

# Weed Case Study



*By Lucy Sheppard*

Area Studied



The area being studied is located on the banks of the Hunter River on the western side of St Josephs Aberdeen. It is owned by the local council of Upper Hunter and they are responsible for its care.

The area being studied is significant due to its proximity to the Hunter River. It is very important to manage this area as in the case of a flood all the weeds could be carried down stream carrying seeds and infesting many other places along the Hunter River. The area experiences a lot of erosion due to the steepness and lack of grass cover thus causing a weed infestation. The weeds were probably transported to the area during a flood and could germinate with out competition due to lack of ground cover. The area has probably never been used for grazing due to the steepness and lack of ground cover. Because of these factors you could also presume it could not be used for anything else. The best way to protect the area from erosion would be to rehabilitate the area with native trees such as gum trees, which have a deep root base to prevent them from being washed away during a flood. The area has under gone some rehabilitation by St Josephs Land Care group but more must be done to prevent a further infestation of weeds.

In the area being studied contains two noxious weeds, African Boxthorn (*Lycium ferocissimum*) and Tiger Pear (*Opuntia Aurantiaca*). There is also a number of other weeds including Galenia (*Galenia pubescens*), Sticky Beaks (*Erigeron Canadensis*), Fennel/Aniseed weed (*Feonculum Vulgare*), Mexican Poppy (*Argemone Ochroleuca*), Patty's Lucerne (*Sida rhombifolia*), Marshmallow weed (*Malva parvifolia* and *Malva sylvestris*) and Mustard weed (*Brassica rapa spp. Silvestris*).

The weeds identified in this area are significant to the protection of farmlands along the Hunter River as seeds are easily carried down stream investing river backs through out the Hunter Valley. The weeds identified above cause extensive damage to farming land if not controlled effectively. It is important that all the weeds in the identified area are controlled effectively to prevent the future contamination. Although there are a number of weeds in the area, the two noxious weeds are considered the most significant therefore the remainder of the assessment will concentrate on them.

### African Boxthorn (*Lycium ferocissimum*)



African Boxthorn is a noxious weed. It was brought into Australia from South Africa in the 1800's as an oriental plant used for hedges throughout Australia. It has since spread into pasture, neglected areas, roadsides, railways and waterways. It is distribute throughout all states and territories of Australia, New Zealand and South Africa.

### Description

African Boxthorn is a perennial shrub up to 5m in height with a deep and extensive branched root system. The main branches are drooped, widely spreading and carry numerous branchlets, each of which ends in a spine. The main stem has spines to 15cm while the branchlets carry

smaller spines. Branchlets carry much smaller shoots which have clusters of leaves, surrounded at the base by many small, light-brown scales. Initially stems are smooth and light brown but become grey and rough as they mature. Leaves are bright green and rather succulent, 3cm long and 2cm wide, which are rounded at the top and tapered to the base. White to pale mauve flowers about 12mm in diameter hang from short stalks, they occur singly or in pairs in the forks of the leaves. Smooth green berries ripen to a bright orange to red colour and contain numerous light-brown, oval, flatten seeds. The African Boxthorn is drought resistant and in times of moisture stress can shed its leaves, making it look dead. The leaves quickly reappear after rain.

### Why is it a weed?

African Boxthorn has become a noxious weed as the bushes form dense, impenetrable thickets that occupy valuable grazing land and harbour vermin such as rabbits. The berries are a host to fruit fly and other insects. African Boxthorn, being an extremely hardy plant, is often hard to kill. It is declared a Category W2 Noxious plant in most areas, and a Category W3 Noxious weed in Cessnock, Muswellbrook, Murrurundi, Scone and Singleton. In the area being studied it is a category W3 noxious weeds, which means that it is a weed that poses a threat to agriculture, the environment or the community, and has the potential to spread to other areas.



