Geikie Gorge National Park (GGNP)
Draft Weed Control Plan

Date: February 2006
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1. Background

Geikie Gorge National Park features Limestone cliffs and a gorge formed by the Fitzroy River carving through the junction of the Oscar and Geikie Ranges, remnants of the Devonian Barrier Reef. The escarpment is rugged, with canyons, karst features and gullies formed by monsoon rains and springs, which are found throughout the park. Alluvial black soils dominate the riverine environment limiting access during the wetter months of the year. Annual large scale seasonal flooding of the Fitzroy River create a dynamic and changeable landscape and can enhance weed dispersal.

Size: 3 136 ha

Vegetation

- Eucalyptus low open woodland with *Plectrachne/Triodia* hummock grass understorey
- Eucalyptus open woodland with *Chrysopogon* tussock grass understorey
- Sparsely wooded mixes species low woodland over sparse *Plectrachne/Triodia* hummock grassland on limestone

Land Systems

- Fossil
- Windjana
- Gogo

Past Use

- Traditional land use
- Grazing

2. Strategic Priorities for Action

Objective	Action	Time frame	Responsibility	Priority H=High M=Moderate L=Low
Build on experience	Evaluate weed control actions to date	Feb 06	RNC Officer NC Officer Senior Ranger	H
Weed control plan for GGNP	Finalise weed control plan with maps and rolling works program	Apr 06	RNC Officer NC Officer Senior Ranger	H
Good record keeping and data accessibility	Cooperate in development of standardised record keeping and database. Training in use of database and access of data.	ongoing	RNC Officer RLNCO NC Officers Senior Ranger All Park staff	H
A certified and well prepared work team	Identify gaps in training, materials and equipment. Support and train staff in control methods, record keeping and monitoring and evaluation.	ongoing	Senior Ranger RLNCO RNC Officer NC Officers	H
Develop and implement works programs	Develop and implement works programs to control weeds in GGNP	ongoing	Senior Ranger	H
Eradicate new, recent and low density incursions	Identify and implement achievable eradication projects	ongoing	Senior Ranger All Park staff RNC Officer NC Officers	H
Prevent entry and further spread of weeds in GGNP	Control weeds in adjacent off reserves areas. Remove weeds from all visitor access areas to prevent weed spread within and among Parks. Control access to locations where visitors present a high risk of weed dispersal, including interpretation where appropriate. Assist in efforts to remove cattle from areas adjacent to national park to prevent spread of weeds by cattle.	ongoing	Senior Ranger All Park staff RNC Officer NC Officers	H
Education and Awareness for Park visitors	Establish a notice board dedicated to enhance weed awareness among visitors, focusing on how they can help. Include tour operators to enhance education and awareness.	ongoing	Senior Ranger All Park staff	M

Objective	Action	Time frame	Responsibility	Priority H=High M=Moderate L=Low
Cooperate with all stakeholders in weed control.	Work in cooperation with TOs, mining companies and their contractors and tour operators.	ongoing	Senior Ranger All Park staff	M
Expand areas surveyed for weeds.	Survey all visitor areas within GGNP. Work towards a complete survey of the park.	ongoing	RNC Officer NC Officers Senior Ranger All Park staff	H
Monitoring and evaluation of weed status, control activities and effectiveness	Revisit and monitor control sites and high risk invasion sites. Increase knowledge on weed status and effectiveness of control methodologies. Annual review of weed control plan.	ongoing	RNC Officer RLNCO NC Officers Senior Ranger All Park staff	H
Facilitate weed identification on Park.	Develop park specific field guide for weed identification.		RNC Officer Senior Ranger All Park staff	M
Confirm current status of old flora base records.	Utilise Flora Base resource to determine collection locations		Park Rangers NC Officer	L

