

6.2.4 Significant Impact Assessment – Squatter Pigeon

Squatter Pigeon has been found predominantly to the south of the TRR4 road reserve, around both of the farm dams, but also along access tracks for the existing service easements, and particularly around the farm dams to the south of the road reserve. The likelihood that a significant impact on Squatter Pigeon could occur as a result of the proposed road is discussed below for each of the significance impact criteria for vulnerable species.

Lead to a long term decrease in the size of an important population of a species

The current population of Squatter Pigeon is estimated at 40,000 and is thought to be stable with no populations being identified individually as significant to the long term survival or recovery of the species. If the local population around TRR4 road reserve is assumed to be as high as 40 individuals, this would represent 0.1% of the Australian population. Squatter Pigeon is known from other locations around Townsville, particularly around the Ross River Reservoir, mainly in open woodland and grassland habitat (Wieneke, 1992), south of Mt Elliot and south of Granitevale Road with most records from this and the last decade (Atlas of Living Australia). While the proposed road does remove areas of native vegetation, the core component of Squatter Pigeon habitat in this area will remain untouched by construction works and is unlikely to lead to a decrease in the size of an important population.

Reduce the area of occupancy of an important population

As indicated above important populations of Squatter Pigeon have not been identified and the area of occurrence of the species as a whole is estimated to cover 440,000 km². There have been no recent changes in the extent of occurrence (i.e. the extent of occurrence is known to be stable at present) (Garnett & Crowley, 2000). Therefore, it is not expected that TRR4 project will reduce the area of occupancy.

Fragment an existing important population into two or more populations

Important populations have not been identified. In terms of the distribution of Squatter Pigeon observed adjacent to TRR4 (Figure 4), it appears to be a number of small populations south west of the TRR4 road reserve on the adjacent state land. The likely size of the population is consistent with the species profile of what is usually expected for this species of between 2 and 20 birds.

Adversely affect habitat critical to the survival of a species

The species profile for Squatter Pigeon, SEWPaC (2013) does not specify any habitat critical to the survival of this species. At the study site Squatter Pigeon has been found in disturbed habitats (access tracks close to a stockyard), which is quite common (Longmore 1976; Lord, 1956). One of the recovery actions identified for Squatter Pigeon is to establish conservation measures to protect grassy woodlands and forests. The combined effects of habitat clearance, habitat degradation and predation are thought to have caused the decline in Squatter Pigeon (southern) populations that occurred during the late 19th and early 20th centuries (Barnard & Barnard, 1925). Other suitable habitat areas are available in the Townsville district, and it is expected that the Squatter Pigeon habitat adjacent to the TRR4 road reserve will not be impacted by road construction.

Disrupt the breeding cycle of an important population

Squatter Pigeon's main breeding season is from mid-October to late January (data in SA Museum; P. Horton, pers. comm.), but clutches have been inferred as early as late August, and as late as February (Pickett 2000; M. Pickett, pers. comm.). Vegetation clearance for construction is unlikely to occur between October and January (wet season). Squatter Pigeon tends to breed on stony rises and in shallow depressions in the ground within 1 km of a permanent water body and forage within 3 km of such a water body. The species also prefers to forage and dust-bathe on bare ground under an open canopy of trees (Squatter Pigeon Workshop, 2011).

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

Squatter Pigeon has not been recorded breeding within the project footprint or close proximity, and habitat that the birds have been recorded nearby is at the closest point 800 m from road construction activities, or otherwise further afield. It is presumed however, given they are known to be sedentary when food and water resources are present that, they would usually breed and forage to the south of the TRR4 road reserve. It is possible that they could disperse from this habitat area across the broader landscape in resource short times such as drought as the regional ecosystems and soil types present are consistent with their habitat. Therefore the TRR4 road would fragment this dispersal habitat to the east. Other landscape level dispersal connections would remain in place.

The proposed project footprint itself is unlikely to reduce the quality of habitat and cause the species to decline.

Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The proposed road will not increase the presence of cats and foxes which are the main predators of Squatter Pigeon (SEWPac, 2013). Moreover, the EMP will manage invasive weeds and other disturbing factors such as fire, which might be a threat to native grasses as well as other pest species.

Introduce disease that may cause the species to decline, or interfere substantially with the recovery of the species

No diseases are known for the species that could be caused by the road construction, nor would actions associated with road construction and or operation interfere substantially with the recovery of the species.

In summary it is not considered that there will be a significant impact on Squatter Pigeon from the project.