### How it Spreads

African Boxthorn seeds are rapidly spread by birds and animals eating their fruit, and so the bushes are often plentiful under trees. The extensive deep roots can produce new growth from broken pieces, so physical removal of bushes will not give complete control; usually there will be some regrowth from the remaining root pieces. African Boxthorn is a threat to the agriculture industry in Australia as it spreads swiftly between areas and once established is hard to control.

### Control

The best control of African Boxthorn is prevention. Weed infestations should be controlled when infestations are small to prevent large-scale establishment. The best approach is usually to combine different methods. Control may include chemical and mechanical control methods combined with land management practices. The control methods chosen should suit your particular situation.

Mechanical Control: Large stands of boxthorn can be cleared by dozing, stickraking or blade ploughing; however regrowth from seed or remaining roots will occur.

Cultivation and herbicides are effective in dealing with seedlings and regrowth.

Physically removing the plant can be beneficial, as dead boxthorn will still provide a haven for rabbits and occupy valuable pasture areas.

Herbicide Control: there are many herbicides on the market designed to control African Boxthorn. It is vital that the correct one is selected depending on the time of the year and your climate. All herbicides must be used in accordance to specified rates. It is vital to only use registered herbicides. For a full list of chemicals see below.

Biological Control: there is no biological control for African Boxthorn.

There are many strategies that could be used to manage African Boxthorn, but though my research I believe the best control method for cost effective, minimal time use and effectiveness in the long term would be “Integrated Weed Management” which means you use a range of management practices at the same time. Due to the size of the boxthorn mechanical control should be used. Firstly the top growth should be pulled out or dozed; this will enable greater access to the root system. Now that the top growth is removed spray all exposed surfaces with an herbicide to prevent regrowth from pieces of broken root or the remaining stump. It is vital to maintain the newly cleared area thus being a good time to revegetate, as plants will not have the competition of the boxthorn. It is vital that the area now be accessed on a regular base to check for any regrowth from the remaining root system, as it is much easier to control a seedling rather than an established plant.

The strategy as stated above would have many benefits to the studied area as it has removed an unsightly weed, which could have a devastating effect on surrounding properties if left uncontrolled. The strategy is designed to be long lasting and easy to manage after the initial control is initiated, the area could easily be managed. There is the possibility of regrowth that may occur from the remaining root system but with continued management it could be easily controlled. There is many advantages with the management strategy as the plant is removed rather than being killed and left in the area as it can no longer harbour vermin such as rabbits so the strategy has thus prevent an infestation of vermin. The area can now be easily revegetated with native grasses and trees, if this is done the area could be used as a area to view the surrounding country, students at St Joseph’s could use it to sketch landscapes in art or as a picnic area for the locals and tourist as you have a beautiful view of the river a surrounding properties. The management strategy has many merits that will allow the area to be enjoyed and it is no longer a threat of the weeds spreading and it can now be easily managed.



### Tiger Pear (*Opuntia aurantiaca*)

Tiger Pear is a noxious weed. It is native to Uruguay, South America and is believed to have been introduced into Australia as an ornamental garden plant during the 1800’s. Tiger Pear is the worst variety of Prickly Pear brought into Australia, and the most difficult to control.

#### Description

Tiger Pear is from the cactaceae family, it is low-growing greyish-green, with narrow segments densely covered with dirty white or pale brown covered with three to seven spines in each cluster the largest being about 3cm (1½ inches) long. It grows to about 50cm but rarely to over 100cm high. Segments are partly flattened to round, mostly to 20 cm long (but may be longer in shaded areas) and up to 4 cm wide, forming irregular stems to 1.5 m long. Tiger Pear flowers in late spring and summer; flowers are yellow and are 3-4cm in diameter. Fruit are ovoid with a depressed top, 2.5–3.5 cm long, red to purple when



ripe. Tiger Pear is extremely hardy, thriving in a range of habitats.

