Lord of the Weeds Competition

1. Identify Area with Weed Problem

The area I have chosen to develop a weed eradication strategy for is the Ecology area at Killara High School. This area has a great infestation of weeds, but I hope that it can be restored to its former natural state. The area was once used as an outdoor learning center, with both practical biology and geography lessons being held within its vicinity. As well as this it was a small but valuable area of native vegetation. Unfortunately, the area is currently unused and receives little attention. When it is restored it will be of more use to both the school community and the wider community as a whole.

2. Research Problems and Management Strategies Appropriate for the Identified Weeds

Name	Description	Why it is a problem	Possible methods of removal
Tradescantia albiflora, Wandering Jew	Perennial weed. Leaves are mid-green, semi-glossy and ovate (3-6cm long and 1-3cm wide). Flowers are small and white, with three petals (8mm long).	Forms a thick mat that smothers other plants and deprives them of light.	Wandering Jew is a fairly easy plant to physically remove. It has weak roots and stems that are easy to remove from the soil. Be careful to remove entire plant and then place all material into a plastic bag before putting it into the bin. Afterwards mulch thickly and establish a competitive plant (Brachycombe) if necessary.
Protasparagus aethiopics, Asparagus fern, sprengeris fern	Leaves and foliage are bright green. Leaves are a needle like shape (8-20mm long, 1-2mm wide) and grow on long arching canes. Its flowers are white or pail pink and bell shaped (3-5mm) long. Its fruit is a red globular berry (5mm in diameter).	Asparagus fern is dangerous to other plants because of its spreading and choking ability. Also the spines hidden within the foliage are hazards. It is often found in gardens, bushland, at roadsides, and in neglected wasteland areas.	Berries should be removed and placed in a seeled plastic bag before being disposed of. Then the foliage should be removed. Pulling and using a small spade to loosen the roots should achieve this.
Lantana Camara, Lantana	Large rambling shrub that can grow 4m in height. Leaves are rough and odorous when crushed (3-10cm long, 2-3 cm wide). Flowers are pink or orange (5-8cm diameter). Fruit are a glossy berry, which is green maturing to black (5-8mm diameter).	It is considered a worldwide weed. It spreads very rapidly and competes with other native plants. It is also considered poisonous to live stock.	Firstly cut the long canes from the main plant and burn them. The removed material must be destroyed otherwise lateral roots will form and this increases the spread of Lantana. Afterwards establish a competitive planting to discourage growth before the whole plant is removed. Then cut the remaining stems of the Lantana close to the ground and apply a paste of Glyposate to the freshly cut wound. Another alternative is Biological control. The insect Hypena juddatis feeds on the leaves of Lantana. This insect can be combined with the moth, Crocidosem lantana, which destroys the seeds of the plant.
Ligustrum Sinense, Small-leaved privet or chinese privet	A shrub to small tree with a multiple trunk (2-4m high). Leaves are dark green on top but	Small-leaved privet has a great spreading capability and can cause allergic reactions.	Hand pulling is effective for seedlings. However when dealing with shrubs or trees ring barking using a hammer and chisel is more affective. Another technique is cutting and painting with a woody weed and

