

Scotch and Illyrian Thistle Weed Management Plan



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PART A- Introduction to area studied

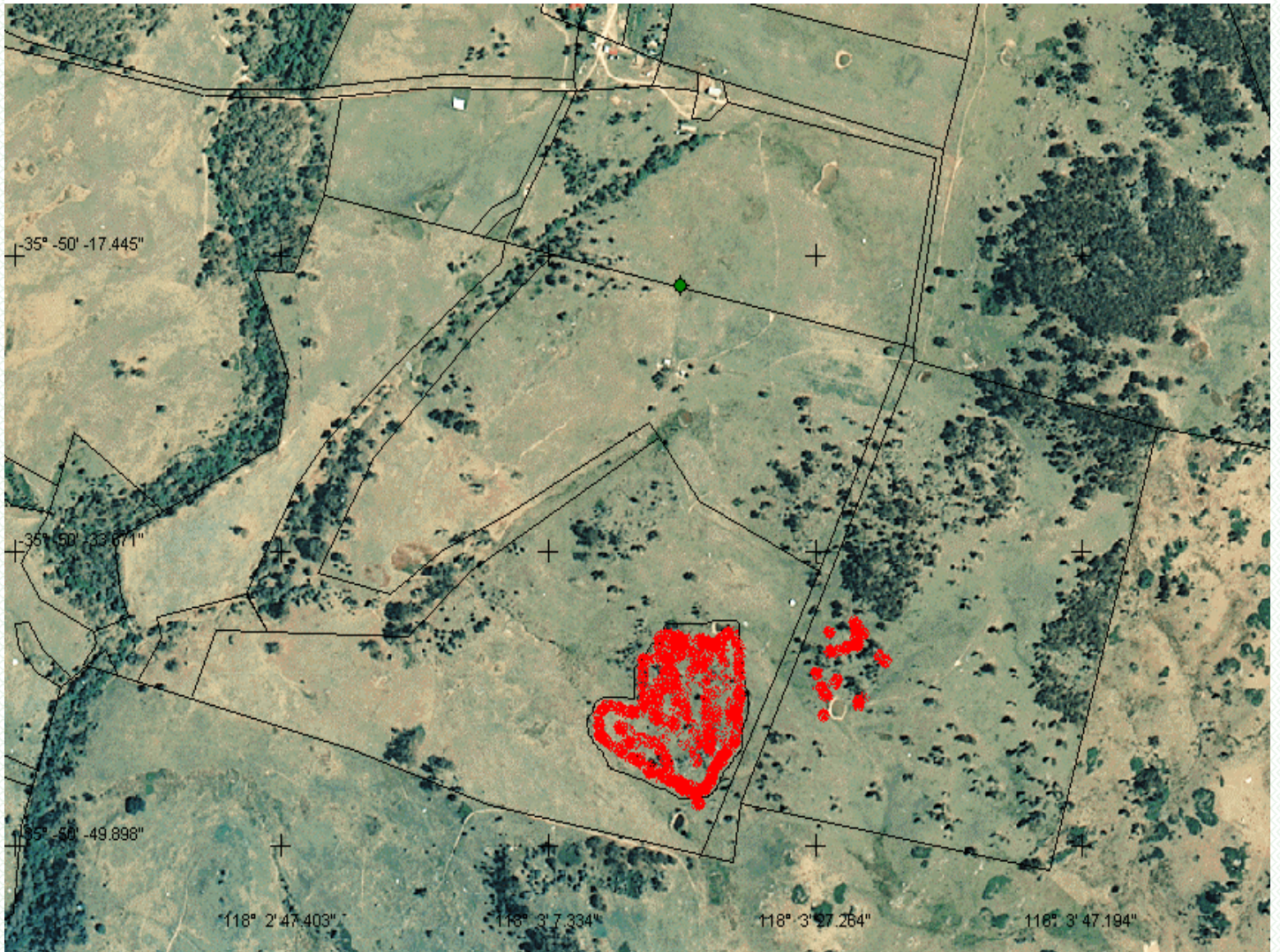
The Weeds that need to be eradicated are present at 'Camoo', 868 Burra Rd, Tumbarumba. Tumbarumba is located on the south western slopes of the Snowy Mountains, 504km south west of Sydney and 701 metres above sea level. 'Camoo' is my family's property that is intended primarily as a productive sheep and cattle enterprise that incorporates integral management programs in order to be as productive as possible. My chosen area is one of the few remaining weed infested paddocks, and due to its huge potential for high productivity, is in desperate need of some TLC. I love this part of our property. It is one of the highest points of the farm and when I was younger before the drought I would ride my horse up there at dusk and watch the sun set. Unfortunately, I am visiting this area less these days; on account of the huge blood drawing spurs that become lodged in my horses legs.