### Why is it a weed?

Tiger Pear has become a noxious weed as it has over taken pasture areas, in pasture areas it can become a major problem for animals, the sharp spines penetrating the soft inner and outer mouth making feeding painful. The spines each have 'barbs' which cling to skin, hides, wool, tyres and almost anything. They cause painful injuries to animals or humans that come into contact with the plant. Tiger Pear is very difficult to control and is category W4 noxious weed that means it cannot be sold knowingly distributed or propagated. Established plants must be prevented from flowering or fruiting, must be prevented from spreading to adjoining properties and occupier must implement biological control or other program as directed by the Local Control Authority.



### How it Spreads

Tiger Pear does not seed freely, but spiny segments break off readily and the small segments may be blown off the plants by the wind or water or become attached to animals and to a less extent on tyres. These small-detached pieces fall among the grass and root where they contact the ground. Being a low growing species they are seldom seen until the young plants become firmly established.



### Control

Mechanical Control: Large stands of boxthorn can be cleared by dozing, stickraking or blade ploughing; however regrowth from seed or remaining roots will occur. Cultivation and herbicides are effective in dealing with seedlings and regrowth.

Herbicide Control: there are many herbicide sprays on the market to effectively control Tiger Pear there are a variety that can be used through out different times of the year.

Biological Control: Cochineal insects are used to attack particular types of prickly pear.

There are many strategies that could be used to manage Tiger Pear, but through my research I have found that different control methods must be used depending on the season, by adjusting your strategy to suit the season your management strategy will be the most effective thus making it cost effective and a long term solution. During the warmer months (October through till May) are the best control is the use of biological control such as cactoblastis or cochineal insects. Due to the size of the infestation and it's proximity to the Hunter River I believe cochineal insects will be better suited as they do not cause segments to break up as Cactoblastis insects do. Although cochineal insects are not as fast or as hungry as cactoblastis may sometimes appear to be, but they are much more reliable and effective. For the cochineal to become established in the Tiger Pear there must be distributed within an infestation. It is important that you select the right cochineal insect as only *Dactylopius Austrinus* work on tiger pear. Once you have selected the correct insect in is as easy as distributing it into the infested area, this will ensure establishment. As cochineals are only active during the summer months to ensure that the



strategy you are using is viable you should choose a different control method during the cooler months.

In the cooler months the most effective control is the use of herbicides. By law you can only use registered herbicides; the most effective herbicide to use is Garlon 600. There is an easy strategy to follow to ensure that the herbicide works to its potential. When spraying you firstly select a registered herbicide and mix at specified rates to achieve maximum results. When spraying you simply spray all of the visible plant as well as  $\frac{1}{2}$  a meter out from the plant to ensure you are spraying the entire tiger pear including any small segments that may not be visible.

The strategies stated above will have many benefits to the studied area, they will enable the area to be managed will ensure that the tiger pear does not spread into surrounding properties. The two strategies above allow the appropriate management strategy to be used depending on when they will provide the most effective control. The two strategies were chosen as they allow for easy management prior to the initial application; the two strategies only need one application, which makes them very effective in the long run as no further applications should be needed. Once the weed has been eradicated it will allow the area to be revegetated without the competition from other weeds, the area can now be used to its full potential.



The studied area must be managed effectively to prevent the infestations from spreading into other properties. It is vital that the local council become aware of the weeds in the area, as it is their responsibility as the landowner to control the weeds and prevent them from spreading. The first step in improving the studied area to allow it to be used effectively is to identify all the weeds so you can develop appropriate management strategies to ensure they are the most viable for the present and long term. Australia has a major issue with weeds over taking land making them unsuitable for grazing or crop production, which is why it is important to be able to correctly identify weeds so they can be controlled effectively.

## Glossary

Weed: A weed is a plant that has the potential to degrade land and biological diversity, thus having a detrimental effect on economic, conservation or social values.

