

# Tatiara Creek Report



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## **Government of South Australia**

South East Natural Resources  
Management Board



Author: Samantha Blight.

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## Introduction

The development of this Management Plan has come about through a sub-regional project developed by Coorong Tatiara Local Action Plan staff and South East NRM staff to identify areas of the Tatiara Creek where management actions such as fencing to manage stock, weed control, erosion control and revegetation to improve the condition of the Creek.

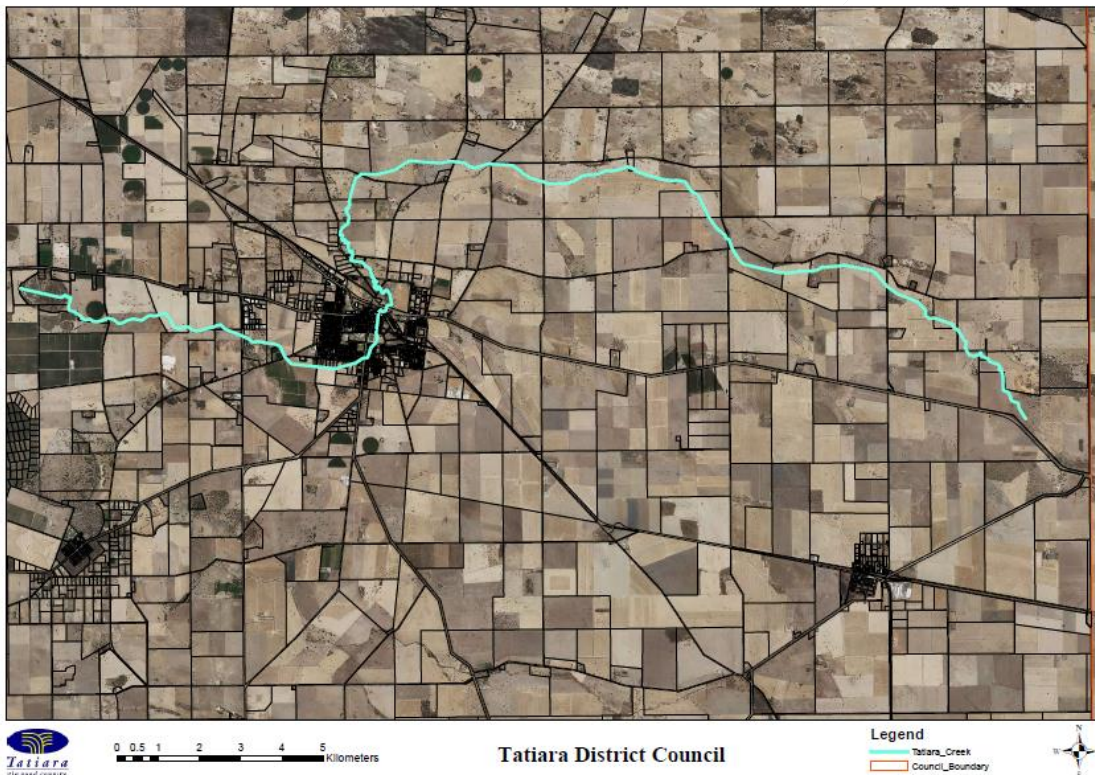
This Plan will support the prioritisation of management works, assist in applying for grants and contribute to landholders understanding of how the management of their section of Creek fits into the whole of Tatiara Creek Management Plan.

## Location

Tatiara Creek is a moderately sized stream in the upper South East with a catchment area over 430 square kilometres. The Creek headwaters are in the western Wimmera of Victoria in the Lillimur area and flows in a westerly direction through Bordertown to Poocher Swamp before disappearing underground via karst “runaway holes” several kilometres west of Bordertown.

As Tatiara Creek traverses through Bordertown the stream receives urban stormwater.

Within the Tatiara Creek catchment the principle land use is cropping and grazing.



Map 1: Tatiara Creek overview from SA/VIC border to Poocher Swamp.