This paddock is infested by **Scotch Thistles** and **Ilyrian Thistles**. It is situated 1500 metres from the central part of the property. It is considered one of the most fertile paddocks on the farm. The thistles are situated in the corner of the paddock, on top of the hill in a pre-drought livestock camp. Other weeds such as sub clover, barley grass and cape weed are also present. The paddock is well drained with granite based duplex soil throughout the entire paddock. This soil is very fertile and rich in nitrogen due to previous dense manure dispersal on the livestock camp. In the summer, this area becomes very dry and again, like during the drought, it becomes bare and more thistle seeds are dispersed and planted. The thistles infest around 6 ha of the entire paddock of 33 ha. 15% of this 6 ha, thistles have smothered out the grass.

Currently the paddock is being grazed by 80 weaner heifers, which are being fattened up before the onset of the cold Tumbarumba winter. This area is also home to many native fauna that live in surrounding fallen trees, rocks and dams.

If this 6 ha of thistles were removed, the land would become a lot more productive. The paddock would become as useful as it is fertile, and room would be created for new pastures to be sown.

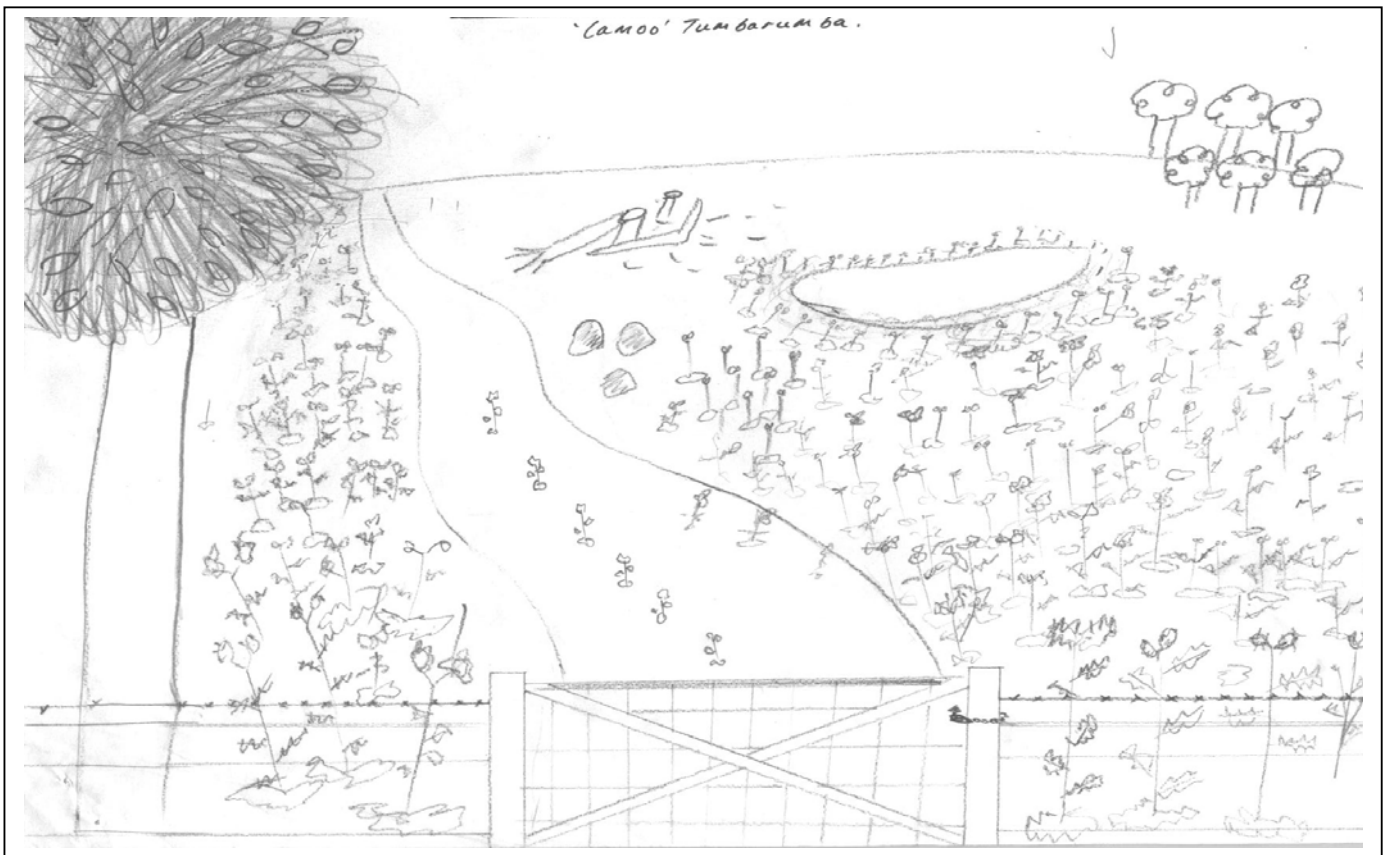
Aerial Map of 'Camoo'



