National Recovery Plan for the Dwarf Kerrawang Rulingia prostrata

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Australian Government

Department of Environment, Climate Change and Water NSW



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This Recovery Plan has been developed with the involvement and cooperation of a range of stakeholders, but individual stakeholders have not necessarily committed to undertaking specific actions. The attainment of objectives and the provision of funds may be subject to budgetary and other constraints affecting the parties involved. Proposed actions may be subject to modification over the life of the plan due to changes in knowledge.

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Summary

The Dwarf Kerrawang *Rulingia prostrata* is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, Threatened under the Victorian *Flora and Fauna Guarantee Act 1988* and Endangered under the NSW *Threatened Species Conservation Act* 1995. The species is endemic to south-eastern Australia, where it is widely distributed from central Gippsland and to the central New South Wales coast. There are over 100,000 plants in about 40 wild populations, although almost all plants occur in a single population, and most populations contain very few plants. Major threats to populations include weed invasion, grazing, swamp drainage and altered fire regimes. This national Recovery Plan for the Dwarf Kerrawang details the species' distribution, habitat, conservation status, threats, and recovery objectives and actions necessary to ensure its long-term survival.

Species Information

Description

The Dwarf Kerrawang *Rulingia prostrata* is a prostrate, mat-forming shrub with trailing branches to 2 m long and ovate to cordate leaves 10–35 mm long and 5–25 mm wide, with serrate to crenate margins, the upper leaf surface sparsely stellate hairy, more densely below, the petiole 3–20 mm long. The inflorescence consists of 3–12 pink, hairy, star-shaped flowers that appear in October and November. Petals are about 1.5 mm long, and the calyx about 3 mm long. A dry, hairy, spherical capsule develops from the centre of the flower and reaches 9 mm diameter at maturity (description from Walsh & Entwisle 1999).

The Dwarf Kerrawang appears to rely on disturbance such as fire or flooding for seed germination, with large increases in numbers noted at some populations after these events (Fox 2006). At one location in New South Wales, it appears to be a successional species, occurring in sub-climax communities regenerating after fire or clearing (Appendix 11.5 in Fox 2006). Population numbers fluctuate widely between years (Appendix 1).

Distribution

The Dwarf Kerrawang is endemic to south-eastern Australia, where it is widely but patchily distributed between Rosedale (central Gippsland, Vic.) to Newcastle (central coast NSW) (Harden 1990; Walsh & Entwisle 1999). The species occurs in the South East Coastal Plain (Vic), Sydney Basin and South Eastern Highlands (NSW) IBRA Bioregions (DEH 2000).



Figure 1. Former and current distribution of Rulingia prostrata

Maps showing the detailed distribution of the Dwarf Kerrawang are available from the Department of Sustainability and Environment (Vic) and Department of Environment, Climate Change and Water (NSW). This information is available on request in a variety of formats for natural resource management purposes.

Population Information

Within its wide distribution, the Dwarf Kerrawang is currently known from 31 sites; 24 in Victoria and seven in New South Wales (Appendix 1). There are perhaps 40 populations containing over 100,000 plants, although almost all of these grow in just one population. Most populations are small, containing fewer than 50 plants. In Victoria, all sites are confined to the Rosedale-Stradbroke-Providence Ponds area of central Gippsland (James 2000, 2002). In New South Wales, six sites (plus two extinct/unrelocated sites) occur near Tallong, Penrose and Goulburn on the Southern Tablelands. The largest population occurs in the Tomago sandbeds area near Newcastle on the central coast of NSW (Harden 1990; DECCW Southern Directorate pers. comm.).

Habitat

Victorian populations of Dwarf Kerrawang occur in ephemeral wetlands and lake margins, often dominated by *Lepidosperma* species (Walsh & Entwisle 1999), with associated native species including *Imperata cylindrica*, *Empodisma minus* and *Leptospermum continentale*, growing on peaty soils (James 2000, 2002).

