INTERIM RECOVERY PLAN NO. 294

Cryptandra congesta

INTERIM RECOVERY PLAN

2010 – 2015

February 2010

Department of Environment and Conservation
Manjimup

SAVING OUR SPECIES

GOVERNMENT OF WESTERN AUSTRALIA

Department of Environment and Conservation
Our environment, our future

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: the Department of 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 Recovery Plans (RPs) or 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This IRP will operate from February 2010 to January 2015 but will remain in force until withdrawn or replaced. It is intended that, if the species is still ranked Vulnerable (VU) this IRP will be reviewed after five years and the need for further recovery actions assessed.

This IRP was given regional approval on 15 January 2010 and was approved by the Director of Nature Conservation on 9 February 2010. The allocation of staff time and 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 February 2010.

IRP PREPARATION

This IRP was prepared by Cassidy Newland[1]

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ACKNOWLEDGMENTS

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

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Cover photograph by Cassidy Newland

CITATION

This IRP should be cited as:
Department of Environment and Conservation (2010) *Cryptandra congesta* Interim Recovery Plan 2010-2015. Interim Recovery Plan No. 294. Department of Environment and Conservation, Western Australia.

SUMMARY

Scientific Name:	***Cryptandra congesta***	**Common Name:**	None
Family:	RHAMNACEAE	**Flowering Period:**	April – October
DEC Region:	Warren	**DEC District:**	Frankland
Shire:	Denmark	**Recovery Team:**	Warren Region Threatened Flora Recovery Team (WRTFRT)
NRM Region:	South Coast NRM Inc.		

Illustrations and/or further information: DEC (2008) *Western Australian Herbarium FloraBase 2 – Information on the Western Australian Flora* (Accessed 2008). Department of Environment and Conservation, Western Australia. http://www.calm.wa.gov.au/science/; Rye, B.L., (1995) New and priority taxa in *Cryptandra* and *Stenanthemum*. *Nuytsia* 10(2): 265-268; Hearn R.W., Meissner R., Brown A.P., Macfarlane T.D., and Annels T.R. (2006) *Declared Rare and Poorly Known Flora in the Warren Region*. Department of Environment and Conservation, Perth, Western Australia.

Current status: In 2007 *Cryptandra congesta* was declared as Rare Flora under the Western Australian *Wildlife Conservation Act 1950* and currently meets Vulnerable (VU) under World Conservation Union (IUCN 2001) Red List criterion D2 as the population is very restricted with an area of occupancy of less than 20km^2. The species is not currently listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The major threat to *C. congesta* is its small population size and restricted distribution, which makes the species vulnerable to disturbance in its habitat. Key threatening processes that have the potential to reduce the extent of the population include *Phytophthora cinnamomi*, inappropriate fire regimes and drying habitat conditions. Feral pig activity and incidental recreational activities such as motorbike riding and bushwalking also have the potential to contribute to population decline.

Description: *Cryptandra congesta* is a small shrub up to 20cm high (rarely up to 30cm) and up to 40cm wide, however most plants are no larger then 10cm high and 10cm wide. The leaves are narrowly oblong, 3mm long, less than 1mm wide and thick. Flowers are white, small and up to 8mm wide white in terminal clusters of 5-12. *Cryptandra arbutiflora*, which also occurs at locations around Mt Lindesay, differs from *C. congesta* in having spine tipped branchlets, a more erect habit of up to 1m high and a longer floral tube.

Habitat requirements: *Cryptandra congesta* grows in shallow siliceous sands over granite in a mixed low heath of *Grevillea fuscolutea, Andersonia sprengelioides, Acacia triptycha, Verticordia plumosa, Melaleuca scabra, Neurachne alopecuroides, Borya longiscapa, Mesomelaena stygia, Hibbertia microphylla, Conostylis pusilla, Hemigenia podalyrina* and *Gastrolobium brownii*.

Habitat critical to the survival of the species, and important populations: Given that *Cryptandra congesta* is listed as Vulnerable, 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 *C. congesta* includes the area of occupancy of populations; areas of similar habitat surrounding and linking populations (these providing potential habitat for populations 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/ecological communities: *Cryptandra congesta* primarily occurs within the boundary of the Mt Lindesay Threatened Ecological Community, frequently in association with *Grevillea fuscolutea* (DRF), *Laxmannia grandiflora* subsp. *brendae* (DRF), *Borya longiscapa* (P2) and *Verticordia endlicheriana* var. *angustifolia* (P2). These species share much of the same habitat and as such, recovery actions implemented under this IRP to improve the quality and security of habitat of *Cryptandra congesta* will benefit these associated species and the TEC.