6.2.5 Impacts on State Biodiversity Values

6.2.5.1 Fauna Habitat Fragmentation and Loss

The loss of native vegetation from the TRR4 corridor may result in local scale habitat fragmentation for locally common species. Habitat fragmentation can lead to an increase in the abundance of predators and generalist species such as the noisy miner and butcher bird that can impact fauna assemblages including BTF. Removal of riparian vegetation may impact on the type of species and population found in the aquatic and terrestrial areas associated with this zone within the areas of clearance.

Barriers to fish passage can occur when riparian vegetation is removed. This occurs via a complex cycle that includes the increase of temperature of the water and reduction in dissolved oxygen to a point in which fish will avoid the area or risk suffocation. In addition, barriers to fish passage can occur when pollutants enter a waterway. The type, level and duration of impact would depend on the type and amount of pollutant entering the waterway, an example of a short term barrier may be sediment runoff from an isolated rain event creating a plume whereas longer term impacts can arise from pollutants that persist or bio-accumulate in the environment.

Physical barriers such as fences are problematic for fauna movement when placed across a corridor or within habitat e.g. barriers in open areas can cause issues for fauna when fleeing fire.

Road corridors can act as a physical barrier to some fauna, such as certain arboreal species and terrestrial animals incapable of flying, thereby limiting their range and potentially increasing competition for resources and isolating populations. Some arboreal species may find the width of large roads to be prohibitive to accessing habitat across the way (Seiler, 2001; NRA, 2012).

The site is part of the Bohle catchment area with several unnamed tributaries of the Bohle River of various stream order located within it. All streams within the study area eventually discharge into the Great Barrier Reef Marine Park (GBRMP) and the Bohle Fish Habitat Area (FHA). Watercourses also provide for two locally and state significant wildlife habitat corridors. Moreover, the site contains wetland management areas (WMA) and wetland trigger areas.

Maintaining environmental flow at Saunders and Stony Creeks has been an important element of the design to reduce the above impacts. Culverts are being designed to meet the Queensland self-assessable codes for waterway barrier works in the green and amber waterways crossed by TRR4, which will ensure fish passage is maintained in the operational phase of the road.

6.2.5.2 Fauna Mortality

There are issues of animal welfare caused by the clearing of habitat and operation of a road which can be anticipated. Clearing operations and subsequent construction may directly result in the death of some native fauna. Fauna may be killed or injured by the machinery involved in the site works or could be killed fleeing from the area of works by falling trees or debris. Often reptiles and frogs are most affected by machinery as they tend to remain hidden in ground cover. Arboreal mammals, bats and birds are more likely to be impacted by falling trees and other debris. Perimeter fencing, pre-clearance surveys, and site inspections during key construction periods such as clearing will mitigate the level of impact.

The removal of habitat would result in displacement of mobile species (e.g. birds and mammals) to similar habitats in the surrounding area, for example to suitable habitat located in the riparian margins outside of the TRR4 corridor. Individual animals which cannot establish new territories in other habitats are likely to migrate from the area, increasing their susceptibility to accidents and predation. These animals often perish as a result of failure to compete for resources with animals that are able to defend established territories. It is possible that the

clearing activities would result in the death of some individual animals, this is particularly true for species such as reptiles that do not have the same dispersal capabilities as birds and some mammals.

During the operational stage of TRR4 fauna mortality may occur from road collisions. Perimeter fencing of the road reserved will mitigate this potential impact.

6.2.5.3 Spread of Introduced Plants and Plant Diseases

Vehicle and human movement, soil disturbances, soil movement and transportation of materials are activities that increase the dispersal or introduction of introduced plant species and diseases. A number of introduced plant species already occur within the TRR4 corridor as identified in Table 15 below. Without appropriate management, the construction of TRR4 has the potential to disperse these weeds into areas where weed species are currently limited, or allow the establishment of these species in newly cleared areas. In addition, new weed species could be introduced to the area through increased vehicle and soil movement, and through long term maintenance operations such as mowing of the road verges.

Weed invasion reduces the overall condition and quality of vegetation, and out-competes many native species for resources such as space, nutrients and light. Weed invasion is a disturbance factor that can change the structure and composition of native vegetation irreversibly.