## History

Wetlands once covered an area of about 44% of the South East but drainage and land clearance associated with European settlement of the region has reduced this to less than 6% of their original extent. These changes in land use and hydrology have significantly altered the ecology of the remaining wetlands, resulting in many remaining dry for long periods and salinities increasing to levels that only favour the more saline tolerant plants and animals (Department for Water 2010).

Tatiara Creek is one of several surface creek systems in the area. The climate in the region is typically considered wet, with cool winters and dry, mild to hot summers

## Landuse

Within the Tatiara Creek catchment farming, both cropping and grazing is the principal land use.

Impacts on the creek vary as a result (i.e. less important to fence the creek if mostly cropping).

## Aboriginal Heritage

There are several Aboriginal heritage sites of known social significance including a reserve at Bordertown. Other sites include the Pinkie Tree, a large Red Gum in Poocher Swamp said to be once used as a living shelter.



*Pinkies Tree, Poocher Swamp.*

Poocher Swamp itself is a site of importance for Aboriginal people. Sites of particular significance to people with kinship and ancestral ties to the area may include meeting areas, burial grounds and campsites. These sites often contain middens, hearthstones and evidence of stone tool making, e.g. scrapers, blades, points, axes and grindstones. The tools are made from a range of minerals such as granite, quartz, flint, silcrete and volcanic materials. Many of these sites are associated with water supplies and usually include swamps, soaks, creeks and runaway holes. There are cultural rules and taboos that relate to how and when different aboriginal groups may enter or use these areas.

Evidence of the early Aboriginal populations can be found around sand lunettes and along the Tatiara and Nalang Creeks. Stone artefacts indicate the location of campsites. Scars can still be seen on 'shield trees' where the bark was removed. It is important to note that Aboriginal heritage is protected at both State and Commonwealth level.

The Aboriginal Heritage Act 1988 protects Aboriginal remains, sites and objects of significance to the anthropology, history culture and archaeology of Aboriginal people. People who find an Aboriginal site, object or remains are required to report the finding to the Aboriginal Heritage Branch of the Department of Premier and Cabinet.

## Hydrology

Two watercourses flow into the Tatiara district from the western Wimmera region of Victoria. These are the Tatiara and Nalang Creeks. Both creeks have their headwater catchments in the near-border zone and seasonal flows are dependent on local rainfall.

The Tatiara Creek flows from Victoria via Pine Hill through Bordertown to Poocher Swamp and continues through Cannawigara Swamp and several smaller ephemeral wetlands. Some of these wetlands have runaway holes within them and others exist in isolation, the most notable being Scown's runaway hole.

Considerable work since 1981 has facilitated the access of floodwaters in wet years to other runaway holes along the Cannawigara Road. Some property owners on the low-lying country have also constructed drainage bores to alleviate flooding.

Both the runaway holes and drainage bores play a key role in directing excess water as recharge back into the underground aquifer.

Tatiara and Nalang Creeks provide valuable recharge to the unconfined aquifer and both the Poocher and Mundulla Swamps are on the list of Nationally Important Wetlands.

The flow in the creeks can last anywhere from a few days to a few weeks. Total annual flow volumes in the Tatiara Creek ranged from 1300 to 20 000 ML between 1987 to 1991 (Herczeg et al., 1997). If the flows from the creeks are sufficient, the swamps form small lakes. This usually occurs in late winter.

The capacity of Poocher Swamp is estimated to be 425 ML (DENR, 1997).

## Environmental Values & Landuse

### Vegetation Communities

The variety of native vegetation communities is determined by the different soil types surrounding Bordertown which consist of grey cracking clay (locally referred to as "the good country"), with its Box and Buloke woodlands *Eucalyptus microcarpa*, *Allocasuarina luehmannii*, *E. odorata*, *E. porosa* and South Australian Blue Gum *Eucalyptus leucoxylon* and Pink Gum *Eucalyptus fasciculosa* on the lighter loam soils.