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

Indigenous consultation: According to the Department of Indigenous Affairs Aboriginal Heritage Sites Register no populations occur in or near a currently registered Aboriginal Heritage site. However, the species occurs around granite outcrops and these are known to be culturally significant sites to Indigenous people. Input and involvement is being sought through the South West Aboriginal Land and Sea Council (SWALSC) 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.

Affected interests: As the majority of populations are on Crown land vested in the Conservation Commission of Western Australia and managed by DEC, the only non-Departmental stakeholders affected by the implementation of this plan are the landholders of the property in which part of Subpopulation 4a occurs.

Social and economic impact: The implementation of this recovery plan has the potential to have some limited social and economic impact as part of Subpopulation 4a is located on private property. Recovery actions refer to continued liaison with the stakeholder with regard to this area. Many of the actions outlined under this recovery plan fall outside of the routine works of the Warren Region and the successful implementation of these actions without additional or external funding will have a significant impact on the current Regional budget. If Nature Conservation funds are unavailable recovery works will be deferred.

Evaluation of the Plans Performance: DEC, in conjunction with the Warren Region Threatened Flora Recovery Team (WRTFRT) 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 is to be reviewed following four years of implementation.

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

1. Staff at DEC's Frankland District are aware of the Declared Rare status of *Cryptandra congesta* and manage it as such.
2. Staff from DEC's Frankland District regularly monitor this species and manage threatening processes where possible.
3. A small portion of the granite habitat of *Cryptandra congesta* is treated with aerial applications of phosphite every two years (commenced 2005) to reduce the impact of *Phytophthora cinnamomi* on species composition, reproduction and community health/ integrity. The phosphite program will be extended to some of the granites on Little Lindesay known to contain *Cryptandra congesta*.
4. The occurrence of the majority of known populations has been mapped in the field.
5. Surveys of potential habitat outside the known distribution have been undertaken to locate new populations or extend the known distribution of the species.
6. Demography attributes of known populations and population extents have been documented following field surveys.
7. Known occurrences on private land have been listed under the Land for Wildlife program.
8. Monitoring sites have been established to investigate fire response of the species.
9. The occurrence of *Phytophthora cinnamomi* has been partially mapped across the species distribution.

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 subspecies in the wild.

Criteria for success: The number of populations have increased or the number of individuals within populations have increased by five percent or more over the term of the plan.

Criteria for failure: The number of populations have decreased or the number of individuals within populations have decreased by ten percent or more over the term of the plan.

Recovery actions

1. Coordinate recovery actions	10. Determine *Phytophthora cinnamomi* susceptibility
2. Monitor populations	11. Map and monitor dieback fronts
3. Liaise with relevant land managers and Indigenous groups	12. Apply phosphite to currently uninfected granite systems
4. Close vehicle access to Little Lindesay and Mt Lindesay	13. Monitor hydrological conditions
5. Conduct further surveys	14. Monitor and control grazing activity
6. Map habitat critical to the survival of *Cryptandra congesta*	15. Seek long-term protection of habitat on private property
7. Collect seed	16. Promote awareness
8. Obtain biological and ecological information	17. Review this plan and assess the need for further recovery actions
9. Develop and implement a fire management strategy	

1. BACKGROUND

History

Cryptandra congesta was collected from Mt Lindesay by Greg Keighery in 1990 and by Brenda Hammersley in 1992. The species was placed with *C. glabriflora* and *C. leucopogon* before being described as a new species by Barbara Rye in 1995 (Hearn et al., 2006; Rye, 1995). In 2006/7 a review of the species' conservation status was undertaken, which confirmed it as a narrow endemic confined to the Mt Lindesay landform and the species was nominated for listing as declared as Rare Flora under the Western Australian *Wildlife Conservation Act 1950*. The species was assessed in the same year by the Threatened Species Scientific Committee and was later gazetted as Declared Rare Flora with a World Conservation Union (IUCN 2001) IUCN ranking of Vulnerable (VU).

Description

Cryptandra congesta is a small shrub up to 20cm high (rarely up to 30cm) and up to 40cm wide, however most plants are no larger then 10cm high and 10cm wide. The leaves are narrowly oblong, 3mm long, less than 1mm wide and thick. Flowers are white, small and up to 8mm wide white in terminal clusters of 5-12. *Cryptandra arbutiflora*, which also occurs at locations around Mt Lindesay, differs from *C. congesta* in having spine tipped branchlets, a more erect habit of up to 1m high and a longer floral tube.

