

**Weed survey of the GNT Resources Dalgaranga Gold Project Disturbance  
Envelope  
May 2021**



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## 1. Background

GNT Dalgaranga Gold Project is located within the Murchison IBRA Region and Western Murchison sub-IBRA region of Western Australia, 60 km west of Mount Magnet. GNT Resources Pty Ltd (GNT) requested a survey of the Dalgaranga Gold Project disturbance envelope to map the current locations of weeds at the site. Previous surveys indicate that eleven introduced species were present at the site (Table 1) from 36 sites.

Table 1: Weeds previously recorded at Dalgaranga

Scientific Name	
<i>Aloe vera</i>	<i>Rumex hypogaeus</i>
<i>Carrichtera annua</i>	<i>Rumex vesicarius</i>
<i>Carthamus lanatus</i>	<i>Salvia verbenaca</i>
<i>Cuscuta epithymum</i>	<i>Solanum nigrum</i>
? <i>Hypochaeris glabra</i>	<i>Tamarix aphylla</i>
<i>Mesembryanthemum nodiflorum</i>	

GNT engaged Jenny Borger Botanical Consultant (JBBC) to undertake a weed survey from the 25<sup>th</sup> to 27<sup>th</sup> May 2021. Following significant rainfall events earlier in the year many plants had germinated and most should be identifiable.

The objective of the survey is to identify the current distribution of weeds at the project and should provide:

- A brief report with associated tabulations and maps to summarize data and field observations
- List of weed species currently within the project disturbance envelope
- Map weed populations within the project disturbance envelope and provide appropriate GIS layer with the data (i.e., CSV; ESRI GIS layer)
- Treatment strategy specific to the weed species identified (e.g., chemical type, timing).

The area of disturbance for the survey includes:

- Access roads (~15km)
- Perimeter around clearing for infrastructure and in between infrastructure (e.g., the accommodation village and office buildings) (~8km)
- Perimeter of the airstrip
- Waste rock landform locations and surrounds
- Golden Wings, Gilbeys and Sly Fox open-cut pits
- Old plant site rehabilitated in 2001.

## 2. Field Survey

The field survey was undertaken by Jenny Borger (botanist) and Jacques Van Rensburg (GNT Senior Environmental Advisor) over 2 ½ days targeting locations with previous records as well as other areas of disturbance not previously surveyed. The locations of weeds were recorded by GPS and tablet. Most identification was done in the field; however, weeds with a basal rosette of leaves which were not in flower were collected and/or photographed for later confirmation. Data was recorded in excel tables for mapping.

### 3. Results

Fourteen species of weeds were recorded (Table 2) of which Ruby dock (*Rumex vesicarius*) was the most common and widespread. The Athel Pine (*Tamarix aphylla*) locations were not surveyed. The locations are presented in Appendix 1. No *Mesembryanthemum nodiflorum* (slender iceplant), *Carrichtera annua* (Ward's weed), *Cuscuta epithymum* or *Rumex hypogaeus* (Double gee) were observed. These species may germinate in winter and may be picked up during the weed spraying program.

Ruby dock was found to be common in the bore fields area and had spread down the creeklines. It was also abundant in the old plant area, mostly in disturbed sites.

The data have been supplied to GNT for mapping.

Table 2: Weeds recorded during the survey

Scientific Name	Common Name	Notes
<i>Aloe vera</i>		Administration area; contained; not spreading
<i>Carthamus lanatus</i>	Saffron Thistle	Site Access Road
<i>Cenchrus ciliaris</i>	Buffel grass	Mostly around buildings
<i>Erigeron bonariensis</i>	Flaxleaf fleabane	Wet mess
<i>Erodium aureum</i>		Isolated occurrences
<i>Hypochaeris glabra</i>	Smooth cats-ear	Workshop area
<i>Latua serriola</i>	Prickly lettuce	Mostly around buildings
<i>Malva parviflora</i>	Marshmallow	Bore DPPB No. 3
<i>Raphanus raphanistrum</i>	Wild radish	Mostly around buildings
<i>Rumex vesicarius</i>	Ruby Dock	Widespread, some dense populations in the old plant area and bore fields
<i>Salvia verbenaca</i>	Wild Sage	Site Access Road
<i>Solanum nigrum</i>	Black Berry Nightshade	Gilbeys Pit West
<i>Sonchus oleraceus</i>	Common Sow Thistle	Around buildings
<i>Taraxacum khatoonae</i>	Dandelion	Camp

There appears to be minimal spread into remnant bushland areas with the exception of the bore fields and old plant area. The area surrounding Sly Fox pit was also surveyed as GNT propose to expand mining activities into this area. No weeds were recorded. *Rumex vesicarius* had been reported as being widespread on the southern side of the airstrip on a previous occasion. A few isolated seedlings were noted at one location (old exploration camp).