The Box and Buloke communities are at the western limit of their range and dominate the adjacent Wimmera region in Victoria (South East Biological Survey, 1997).

### Red Gum Country

This landscape is typically flat to gently undulating with minor sandy and stony rises. Seasonal swamps and runaway holes provide recharge to the groundwater table. The main soils are shallow red and black

sandy loam to loam over limestone, and sandy loam over red, grey or brown clay with soft to rubbly lime at depth.

Production potential and land use: The soils are moderately fertile and generally well drained, although salt can build up after prolonged irrigation.

This land class is some of the most productive in the Tatiara. A wide range of dryland crops and pastures are grown and irrigation is used for the production of hay, pasture seeds and wine grapes.

## Wimmera Country

As the name implies, this landscape is the westward extension of the Victorian Wimmera. It is a very gently undulating slightly elevated plain which the Tatiara and Nalang Creeks pass through.

Localised micro-depressions (crabholes or gilgai) ensue in places and as a result differential shrinking and swelling of clayey substrate materials occurs. The characteristic soils are deep cracking clays. These tend to be black to dark grey or brown. They are usually alkaline throughout.

To the north of the Dukes Highway and surrounding the Tatiara creek mixed soils form a transition zone. Here the soil types can change markedly within small distances and may consist of red sandy clays with free ironstone, red hard setting clays, black or grey clay loams and sandy rises.

Remnant vegetation associations can be quite variable with stands of River Box, Redgum, Bluegum, Peppermint Box, Bulloak, Mallee, Stringybark and Native pine all present.

Production potential and land use: Due to their inherent fertility the soils are able to sustain a program of continuous cropping incorporating rotations of cereals, pulse crops and oilseeds with ley pasture break years. However in times of drought this landscape can perform less favourably when compared to the surrounding Red Gum country and sand over clays due to its lesser ability to respond to light spring rainfall events.

## Threats

### Weeds

The main problem weeds found along the Tatiara Creek can be divided into the following three broad groups:

- Perennial grassy weeds;
- Woody weeds and;
- Herbaceous weeds;

Other weeds such as annual grasses and broadleaf weeds have less of an impact.

### Perennial Grassy Weeds

Perennial grassy weeds mainly consist of pasture grasses that spread into watercourse areas and, when not grazed, can take over a site to the exclusion of native species. Phalaris is the most prevalent, but Cocksfoot and Perennial Ryegrass also occur.

### Control

Perennial grassy weeds can be controlled using a non-selective herbicide approved for use near a watercourse. The herbicide should be applied according to the label instructions. It is important to apply it when the plants are actively growing, such as in late Autumn or Spring to early Summer. If the grasses have a lot of dead matter, control will be more effective if the grass is slashed or grazed first and the re-growth sprayed.





*Left un-grazed and unmanaged, perennial pasture grasses can overtake a watercourse.*

## **WOODY WEEDS**

Very few woody weeds occur along the Tatiara Creek. Woody weeds such as Wild Ash (*Fraxinus sp.*) and Cotton Palm (*Washingtonia robusta*) were detected within the Bordertown township notably at Rouse waterhole and along sections of the Creek within the township.







*Rouse waterhole, escaped garden plants including wild ash trees and cotton palms.*

## **Erosion**

When site visits were undertaken no sign of significant erosion was observed along Tatiara Creek. Erosion will occur as a result of fast flowing surface water where there is inadequate ground cover to hold the soil together, resulting in scouring, ruts and rills and the removal/deposition of sediment elsewhere.

Creek bank erosion can be exacerbated from livestock traffic especially where minimal ground cover is present.

Fencing of the Creek line to include riparian vegetation buffer (minimum 10 meters wide both sides of Creek) will allow control of stock movement whilst protecting the fragile banks at risk of erosion.

## **Current Condition**

### **Zone 1(Red)**

This zone represents sections of the Creek that will benefit from further investment such as fencing and subsequent management of natural regeneration and control of grassy understorey to reduce the fire fuel load hazard.

