT
Cost: $10,000 per year

15. Propose ranking criteria change for *Latrobea colophona*

At the next meeting of the TSSC a recommendataion will be made that the ranking criteria be amended from CR C1+C2a(i); D to CR B1ab(iii,v)+2ab(iii,v). The species no longer meets the current criteria as it is now known from three populations and 1300 mature individuals.

Action: Propose ranking criteria change for *Latrobea colophona*
Responsibility: DEC (SCB, Albany District) through ADTFCRT
Cost: $1,000 in year 1

16. Review this IRP and assess the need for further recovery actions

If *Latrobea colophona* is still ranked as CR at the end of the five-year term of this IRP, the need for further recovery actions, or a review of this IRP will be assessed and a revised plan prepared if necessary.

Action: Review this IRP and assess the need for further recovery actions
Responsibility: DEC (SCB, Albany District) through the ADTFCRT
Cost: $2,000 in year 5

Table 5. Summary of Recovery Actions

Recovery Action	Priority	Responsibility	Completion Date
Coordinate recovery actions	High	DEC (Albany District) through the ADTFCRT	Ongoing
Nominate *Latrobea colophona* for listing under the Commonwealth EPBC Act	High	DEC (SCB)	2011
Map habitat critical to the survival of *Latrobea colophona*	High	DEC (SCB, Albany District) through the ADTFCRT	2012
Apply phosphite	High	DEC (Albany District) through the ADTFCRT	Ongoing
Determine *Latrobea colophona's* susceptibility to *Phytophthora cinnamomi*	High	DEC (Albany District) through the ADTFCRT	2011
Collect seed and other material to preserve genetic diversity	High	DEC (Albany District, TFSC), BGPA through the ADTFCRT	2015
Monitor populations	High	DEC (Albany District) through the ADTFCRT	Ongoing
Implement grazing control	High	DEC (Albany District) through the ADTFCRT	Ongoing
Conduct further surveys	High	DEC (Albany District) through the ADTFCRT	Ongoing
Develop and implement a fire management strategy	High	DEC (Albany District) through the ADTFCRT	Developed by 2011with implementation ongoing
Undertake and monitor translocations	High	DEC (Science Division, Albany District) through the ADTFCRT	2015
Liaise with Indigenous groups	High	DEC (Albany District) through the ADTFCRT	Ongoing
Promote awareness	Medium	DEC (Albany District, SCB, and Strategic Development and Corporate Affairs Division) through the ADTFCRT	Ongoing
Obtain biological and ecological information	Medium	DEC (Science Division, Albany District District) through the ADTFCRT	2015
Propose ranking criteria change for *Latrobea colophona*	Medium	DEC (SCB, Albany District District) through the ADTFCRT	2011
Review this IRP and assess the need for further recovery actions	Medium	DEC (SCB, Albany District District) through the ADTFCRT	2015

4. TERM OF PLAN

This IRP will operate from June 2010 to May 2015 but will remain in force until withdrawn or replaced. If the species is still ranked CR after five years, the need for further recovery actions will be determined.

5. REFERENCES

Atkins, K. (2009) *Declared Rare and Priority Flora List for Western Australia.* Department of Environment and Conservation, Perth, Western Australia.

Barrett, S. (2000) *Montane Heath and Thicket of the South West Botanical Province, above approximately 900 m above sea level* (Eastern Stirling Range Montane Heath and Thicket Community) *Interim Recovery Plan* No. 52, 1999-2002. Department of Conservation and Land Management, Western Australia.

Barrett, S., Comer, S., Freebury, G., Grant, M. and Broomhall, G. (2006) Draft Fire Management Strategy for Stirling Range National Park. Department of Environment and Conservation, Albany.

Barrett, S., Dillon, R. and Monks, L. (2009) Translocation Proposal *Latrobea colophona* (Papilionaceae). Department of Environment and Conservation, Western Australia.

Conservation and Land Management (1992) Policy Statement No. 44 *Wildlife Management Programs*. Department of Conservation and Land Management, Western Australia.