There is also the potential for the spread of plant diseases, such as Myrtle rust (*Uredo rangelii*) and Root-rot dieback (*Phytophthora cinnamomi*). DAFF have reported that Myrtle rust has been detected in Townsville in both a nursery and urban setting (2012), and Root-rot dieback has been present in the Townsville area for at least a decade, although the closest *Phytophthora* infection has been at Mt Spec, Paluma in the wet tropics rainforest (Gadek, 1999) and would be unlikely to occur in the Bohle Plains. However to prevent this from occurring, appropriate hygiene protocols for vehicle and movement of materials (e.g. imported soil and mulch) should be employed to reduce any potential impacts.

Table 15 List of Weed Species Recorded within and Adjacent to the Two Lane Construction Footprint

Species name	Common name	Growth form	Family	LPA status^	PMP status#
<i>Aeschynomene paniculata</i> *	Pannicle joint vetch	Shrub	Fabaceae		
<i>Alternanthera ficoidea</i> *	Joy weed	Creeper	Amaranthaceae		
<i>Clitoria ternatea</i> *	Butterfly pea	Vine	Fabaceae		
<i>Cryptostegia grandiflora</i>	Rubbervine	Vine/shrub	Apocynaceae	Class 2	High priority
<i>Hyparrhenia rufa</i> *	Thatch grass	Grass	Poaceae		
<i>Hyptis suaveolens</i> **	Hyptis	Shrub	Lamiaceae		
<i>Lantana camara</i>	Lantana	Shrub	Verbenaceae	Class 3	
<i>Leucaena leucocephala</i> **	Coffee bush	Shrub/tree	Mimosaceae		High priority
<i>Macroptilium atropurpureum</i> **	Siratro	Vine	Fabaceae		
<i>Macroptilium lathvroides</i> *	Phasey bean	Vine	Fabaceae		
<i>Megathyrus maximus</i> **	Guinea grass	Grass	Poaceae		
<i>Melinis repens</i> *	Red Natal grass	Grass	Poaceae		
<i>Neptunia spp</i> *	Sensitive plant	Shrub	Fabaceae		
<i>Passiflora foetida</i> **	Stinking passion flower	Vine	Passifloraceae		
<i>Ricinus communis</i> **	Castor oil	Shrub	Euphorbiaceae		

Species name	Common name	Growth form	Family	LPA status^	PMP status#
<i>Sporobolus spp</i>	Rat's tail grass	Grass	Poaceae	Class 2	High priority
<i>Stachytarpheta jamaicensis**</i>	Snakeweed	Shrub	Verbenaceae		
<i>Stylosanthes spp.</i>	Stylo	Shrub	Fabaceae		
<i>Themeda quadrivalvis**</i>	Grader grass	Grass	Poacea		Potential weed
<i>Urochloa mutica**</i>	Para grass	Grass	Poacea		
<i>Xanthium strumarium**</i>	Noogoora burr	Shrubs	Asteraceae		
<i>Ziziphus mauritiana</i>	Chinee apple	Tree	Rhamnaceae	Class 2	High priority