The Creek is fenced on one side along Edwards/Ridgeway (north) boundary and it is recommended double fencing if funding becomes available (approx.2kms.). Both landholders are willing to complete fencing and are flexible as to utilising different weed control methods i.e. controlled crash grazing, chemical control, mechanical slashing etc.



*Example of single fenced Tatiara Creek line along Edwards/Ridegeway (north) boundary.*

The Creek line from Pine Hill Road Bridge to Ridgeways was planted out with River Red Gums (*Eucalyptus camaldulensis*) from 1970 to 1995 by Ian Ridgeway. Redgums are reluctant to grow in this location as the soil types are more suited to River Box (*E. largiflorens*).

An unfenced reserve of approximately 40 hectares located on the Creek line east of Pine Hill Rd on the property boundary of Ridgeway & Langley contains mature stands of River Box (*E. largiflorens*) & Redgums (*E. camaldulensis*) and is surrounded by cropping paddocks.



*Unfenced reserve containing mature Redgums, Riverbox and Broad leaved box.*





*Tatiara Creek line planted out with River Redgums (*Eucalyptus camaldulensis*) by Ian Ridgeway.*

The Creek continues in a north easterly direction through Eats & Langley properties and comprises a mixture of scattered River Box (*E. largiflorens*) and Bluegums (*E. leucoxlyn*) together with cleared and widened spoon drain type culverts to accommodate cropping in surrounding paddocks (see below picture).



*An example of how the Creek has been transformed into more of a drain than a creek.*



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# Tatiara Creek Report

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The Redgums approximately two kilometres north of Tolmer Lake were extensively harvested in the early days for kiln timber to fuel a brick kiln that is now near the old dump access road.

The trees show scars of harvesting and have regenerated back to healthy mature trees today (refer below pic).

Redgum timber burns long and slow and creates a lot of heat and would have been the preferred wood for kilns and boilers in the early days.



*Evidence of trees being harvested for their timber along the Creek line approximately 2kms north of Bordertown.*

The Creek line south from Winter-Lake, approximately 2 kilometres north of Bordertown has a good mixture of vegetation with sections of the Creek planted with River Redgums with other sections containing naturally occurring stands of Redgums and some Riverbox.

Concerns for management are maintaining vehicle Creek crossings and keeping grassy fire fuel loads to a minimum especially in areas that are fenced off from stock.

***\*Crash grazing these areas to reduce the biomass or mechanical slashing is recommended\*.***

## **Zone 2 (Yellow)**

Finlayson Road to Senior Road. Within this zone much of the natural Creek has been deepened with large banks so that normal flooding across the flats is restricted to the Creek line.

This zone represents riparian areas with scattered red and blue gums, little to no native understorey and is dominated by escaped pasture grasses such as Phalaris, Cocksfoot, etc.

Adjacent principle land use is cropping.

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# Tatiara Creek Report

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It is recommended that scheduled maintenance of fence lines at the end of autumn/winter be undertaken at Creek crossings to ensure integrity is maintained so stock are safely contained.



*Top and Bottom: An example of steep Creek banks within zone 2 at road/creek crossing on Finlayson Rd.*



## **Zone 3 (Green)**

The principal land use surrounding the Creek in this zone is cropping. The Creek has been transformed into more of a drainage line than a Creek, it is very much depauperate of native vegetation in most sections, with a few scattered solitary mature Redgums (*E. camaldulensis*).



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# Tatiara Creek Report

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This section of the Creek would benefit from more trees being planted. If planting was to occur fencing would have to be constructed if paddocks are to carry livestock.

## Zone 4 (Purple)

Within Bordertown precinct between North Terrace and South Terrace the Creek line has been transformed into concrete culverts thereby minimising the effects of stream bank erosion at that location. This also removes any possibility of revegetation/restoration efforts in this area.



*Tatiara Creek within township September 2010.*

The Creek continues its flow from South Terrace through to South Avenue through the urbanised residential part of Bordertown. The Creek line has been deepened in sections.