In New South Wales the species occurs in a range of habitats quite different to those in Victoria. In the Tomago sandbeds area it occurs locally as a pioneer species in ecotonal swamp forest containing *Eucalyptus haemastoma, Eucalyptus robusta* and *Melaleuca quinquenervia*, on heavy organic sandy soils in Pleistocene sands disturbed by mining and bushfires in the mid 1990s. Plants were recently observed growing on open sandy sites in the ecotone between sedge swamp and swamp forest (Appendix 11.5 in Fox 2006). Swamp forest is a groundwater dependant ecosystem that represents a substantial vegetation community of the Tomago sandbeds.

On the Southern Tablelands, Dwarf Kerrawang occurs in *Eucalyptus pauciflora* grassy woodland at Roses Lagoon, in *Eucalyptus agglomerata* open forest at Tallong and in *Eucalyptus mannifera* low open woodland at Penrose. There is no information on the habitat for the two historic records. At all known sites the soils are sandy, unlike the heavier peaty soils apparently favored in Victoria.

Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Threats

The Dwarf Kerrawang was almost certainly more widespread and abundant within the regions where it currently occurs, but populations have been fragmented and depleted historically by land clearance for settlement, agriculture and plantation forestry. The species has declined or disappeared from several locations in Victoria (James 2000; Fox 2006), and the sites of most extant populations have been severely altered from their natural state and face a range of current threats (James 2002). Three populations in NSW are known from just single plants, and the risk of local extinction of the species at these sites is very high, especially from stochastic events. Threats across the range of the species include swamp drainage, dam construction, track maintenance, grazing, weed invasion, altered fire regimes. Population numbers fluctuate widely.

Details of threats at each site are contained in Appendix 1. Major threats are summarised as follows:

Weed invasion: Introduced and native environmental weeds threatened most populations in Victoria, with the main species being the native plant Burgan *Kunzea ericoides* that rapidly colonises disturbed sites, Blackberry *Rubus fruticosus* species aggregate (a Weed of National Significance) and the introduced grass Kikuyu *Pennisetum clandestinum* (James 2000; Fox 2006). Populations in NSW appear to be less at risk from weed invasion.

Inappropriate fire regimes. The response of *Rulingia prostrata* to fire is not known. In Victoria, sites with low population sizes tend to be those that have not been burnt for many years (eg. >10 years), however there is little direct evidence that lack of fire is the cause. Further determination of appropriate fire regimes is needed to adequately manage *Rulingia prostrata*.

Drying out of sites. At several sites, the Dwarf Kerrawang occurs on wetland margins and along drainage lines, or at sites with the water table close to the surface. Long term drying of these sites, through reduced flooding, climate change, alteration of drainage flows and lowering of the water table will alter habitats and perhaps impact on the Dwarf Kerrawang.

Grazing. Grazing by macropods, perhaps wombats, rabbits and Sambar Deer appears to be threatening plants at some sites on public land in Victoria (James 2000; Fox 2006), while populations on private land are likely to be damaged by domestic stock (James 2002). Grazing appears to be less of a threat for most NSW populations.

Site disturbance. Earthworks and vehicle movement on and near some populations may damage or destroy plants, affect natural drainage patterns and degrade habitat.

Recovery Information

Overall Objective

The **overall objective** of the recovery plan is to minimise the probability of extinction of the Dwarf Kerrawang in the wild and to increase the probability of important populations becoming self-sustaining in the long term.

Within the life span of this Recovery Plan, the **specific objectives** of recovery for the Dwarf Kerrawang are to:

- Acquire accurate information as baseline data for ongoing monitoring.
- Identify habitat that is critical, common or potential.
- Ensure that all populations and their habitat are protected and managed appropriately.
- Manage threats to populations.
- Identify key biological functions.
- Determine the growth rates and viability of populations.
- Establish populations in cultivation.
- Build community support for conservation.

Program Implementation

The Recovery Plan will run for five years from the time of implementation and will be managed by the Department of Sustainability and Environment for Victorian populations, and the Department of Environment and Climate Change for NSW populations. A Dwarf Kerrawang regional recovery team has been established to manage the species' recovery in Victoria (Fox 2006).