Area affected by Scotch and Illyrian Thistles

SCALE: 1 : 10000

Sketch of Thistle Infested Area





Central part of property

Livestock

Thistle Infested Area

Fallen Trees/
Rubble

Sub clover,
barley grass,
Cape weed.



Paddock seriously affected by the thistles



This thistle has entered its winter 'chill' period, consequently looking

PART B- Weed Identification

Scotch Thistle

Common names: Scotch Thistle, Cotton Thistle

Scientific name: *Onopordum acanthium*

Family: Asteraceae.

Form: Herb

Origin: Europe, western and central Asia and Asia Minor.

Scotch Thistle is a noxious weed (harmful to living things and not native to area). The plant germinates, flowers, seeds, and dies - this process is biennial. The scotch thistles in my area currently have been through this process and died.

Appearance: In the first year before dying, Scotch Thistles form a circular usually basal clump of leaves and in the second year a seed stalk is produced. The leaves that grow off this stalk are large (around 60 cm long and 30 cm wide) and strongly armed with spines. The blades form conspicuous fringelike extensions down the side of the stem. The entire plant is finely hairy to wooly, giving it a silvery gray colour. Flower heads are borne in midsummer in groups of 2 or 3 on branch tips. The flowers are borne tightly together and are globe shaped, upright, intensely spiny, and up to 6 cm in diameter. Flowers are purple. Seeds are slender, smooth, and plumed. The Thistles root system consists of a stout taproot.



Due to the Scotch thistles being at the end of their 2-year life cycle, they are currently dead and brown.



This is the Scotch Thistles rosette. It has formed, as the component of the new plant life cycle.

Illyrian Thistle

Common name: Illyrian Thistle

Scientific name: *Onopordum illyricum*

Family: Asteraceae

Form: Herb

Origin: Europe, western and central Asia and Asia Minor.

Illyrian thistle is particularly common on the highly fertile soils associated with pasture improvement. It is a noxious weed, and has the same reproductive cycle as Scotch Thistle.

It has a whitish-grey, woolly appearance. Its main distinguishing feature is the configuration of the flower head. The flowers are purple and protrude slightly from the head. The bracts surrounding the flower are much broader than 3 mm at the base, are reddish-purple in colour and are all reflexed.

The rosette leaves are more deeply lobed and the plant (over 2 metres high) looks skeletal and angular.



The Rosette of an Illyrian Thistle



This picture was taken at the reproductive stage of the Illyrian Thistle's life cycle, before it died and the seeds were dispersed.

Scotch or Illyrian?

Scotch Thistles and Illyrian Thistles are very similar and before I did my research I found it very hard to distinguish the two. I have learnt that there is a large variation within each species due to crossbreeding between Scotch and Illyrian thistles. They are considered the same in terms of impact and control methods.



Illyrian thistle has an angular and skeletal form.



Illyrian thistle seed head flowering. The broad backward bending spiny bracts are characteristic.



Scotch thistle has a whitish-grey woolly appearance and less angular appearance than Illyrian thistle.



Scotch thistle seed head. The bracts are slender and only the lower ones backward bending.

PART C- Problems and Significance

The problems of Scotch and Illyian Thistle at 'Camoo' run considerably deeper than my personal frustration.

These weeds are declared as noxious weeds in half of the local government areas in NSW. This means that 50% of local councils in NSW (including Tumbarumba's) consider Scotch and Illyrian thistles a harmful and unnecessary plant, and urge farmers to remove them. It is of great State Government concern that the plants have recently appeared in denser infestations on the Central-Western Slopes, North-Western Slopes and Northern Tablelands. The extent to which this plant can affect the average land manager's environmental and economic resources is huge.

Scotch and Illyrian Thistles have been a problem at 'Camoo' for decades. In 1988, 20% of the property was covered with the species and since then my family has spent a lot of time, effort and finances on control methods.