3. Rolling Works Program Guidelines

Month	Action	Location	Priority H=High M=Moderate L=Low

4. Weed Profile

Weeds recorded/observed on site by CALM staff		
LATIN NAME	**COMMON NAME**	**OCCURRANCE**
Acacia farnesiana	Prickly Acacia	
Achyranthes aspera	Kimberley Tick Weed	
Aerva javanica	Kapok Bush	
Alternanthera pungens	Khaki Weed	
Amaranthus viridis	Green Amaranth	
Bidens bipinna	Cobbler's Pegs	
Calotropis procera	Rubber Bush	
Cardiospermun halicacabum	Small Balloon Creeper	
Cenchrus biflorus	Gallon's Curse	
Cenchrus ciliaris	Buffel Grass	
Cenchrus echinatus	Mosman River Grass	
Datura inoxia	Thornapple	
Euphorbia hirta	Asthma Plant	
Heliotropium indicum	Indian Heliotrope	
Macroptilium atropurpureum	Purple Bean, Siratro	
Merremia dissecta	Hariy Merremia	
Parkinsonia aculeata	Parkinsonia	
Passiflora foetida	Passionfruit vine	

Potential weeds (not limited to these species.)	
LATIN NAME	**COMMON NAME**
Azadirachta indica	Neem
*Chloris inflata**	Purple Top Chloris
Cryptostegia grandiflora	Rubbervine
Hyptis suaevolens	Mint Weed
Jatropha gossypifolia	Bellyache Bush
*Leuceana leucocephala**	Leuceana
Sida spp.	
*Tribulus terrestris**	Caltrop
Xanthium occidentale	Noogoora Burr

*strong possibility that already present, but currently unrecorded.

5. Past and Current Control Actions

Species	Location	Past & Current control techniques	**Notes** (including response to disturbance, dispersal and infestation issues.
Acacia farnesiana	Savanna woodland on entry to Park.	No control.	Typically occurs in overgrazed degraded landscapes. Remove cattle to control weed. Some debate about its status.
Achyranthes aspera	Most intrusive along walk trails, but also dense in locations with limited human access.	No control	Probably largely spread by cattle and wallabies. Also readily spread by walkers.
Aerva javanica	Banks of Fitzroy River, walk trails, savanna woodland.		Generally limited to disturbed areas. Will grow in dry conditions. Prolific seeder.
Alternanthera pungens	Car parks and lawns.	Control undertaken by Park staff with 2,4-D	Was control successful? Other CALM staff hand remove or burn infestations. Readily transported by tourists in shoes, tyres and clothing.
Amaranthus viridis			
Bidens bipinna	Cattle country - banks of Fitzroy River	No control.	Its presence is most obvious when 'forked' seeds attach to clothing – by which time plant has died off.
Calotropis procera	Banks of Fitzroy and tributaries, savanna woodland.	Control trials at 'vege patch',	Control success limited. Very hardy species. Cut stump trials unsuccessful. Primarily occurring on naturally or human induced degraded landscapes. Ideal control requires controlling the disturbance.
Cardiospermun halicacabum	Shadier habitat, river banks.	No control.	
Cenchrus biflorus	On banks of Fitzroy River		Significantly hampered walking and access during 2005 weed control. Burrs very invasive and can be painful.
Cenchrus ciliaris	Widespread in savanna country.	No control undertaken.	
Cenchrus echinatus	Widespread in savanna country.		

Species	Location	Past & Current control techniques	**Notes** (including response to disturbance, dispersal and infestation issues.
Datura inoxia	On banks of Fitzroy River in more moist areas.	No control	Possibly a 'sleeper weed'
Euphorbia hirta			
Heliotropium indicum	On lower banks of Fitzroy River in more moist areas	No control	Possibly a 'sleeper weed'
Merremia dissecta	On road into Park.	Plant identified on entry road was sprayed in 2004. No known subsequent follow up undertaken.	In general much less impacting than P. foetida, however may be regarded as 'sleeper weed'.
Parkinsonia aculeata	Banks of Fitzroy River and tributaries (Eg. Croc Creek, Garangajar Ck). Also on Brooking Spring pastoral lease and up and down river beyond park boundaries.	Control along Fitzroy River and tributaries undertaken by Park staff, Green Corps, South West Crew and Broome staff. Approx 15km of habitat surveyed.	WONS. Requires neighbour consultation and education to incorporate catchment based control approach. Control to date most successful using 1:60 Access:Diesel, applying chemical to bark – increased height relative to increased tree size. Infestation mix of single mature and juvenile trees and dense groves of what are currently juvenile trees. Bird nests often in trees. Seen to be flowering in very dry periods.
Passiflora foetida	On banks of Fitzroy River, mesic habitats, limestone, savanna woodland.	No broad scale control. Some hand pulling undertaken near tourist visitation area.	Primary impact is in moist riparian habitat. Growth notably less vigorous in drier habitats.