Distribution and habitat

Cryptandra congesta is a narrow endemic that is confined to the Mt Lindesay – Little Lindesay landform north of Denmark. It grows on the fringes of granite outcrops among mixed low scrub with *Allocasuarina humilis, Grevillea fuscolutea, G. cirsiifolia, Neurachne alopecuroides, Andersonia sprengelioides, Acacia triptycha, Borya longiscapa, Mesomelaena stygia, Hibbertia microphylla, Dillwynia laxiflora, Conostylis pusilla, Hemigenia podalyrina, Melaleuca scabra, Verticordia plumosa* and *Gastrolobium brownii*. *C. congesta* and *B. longiscapa* are confined to the same landform and most of their range is now recognised as the Mt Lindesay Threatened Ecological Community.

Map 1. Distribution of *Cryptandra congesta.*

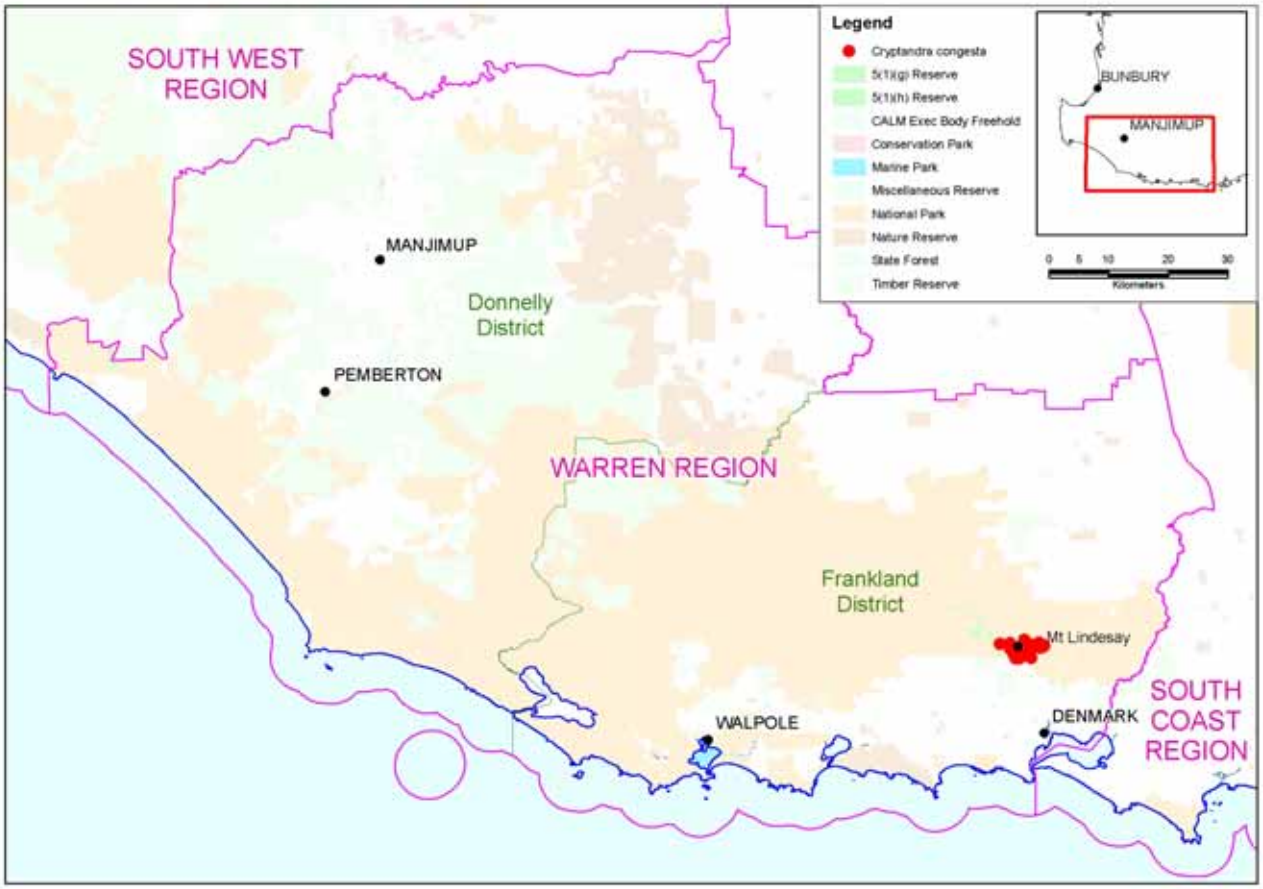

Table 1. Summary of population land vesting, purpose and manager

Pop. No	Location	DEC District	Shire	Vesting	Purpose	Manager
1A	Mt Lindesay NP	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
1B	E of Little Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
1C	NE of Little Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
1D	Little Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
1E	N of Little Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
1F	NW of Little Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
1G	NW of Little Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
2A	SW of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
2B	SW of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
2C	SW of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
3A	W of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
3B	W of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
3C	W of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
4A	S of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA/ Freehold	National Park/ Private Property	DEC/ Landowners
4B	S of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
5A	SE of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
5B	SE of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
5C	SE of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
6	ENE of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
7	NNE of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC
8	W of the summit of Mt Lindesay	Frankland	Denmark	Conservation Commission of WA	National Park	DEC

Populations in **bold text** are considered to be Important Populations.