Scotch and Illyian Thistles compete with the pastures of this paddock, growing in dense thickets. Since the Thistle covers 18% of the entire paddock, almost one fifth of potential pasture production is eliminated. Currently there are 80 heifers in the paddock, but if the Thistle was eradicated there would be enough room for 99 heifers of equivalent condition.

The Thistles do not only impact on the paddocks productivity. Animal welfare is an issue. Severe injury is inflicted unnecessarily on the livestock as they have to move through the infested



These sharp spines are damaging to stock

area to reach the dam. Scotch Thistle's broad spiny wings have not allowed the area to continue as a livestock camp, made one dam virtually inaccessible and made mustering an onerous duty. Spines can also cause mechanical damage, particularly around the mouths and eyes of animals. The thistles are rejected as food by stock due to their sharp spines.

Other plants in the paddock are smothered by the thistle. Growing highly productive pastures such as phalaris is virtually impossible as the thistles survive well into summer, and afterwards there is no chance of the phalaris recovering.

The seeds disperse by being spread into the wind and attaching to objects such as animals, farm machinery, contaminated hay, silage, grain, or being blown into nearby water ways. The Thistle's ability to establish amongst existing vegetation is very high due to its intrinsic biological features, and therefore the need for eradication is even higher due to the risk of the infestation increasing.

Birds are known to eat the thistles seed - a potential food source to pest birds. The seeds also contribute to vegetable fault in wool. This is another major impact on quality of produce.

There are absolutely no sensible advantages of Scotch and Illyian Thistle in this paddock.

PART D- My Management Strategy

I have decided to use an 'Integrated Weed Management' (IWM) program in order to eradicate all present Scotch and Illyrian Thistles. An IWM is vital for this situation due the thistles reluctance to be eradicated because of:

- Their biennial growth habit meaning there is always a wide and mixed age population.
- Their long seed life-span meaning seed can remain viable in soil for up to more than eight years.
- Impeding dense patches that demand more than one management tool.

Short Term Plan: 1-3 Years

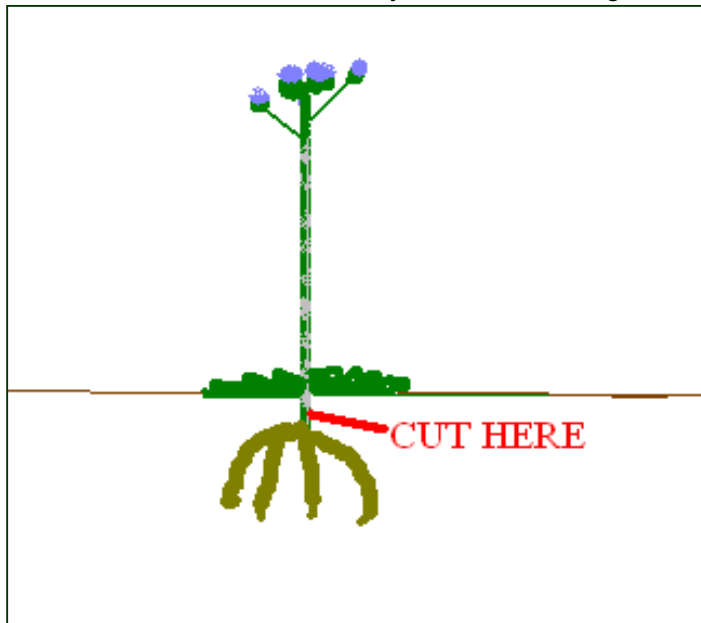
1. **Chemical-** Visit local Hardware store and purchase appropriate amounts of herbicides. I will use an herbicide called Clopyralid, a chemical that is effective in killing seedlings and young rosettes. The most effective time for application is from January to February since this is when the majority of rosettes are in their early and most vulnerable stage.

Rate of Application:

1. Spray the rosettes in the spring or autumn, autumn is mostly recommended.
2. Spray all live plants that escaped the spring application the next summer or autumn, when they are seedlings.

Contact the Regional Chemical Standards Officer of the Department of Natural Resources and Environment to ensure Clopyralid is safe for my area. I will also *read the product label and follow all label instructions carefully before using the herbicide.*

2. Mechanical- Remove any thistles standing alone away from main cluster by cutting



approximately 12cm below the soil surface.

3. Biological- Lease/buy 10 goats (depending on which is cheapest). Goats will completely remove flower heads, stunting seed dispersal.