6. Species by Species Priorities for Action

Species	Impact	Objective	Actions	Priority H=High M=Moderate L=Low
Acacia farnesiana	Outcompete native species.	Monitor	Remove cattle from Parks in consultation with pastoral lease holder. Remove Pigs. The level of disturbance created by feral ungulates promotes weed dispersal and recruitment.	L
Achyranthes aspera	Out competes native species. Nuisance, attaching to clothing.	Remove	Trial chemical control and post wet season hand pulling (when no burrs are present). Interim measure - close infested trail to prevent further spread by visitors. Remove cattle and pigs from Parks.	M
Aerva javanica	In current growth habit limited impact.	Minimise impact	Grubbing - remove/burn seed 'mats' beneath plant.	L
Alternanthera pungens	Nuisance.	Remove	Isolate infestation areas from visitors. Grubbing or chemical application or burn.	M
Amaranthus viridis		Monitor		L
Bidens bipinna	Nuisance	Minimise impact	Determine extent of infestation. Remove initially from visitor access areas. Remove cattle and pigs from Parks.	M
Calotropis procera	Out-competes native species. Poor aesthetics	Remove	Identify strategic control locations. Herbicide application at seasonally appropriate times – consider EIA. Remove cattle and pigs from Parks.	M-H
Cardiospermun halicacabum	Unknown. Possibly out-competes native species.	Monitor		L
Cenchrus biflorus	Nuisance. Out competes native grasses. Responds well to fire. Increased fire intensity.	Minimise impact	Identify extent of occurrence, practicality of removal and response to control measures.	M

Species	Impact	Objective	Actions	Priority H=High M=Moderate L=Low
Cenchrus ciliaris	Increases fire fuel load and intensity. Responds well to fire. Out-competes native grasses and limits seed availability for granivorous birds.	Monitor	Withhold fire from infested areas, slash or apply chemicals to prevent seed set.	L
Cenchrus echinatus		Minimise impact	Identify extent of occurrence, practicality of removal and response to control measures. Remove cattle and pigs from Parks.	M
Datura inoxia	Unknown	Monitor	Identify locations and monitor for rate of spread and fruiting habits.	L-M
Euphorbia hirta		Monitor		L
Heliotropium indicum		Monitor	Identify locations and monitor for rate of spread and fruiting habits.	L-M
Merremia dissecta	Smothers vegetation.	Remove/eradicate	Identify control site on Geikie Road. Remove new growth.	H
Parkinsonia aculeata	Can form dense thickets which are impenetrable. Out compete native species and inhibit ground story vegetation.	Eradicate	Herbicide application at seasonally appropriate times – consider EIA.	H
Passiflora foetida	Smothers and kills all vegetation layers.	Minimise impact	Trial removal techniques and herbicide application at high priority locations. Assess results from WNP.	M-H