Biology and ecology

The biology and ecology of *Cryptandra congesta* remains largely unknown as the species was not known until collected in 1990. However the following characteristics have been collated from population monitoring and recent surveying.

Cryptandra congesta is a narrow endemic confined to the Mt Lindesay landform where it can be found growing in shallow yellow sandy clay soils, frequently with fine granitic gravel in areas where the vegetation is low and open. These areas are usually characterised by low open sedges and low open shrubs.

Cryptandra congesta flowers between April and October. Flowers persist on the shrub and retain at least some seed for a period.

Cryptandra congesta has been reported to be killed by fire, regenerating from soil-stored seed with the first seedlings reaching reproductive maturity in the fourth year following fire.

Threatening processes

Cryptandra congesta is gazetted as Declared Rare Flora under the Western Australian *Wildlife Conservation Act 1950* and currently meets Vulnerable (VU) under World Conservation Union (IUCN 2001) Red List criterion D2 as the populations are very restricted with an area of occupancy of less than 20km^2. The species is not currently listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Threats include:

- **Inappropriate fire regimes** - fire has been reported to kill the majority of plants burnt, with regeneration occurring from seed germination. As a result, recently burnt populations remain vulnerable to further fire until germinates have reached sufficient size to replenish seed stock and account for mortality rates. As such the occurrence of fire before the re-establishment of the soil seed bank is a serious threat to the species. It is however to be noted that vegetation in many of the plant communities in which *Cryptandra congesta* occurs, are often open and discontinuous and under mild fire conditions it is expected that fire will not burn the majority of plants within affected populations, whilst under severe fire conditions its is expected that the majority of plants within the path of the fire will burn.
- **Vehicle access** threatens Subpopulations 1b, 1d, 1e, 2a, and 2b. An old 4WD vehicle access track runs from Stan Road to Little Lindesay and Mt Lindesay where it connects to the end of the Mt Lindesay walk trail. Past use of the track has contributed to the spread of *Phytophthora cinnamomi* and has degraded the granite communities along the start of the track in an area that harbours Subpopulations 2a, 2b and 2c. While the track is officially closed it is still used regularly by motorbikes and occasionally by 4WDs and continues to threaten the granite communities. In addition, use of the Mt Lindesay walk trail as a return route by motorbikes threatens Subpopulations 2a and 2b.
- **Recreational access** in relation to walking and exploration of granite outcrops is a minor threat that is expected to have the greatest impact on populations following fire when seedling regeneration sees the populations at their most vulnerable.
- ***Phytophthora cinnamomi*** is currently considered an indirect threat to *Cryptandra congesta* through the degradation of habitat critical to its survival. While the susceptibility of *Cryptandra congesta* to *P. cinnamomi* has not yet been determined, the pathogen is present within its habitat.
- **Drought** is a serious threat to the species. Its highly restricted occurrence on shallow soils fringing granite outcrops, makes it vulnerable to any loss of available habitat through the effects of drought. As with other narrow endemics associated with the Lindesay landform, it can be expected that occurrences on slopes with a more westerly and northerly aspect will receive a greater intensity of solar radiation and therefore such occurrences are likely to be the first to be affected by drought and monitoring these populations should provide early warning to drought impacts on the species.
- **Feral pigs and rabbits** are a potential threat that is likely to threaten the species if the animals are allowed to increase and spread. Populations of both animals occur within the Mt Lindesay National Park, although no impacts have yet been recorded in habitat critical to the survival of *Cryptandra congesta.*
- **Roadworks** is not considered a major threat to the species, however Subpopulation 4a occurs to the north and south of Nutcracker Road and any maintenance of the road within the boundary of the population is likely to remove or damage some individual plants.