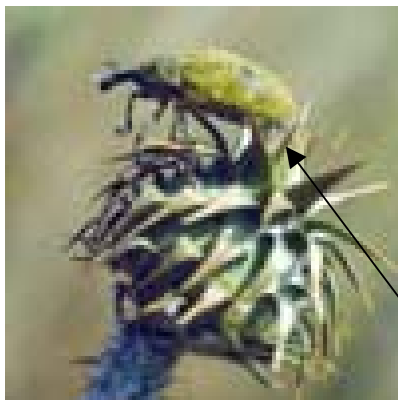
4. Fence off the infested area to reduce stock from entering causing seed dispersal and physical trampling of seed into

the ground. Fencing off immediately is useful as then I will be able to track exactly the areas in which the thistles die and spread.

Long Term Plan: 3 + Years

1. Chemical- Retreatment might be necessary for four to six years. Depending on effectiveness of short term combination, I will be able to determine how much Clopyralid I will need to use and/or whether I need to change chemicals. As the weeds develop resistance to particular herbicides over time, I may have to start using a different brand. Products to keep in mind for long-term action include those that contain Dicamba, MCPA, Picloram or 2,4-D. *I will always read the chemical's label carefully.*

2. Biological- I will use an insect called the seed-head weevil (*Larinus latus*) to control the thistles. Weevils feed on the thistles leaves and stem in order to eventually kill the plant. Once I have ensured that the weevils have established a secure working environment, I will ensure that they are healthy, reproduction levels are up to standard and that population numbers are under control.



The seed-head weevil (*Larinus latus*) image courtesy of CSIRO

3. **Mechanical-** if necessary I will slash prior to flowering. This will prevent the seeds from maturing and finally dispersing. If flowers begin to grow then I will mow to reduce seed production.

Annual IWM Timetable

	<i>Jan</i>	<i>Feb</i>	<i>March</i>	<i>April</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>Aug</i>	<i>Sept</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>
Active Growth			-	-	-	-	-	-	-	-		
Biological						-	-	-				
Mechanical			-	-	-	-	-	-	-	-		
Chemical				-	-	-			-	-		

*This is only an outline and I will need to take all progressive factors of the paddock into account.

Prevention- part of every effective IWM

When all the thistles have finally died, reestablishing competitive perennial grasses and monitoring infested areas on a yearly basis will be critical. Native grasses will probably establish over time, but it is also very important that I sow a pasture such as sub clover to ensure thistle does not over take again.

When I am confident that all of the Scotch and Illyrian Thistle has been eradicated I will prevent as much overgrazing and soil disturbance as possible. This is because seeds can remain dormant in the soil for up to 20 years and tend to germinate when exposed to light. Over grazing and soil disturbance is a path for the suns light entrance.

PART E- Merits of weed strategy

My strategy will improve this area by eradicating all present weeds and therefore improving 6 ha of fertile, productive soil. The primary use of this area will be the same as the rest of the paddock - agricultural production. Once new perennial grasses have been established the land will appear as if it had never been affected by Scotch and Illyrian Thistles.

It will be easy to continue this management process once it has been initiated because of the simple process (long term / short term) that it incorporates.

By using my 'Integrated Weed Management plan' I have ensured that the thistles have a minimum chance of growing back. Chemical control is a short term though very effective method of weed management and supported by the biological and mechanical control I am guaranteed to have very high success rate. It is true that if I used biological, mechanical or chemical treatment alone the thistles would not be eradicated.

Clopyralid is acclaimed to be highly effective for killing noxious weeds.

Slashing the thistles means that their height will be uniform. Consequently, when I apply the herbicide it will penetrate more deeply and evenly, increasing thistle death rate.

Seed-head weevils have another advantage in that they can be relocated. Seed-head weevils are currently widespread and together have reduced seed rain at several sites in NSW by more than 90%. This state-of-the-art biological technology is enhanced as it is a renewable source of control. As the insects die, new eggs are hatching and this eliminates continual cost of buying new ones.

It is highly likely that I could receive a grant from the CSIRO for my seed-head weevils. CSIRO are continually striving to research and test this weevil's effectiveness. They are open to farmers (like me) testing their product with a reduced price.

I am looking forward to being able to gallop through this paddock on my horse and not have to worry about thistles anymore.

Photo Gallery



This is the base of a Scotch Thistles taproot. It had been removed mechanically, by being cut beneath ground level.

This image is intended to give you an idea of how big the seed head weevils are.



This Scotch Thistles stem has been attacked by a seed weevil.

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