Program Evaluation

The Recovery Team will be responsible for annual assessments of progress towards recovery. This Recovery Plan will be reviewed within five years of the date of its adoption under the EPBC Act.

Recovery Actions and Performance Criteria

Action	Description	Performance Criteria
Specific	objective 1	
Acquire	accurate information as baseline data for ongoing monitoring	
1.1	Acquire baseline population data by conducting detailed field and desk top surveys including (a) identification of the area and extent of populations; (b) estimates of the number, size and structure of populations and (c) estimation of population change. Responsibility: DSE, DECCW	 Review of conservation status for input to state and national threatened species lists. All known populations accurately counted and mapped.
Specific	c objective 2	
Identify	habitat that is critical, common or potential	
2.1	Accurately survey known habitat and collect floristic and environmental information describing community ecology and condition. Responsibility: DSE, DECCW	 Requirements for completion of essential life history stages, recruitment and dispersal identified at known sites. Habitat critical to survival mapped.
2.2	Identify and survey potential habitat in Victoria and (where practical) in NSW using ecological and bioclimatic information indicating habitat preference.	Predictive model for potential habitat developed and tested.
• •	Responsibility: DSE, DECCW	
Specific	c objective 3	
Ensure	that all populations and their habitat are legally protected	
3.1	Protect populations on public land. Responsibility: DSE, DECCW	 Negotiate agreement with neighbours at The Billabong Flora Reserve to ensure protection of aquifers and natural water flows. Develop Joint Management Agreements with managers of the Tomago Sandbeds, Hanging Rock Swamp, Roses Lagoon sites. If the Thirlmere Lakes NP site can be re-located, incorporate
3.2	Protect populations on private property. Responsibility: DSE, DECCW	 appropriate management actions into the park mgt plan. Initiate private land management agreements in consultation with land owners under <i>Victorian Conservation Trust Act 1972</i>, <i>Conservation, Forests and Lands</i> Act <i>1987</i>, <i>Wildlife Act 1975</i> at Ben Winch Swamp, Monkey Creek, Deep Water Morass, Lindenow South, Fernbank, Meerlieu–Bengworden Rd. Negotiate appropriate management and protective measures for the Tallong and Tomago Sandbeds sites.

Action	Description	Performance Criteria							
Specific	Specific objective 4								
Manage	threats to populations								
4.1	Identify disturbance regimes to maintain habitat, where this is deemed necessary after specific objective 2.1 is carried out.	 If necessary following specific objective 2.1, prepare management prescriptions for ecological burning at targeted sites 							
	Responsibility: DSE	Siles.							
4.2	Control threats from pest plants, animals, and predators by preventing access, re- routing tracks, using application of chemical control, hand removal of weeds, fencing sites and/or caging plants. Responsibility: PV	 Measurable seedling recruitment/vegetative regeneration and a measurable reduction in plant mortality at The Billabong Flora Reserve, Providence Ponds Flora and Fauna Reserve north- east, and Moormurng Flora and Fauna Reserve. 							
		• Control of Kunzea ericoides at The Billabong Flora Reserve.							
		• Determine presence of Sambar Deer at the Providence Ponds Flora and Fauna Reserve north-east, and if present implement methods to remove them.							
		 Prevention of vehicular access to Moormurng Flora and Fauna Reserve and an alternative water point identified for fire fighting purposes (James 2000). 							
4.3	Negotiate appropriate management actions for the NSW sites Responsibility: DECCW	 Incorporate agreed management actions into the Joint Management Agreements for the Tomago Sandbeds, Hanging Rock Swamp and Roses Lagoon sites. 							
		 Existing individuals of the population near Newcastle on private land are maintained. 							
Specific	objective 5								
Identify	key biological functions								
5.1	Evaluate current reproductive/regenerative status, seed bank status and longevity, fecundity and recruitment levels of all populations.	 Seed bank/regenerative potential quantified for each important population. 							
	Responsibility: DSE								
5.2	Determine seed germination requirements by conducting laboratory and field trials	Stimuli for recruitment/regeneration identified.							
	aimed to identify key stimuli and determine stimuli for vegetative regeneration. Responsibility: DSE	 Management strategies identified to maintain, enhance or restore regenerative processes fundamental to reproduction and survival. 							