The intent of this plan is to provide actions that will deal with immediate threats to *Cryptandra congesta*. 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	Area m² (extent)	Condition	Threats
1A	Mt Lindesay NP	National Park	2006	10800	11000	Healthy	Inappropriate fire regimes, dieback, drought
1B	E of Little Lindesay	National Park	2006	200	25000	Healthy	Inappropriate fire regimes, recreational access, vehicle access, dieback, drought
1C	NE of Little Lindesay	National Park	2006	22000	35000	Healthy	Inappropriate fire regimes, dieback, drought
1D	Little Lindesay	National Park	2006	1900	22000	Healthy	Inappropriate fire regimes, recreational access, vehicle access, dieback, drought
1E	N of Little Lindesay	National Park	2006	600	22500	Healthy	Inappropriate fire regimes, recreational access, vehicle access, dieback, drought
1F	NW of Little Lindesay	National Park	2006			Healthy	Inappropriate fire regimes, dieback, drought
1G	NW of Little Lindesay	National Park	2006	1000	NA	Moderate	Inappropriate fire regimes, dieback, drought
2A	SW of the summit of Mt Lindesay	National Park	2006	1300	1000	Healthy	Inappropriate fire regimes, recreational access, vehicle access, dieback, drought
2B	SW of the summit of Mt Lindesay	National Park	2006	15000	240000	Healthy	Inappropriate fire regimes, recreational access, vehicle access, dieback, drought
2C	SW of the summit of Mt Lindesay	National Park	2006	10000	20000	Healthy	Inappropriate fire regimes, dieback, drought
3A	W of the summit of Mt Lindesay	National Park/ Private Property	2005	NA	NA	Moderate	Inappropriate fire regimes, dieback, drought
3B	W of the summit of Mt Lindesay	National Park	2005	NA	NA	Moderate	Inappropriate fire regimes, dieback, drought
3C	W of the summit of Mt Lindesay	National Park	2007	3500	25000	Moderate	Inappropriate fire regimes, dieback, drought
4A	S of the summit of Mt Lindesay	National Park	2006	1500	500	Moderate	Inappropriate fire regimes, dieback, drought, roadworks
4B	S of the summit of Mt Lindesay	National Park	2006	8000	6000	Healthy	Inappropriate fire regimes, dieback, drought
5A	SE of the summit of Mt Lindesay	National Park	2006	3000	41000	Moderate	Inappropriate fire regimes, dieback, drought
5B	SE of the summit of Mt Lindesay	National Park	2006	15000	30000	Healthy	Inappropriate fire regimes, dieback, drought
5C	SE of the summit of Mt Lindesay	National Park	2006	800	13000	Healthy	Inappropriate fire regimes, dieback, drought
6	ENE of the summit of Mt Lindesay	National Park	2006	800	3500	Moderate	Inappropriate fire regimes, dieback, drought
7	NNE of the summit of Mt Lindesay	National Park	2006	1500	2200	Moderate	Inappropriate fire regimes, dieback, drought
8	W of the summit of Mt Lindesay	National Park	2006	300	NA	Moderate	Inappropriate fire regimes, dieback, drought

Populations in **bold text** are considered to be Important Populations.

Guide for decision-makers

Section 1 provides details of current and possible future threats. Developments and/or land clearing in the immediate vicinity of *Cryptandra congesta* 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, or the local surface and ground water hydrology, such that drainage in the habitat of the species would be altered.

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

Given that *Cryptandra congesta* is listed as Vulnerable, 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 *C. congesta* includes the area of occupancy of populations; areas of similar habitat surrounding and linking populations (these providing potential habitat for populations 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/ecological communities

Cryptandra congesta primarily occurs within the boundary of the Mt Lindesay Threatened Ecological Community, frequently in association with *Grevillea fuscolutea* (DRF), *Laxmannia grandiflora* subsp. *brendae* (DRF), *Borya longiscapa* (P2) and *Verticordia endlicheriana* var. *angustifolia* (P2). These species share much of the same habitat and, as such, recovery actions implemented under this IRP to improve the quality and security of habitat of *Cryptandra congesta* will benefit these associated species and the TEC. These taxa are listed in the table below:

Table 3: Conservation-listed flora species occurring in habitat of *Cryptandra congesta*

Species name	Conservation Status (Western Australia)	Conservation Status (EPBC Act 1999)
Laxmannia grandiflora subsp. *brendae*	DRF, Vulnerable	
Grevillea fuscolutea	DRF, Vulnerable	
Borya longiscapa	Priority 2	
Verticordia endlicheriana var. *angustifolia*	Priority 2	

For a description of the priority categories see Atkins (2006)

Cryptandra congesta falls largely within the Mt Lindesay Threatened Ecological Community (Mt Lindesay TEC) (see table below).

Table 4: Threatened Ecological Community (TEC) in which *Cryptandra congesta* occurs in association

Community Name	Conservation status (WA)
Mt Lindesay – Little Lindesay Vegetation Complex	Endangered

For a description of the TEC 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 1993, and will assist in implementing Australia's responsibilities under that convention. This species is not specifically listed under any international treaty, however, and this IRP does not affect Australia's obligations under any other international agreements.

