Lot 22 Tyrone Place

Ecological Report

Prepared for CSR Building Products Ltd.

by WetlandCare Australia

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Lot 22 Tyrone Place, Erskine Park currently stands as a drained wetland with input from an unnamed creek which flows through the property. A diverse range of native plants exist on site, interspersed with a variety of exotic plants (see table 1). Although no formal fauna studies have occurred, a range of faunal species have been observed on site including; frogs, snakes, lizards and numerous wetland and woodland birds.

The current ecological function of the wetland area is that of habitat provision and water quality improvement. The previous draining of the wetland for weed control and future development nearby has left the main wetland site relatively dry with no standing open water. This has allowed a number of native *Juncus* species to recolonise.

In order to maintain ecological function for the proposed creek realignment and wetland system, design and construction details should:

- Include a floodplain element
- Include open water and littoral zones
- Retain mature trees where possible for seed production
- Maximise potential habitat and include water polishing elements such as macrophyte zones, sedimentation pond and water level control structures
- Remove or control all pest species

The inclusion of these elements will ensure the ecological benefits of the site are maintained and improved in terms of both habitat provision and ecological function.

Recommendations provided herein relate to current working drawings X030033 Drawingset A3 20110902_110920 provided to us by CSR Building Products Ltd. WetlandCare Australia request to review any amended drawings and would appreciate the opportunity to have a representative on site during construction phases, particularly of wetland ponds and riffle zones.

Table 1. Weeds and native plants recorded on site

Native	Weed
Bolboschoenus fluviatilis	**Typha sp.**
Carex spp	**Araujia sericifera**
Casuarina glauca	**Asparagus asparagoides**
Chenopodium sp.	**Aster squamatus**
Cynodon dactylon	**Cirsium arvense**
Juncus subsecundus	**Cortaderia jubata**
Ludwigia peploides	**Cyperus eragrostis**
Myriophyllum sp.	**Juncus acutus**
Paspalum distichum	**Paspalum dilatatum**
Persicaria decipiens	**Ranunculus sceleratus**
Persicaria hydropiper	**Rubus anglocandicans**
Persicaria lapathifolia	**Salix fragilis**
Triglochin microtuberosum	**Salvinia molesta**
Triglochin procerum	**Solanum pseudocapsicum**

Eastern Gambusia *(Gambusi holbrooki*) have been observed in the existing creek. NSW DPI has listed Eastern gambusia as noxious in NSW. Eastern gambusia is an aggressive predator and is listed as a Class 1 noxious species outside the greater Sydney area. They are known to attack, kill and eat small native fish, water bugs, frog eggs and tadpoles. They compete for food with native fish, eat their eggs and attack and kill the fry. Gambusias also eat frog eggs and attack tadpoles by nipping their tails, often killing the tadpoles. They also eat many different types of water bugs.

Recommendations

- Provision should be made for the dispersal of native animals to the adjacent eastern site by staged earthworks beginning at the western end of the site.
- An opportunity exists prior to earthworks to relocate frog species from existing wetland area upstream to existing creek.
- Remove all *Juncus acutus* and stockpile for drying out and disposal.
- Remove all other weeds, notably Blackberry, Willows and Pampas Grass.
- Large stands of *Bulboschoenus fluviatilis* exist in the main wetland; these should be retained where possible however in the event of earthworks in existing stands, the bulbs should be collected and stored for replanting following works.
- Collect seed from existing stands of *Carex* sp. and native *Juncus* sp. for hand broadcasting following works.
- Collect seed from existing Melaleuca and Casuarina species for propagation and revegetation.
- Retain remnant Eucalypts where works are to begin on eastern section of creekline.
- Install high density patchwork planting for wetland revegetation (6 - 8 plants /m^2).

- Remove Gambusia from existing creek prior to connection to new creekline.
- Open water pond construction should ensure a range of depths are provided (as a guideline 30% < 0.5m, 50% 0.5 – 1.0m, 20% > 1.5m but not more than 2.5m)
- Install rocks in centre of larger wetland to provide a refuge island. This should be low in profile and not more than 30cm above normal water level.
- Outlet drain from existing southern dam should be planted out with appropriate wetland littoral zone species outlined in Table 2 as part of the treatment train for water quality objectives.
- All artificial rock riffle structures must be constructed so they are not a barrier to fish migration. The gradient of the downstream face should not be less than 1:20 (ie. not steeper) and the upstream face and sides no greater than 1:4. Rocks used must resist erosion and match local geology. Some oversized rocks should be used to create complex hydraulic flows and provide a range of habitat conditions. A shallow V-shaped crest should be formed across the riffle to concentrate flows to the centre, reducing the chance of flows outflanking the riffle zone and thus allowing fish passage for a greater range of flows.
- Rock cairns should be placed on outer bends of channel to prevent erosion during high flows.
- All large trees removed during earthworks should be retained for use as habitat elements. Large woody debris should be installed as per design drawings X030033.
- Any surface that has been graded to expose subsoil must have clean topsoil applied to a minimum depth of 200mm and covered with coir netting prior to planting. Top soil removed from the site as part of earthworks should not be reused due to the risk of spreading *J. acutus* seeds.
- Ongoing monitoring and management of weeds, particularly *J. acutus,* is essential.

Table 2. Species suitable for wetland, littoral zone and floodplain revegetation

Aquatic	Littoral zone	Ecotone	Floodplain
	Baumea articulata	*Carex appressa*	*Capillipedium spicigerum*
Ludwigia peploides	*Bulboschoenus caldwellii*	*Juncus usitatus*	*Casuarina glauca*
Myriophyllum papillosum	*Bulboschoenus fluviatilis*	*Juncus subsecundus*	*Lomandra longifolia*
Triglochin procerum	*Lepironia articulata*	*Lomandra longifolia*	*Melaleuca linariifolia*
Triglochin microtuberosum	*Philydrum lanuginosum*	*Phragmites australis*	*Melaleuca styphelioides*
	Paspalum distichum	*Paspalum distichum*	*Poa labillardieri*
	Schoenoplectus validus	*Triglochin striatum*	*Themeda australis*

WetlandCare Australia is willing to assist CSR during the construction phase of the proposed creek realignment and wetland establishment to ensure the best ecological outcomes are achieved.