There are several pedestrian bridges and vehicle crossings in this vicinity which require maintenance to control the build-up of sediment and tree debris, especially after high flow events.

Rouse waterhole as its name suggests is a deeper section of the Creek which tends to remain wet/damp for most of the year. It is however at threat of being over-run by escaped garden plants and other weeds which will restrict any native plant recruitment.

This area would benefit from removal of woody and escaped garden plant weeds, maintenance of re-growth and maintenance to remove build-up of organic matter, tree branches/debris and litter.





*Rouse waterhole.*



*Rouse waterhole; example of exotic Wild Ash tree.*

From South Ave. the Creek continues west-south-westerly along the back boundaries of residential and farmland properties through to Pigeon Flat Rd. Both sides of the Creek are fenced along this section.

Routine maintenance is required to keep fencelines at road crossings clear of debris and ensure effectiveness for stock control. Control of perennial grasses such as *Phalaris* which can form dense tussocks restrict the natural flow of water causing unnecessary diversions potentially leading to erosion of areas not usually subject to flowing water.



*Weeds along Creek at road crossing on Clayton Farm Rd.*

Pigeon Flat Rd. to Meatworks Rd the Creek travels along the boundary of Bordertown's effluent storage ponds. The Creek is in average condition with scattered pockets of Blue Gums with no understorey plants.

Anecdotal information obtained through personal conversation suggests that effluent periodically flows/seeps into the Creek during wet years. I cannot confirm this since during site visits the Creek water levels were low and no water chemistry analysis was conducted.

Litter appears to be a problem at the intersection of Meatworks Rd with the Creek (see image below). A further investigation is needed to determine the source of the litter to enable an appropriate recommendation of action.



*General litter polluting the Creek at Meatworks Road.*



## Zone 5 (Polygons)

This zone represents riparian areas in good condition which are already well protected (fenced).

Approximately forty years ago an area of approximately three hectares on Jamie Edwards property was fenced off at the eastern end of Tatiara Creek nearest the border. Natural regeneration of Riverbox (*Eucalyptus largiflorens*), small pockets of Bull mallee (*E. behriana*), and Buloke (*Allocasuarina leuhmannii*) trees have naturally regenerated over various flood events during this time.

Mature fringing Bluegum (*Eucalyptus leucoxlyn*) and Redgum (*E. camaldulensis*) occur along the Creek line in this area. Soils are black/grey cracking clays with evidence of runaway holes appearing.



*Zone 5 example focusing on eastern section of Jamie Edwards property close to SA/Vic border.*



*Runaway hole appearing at eastern end of Jamie Edwards property.*



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# Tatiara Creek Report

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A fenced off reserve (approximately 10 hectares in size) is located on Ted Langley's property where the Creek intersects Pine Hill Rd approximately 200m south of Langley Road. The area comprises transitional soil types and contains a diverse mix of River Box (*E. largiflorens*), SA Bluegum (*E. leucoxlyn*) and a few scattered Broad leaved Box (*Euc. Behriana*).



*Fenced off reserve (approximately 5 hectares) located at Langley/Milne crossroads supports a good healthy community of Black Box (Eucalyptus largiflorens).*

## Tolmer Lake

Tolmer Lake resulted from excavation of soil from the area in the 1980's to facilitate the construction of the Dukes Highway overpass and was completed in 1998. Wayne Dodd suggested that the excavation be planned as a recreation lake area that could be filled with water naturally from the Tatiara Creek, and topped up in dry years by an underground bore located nearby.

In 1991 community members formed a Lake Committee to implement revegetation works, art installations, interpretive signage, a jetty and walking trails surrounding the lake.

Bordertown Primary School children contributed to the tree planting activities together with the Lake committee members.

In wet years Tatiara Creek, via an inlet is allowed to fill the Lake naturally and in dry years is filled up by a bore to maintain water levels.

Vegetation along the Creek line is mainly Redgum (*E. camaldulensis*) and Bluegum (*E. leucoxlyn*) plant associations with some Riverbox (*E. largiflorens*), but less so as Redgums become the dominant species.