Indigenous consultation

According to the Department of Indigenous Affairs Aboriginal Heritage Sites Register no populations occur in or near a currently registered Aboriginal Heritage site. However, the species occurs around granite outcrops and, as these are known to be culturally significant sites to Indigenous people, input and involvement is being sought through the South West Aboriginal Land and Sea Council (SWALSC) 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.

Affected interests

The majority of populations are on Crown land vested in the Conservation Commission of Western Australia and managed by DEC, with the only other stakeholder affected by the implementation of this plan being the landholders of the property in which part of Subpopulation 4a is found.

Social and economic impact

The implementation of this recovery plan has the potential to have some limited social and economic impact as part of Subpopulation 4a is located on private property. Recovery actions refer to continued liaison with the stakeholder with regard to this area. Many of the actions outlined under this recovery plan fall outside of the routine works of the Warren Region and the successful implementation of these actions without additional or external funding will have a significant impact on the current Regional budget. If Nature Conservation funds are unavailable recovery works will be deferred.

Evaluation of the Plan's Performance

DEC, in conjunction with the Warren Region Threatened Flora Recovery Team (WRTFRT) 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 subspecies in the wild.

Criteria for success: The number of populations has increased or the number of individuals within populations has increased by five percent or more over the term of the plan.

Criteria for failure: The number of populations has decreased or the number of individuals within populations has decreased by ten percent or more over the term of the plan.

3. RECOVERY ACTIONS

Existing recovery actions

Staff at DEC's Frankland District are aware of the Declared Rare status of *Cryptandra congesta* and manage it as such.

Staff from DEC's Frankland District regularly monitor this species and manage threatening processes where possible.

A portion of the granite habitat of *Cryptandra congesta* is treated with aerial applications of phosphite every two years (commenced 2005) to reduce the impact of *Phytophthora cinnamomi* on species composition, reproduction and community health/ integrity. The phosphite program will be extended to some of the granites on Little Lindesay known to contain *Cryptandra congesta*.

The occurrence of the majority of known populations has been mapped in the field.

Surveys of potential habitat outside the known distribution have been undertaken to locate new populations or extend the known distribution of the species.

Demography attributes of known populations and population extents have been documented following field surveys.

Known occurrences on private land have been listed under the Land for Wildlife program.

Monitoring sites have been established to investigate fire response of the species.

The occurrence of Phytophthora cinnamomi has been partially mapped across the species distribution.

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 WRTFRT is coordinating recovery actions for *Cryptandra congesta* and will include information on progress in their annual report to DEC's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: DEC (Warren Region) through the WRTFRT
Cost: $1,500 per year

2. Monitor populations

Cryptandra congesta populations will be monitored annually. Data will be collected on population demography variables such as age structure, mortality, recruitment, reproductive processes and distribution. Threatening processes will also be monitored and efforts made to mitigate or reduce impacts where possible, eg from disturbance events, native herbivore grazing, feral pigs, recreational activities, weed encroachment, fire management activities and drought.

Action: Monitor populations
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $4,500 per year

3. Liaise with relevant land managers and Indigenous groups

Part of Subpopulation 4a occurs on private property. Close liaison with the land managers is essential in ensuring good and cooperative management of the species. *Cryptandra congesta* occurs in habitat which is suspected to be culturally sensitive and Indigenous consultation will take place to determine if there are any issues or interests.

Action: Liaise with relevant land managers and Indigenous groups
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $1,500 per year

4. Close vehicle access to Little Lindesay and Mt Lindesay

Use of the informal internal vehicle access track which runs from Stan Road to Little Lindesay and Mt Lindesay has degraded the granite ecosystems harbouring Subpopulations 1b, 1d, and 1e. This access has also led to motorbikes continuing down the walk trail threatening Subpopulations 2a and 2b. While the track is officially closed vehicle access needs to be addressed to prevent further damage to the populations and associated habitat.

Action: Close vehicle access to Little Lindesay and Mt Lindesay
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $3,000 in the first year

5. Conduct further surveys

Surveys supervised by DEC staff, with assistance of volunteers, should be conducted during the species' flowering period. While many areas of Mt Lindesay have been searched and new populations found, due to the time required to reach much of the potential habitat at Mt Lindesay, there still exists potential habitat which has yet to be searched.