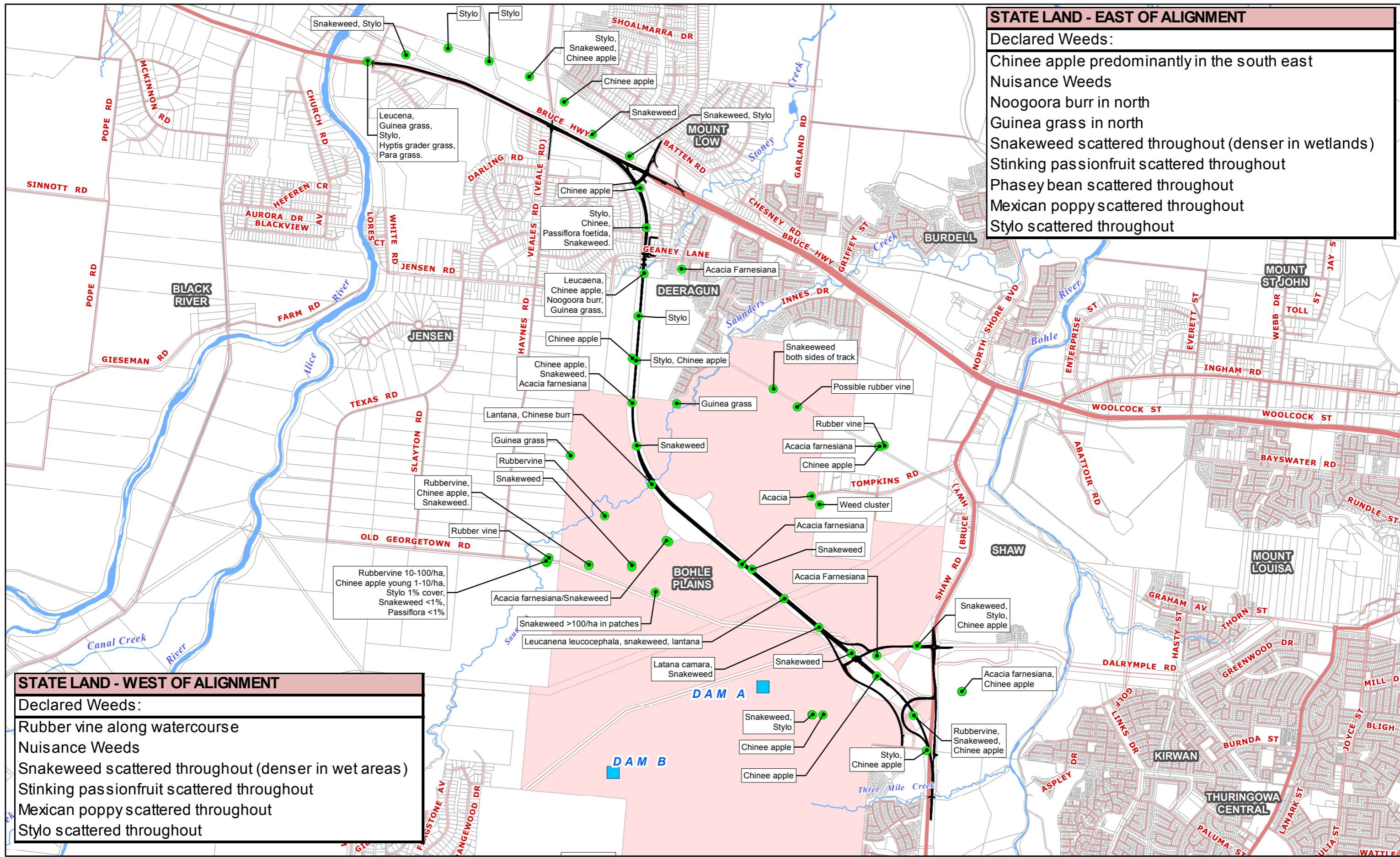
^LPA= Land Protection (Pest and Stock Route Management) Act 2002.

#PMP= Townsville City Council Draft Pest Management Plan (2010-2014).

*=species not listed by the State as a significant weed.

**=species listed by the State as a significant weed.

Weed distribution on and around the TRR4 road reserve is shown in Figure 10.



STATE LAND - EAST OF ALIGNMENT

Declared Weeds:
 Chinee apple predominantly in the south east
 Nuisance Weeds
 Noogoora burr in north
 Guinea grass in north
 Snakeweed scattered throughout (denser in wetlands)
 Stinking passionfruit scattered throughout
 Phasey bean scattered throughout
 Mexican poppy scattered throughout
 Stylo scattered throughout

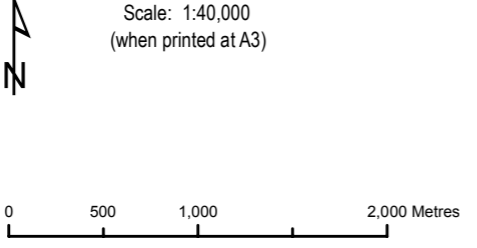
STATE LAND - WEST OF ALIGNMENT

Declared Weeds:
 Rubber vine along watercourse
 Nuisance Weeds
 Snakeweed scattered throughout (denser in wet areas)
 Stinking passionfruit scattered throughout
 Mexican poppy scattered throughout
 Stylo scattered throughout



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Cadastre, Study Area, Water body provided by Townsville City Council 2011.
 Squatter Pigeon - AECOM 2012 and NRA 2013
 StreetPro © 2010 Pitney Bowes Software Pty Ltd
 Roads, Watercourse - © 2010 PSM Australia Pty Ltd
 Weed locations - RPS and AECOM 2013



Legend

● Weeds	 Highways	 TRR4 Project
 Dam Locations	 Main Roads	 Property Boundary
	 Local Roads	 State Land (tenure)

TOWNSVILLE RING ROAD SECTION 4
Weed Distribution on TRR4 Road Reserve and in Adjacent Land

Figure 10