7. Species Characteristics

Species recorded and with potential to occur	**Type**	**Life Cycle**	**Flowering / Fruiting** (not necessarily local conditions)	**Dispersal**
Acacia farnesiana	Shrub/small tree	perennial	May-November	Stock, wind, water
Achyranthes aspera	Herb/shrub	annual or perennial	March-August	Adheres, water
Aerva javanica	Shrub	perennial	February-October	Wind, water
Alternanthera pungens	Herb	annual or perennial	December-May	Adheres, water
Amaranthus viridis	Herb	annual	February-August	Adheres, water
Azadirachta indica	Tree	perennial	October-January	Bird and animal faeces
Bidens bipinna	Herb	annual	March-May	Adheres, water
Calotropis procera	Shrub/small tree	perennial	April-August	Wind, water
Cardiospermun halicacabum	Vine	annual or perennial	Near all year round	Wind, water
Cenchrus biflorus	Grass	annual	November-May	Adheres, water
Cenchrus ciliaris	Grass	perennial	November-May	Adheres, water
Cenchrus echinatus	Grass	annual or perennial	November-May	Adheres, water
Chloris inflata	Grass	annual	April (when moist)	Wind, water
Cryptostegia grandiflora	Vine	perennial	All year round	Wind, water
Datura inoxia	Herb	annual	Near all year round	Wind, water
Euphorbia hirta	Herb	annual or perennial	April-October, January	Wind, water
Heliotropium indicum	Herb	annual	July-October	Wind, water
Hyptis suaevolens	Shrub/herb	annual	March-August or when moist	Adheres, water
Jatropha gossypifolia	Shrub/small tree	perennial	February-May	Shattering capsules
Leuceana leucocephala	Small tree	perennial	Throughout the year	Stock, wind, water
Macroptilium atropurpureum	Vine	perennial	March-July	Seed and stolons
Merremia dissecta	Vine	perennial	May-June	Shattering capsules
Parkinsonia aculeata	Shrub/tree	perennial	May-August	Stock, wind, water
Passiflora foetida	Vine	perennial	February-August	Bird and animal faeces
Sida spp.	Small shrub/herb	annual or perennial	April-Sept	Adheres
Tribulus terrestris	Herb	annual or biannual	February-August	Adheres, water
Xanthium occidentale	Herb	annual	May-October	Adheres, water

8. Control Methods

This list is not to be considered exhaustive, nor is the chemical status to be considered static. **Ongoing research is required to update and maintain this list.**

ALWAYS REFER TO THE PROCUCT LABEL AND MATERIAL SAFETY DATA SHEET (MSDS) BEFORE PURCHASING AND USING HERBICIDES.

MSDS and Product labels contain information essential information on chemical behaviour in the environment and guide in the environmentally and personally safe application of herbicide products. NOTE: some chemicals will not be appropriate, under any circumstances, for application on CALM managed lands.

Species	Source	Recommended Control	Plant Status Recommended spraying conditions	On/off* label
Acacia farnesiana	Dow Agro Sciences	Access: Diesel 1:60	Basal Bark on stems up to 5cm. Cut Stump for stems larger than this	On (Acacia spp.)
	Dow Agro Sciences	Starane: Water 3L/100L	Basal Bark on stems up to 5cm diameter.	On
Achyranthes aspera				
Althernanthera pungens	Summit Agro	2,4-D625: water 1.1-2.2L/ha	Spray as seedlings	Off in WA
Amaranthus viridis				
Azadirachta indica	OLW CALM	Roundup: water 50% to neat	Cut stump on actively growing plants. Spray *immediately* after cutting. Varied results.	Off
	DAWA, 2005 OLW	Access or Garlon:Diesel 1:60	Cut stump or basal bark during active growth. May require re-treatment. For larger plants basal bark height at least 1m. Varied results.	Off
		Grub seedlings and smaller plants.	Easier under moist conditions	
Bidens bipinna	Nufarm	RoundupBiactive:Water 90mL/15L	Foliar spray	On
	Summit Agro	2,4-D + surfactant 1.8-3,5L/1ha	Foliar spray	
Calotropis procera	DAWA 2002	Access:Diesel. 1:60	Cut Stump or Basal Bark on larger trees	On?
	DAWA 2002	Tordon: water 1:50	Seedlings and small trees actively growing.	On?