Goats were common in the survey area and may promote weed spread. Grazing was noted on some species, particularly *Erigeron bonariensis* and occasionally on *Rumex vesicarius*. Images of the weeds are presented in Appendix 2.

#### 4. Weed control

GNT have engaged an experienced person to undertake weed control who will be able to assess the populations and apply the most effective treatment at the time of application. The following treatments are a guide.

Species	Control/ Management
<i>Aloe vera</i>	N/A (grown in garden bed)
<i>Carthamus lanatus</i>	Glyphosate; Dicamba (broad leaf selective) can be mixed with Glyphosate for increased impact
<i>Cenchrus ciliaris</i>	Cut out and physically remove small populations and seedlings. Entire plants with dormant buds must be removed. Spray with Verdict 6 L/ha (based on 500 L water/ha) + wetting agent or spot spray with 1% glyphosate six weeks after heavy rain. Follow-up with seedling control.
<i>Erigeron bonariensis</i>	Glyphosate + Metsulfuron + 2,4-D product
<i>Erodium aureum</i>	A wide range of herbicides can be used. Glyphosate should work. Follow up with Tordon or a 2,4-D based product if necessary.
<i>Hypochaeris glabra</i>	Glyphosate; Dicamba (broad leaf selective) can be mixed with Glyphosate for increased impact
<i>Latuca serriola</i>	Glyphosate; Dicamba (broad leaf selective) can be mixed with Glyphosate for increased impact
<i>Malva parviflora</i>	Hand remove isolated plants. Naturally tolerant of Glyphosate. Try Tordon + Pulse Penetrant
<i>Raphanus raphanistrum</i>	Have had success on Brassicas with Glyphosate. Dicamba (broad leaf selective) can be mixed with Glyphosate for increased impact
<i>Rumex vesicarius</i>	Glyphosate + Simazine. It's a residual selective broad-leaf herbicide. It stays in the top couple of cm of soil and acts on the new germinants for a few months.  The best time to treat ruby dock is 2 to 3 weeks after rain and before they start to set seed. Ideally do a follow up spray 4-6 weeks after the first hit and switch to Tordon if there are any resistant plants.
<i>Salvia verbenaca</i>	Spray small areas until just wet and a 1-2 metre buffer strip with a mixture of 1 litre of Tordon® 75-D in 100 litres of water.
<i>Solanum nigrum</i>	Hand weed small infestations. Glyphosate + Pulse Penetrant + Simazine
<i>Sonchus oleraceus</i>	Glyphosate + Pulse Penetrant + Simazine (a residual) or Tordon (has some residual effect)
<i>Tamarix aphylla</i> (Athel Pine)	Athel pine can be done any time via mechanical removal. The area needs to be monitored for new plants thereafter. The little ones should be able to be killed with Glyphosate or Tordon.
<i>Taraxacum khatoonae</i>	Manually remove individual plants Tordon + Pulse Penetrant for infestations