Action	Description	Performance Criteria							
Specifi	Specific objective 6								
Determ	ine the growth rates and viability of populations								
6.1	Measure population trends and responses against recovery actions by collecting demographic information including recruitment and mortality and timing of life history stages.	Monitoring developed and commenced.Census data for all Victorian populations.							
	Responsibility: DSE								
6.2	Collate, analyse and report on census and monitoring data and compare with management histories.	 Population growth rates determined and Population Viability Analysis completed for important populations. 							
	Responsibility: DSE								
Specifi	c objective 7								
Establis	sh populations in cultivation								
7.1	Establish cultivated plants <i>ex situ</i> for inclusion in living collections to safeguard against any unforeseen destruction of wild populations.	Development of effective propagation and cultivation techniques. RBG have already been successful at propagating some acadima (lamas 2000)							
	Responsibility: DSE, RBG	 At least 50 mature plants in cultivation from a range of 							
		genotypes and populations.							
7.2	Establish a seed bank and determine seed viability.	 Seed from a range of populations in storage. 							
	Responsibility: DSE								
Specifi	c objective 8								
Build c	ommunity support for conservation								
8.1	Identify opportunities for community involvement in the conservation of <i>R. prostrata</i> . Responsibility: DSE	 Presentation(s) to community nature conservation groups in regions where species occurs. 							

Abbreviations

DECCW Department of Environment, Climate Change and Water, New South Wales

DSE Department of Sustainability and Environment, Victoria

PV Parks Victoria

RBG Royal Botanic Gardens, Melbourne

Management Practices

The philosophy of the strategy for recovery is habitat conservation, restoration and management combined with an understanding of the ecological and biological requirements of the Dwarf Kerrawang. The emphasis is on using knowledge to better implement *in situ* management techniques that protect populations and promote regeneration and recruitment. To achieve this, recovery actions are primarily structured (i) to acquire baseline data, (ii) assess habitat condition including ecological and biological function, (iii) protect populations to maintain or improve population growth and (iv) to engage the community in recovery actions.

On-ground site management will aim to mitigate threatening processes and thereby ensure against extinction. Major threats requiring management include accidental destruction or damage via planned landuse change, competition from pest plants, inappropriate fire regimes and grazing by pest animals. A range of strategies will be necessary to alleviate these threats including weed control, fire management, fencing, and control of pest animals.

Broadscale protection measures applicable to all populations include legal protection of sites, habitat retention and liaison with land managers including private landholders. In addition, searches of known and potential habitat should continue to better define the distributions and size of populations.

The Recovery Plan also advocates strategies to fill some of the major gaps in our knowledge to date. These include an understanding of the mechanisms underlying recruitment and regeneration. Successful *in situ* population management will be founded on understanding the relationships between the Dwarf Kerrawang and associated flora, and its response to environmental processes. These are directly linked to biological function and are thus vital to recovery. Demographic censusing will be necessary to gather life history information and to monitor the success of particular management actions. In addition, *ex situ* conservation measures will be required and will include seed storage.

Community participation in recovery actions will be sought, particularly in regard to recovery team membership and implementation of on-ground works.

To reduce the likelihood of unforseen development activities negatively impacting upon the Dwarf Kerrawang, the regional recovery team will provide relevant information on distribution, ecology and/or habitat to relevant land managers. Such increased awareness should allow new populations to be found if they exist, and improve the likelihood of adequate searches being made during development application assessments.

Affected interests

Populations of the Dwarf Kerrawang occur on both private and public land, managed for a variety of purposes (Appendix 1).

Role and interests of indigenous people

Indigenous communities on whose traditional lands *Rulingia prostrata* occurs are being advised, through the relevant Regional Indigenous Facilitator, of this Recovery Plan and invited to provide comments. Indigenous communities will be invited to be involved in the implementation of the Recovery Plan.