The western Lake banks were revegetated with *Acacia salicina* which has become naturalised providing a dense thicket of plants as it has in other areas of the Lake.

# Tatiara Creek Report

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The site is popular for travelling visitors to take a break and is utilised by Bordertown locals as a recreation ground.



*Tolmer Lake*

## **Poocher Swamp**

The Poocher Swamp Reserve covers a total area of 77 hectares. In the late 1950s, a number of levee banks were constructed in the swamp to impound water and attract bird life. The swamp fills from Tatiara Creek. The impoundment of water over many years has caused the inundation of the river red gums (*Eucalyptus camaldulensis*), and consequently many have died but extensive regrowth is occurring at the upper limits of the flood waters and at the entrance of Tatiara Creek in to the swamp.

Understorey vegetation is mostly weed species. These are numerous, particularly in the muddy sections of the reserve. Aquatic species occur in the shallower sections of the reserve and are dominated by Ribbon Weed (*Triglochin procerum*), Red Water-milfoil (*Myriophyllum verrucosum*), Stonewart (*Nitella* sp), Swamp lily (*Ottelia ovalifolia*), Azalia (*Azalia filiculoides*), and several rush species.

Due to the extensively cleared nature of the surrounding land, Poocher Swamp Game Reserve is an isolated island of modified swamp.



*Poocher Swamp, September 2010.*



## Runaway Holes

Runaway holes (or sink holes) are surface cavities through the limestone which provide direct drainage to the unconfined aquifer, while drainage bores are man-made and work in a similar manner. A number of runaway holes are scattered throughout the district, mostly west and north of Bordertown. They usually terminate a flood path, or artificial drain from an adjacent creek or swamp.

In a number of cases land development has altered original flows. Work undertaken by the Cannawigara Water Conservation Region Inc, Tatiara District Council, South East NRM Board and the South Eastern Water Conservation and Drainage Board over the last 30 years has enhanced the area's natural runaway holes by cleaning out sediment and providing stone sills to reduce silting and providing channels and gates to allow recharge without flooding of co-operating landholders.

Runaway holes and drainage bores can provide rapid fresh water recharge to the aquifer at times of excessive rainfall events as well as acting as a flood mitigation mechanism.

Poocher Swamp contains a series of large runaway holes which diverts high volumes of surface water flows underground, but once the Swamp reaches capacity the water overflows to the west to the most western known runaway hole called Scown's Runaway Hole.



Scown's Runaway Hole

## Landholder Support

### Priority Sites and Actions

Zone 1 and Zone 2 sites have been identified as areas that would positively benefit from further investment. These areas have been selected based on the following principles:

- Current condition i.e. native vegetation present *versus* not present;
- Willingness of landholders to double-fence Creek line;
- Extending connectivity from already protected areas;
- Willingness of landholders to undertake revegetation.

Priority sites within these zones are:

- Creek line from fenced off section of Tatiara Creek close to the Victorian border through to Pine Hill Rd (Edwards & Ridgeway properties)
- Forty hectare reserve located on Creek line bordering Langley and Ridgeway properties.
- Creek line from Finlayson Rd through to Senior Rd (Entire zone 2).
- Creek line from Finlayson Rd to Scott Lane.

The remaining sections of zone 1 are omitted from the priority list because of factors including limited landholder support.

**Priority Recommended actions:**

- Double fencing Creek line with a minimum buffer of ten meters;
- Fence off reserve located on Creek line east of Pine Hill Rd on the property boundary of Ridgeway & Langley;



## References

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Foulkes, J. N. and Heard, L. M. B. (Eds.) (2003). A Biological Survey of the South East, South Australia. 1991 and 1997. (Department for Environment and Heritage, South Australia).

### Tatiara Creek Management Zones



**LEGEND**

- zone 1
- zone 2
- zone 3
- zone 4
- zone 5

Map data is compiled from a variety of sources and hence its accuracy is variable.

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