	light green underneath (1-3cm wide, 3-7cm long). Flowers are white. Fruit is a small black berry (4mm diameter).	Infestations frequently occur along creek margins, watercourses, roadsides, and nature reserves.	tree killer. Whichever method is used you will have to keep watch and remove all regrowth.
Bidens Pilosa Also known as farmers friends or cobbler's peg	This annual plant grows upto about 1.5-2meters tall. Leaves are bright green, slightly hairy, and tapered ovals with segregated margins. They are attached to brow stems. Its seeds are dark brown or black, skinny and have barbed ends. These barbs attach themselves to material or fur.	Farmer's friend can spread very quickly effectively, using its barbed seeds. It is often found in crops and in livestock grazing areas. This can have detrimental consequences if seeds become caught up in the fleece of sheep.	Plant can be removed by physically cutting the root from stem with sharp knife. Also Glyphosate can be effective. Care should be taken when disposing of seed heads.
Cotoneaster	Cotoneaster is a large shrub or tree that can grow to be 4m in height. It has bright orange and red berries. Its leaves are deep green, veined and oval shaped.	Cotoneaster spreads quickly and over large distances because its fruit is attractive to birds that spread its seeds in their droppings. Consequentially it competes with native plants for light, space, and nutrients.	Complete removal of the tree is the only successful type of physical removal. As cutting the tree back will simply encourage it to re-shoot. In cases where this is not possible a woody weed killer may be effective.
Cortaderia jubata Pampas grass	This tussock forming grass can grow up to a height of 4m. Its grass like leaves can grow up to two meters in length. Leaves are normally dark green and narrow, 20-3cm. The hollow stems are attached to the plumed flowers, which are Pink in colour but fade beige.	Pampas grass spreads vigorously and can grow in a variety of conditions. It competes with native plants. Grows in gardens, wastelands, bushlands and roadside areas	If present, seed heads should be removed first, then cut off the foliage. Lastly, remove crown by slicing or sawing through beneath the foliage. Glyphosate can also be used to control Pampas grass.

3. Management Strategy

Equipment Needed:

- A willing work force
- Spades and shovels
- Secateurs
- Native thick mulch
- Bush saw
- Spray can or bottle
- Chisel
- Recycled heavy-duty plastic
- Thick gardening gloves
- Sharp knife
- Axe
- Crowbar

Procedure:

1. Positively identify all of the offending weeds. Research all removal possibilities and decide on the most effective. (Obviously this has already been done.)
2. Physically remove all Wandering Jew. This should be possible by hand, but a shovel may be needed. You must be careful to remove the entire plant otherwise it will quickly regenerate. The extracted weed must be completely removed from the ecology area and wrapped in heavy-duty plastic before it is placed in the rubbish. It can re-root it's self after initial removal. Afterwards spread thick native mulch over the area and plant a competitive plant (perhaps Brachycombe).
3. The Asparagus fern infestations are isolated so hand pulling will be effective. (A small spade may be useful.) Again the entire root system must be removed. If in flower or fruiting, remove all flowers or fruit before pulling out the plant. All of the plants, flowers, and fruit must be removed from the ecology area, to prevent re-generation.
4. Next, remove the Lantana. Firstly cut off any long canes from the main body. These canes must then be burnt. If they are not completely destroyed lateral roots will form and increase the spread of Lantana. Next we will introduce our biological control. The insect Hypena juddatis and moth, Crocidosem lantana. Together they will stop the Lantanas reproduction and hinder its growth. Lastly a native competitive plant needs to be established to smother the Lantana.
5. There are mainly small infestations of small-leaved privet. The larger of these plants are to be ring barked, with a hammer and chisel. Later, when they are weaker they will be easy to pull out. The smaller plants need to be hand pulled, making sure that all roots are removed. Again all plants must be carefully removed from the ecology area and properly disposed of.
6. Bidens Pilosa, has a large infestation in the ecology area. The plant will be removed by cutting the stems from the root system with a sharp knife. The stems and seed heads should be wrapped in plastic and then disposed of. Afterwards a thick layer of native mulch needs to be spread over the area and a competitive plant introduced. Further physical weeding will be needed.
7. Next we will tackle the Cotoneaster. These plants must be completely removed. Necessary tools are an axe, crowbar, and sharp shovels. When removing plants be careful not to leave the roots or fruit in the ecology area. Afterwards thick native mulch needs to be spread throughout the area and a competitive plant established.
8. Lastly the pampas grass is to be destroyed. If in seed, the seed head must firstly be carefully removed, bagged, and disposed of. Then remove all foliage either with secateurs or by hand. Lastly, remove the crown by slicing or sawing through beneath where the foliage used to be.
9. Monthly weeding and mulching will be needed to stop the weeds from regenerating.
10. Plant a variety of local native seedlings to help regenerate the area.