Action: Conduct further surveys
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $4,000 per year

6. Map habitat critical to the survival of *Cryptandra congesta*

It is a requirement of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that spatial data relating to habitat critical to the survival of the species be determined. This is alluded to in Section 1. Some of the habitat critical to the species survival has already been mapped as a result of the pre-nomination survey work and population mapping. However, extended potential habitat that could be important has not been considered in detail. If additional populations are located, then habitat critical to their survival will also be determined and mapped.

Action: Map habitat critical to the survival of *Cryptandra congesta*
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $2,000 in year 2

7. Collect seed

Seed will be collected from as wide a range of individuals as possible for *ex situ* conservation at DEC's Threatened Flora Seed Centre.

Action: Collect seed
Responsibility: DEC (Frankland District, TFSC) through the WRTFRT
Cost: $3300 per year (for three years)

8. Obtain biological and ecological information

A scientific study is required to provide a sound understanding of the biology and ecology of *Cryptandra congesta* to enable a scientific basis for its management in the wild. It is proposed that the design of Action 10 below be included within this study to maximise the value of information gathered. This study will include:

- Defining the habitat requirements of the species.
- Determining the reproductive methodology, phenology and seasonal growth of the species.
- Investigating the population genetic structure, levels of genetic diversity and minimum viable population size.
- Longevity of plants and time taken to reach maturity.
- Determining the response of the species to disturbance.

Action: Obtain biological and ecological information
Responsibility: DEC (Frankland District, Science Division) through the WRTFRT
Cost: $15,000 per year

9. Develop and implement a fire management strategy

Fire has been identified as a potential threat to the species but the development and implementation of an appropriate fire regime should be able to prevent any significant impacts from the introduction of fire in the landscape. In order to determine the requirements for an appropriate fire regime monitoring sites were established at Mt Lindesay for the species prior to the introduction of prescribed fire and the introduction of fire was planned to result in a mix of burnt and unburnt sites to allow the collection of information relating to the fire response and phenology of the species. When sufficient information is available fire management strategy will be developed by DEC's Frankland District in consultation with relevant authorities and land managers and the WRTFRT. It is intended that this strategy be developed as a combined strategy for the Mt Lindesay landform which seeks to incorporate the requirements of other threatened and priority species occurring within associated critical habitat, requirements for the Mt Lindesay TEC and acknowledges the fire management requirements within the landscape.

Action: Develop and implement a fire management strategy
Responsibility: DEC (Frankland District) through WRTFRT; relevant authorities
Cost: $2,900 in first year, and $1,700 in years 2-5

10. Determine *Phytophthora cinnamomi* susceptibility

Phytophthora cinnamomi is present within the habitat of *Cryptandra congesta*, however its susceptibility is not known. Root and soil samples will be taken from any plants that are found to be recently dead in suspect areas. Significant fronts will be mapped and monitored in the vicinity of critical habitat, particularly following fire management activities. Aerial phosphite application will be used to target high priority areas and reduce the spread of *P. cinnamomi* into currently uninfected areas within the TEC.

Action: Determine *Phytophthora cinnamomi* susceptibility
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $2,000 in the first year

11. Map and monitor dieback fronts

Action: Map and monitor dieback fronts
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $3,000 per year

12. Apply phosphite to currently uninfected granite systems

Action: Apply phosphite to currently uninfected granite systems
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $10,000 in years 1, 3 and 5 (to expand current project to Little Lindesay).

13. Monitor hydrological conditions

It is expected that a long term dry trend associated with climate change could lead to a reduction in the annual growth of the species and the decline of existing plants. Monitoring of the hydrological conditions including yearly rainfall, the dry season period, month of break of the dry season and summer rainfall should be recorded using a small network of rainfall data loggers placed strategically around Mt Lindesay. Where possible, collection of data from data loggers should be planned in conjunction with Recovery Action 2 to reduce costs.

Action: Monitor hydrological conditions
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $5000 in the first year and then $2000 each subsequent year

14. Monitor and control grazing activity

Where deemed necessary as a result of monitoring, control of grazing from feral pigs, rabbits and kangaroos within the Mt Lindesay area will be undertaken.

Action: Monitor and control grazing activity
Responsibility: DEC (Frankland) through the WRTFRT
Cost: $3,000 per year

15. Seek long-term protection of habitat on private property

Subpopulation 4a of *Cryptandra congesta* occurs in remnant bushland on a farm bordering the Mt Lindesay National Park, staff from DEC's Frankland District should liaise with the landholders to investigate options for a conservation covenant or the Land for Wildlife scheme and possibly acquisition. Departmental staff will seek to ensure conservation management of the public land on which population 4a occurs.

Action: Seek long-term protection of habitat on private property
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $1,200 within third year

16. Promote awareness

Cryptandra congesta and other species associated within the Mt Lindesay TEC are poorly known in the community. Promoting awareness of them is likely to help protect these species and raise the value placed on them by the community.