Conservation and Land Management (1994) Policy Statement No. 50 *Setting Priorities for the Conservation of Western Australia's Threatened Flora and Fauna*. Department of Conservation and Land Management,

Western Australia.
Conservation and Land Management (1995) Policy Statement No. 29 *Translocation of Threatened Flora and Fauna*. Department of Conservation and Land Management, Western Australia.
Department of Environment and Conservation (2007) *Definitions, categories and criteria for Threatened and Priority Ecological Communities*. Department of Environment and Conservation, Western Australia. http://www.dec.wa.gov.au/management-and-protection/threatened-species/wa-s-threatened-ecological-communities.html.
Vallee L., Hogbin T., Monks L., Makinson B., Matthes M. and Rossetto M. (2004) Guidelines for the Translocation of Threatened Australian Plants. Second Edition. *The Australian Network for Plant Conservation*. Canberra, Australia.
Western Australian Herbarium (1998−) *FloraBase − The Western Australian Flora*. Department of Environment and Conservation. http://florabase.dec.wa.gov.au/.
Wilkins, C.F. and Chappill, J.A. (2007) Three new species of *Latrobea* (Leguminosae:Mirbelieae) from south-western Australia. *Nuytsia*, 17, 483-492.
World Conservation Union (2001) *IUCN Red List Categories: Version 3.1*. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

6. TAXONOMIC DESCRIPTION

Latrobea colophona

Wilkins, C.F. and Chappill, J.A. (2007) Three new species of *Latrobea* (Leguminosae:Mirbelieae) from south-western Australia. *Nuytsia*, 17, 483-492.

Shrub erect, 0.25−1 x 0.5 m. *Stems* grey-green or red, with green, flat spots or tubercules, present or absent, ribbed, with dense, appressed or spreading, straight or wavy hairs *c*. 0.25−0.6 mm long. *Stipules* caducous, dark red, oblong-linear, erect, 0.15−0.2 x 0.1 mm. *Leaves* dense, overlapping, ascending; *petiole* pale yellow, wrinkled, 0.25−0.8 mm long; *blade* with tapering base, concolorous, grey-green, minute red spots present or absent, not glaucous, flat at base to concave towards apex, narrowly-obovate, 3.5−9.0 x 1.1−3.2 mm, one prominent vein on abaxial surface, apical leaves not or slightly tuberculate, with moderately dense hairs, 0.2−0.8 mm long on margin, adaxial and abaxial surfaces, mature leaves glabrescent; margin entire or minutely denticulate, flat, apex straight, with apiculum dark red, deciduous or persistent, *c*. 0.1 mm long. *Flowers* 1−3 axillary, without enclosing floral leaves. *Bracts* ovate, 0.8−2.5 x 0.6−1.4 mm, margins with sparse, spreading, straight hairs *c*. 0.2 mm long. *Bracteoles* caducous from mid pedicel, narrowly-ovate to filiform, 1.3−2.8 x 0.3−0.8 mm, margins with sparse, spreading, straight white hairs *c*. 0.1 mm long. *Pedicels* 1.5−3.6 mm long. *Buds* yellow-green with scattered to medium density, spreading, white hairs *c*. 0.5 mm long, with 5 faint ribs, petals emerging from calyx before buds are fully developed, mature buds *c*. 6 x 2.5 mm, apiculum on lobe apex straight, dark red, 0.15 mm long. *Hypanthium* 0.5−0.7 mm long. *Calyx* tube 0.5−1.5 mm long, lobes valvate, symmetrical, all split to same level, 4.0−4.8 x 0.6−1.1 mm, marginal and inner surface hairs present. *Standard* claw 1.1−1.6 x 0.45−0.6 mm, lamina bright yellow with cream spot at base, sagittate, 6.5−7.8 x 6.5−7 mm, auricles absent, apex hooded, acute and incurved. *Wing* claw curved, 1.6 mm long, lamina yellow with red markings at base, 6.1−6.7 x 1.8−2 mm, slightly broader toward apex, auricles at base of abaxial and adaxial margins, apex obtuse. *Keel* claw straight, *c*. 1.4 x 0.3 mm, lamina yellow, 5.7−6.8 x 2.3−2.6 mm, upper margin minutely papillate, apex obtuse and straight. *Stamen* filaments uniform length and width, or scarcely alternating shorter or longer, 4.6−6.3 x 0.15−0.2 mm; *anthers* white, with red connective, dorsifixed, uniform size, 0.3−0.6 x 0.3 mm. *Gynoecium* stipe 0.5−0.55 mm long, ovary 1.3−2 x 0.5−0.7 mm, outer surface densely hairy; *style* filiform, attachment to ovary well defined, *c*. 4.0 x 0.1 mm with minute terminal *stigma*; *ovules* 2, funicles *c*. 0.2 mm long. *Fruit* and *seed* not seen.