Benefits to other species/ecological communities

The Recovery Plan includes a number of potential biodiversity benefits for other species and vegetation communities in Victoria. Principally, this will be through the protection and management of habitat. Native vegetation surrounding the habitat of *Rulingia prostrata* in Victoria includes the threatened Flora and Fauna Guarantee-listed Forest Red Gum (*Eucalyptus tereticornis*) Grassy Woodland Community (James 2002). The adoption of broad-scale management techniques and collection of baseline data may also benefit a number of other plant species growing in association with *Rulingia prostrata*, particularly those species with similar life forms and/or flowering responses.

The Recovery Plan will also provide an important public education role as threatened flora have the potential to act as 'flagship species' for highlighting broader nature conservation and biodiversity issues such as land clearing, grazing, weed invasions and habitat degradation due to other causes.

Social and economic impacts

The implementation of this Recovery Plan is unlikely to cause significant adverse social and economic impacts. Significant populations occur on public land already managed for nature conservation. Some populations occur on private land managed by Trust for Nature, which has nature conservation as an aim of management. Protection measures for other populations on private land and other public land will be achieved through negotiation with and assistance to land owners and managers.

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Priority, Feasibility and Estimated Costs of Recovery Actions

Action	Description	Priority	Feasibility	Responsibility	Cost estimate					
					Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	Monitoring									
1.1	Collect baseline data	1	100%	DSE, DECCW	\$30,000	\$0	\$0	\$0	\$0	\$30,000
2	Habitat requirements									
2.1	Survey known habitat	1	100%	DSE, DECCW	\$40,000	\$0	\$0	\$0	\$0	\$40,000
2.2	Identify, survey potential habitat	1	75%	DSE, DECCW	\$20,000	\$0	\$0	\$0	\$0	\$20,000
3	Legal protection of habitat									
3.1	Protect public land habitat	2	80%	DSE, DECCW	\$0	\$10,000	\$0	\$2,000	\$2,000	\$14,000
3.2	Protect private land habitat	1	50%	DSE, DECCW	\$0	\$2,000	\$2,000	\$0	\$0	\$4,000
4	Manage threats									
4.1	Identify disturbance regimes	2	75%	DSE	\$0	\$10,000	\$0	\$0	\$0	\$10,000
4.2	Control threats	1	75%	PV	\$0	\$20,000	\$20,000	\$0	\$0	\$40,000
4.3	Negotiate NSW management	2	80%	DECCW	\$2,000	\$0	\$2,000	\$0	\$2,000	\$6,000
5	Identify key biol. functions									
5.1	Evaluate reproductive status	3	75%	DSE	\$0	\$12,000	\$12,000	\$0	\$0	\$24,000
5.2	Seed germination	3	75%	DSE	\$0	\$10,000	\$10,000	\$0	\$0	\$20,000
6	Growth rates, pop. viability									
6.1	Conduct censusing	3	100%	DSE	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$75,000
6.2	Collate, analyse and report	3	100%	DSE	\$1,000	\$1,000	\$1,000	\$1,000	\$5,000	\$9,000
7	Establish pops. in cultivation									
7.1	Establish cultivated plants	3	70%	DSE, RBG	\$0	\$0	\$15,000	\$15,000	\$15,000	\$45,000
7.2	Establish a seed bank	2	50%	DSE	\$0	\$0	\$4,000	\$4,000	\$4,000	\$12,000
8	Education, communication									
8.1	Community extension	3	100%	DSE, DECCW	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$30,000
				TOTAL	\$114,000	\$86,000	\$87,000	\$43,000	\$49,000	\$379,000

Appendix 1 Dwarf Kerrawang site, population and threat information

Table adapted from Fox (2006)