4. Analysis of procedure

- The fist step is to logically and correctly identifying the offending weeds of the area. This is the most crucial step in ensuring that the procedure will work effectively. It is imperative that the weeds are positively identified as the entire procedure aims towards removing particular individual weed species. If the weed/s are not correctly identified then the chosen method of eradication will not be as effective.
- I decided to remove the wandering Jew by physical means. Wandering Jew is easily removed as it has weak roots and stems that are easily removed from the soil; especially when in drought conditions that we are currently experiencing.
- I chose to pull out the asparagus fern by hand as all of its infestations are isolated. If enough care is taken to remove the entire plant this method is more successful then a herbicide treatment.
- The Biological control chosen to suppress the infestation of lantana has much merit. This method has the least intrusion and impact on the surrounding environment.
- The simple method of ringbarking, as prescribed for the small-leaved privet is an extremely successful method that does not require much manual labour.
- The chosen method of eradicating the Bidens Pilos, cutting the stem from the roots with a sharp knife, is effective and much less labour intensive than digging out their entire intricate root system. It has been noted that this method will require further weeding, but with the help of thick mulch this will be kept to a minimum.
- The entire removal of the Cortaderia plants will be an enormous feat. But it is one that is necessary if the weed is to be eradicated.
- The removal process of the Pampas Grass is an effective one that will fulfil its goal. Importantly the seed head is removed to ensure that it cannot reseed.
- The use of a native competitive plant is a very successful and environmentally friendly way to smother the targeted weed.
- Covering the treated areas with mulch traps much needed moisture and slows or stops regrowth of the eradicated weeds.
- Lastly, monthly follow-up weeding sessions are essential in keeping the Ecology area weed free.

5. Merits of the Procedure

I belive my strategy is ideal for the eradication of weeds the in Ecology area at Killara High School. It identifies and implements the best method of removal for individual weeds while addressing and adhering to the wellbeing of the whole ecology area and its surrounding environment.

A particularly outstanding merit of my procedure is that no chemicals or herbicides are used. Often chemical solutions are the quickest and easiest to undertake. However, I believe that there is no quick solution to a large problem, such as the infestation of the Ecology area. Cutting corners, by using the chemical solutions would only result in larger self-inflicted problems in the foreseeable future. It would result in the degradation of soil and as a result make it more difficult for other native plants to grow. It would produce pollutants that would infect our waterways and environments. Chemicals could possibly poison other innocent native flora and/or fauna. In boycotting the chemical solution I have greatly benefited the surrounding environment. Instead of chemicals I have turned to other methods such as physical labour, mulching and biological control.