	DAWA 2002	Grazon: water 1:200	Foliar spray to seedlings and small trees	On?
Cenchrus biflorus		1% Glyphosphate + surfactant + ph buffer	Be aware that this is *Non Selective*	On
Cenchrus echinatus		1% Glyphosphate + surfactant + ph buffer	Be aware that this is *Non Selective*	On
Chloris inflata		1% Glyphosphate + surfactant + ph buffer	Be aware that this is *Non Selective*	On
Cryptostegia grandiflora	Dow Agro Sciences	Grazon DS: Water 350-500mL /100L	1.5m tall and flowering, and higher rate for higher than 1.5m in dense stand. Spray leaves, stems and base to run off. Regrowth to be controlled by basal barking.	
	Dow Agro Sciences	Access:Diesel 1:60 BB,	Basel Bark stems under 5cm, Cut Stump larger than 5cm.	On
	Summit Agro	2,4-D 625: water, 160mL:10L	Apply to stumps immediately after cutting	On
	DAWA, 2002 *C. grandiflora* Manual	Brushoff: water 1.5g/10L + wetting agent	During active growth. Foliar application. Ensure thorough coverage of all foliage and leaders.	On
	DAWA, 2002 *C. grandiflora* Manual Dow Agro Sciences	Garlon:diesel 1L/60L	Basal Bark and Cut Stump when actively growing. Apply liberally.	On
	DAWA, 2002	2,4-D amine: water. 200mL/15L	Cut Stump – apply fresh.	
	C. grandiflora Manual.	Grazon:water 350-500mL/100L	Spray leaves and stems and base of plant to runoff	On
Datura inoxia	QLD Dept Primary Industries, 1977	2,4-D: water. Up to 2.2kg/ha or mix with picloram	Young plants most susceptible to foliar spray.	Off ? (QLD only) out of date?
	DAWA, 2002	2,4-D ester and amine 30mL/10L and 40mL/10L. Option to add 30mL Roundup 360.	Spray before seeding. If seeding, then use Roundup 360 mix. Will need to re-treat seedlings.	On
	DAWA, 2002	Starane 750mL-1L/ha	Plants less than 15cm high and with max 8 leaves. Will need to re treat seedlings.	On?
	DAWA, 2002	Roundup 360: Water 100mL/10L + wetting agent.	Apply during active growth. Dilute if plants less than 15cm.	On?

Euphorbia hirta		0.3% 2,4-D + surfactant.		
Heliotropium indicum	Dow Agro Sciences	Starame:Water 1000mL/100L	Flowering (label specifies for sp. *amplexicule*)	Off (QLD only)
	Dow Agro Sciences	Grazon DS:water 500mL/100L	Flowering. (label specifies for sp. *amplexicule*)	Off (QLD, NSW only)
	Summit Agro	2,4-D: Water 1.8L-3.5L/1ha	(label specifies for sp. *amplexicule*)	QLD
	DAWA, 2002	2,4-D ester or amine: water 30mL or 40mL:10L	Asap after germination.	On?
	DAWA, 2002	1g metsulfuron+5mL Roundup360: 10L water + wetting agent		
Hyptis suaveolens	QLD Dept Primary Industries 1977	2% 2,4-D		Off (QLD only?
	East Kimb. NCO	0.2% 2,4-D + surfactant.		
		Grub single plants		
Jatropha gossypifolia	Dow AgroSciences. DAWA 2002	Starane:Water 500mL/100L + 'Uptake' Spraying Oil.	Seedling, juvenile, flowering	On
	DAWA 2002	Metsulfuron:water 1g/10L	Foliar application. Do not apply if rain is expected in 4 hours.	On?
	DAWA, 2002	Garlon 600: Diesel 1:50	Cut Stump	
Leuceana leucocephala	Dow Agro Sciences	Access: Diesel 1:60,	Basal Bark on stems up to 5cm. Cut Stump for stems larger than this.	On
Macroptilium atropurpureum	Summit Agro	2,4-D 625: water. 1.8L/ha	Foliar application	Off (NSW, QLD, TAS)
Parkinsonia aculeata	Dow AgroSciences DAWA, 2002	Access: Diesel 1:60,	Basal Bark on stems up to 5cm. Cut Stump for stems larger than this. DO NOT try to mix with water	On
	Dow AgroScience P. aculeata manual.	Grazon DS:water 350mL/100L + Uptake Spraying Oil.	Under 2m only. Foliar – whilst actively growing. Apply liberally, avoid when fruiting.	On
	DAWA, 2002	Garlon 600:diesel 1:60	When actively growing. Basal Bark application. May require follow up. Mix for same day use only.	On?