## Appendix 1: Locations of weeds

Scientific Name	Date	Easting	Northing	No.	Location
<i>Carthamus lanatus</i>	26/05/2021	527212	6920874	1	Site Access Road
<i>Cenchrus ciliaris</i>	25/05/2021	527454	6919737	10	Stores RY01
<i>Cenchrus ciliaris</i>	25/05/2021	527385	6919817	2	
<i>Cenchrus ciliaris</i>	26/05/2021	525923	6920488	1	Gilbeys TSF
<i>Cenchrus ciliaris</i>	26/05/2021	525740	6920666	1	Gilbeys TSF
<i>Erigeron bonariensis</i>	26/05/2021	531095	6921880	300	Wet Mess
<i>Erodium aureum</i>	26/05/2021	531022	6921019	2	Camp
<i>Erodium aureum</i>	26/05/2021	525561	6918878	1	Borefields Access Road
<i>Hypochaeris glabra</i>	25/05/2021	527438	6919764	25	GNT Workshop
<i>Latuca serriola</i>	26/05/2021	531047	6921873	5	Camp
<i>Latuca serriola</i>	26/05/2021	531020	6921813	1	Camp
<i>Latuca serriola</i>	26/05/2021	531046	6921805	1	Camp
<i>Malva parviflora</i>	26/05/2021	521466	6919976	1	DPPB No. 3
<i>Raphanus raphanistrum</i>	25/05/2021	527438	6919764	2	GNT Workshop
<i>Raphanus raphanistrum</i>	25/05/2021	527663	6921787	1	Access track to Bore Field
<i>Rumex vesicarius</i>	25/05/2021	527545	6921270	1	GWHR
<i>Rumex vesicarius</i>	25/05/2021	528814	6922019	10	GW2
<i>Rumex vesicarius</i>	25/05/2021	528644	6922011	200	Old Plant Access Road
<i>Rumex vesicarius</i>	25/05/2021	528553	6922007	100	Old Plant Access Road
<i>Rumex vesicarius</i>	25/05/2021	528434	6922001	100	Old Plant Access Road
<i>Rumex vesicarius</i>	25/05/2021	528312	6921991	1000	Old Plant Access Road
<i>Rumex vesicarius</i>	25/05/2021	528199	6921984	1000	Old Plant Access Road
<i>Rumex vesicarius</i>	25/05/2021	528158	6921917	1000	Old Plant area
<i>Rumex vesicarius</i>	25/05/2021	528114	6921950	20	Old Plant area
<i>Rumex vesicarius</i>	25/05/2021	528099	6921979	10000	Old Plant area
<i>Rumex vesicarius</i>	25/05/2021	527893	6921906	100	Old Plant area
<i>Rumex vesicarius</i>	25/05/2021	527930	6921899	1000	Old Plant area
<i>Rumex vesicarius</i>	25/05/2021	527908	6921819	50	Old Plant area
<i>Rumex vesicarius</i>	25/05/2021	527795	6921769	1000	Old Plant Access Road
<i>Rumex vesicarius</i>	25/05/2021	527850	6921585		End
<i>Rumex vesicarius</i>	25/05/2021	527666	6921789	5000	Old Plant area
<i>Rumex vesicarius</i>	25/05/2021	525473	6918837	10	Access track to Bore Field
<i>Rumex vesicarius</i>	25/05/2021	525209	6918976	10	Access track to Bore Field
<i>Rumex vesicarius</i>	25/05/2021	524691	6919843	10	Access track to Bore Field
<i>Rumex vesicarius</i>	26/05/2021	530891	6922001	25	Exp camp
<i>Rumex vesicarius</i>	26/05/2021	530962	6921882	1	Camp
<i>Rumex vesicarius</i>	26/05/2021	531020	6921883	5	Camp
<i>Rumex vesicarius</i>	26/05/2021	531025	6921873	10	Camp
<i>Rumex vesicarius</i>	26/05/2021	531047	6921873	10	Camp