Site no.	Location	Land mgr	Population size (year)	Pop area & extent (year)	Pop structure	Current threats					
Victo	Victoria										
1	Billabong Reserve	PV	5,000–10,000 (2000) 126 (2003) 251–500 (2004)	20 m x 10 m (2003)	Mature, non- senescent	Rabbit grazing, soil disturbance; <i>Kunzea ericoides</i> & weed invasion					
2	Providence Ponds Flora & Fauna Reserve (north)	PV	9 (2000) 5–10,000 (2003) 100,000 (2005)	50 m x 30 m (2004)	?	Grazing (if pop. declines); change to fire regime					
3	Moormurng Flora & Fauna Reserve	PV	1 (1995) 21 (2004)	50 m x 20 m (2004)	Mature, non- senescent	Small population size; <i>Kunzea ericoides</i> invasion					
4	Blond Bay Wildlife Reserve (Phiddian's Swamp)	PV	0 (pre 2004) est. 3000 (2005; pop. appeared post- autumn 2004 wildfire)	500 m x 70 m (2005)	Mature, non- senescent (1997)	Drought; grazing; wombat disturbance					
	Blond Bay (Tussock Swamp)	PV	2 (pre 2003) 64 (2003) 250–500 (2004)	30m x 30 m	?	Drought					
5	Ben Winch Swamp (populations A, B and C)	PV	470–680 (2000) 29 (2003) 12 (2005)	300 m x 15 m	?	Heavily grazed; small population size; soil erosion; inappropriate flooding regime; <i>Kunzea</i> <i>ericoides</i> invasion					
6	Monkey Creek, Clements Rd, Stradbroke	Private	400 (2000) 63 (2003)	100 m x 2 m (2003)	Mature, non- senescent (2003)	Earthworks					
7	Deep Water Morass pop. 1	Private	400–600 (2000) 29 (2003)	100 m x 5 m	Mature, non- senescent;	Grazing (goats & horses); soil disturbance; weed invasion (blackberry, kikuyu, cape wattle)					
	Deep Water Morass pop. 2	Private	400–600 (2000) 10 (2003)	10 m x 5 m	Mature, non- senescent	Grazing; soil disturbance; weed invasion (blackberry, kikuyu, cape wattle)					
8	APP Fernbank	Private	71 (2000) 106 (2004)	400 m x 10 m	Mature, non- senescent	Earthworks; small population size; timber harvesting; utilities construction/maintenance					
9	Providence Ponds Flora & Fauna Reserve (sth-west)	PV	3 (1992)	?	?	? (last surveyed 1992)					
10	Brunyee Swamp, Fernbank	Private	0 (2000) 14 (2003)	1.5m x 1.5 m (2003)	Mature, non- senescent	Small population size; rabbit grazing; soil disturbance					
11	Property adjacent sth-east Providence Ponds FFR	Private	1 (1995) 0 (2004)	50 m x 50 m	?	Earthworks					
12	Meerlieu	Private	25 (1999)	30m x 30 m	20 mature, non-	Grazing (native herbivores & stock); drought;					