Noxious: 1-declared under legislation and a problem to natural areas, primary production, and the environment or affecting human health. 2-any plant which is deemed harmful, damaging or causes a loss in production or intrinsic values may be declared noxious. Its control will be determined by relevant legislation

WONS: Weeds of National Significance

Indigenous: evolved in a location/ region or migrated by long distance dispersal before European settlement in Australia

Fruit: formed from the ovary wall or other floral parts of the flower; it encloses the seed.

Seed: the result of the male and female gametes fusing, the start of a new plant.

Native Trees: trees that are indigenous to Australia

Soil Erosion: the transporting of soil particles by wind, water or gravity

Biological Control: the use of the plant's natural enemies such as insects, mites and disease to control weed populations.

Herbicide Control: is a chemical, which is biologically active and is used to kill or control the growth or emergence of specific plants and weeds.

Degradation of Soil: physical damage or reduction in the soils productive capacity due to the processes such as erosion or weeds.

Residual herbicide: herbicide, which is soil acting and controls germinating weeds over an extended period

Rejuvenation of pastures: Renovation of 'run-down' pastures by undertaking weed control, reseeding, fertilising or other practice to improve productivity

Selective herbicide: a herbicide which controls a specific group of plants but is inactive against others, i.e. Grass herbicides.

Runoff: Rainfall in excess of the infiltration rate, which is lost as surface flow

Pesticide: term used for any chemical used for the control of weeds, insects or disease in crops and pastures.

Non-selective herbicide: An herbicide, which is non-specific and controls most vegetation to which it is applied. Glyphosate is an example of a non-selective herbicide.

## *Bibliography*

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### Internet

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[www.weeds.org.au](http://www.weeds.org.au) - National site for weeds of national significance  
[www.agric.nsw.gov.au](http://www.agric.nsw.gov.au) - NSW Agriculture site  
[www.weedmanager.net](http://www.weedmanager.net) - Photographs of weeds  
[www.sainty.com.au](http://www.sainty.com.au) - For books and other wetland information  
[www.hccrems.com.au](http://www.hccrems.com.au) - Hunter and Central Coast Regional Environmental

### CD

Bunn, Ken 2004, *Weeds of the Hunter and Central Coast*, Hunter Central Coast Weed Management Committee.

Chemical Control Options for the Control of Tiger Pear

Chemical	Rate	Comments
Trilogy Garlon 600	3.0L in 100L water or 1.0L in 75L distillate	Apply as though a foliar spray
Trilogy + Picloram Access	1.0L in 60L diesel	Folia application, thoroughly wet plant

### Chemical Options for the Control of African Boxthorn

Chemical options	Rate: Spot/Boom	Comments
<b>Triclopyr +Picloram</b> Grazon DS®	500 ml in 100 L of water	Apply when bushes have good leaf cover, growth and <b>no leaf fall</b>
<b>Triclopyr + Picloram</b> Access ®	1.0 L in 60 L of diesel	Apply as basal bark/cut stump application
<b>Picloram +2,4 -D</b> Tordon 75D ®	1.3 L in 100 L of water	Small bushes only. Spray soil to drip line. Thorough coverage is essential
<b>Glyphosate 360 g/L</b> Various trade names	700 ml to 1.0 L in 100 L of water	Low rate on young bushes, high rate on mature bushes.
<b>Glyphosate - trimesium</b> Touchdown®	1.0 L in 100 L of water	Actively growing bushes. Spray thoroughly
<b>Triclopyr</b> Garlon 600â	1.0L in 30L of diesel	Cut stump /basal bark application
<b>Tebuthiuron</b> Graslan®	2 g per square metre	Estimate the area within 30 cm beyond the drip line of the target plant - calculate the amount of Graslan required to cover the area and distribute evenly in this area. <b>Do not use within 30 m of desirable trees.</b>
<b>Hexazinone</b> Velpar L®	4 ml per spot	Bushes up to 3m tall. 1 spot per metre of height. <b>Do not apply near desirable trees.</b>