Action: Promote awareness
Responsibility: DEC (Frankland District) through the WRTFRT
Cost: $1,500 per year

17. Review this plan and assess the need for further recovery actions

If *Cryptandra congesta* is still listed as declared rare flora 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 plan and assess the need for further recovery actions
Responsibility: DEC (Frankland District, Species and Communities Branch (SCB)) through the WRTFRT
Cost: $2,000 in year 5

Table 5. Summary of recovery actions

Recovery Actions	Priority	Responsibility	Completion date
Coordinate recovery actions	High	WRTRFT	Ongoing
Monitor populations	High	DEC (Frankland District) through WRTFRT	Ongoing
Liaise with relevant land managers and Indigenous groups	High	DEC (Frankland District) through WRTFRT	Ongoing
Close vehicle access to Little Lindesay and Mt Lindesay	High	DEC (Frankland District) through WRTFRT	2010
Conduct further surveys	High	DEC (Frankland District) through WRTFRT	Ongoing
Map habitat critical to the survival of *Cryptandra congesta*	High	DEC (Frankland District) through WRTFRT	2011
Collect seed	Medium	DEC (Frankland District, TFSC) through WRTFRT	2012
Obtain biological and ecological information	Medium	DEC (Frankland District, Science Division) through WRTFRT	2015
Determine *Phytophthora cinnamomi* susceptibility	Medium	DEC (Frankland District) through WRTFRT	2010
Develop and implement a fire management strategy	Medium	DEC (Frankland District) through WRTFRT; relevant authorities	Developed by 2010 with implementation ongoing
Map and monitor dieback fronts	Medium	DEC (Frankland District) through WRTFRT	2015
Apply phosphite to currently uninfected granite systems	Medium	DEC (Frankland District) through WRTFRT	2015
Monitor hydrological conditions	High	DEC (Frankland District) through WRTFRT	Ongoing
Monitor and control grazing activity	Low	DEC (Frankland District) through WRTFRT	Ongoing
Seek long-term protection of habitat on private property	Medium	DEC (Frankland District) through WRTFRT	2012
Promote awareness	Low	DEC (Frankland District) through WRTFRT	2015
Review this plan and assess the need for further recovery actions	Low	DEC (Frankland District, SCB) through WRTFRT	2015

4. TERM OF PLAN

This IRP will operate from February 2010 to January 2015 but will remain in force until withdrawn or replaced. If the species is still listed as declared rare flora after five years, the need for further recovery actions will be determined.

5. REFERENCES

Atkins, K. (2008) *Declared Rare and Priority Flora List for Western Australia.* Department of Environment and Conservation, Perth, Western Australia.

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Department of Environment and Conservation (2007) *Definitions, categories and criteria for Threatened and Priority Ecological Communities*. Department of Environment and Conservation, Western Australia (Accessed 2007). http://www.naturebase.net/content/view/273/1208/.

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Rye, B.L. (1995) New and priority taxa in *Cryptandra* and *Stenanthemum*. *Nuytsia* 10(2): 265-268.

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

Rye, B.L., (1995) New and priority taxa in *Cryptandra* and *Stenanthemum*. *Nuytsia* 10(2): 265-268.

Shrub low and spreading, 0.1-0.2 m high. Branchlets not spinescent. Young stems with simple appressed or antrorse hairs 0.1-0.3 mm long. Stipules 0.6-1mm long, acute glabrous outside or with a few short hairs along mid-vein, usually with a few cilia. Petioles 0.5-0.7 mm long. Leaf blades narrowly ovate or narrowly oblong, 2-3.3 x 0.6-0.9 mm, obtuse to acute; lower surface glabrous on the visible mid-vein, densely hairy on the usually concealed sides; upper surface glabrous, minutely papillose-toothed on the margins especially towards the apex. Floral bracts 4-6 per flower, ovate, c. 2 mm long acute or attenuate, prominently ciliate, the longest cilia 0.3-0.6 mm long; outer surface often hairy along the mid-vein. Flowers usually 5-12 per branchlet, in a head-like cluster 5-8.5 mm wide, white. Floral tube 1.3-1.7 mm long (enlarging to c. 2 mm in fruit), glabrous towards base, becoming densely hairy towards apex, with a minute papillae or minute simple hairs; stigmatic surfaces lateral, scarcely forming lobes. Schizocarp c. half inferior, c. 1.8 x 1.4 mm; superior portion concealed within free floral tube, hairy. Seeds c. 1.4 x 0.75 mm, pale to medium orange-brown.