	DAWA, 2002	Velpar:water 35mL/10L	Do not spray in dry conditions and avoid fruiting periods. Foliar application.	On?
Passiflora foetida	Dow Agro Sciences	Starane: Water 450mL:100L	Established plants and regrowth.	On
		Pull roots where possible		
Sida sp	Dow Agro Science DAWA 2002	Starane:Water 1000mL/100L	Seedlings, juveniles, flowering	On
Tribulus terrestris	Dow Agro Sciences	Starane:Water 500mL/100L + 'Uptake' Spraying Oil.	Seedlings and up to 30cm diameter.	Off (QLD, NSW only)
	Nufarm	Roundup 360:water 90mL/15L	Be aware that this is *Non Selective*	On
	Summit Agro	2,4-D 625, 1.1L/ha	Foliar application	
Xanthium occidentale	Dow AgroSciences	Starane: Water 75mL/100L	Foliar application Plants up to 40cm high	On
	DAWA, 2000	2,4-D amine and ester 30mL:10L water	Apply ester before flowering, apply amine to seedlings. Hot fire will kill burrs, whilst moderate fires will encourage germination.	On?
	DAWA, 2002	Roundup 360:water 100mL:10L (possibly also mix with metsulfuron).	Apply before burrs form.	On?
	DAWA, 2002	Metsulfuron:water 0.75g/10L	Apply to actively growing plants. Thoroughly wet foliage, spot treatment only.	On?
	Summit Agro	2,4-D 625: water 160mL/100L	Apply to young actively growing weeds/pre flowering.	Off (QLD only)
	Nufarm	Roundup Biactive: Water 90mL/15L	Foliar spray	Off (QLD, NSW only)

*Anybody wishing to use chemicals which have not been registered for specific weed use is required to apply for the appropriate permit through the respective chemical company.

9. Environmental Impact Assessment

Weed survey and control operations must be mindful of potentially detrimental environmental impacts which occur as a result of these actions.
The following issues must be taken into consideration during the planning process. Impacts must be defined as manageable and therefore acceptable, or non acceptable. The management of the former must be determined and planning put in place prior to the outset of any field operations.

POTENTIAL IMPACT	POTENTIAL CAUSE	SUGGESTED MANAGEMENT
Erosion	Removal of weed cover exposes soil and un-consolidates soil.	Undertake weed control in manageable areas. Avoid large scale weed remove immediately prior to the wet season when winds and rain will exacerbate erosion. Where possible use selective herbicide.
Damage to non target species	Inappropriate herbicide selection. Nature of herbicide (residual, non selective, volatile, soil and aquatic half life, mobility etc) not understood.	Read herbicide label and MSDS carefully. Understand the terminology and the implications. Eg, do not apply highly mobile chemicals in the wet season. Understand soil type environmental which will effect the herbicide reaction. Also be aware of 'at risk' fauna species (terrestrial & aquatic).
Pollution of water courses	Inappropriate herbicide selection or herbicide applied at an inappropriate time.	Read herbicide label and MSDS carefully. Understand the terminology and the implications. Eg, do not apply highly mobile chemicals in the wet season. Do not apply water toxic chemicals near water. Be aware of wind direction, rain forecasts, chemical drift and volatility.
Spread of weed	Inadequate clean down efforts and/or facilities after weed control work.	Awareness. Know of all weeds in control area, even those which are not target weeds. Wear gaiters to limit burrs attaching to socks. Check vehicle for seeds before moving into and out of control area. Burn weed waste on site where realistic. Cover weed waste completely before transporting.
Visual amenity non favourable	Dead and dying vegetation, flagging tap, chemical dye…	Provide visitor interpretation. Explain, what, why and anticipated outcome – and how they can help.
Disturbance to habitat	Vehicle activity, chemical dispersal, general human activity.	Try to be aware of the sensitivity of area which is being entered. If it is known significant flora or fauna habitat, walk into site and as much as possible 'tread-softly'. Determine if your impact will be greater than that of the weed.
Encouraging weed recruitment and destruction of native habitat.	Fire as a weed control tool. In some instances, fire at an inappropriate intensity will promote weed recruitment and germination.	Apply fire as a control tool (in the case of woody weeds this typically requires intense heat generation) only where long term damage to native flora and fauna will be negligible. Understand the level of fire intensity required to create desired outcome and the on ground conditions which will achieve this.
Encouraging weed recruitment (2)	Hand removal of weeds/grubbing turning soil over and creating seed bed. Slashing or canopy reduction.	Recognize the possible outcome and factor follow up into works programme until recruitment has ceased. Such an option has limited merit at the end of the dry season, where access during the wet season may prevent follow up.