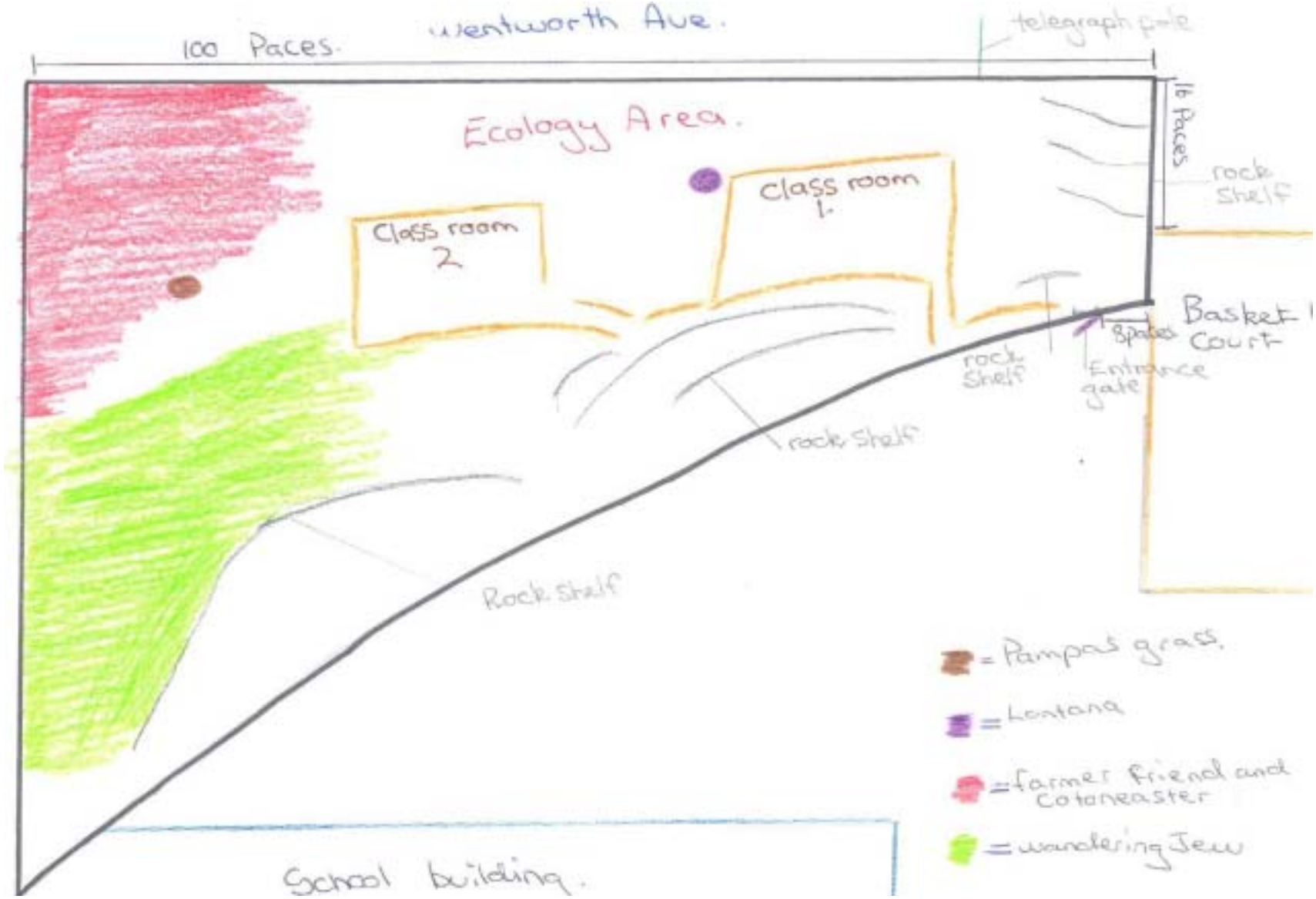
After the eradication of weeds the appearance of the Ecology area will improve dramatically. With the planting of local native seedlings the once unsightly area will evolve into a beautiful bush sanctuary. Also the practicality of the area will be greatly enhanced. The now overgrown classroom areas will be able to function again. The ecology area will become an educational opportunity.

The native biodiversity of the area will dramatically increase. The abolished weeds will make way for new native species of vegetation. Hopefully this increase in native flora will encourage increased native fauna.

I have acknowledged that my procedure will require a lot of initial manual labour and afterwards an amount of maintenance. In acknowledging this it should also be noted that if done regularly the follow-up maintenance would be very minimal.

My procedure is an integrated one that uses many different techniques to ensure that it is effective. My procedure is environmentally friendly and will encourage native flora and fauna to flourish.

The Killara Ecology Area and Major Infestations



Photos of Weeds in the Killara High Ecology Area

Cotoneaster

Ligstrum Sinense, Small Leaved Privet

Bidens Piloa Farmers Friend

Protasparagus aethiopics, Asparagaus fern

Lantana Carmara, Lantana

Tradescantia Albiflora, Wandering Jew

Cortaderia Jubata, Pampas Grass

Lucy Ellen at the Ecology Area