te no.	Location	Land mgr	Population size (year)	Pop area & extent (year)	Pop structure	Current threats
Sit						
			25 (2003)	(2003)	senescent 5 senescent	changing hydrology
13	Bush Family Reserve, Meerlieu (at least 9 discrete populations) BFR 1	TFN	200 (2005)	100 m x 20 m	?	Grazing (kangaroos, rabbits); soil disturbance; drought; Burgan & weed invasion (<i>Hypochaeris</i> , Kikuyu)
	BFR 2	TFN	40 (2005)	25 m x 10 m	?	Kunzea ericoides & weed invasion (kikuyu); grazing (native & introduced herbivores); small population size
	BFR 3	TFN	15 (2005)	15 m x 10m	?	Burgan & weed invasion (Kikuyu); grazing (native & introduced herbivores); inappropriate fire regime
	BFR 4	TFN	10 (2005)	30 m x 10 m	?	Burgan & weed invasion (Kikuyu); grazing (native & introduced herbivores)
	BFR 5	TFN	50 (2005)	20 m x 20m	?	Burgan & weed invasion (introd. grasses); grazing (native & introduced herbivores)
	BFR 6	TFN	15 (2005)	20 m x 20 m	?	Burgan invasion; grazing (native & introduced herbivores); wombat digging
	BFR 7	TFN	25 (2000) 0 (2005)			Burgan & weed invasion (introd. grasses); grazing (introduced herbivores); lack of fire?
	BFR wetland 2	TFN	12 (2000)	?	?	?
	BFR wetland 3	TFN	2 (2000)	?	?	?
14	Billabong West Reserve	TFN	27 (2000) 23 fenced; 7 unfenced (2004)	20m x 20 m (fenced) 10 x 10 m (unfenced)	Mature, non- senescent	Small population size
15	Frair's Reserve	TFN	10–12 (2000) 60 (2004)	60m x 15m	NK	Burgan invasion; grazing (native herbivores)
16	Meerlieu Bushland Reserve	PV	2 (2005)	2 m x 1 m	Immature	Grazing (domestic stock; reserve under grazing licence)
17	Holey Plains State Park, Clearwater Lake West	PV	1000 (2004); 'new' population appeared post 2003 wildfire	200 m x 200 m (2004)	?	Vehicle movement (motorbikes)
18	Holey Plains State Park, Clearwater Lake East	PV	18 (2004); 'new' population appeared post 2003 wildfire	10 x 20m	?	Grazing (macropods); vehicle movement (motorbikes)
19	Holey Plains State Park, Forester Block	PV	100 (2004); 'new' population appeared post 2003 fuel reduction burn	150m x 150m	?	No discernible threats
20	Holey Plains State Park, Long View Block	PV	40 (2004) 12 (2005)	100m x 100m	?	No discernible threats

Site no.	Location	Land mgr	Population size (year)	Pop area & extent (year)	Pop structure	Current threats
21	Monkey Duck Swamp, Loch Sport	PV	0 (2000)	?	?	Drought; increasing salinity?
22	Property at Meerlieu	Private	6 (2006); new record	20m x 20m	Mature, non- senescent	Inappropriate fire regime; drought; blocked water flow; Burgan invasion
23	Property adjacent to Bush Family Reserve at Meerlieu	Private	4 (2006)	NK	All small plants	Grazing; small population size
24	Property at Fernbank	Private	250+ (2006)	On dam wall	Healthy	?
New	South Wales	-				
25	Tomago Sandbeds, Newcastle	DECCW, HWC	>1,000 plant 'clumps' (2005)	scattered over large area	?	Plants regenerating in areas disturbed by sand mining and bushfires, however may be potentially threatened by further sand mining, or inappropriate fire regimes.
26	Hanging Rock Swamp, Penrose	F-NSW	'small no.' (c. 1999)	?	?	Road/firebreak works; activities associated with pine forest mgt
27	Penrose State Forest, Penrose	F-NSW	1 (2005)		?	Road works
28	Rose Lagoon, Goulburn	Crown	1 (2005)		?	Grazing & trampling by stock; trampling by users of adjacent roadside rest area
29	Tallong	Private	1 (2004)		?	Rural subdivision development
30	Roadside, Braidwood-Nerriga Road, Braidwood	?	7 (2006)	?	?	Small population size; vulnerable location-road edge in dense grass
31	Wingello State Forest, Wingello (reported to NSW DEC by Australian Plant Society 2005)	F-NSW	100 (2006)	2 ha (2006)	?	vulnerable location along roadside and among pine trees; harvesting at least 10 years away (K. McDougall DEC NSW)
	Picton Lakes	?	Plants not relocated since initial record in 1911	?	?	?
	Barbers Creek, Wingello (precise location unknown; area searched by NSW DECCW but most suitable habitat is on private land not readily accessible (2006)	Private	Plants not relocated since initial record in 1898	?	?	?

Abbreviations: DECCW = Dept of Environment, Climate Change and Water; DoD = Department of Defence; F-NSW = Forests NSW; PV = Parks Victoria; TFN = Trust for Nature, Hunter Water Corporation = (HWC)

Table adapted from Fox, P. 2006. Management Plan for the nationally endangered plant Dwarf Kerrawang (*Rulingia prostrata*) in Gippsland, Victoria 2006–2011. Ethos NRM Pty Ltd. Used with permission.