10. Monitoring and Evaluation

Monitor for:

- Weed prevalence and distribution
- Outcomes/level of success of control measures
- Rate of weed establishment and recruitment
- Weed invasion at weed free sites.

Regular monitoring will be integrated into the works programme to determine the effectiveness of chemical and manual weed control. This may be achieved with monitoring areas using digital photographs and a monitoring checklist at strategic sites.

Annual survey program will be carried out in late wet/early dry season when weeds are identifiably by fruits or flowers and when weeds have had the opportunity to germinate and new infestations can be identified early in the establishment phase.

Record keeping

To facilitate 'useful' outcomes, general *survey* work should record (at minimum) the following information:

- Date
- Location and GPS reading and extent of survey
- Species name
- Extent of infestation (approximate number of plants or area in ha)
- Density
- Status of plants (eg. healthy, sick, dormant, flowering, fruiting, juvenile, mature etc)
- General habitat (eg. riparian, woodland, outcrop etc) and condition (dry, wet)
- Photo record with site information board (site No and date)

Control work (eg, spraying, grubbing, slashing, burning), in addition to the above, should also record (at minimum) the following information:

- Control conditions (humid, dry, windy, soil status etc…)
- Time of day
- Where relevant: Chemical dilution, application method
- Where relevant: Slashing height, burning conditions, grubbing technology.

11. Resource Requirements for weed related projects.

Requirement	Frequency	Estimated cost per event or financial year	No. staff involved
Chemcert Training	Once	?	All field staff
Mapping/GPS/database training	Biennial	?	All field staff
Spray units (chapin)	Once with initial outlay	$1000 (+ 250 each subsequent year)	~ 10.
Chemical	Annual	$1500	~ 10
PPE + first aid	Annual	$400	~ 10
Purpose built chemical storage shed at GGNP	Once	$7000	
Volunteer co-ordination and set up	Annual	$1500	~ 5
Weed interpretation and education	Annual	$1000	~ 5
Equipment (GPS, Cameras etc)	Every 3 years.	$1000	4
Boat maintenance and fuel	Annual	$3000	
Vehicle and quad bike maintenance and fuel	Annual	$???	
Dedicated staff hours	Monthly	XXX hours @ $XXX/hr = $XXX	~5
Data base set-up	Once	$???	
Herbarium set up	Once	$500	~ 5
Cattle surveys and co-ordination of muster	Annual	$2500	~ 3
Aerial photograpy for mapping	Once every 8 years	?	

'staff' is inclusive of trainee rangers.

Total cost year 1 (2005/2006 Financial Year): $

Costs annually thereafter: $

Signed off by

- Regional Manger .....

Date .....

- Regional Leader Nature Conservation .....

Date .....

- District Manager .....

Date .....