Scientific Name	Date	Easting	Northing	No.	Location
<i>Rumex vesicarius</i>	26/05/2021	531029	6921787	10	Camp
<i>Rumex vesicarius</i>	26/05/2021	531057	6921823	1	Camp
<i>Rumex vesicarius</i>	26/05/2021	531091	6921839	1	Camp
<i>Rumex vesicarius</i>	26/05/2021	531111	6921892	5	Camp
<i>Rumex vesicarius</i>	26/05/2021	528444	6921707	10	Site Access Road
<i>Rumex vesicarius</i>	26/05/2021	528245	6921636	5	Site Access Road
<i>Rumex vesicarius</i>	26/05/2021	527595	6921263	100	Site Access Road
<i>Rumex vesicarius</i>	26/05/2021	527462	6921120	250	Site Access Road
<i>Rumex vesicarius</i>	26/05/2021	527212	6920874	50	Site Access Road
<i>Rumex vesicarius</i>	26/05/2021	524699	6920717	5	Rear of Gilbeys WRD
<i>Rumex vesicarius</i>	26/05/2021	521531	6919944	1	Borefields Access Road
<i>Rumex vesicarius</i>	26/05/2021	521466	6919976	1	DPPB No. 3
<i>Rumex vesicarius</i>	26/05/2021	521297	6919933	25	Borefields Access Road
<i>Rumex vesicarius</i>	26/05/2021	520755	6919963	1	Borefields Access Road
<i>Rumex vesicarius</i>	26/05/2021	521455	6919894	2	DBBP No. 3 to DBBP No.1
<i>Rumex vesicarius</i>	26/05/2021	521351	6919244	100	DBBP No. 3 to DBBP No.1
<i>Rumex vesicarius</i>	26/05/2021	521318	6919167	200	DBBP No.1
<i>Rumex vesicarius</i>	26/05/2021	521236	6918838	100	Borefields
<i>Rumex vesicarius</i>	26/05/2021	521063	6918502	100	Borefields Creek
<i>Rumex vesicarius</i>	26/05/2021	521100	6918479	200	Borefields Creek
<i>Rumex vesicarius</i>	26/05/2021	520652	6917959	5	Borefields
<i>Rumex vesicarius</i>	26/05/2021	520365	6917921	50	DBBP No. 5
<i>Rumex vesicarius</i>	26/05/2021	520649	6918956	10	DBBP No. 4
<i>Rumex vesicarius</i>	26/05/2021	530856	6921538	10	Airstrip south
<i>Rumex vesicarius</i>	26/05/2021	525893	6920520	5	Gilbeys TSF
<i>Rumex vesicarius</i>	26/05/2021	527140	6920143	1	Workshop area
<i>Rumex vesicarius</i>	26/05/2021	527122	6920103	1	Workshop area
<i>Rumex vesicarius</i>	26/05/2021	527117	6920099	2	Workshop area
<i>Rumex vesicarius</i>	26/05/2021	527163	6920024	10	shallow pond
<i>Rumex vesicarius</i>	27/05/2021	525493	6919124	5	Gilbeys South
<i>Rumex vesicarius</i>	27/05/2021	524870	6919515	5	Magazine
<i>Rumex vesicarius</i>	27/05/2021	525302	6919937	5	Gilbeys WRD adjacent to TSF
<i>Rumex vesicarius</i>	27/05/2021	525163	6920202	5	TSF
<i>Rumex vesicarius</i>	27/05/2021	525519	6920859	5	TSF corner
<i>Salvia verbenaca</i>	26/05/2021	527595	6921263	500	Site Access Road
<i>Salvia verbenaca</i>	26/05/2021	527462	6921120	500	Site Access Road
<i>Salvia verbenaca</i>	26/05/2021	527212	6920874	1000	Site Access Road
<i>Solanum nigrum</i>	26/05/2021	525718	6919916	5	Gilbeys Pit West
<i>Sonchus oleraceus</i>	25/05/2021	527418	6919780	20	Stores
<i>Sonchus oleraceus</i>	26/05/2021	530962	6921882	5	Camp
<i>Sonchus oleraceus</i>	26/05/2021	530997	6921862	5	Camp
<i>Sonchus oleraceus</i>	26/05/2021	531013	6921825	1	Camp

Scientific Name	Date	Easting	Northing	No.	Location
<i>Sonchus oleraceus</i>	26/05/2021	531026	6921851	25	Camp
<i>Sonchus oleraceus</i>	26/05/2021	531037	6921889	10	Camp
<i>Sonchus oleraceus</i>	26/05/2021	531045	6921894	10	Camp
<i>Sonchus oleraceus</i>	26/05/2021	531069	6921848	1	Camp
<i>Sonchus oleraceus</i>	26/05/2021	531052	6921789	5	Camp
<i>Sonchus oleraceus</i>	26/05/2021	531076	6921834	5	Camp
<i>Sonchus oleraceus</i>	26/05/2021	531095	6921880	30	Wet Mess
<i>Sonchus oleraceus</i>	26/05/2021	527137	6920101	10	Workshop area
<i>Sonchus oleraceus</i>	26/05/2021	527124	6920096	20	Eating area
<i>Taraxacum khatoonae</i>	26/05/2021	531091	6921789	1	Camp

Appendix 2: Images of weeds

Scientific Name	Image
<p><i>Carthamus lanatus</i></p> <p>File photo</p>	
<p><i>Cenchrus ciliaris</i></p> 	
<p><i>Erigeron bonariensis</i></p>	



*Erodium aureum*



*Hypochoeris glabra* – smooth leaf; wild radish (*Raphanus*) at back



*Latuca serriola*

(File photo)



*Malva parviflora*



*Raphanus raphanistrum*

(*Hypochoeris* in foreground)



*Rumex vesicarius*

Seedling



Semi mature plant; pre-flowering



*Salvia verbenaca*

Very aromatic; will have purple flowers



*Solanum nigrum*

Flowers and fruit present



*Sonchus oleraceus*



*Taraxacum khatoonae*

