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Cover picture: Established tall wheat grass in the Beeac area.

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1. INTRODUCTION

1.1 Project Description

Tall wheat grass species (*Thinopyrum ponticum*) has been used for some years in the Corangamite region to improve productivity on secondary saline sites. Dryland salinity is increasingly impacting upon agricultural productivity as well as causing a significant ecological cost to remnant and riparian vegetation. This review will explore the status of tall wheat grass for the use in management of secondary saline discharge sites in the Corangamite region.

Over the last few years there has been increasing concern about the ‘weediness’ properties of Tall wheat grass and in particular the threat to primary salinity sites and Ramsar wetlands. The appropriateness of its use in support of salinity amelioration in the Corangamite region is being questioned, although this deep-rooted perennial can provide a valuable ecological service by reducing salt wash-off and subsequently decrease in salinity levels.

This review will identify the recognised benefits and the risks of using Tall wheat grass, discuss the options and provide recommendations for an appropriate policy on the future use and management of Tall wheat grass in the Corangamite region.

1.2 Project Objectives

The objectives of the review are to:

- Establish the current use and extent of tall wheat grass in the region.
- Identify the environmental risks and the benefits associated with tall wheat grass establishment.
- Identify a set of protocols for low risk use and management of the plant for salinity mitigation and improved productivity of affected land.
- Provide sufficient detail to enable informed decision making for future investment in the use and management of tall wheat grass.
2. DESCRIPTION OF TALL WHEAT GRASS

Tall wheat grass (Figure 1) is a member of the Poaceae family (Barrett-Lennard 2003). It is native to the Balkans, Asia Minor and Southern Russia where it occurs on marshes, seashores and areas inundated by seawater (Thompson et al 2001).

Tall wheat grass is a tall tufted summer growing perennial grass, with stems that can grow to 1 metre or more. Its roots can extend down to 3.5m with some roots that are fibrous and prolific near the soil surface. Tall wheat grass only reproduces from seed (Barrett-Lennard 2003). Despite being a strong competitor when established, plants develop slowly as it is a weak seedling and are inhibited by competition, generally requiring bare ground to establish (KTRI 2001). Seedlings are susceptible to water inundation and unless they have their heads above water, they will die (Borg pers comm). Leaves are greyish or bluish green. The seed head is a spike 10-15cm long and flowering occurs between November and March (Barrett-Lennard 2003). The seeds are large and are dispersed in water and by stock. The seeds do not disperse by wind. It is also important to ensure the seed is less than two years old as the viability greatly reduces in old seeds (Nichols 2002).

Tall wheat grass has been grown on saltland in Australia since at least 1945. It was introduced for the management of saline soils because of the deep root system and perennial growth cycle. The Soil Conservation Authority of Victoria encouraged commercial production of seed in Victoria in 1968 for pasture and reclamation of saline and alkaline soils (Barrett-Lennard 2003). However, it is only since the 1980s that it has been promoted in Victoria (Thompson et al 2001).

Tall wheat grass is suitable for planting in moderately saline and waterlogged sites, particularly where barley grass often colonises (Robinson 2000). These are areas often with patches of bare soil (Figure 2) and salt tolerant plants such as Round Leaf Wilsonia (Wilsonia rotundifolia), Beaded Glasswort (Sarcocornia quinqueflora), Bucks Horn Plantain (Plantago coronopus) and Sea Barley Grass (Critesion marinum) (Appendix) (Buntine 1994). Tall wheat grass can survive salinity levels up to 40 dS/m but will not persist in soils that are waterlogged over spring and into summer (Nichols 2002).

There are two varieties of tall wheat grass, ‘Tyrell’ and ‘Dundas’. These are specially suited for poorly drained and salty country. The new variety ‘Dundas’ has been selected from the older variety ‘Tyrell’ for its increased leaf production, less stem, greater forage quality and palatability for stock (Robinson 2000).
3. DISTRIBUTION OF TALL WHEAT GRASS IN THE CORANGAMITE REGION

The actual extent or distribution of tall wheat grass has not been mapped for the Corangamite Region, yet it is known to be widespread throughout the Corangamite Catchment including many of the wetlands. During discussions with Greening Australia (GAV) it was reported that wetlands such as Beeac Swamp, Lake Corangamite and areas around Leslie Manor, all Ramsar lakes and lakes of National Significance have Tall wheat grass present. The presence of tall wheat grass around these areas is likely to have resulted from seed spread from surrounding farming land.

4. BENEFITS OF TALL WHEAT GRASS.

Many landholders in salt affected land within the Corangamite region have established tall wheat grass pastures and are considering planting more in the future due to its production value in saline discharge sites.

Tall wheat grass is a summer active perennial that grows in saline soils, unsuitable to most other agricultural pasture species. It also grows in acid or alkaline soils and tolerates winter-waterlogged soils that dry out in summer (Nichols 2002). It maintains a green cover all year round that protects normally degraded sites from wind and water erosion.

Tall wheat grass helps to dry out the soil profile in summer and reduces water pooling over an area in winter. This also reduces fresh water recharge (Department of Agriculture, n.d.).

![Figure 2](image-url) - A salinity affected paddock North of Lake Beeac, Victoria where Sea Barley Grass Persists and bare patches are present.
This process then allows less salt tolerant plants and more productive pasture such as sub-clover to colonise as soil conditions improve. The addition of clover improves the quality of the pasture, and increases the nitrogen content of the soil (Buntine, 1994). Established Tall wheat grass pastures are known to promote the growth of companion legumes such as Balansa clover, which will produce good quality hay and silage (Dryland Salinity 2004).

Research conducted at the Pasture and Veterinary Institute, DPI Hamilton Victoria indicates that green Tall wheat grass plants has a nutritional value not far below perennial ryegrass and phalaris (Dryland Salinity and Flood Management 2004). Results from another study at DPI Hamilton showed that when tall wheat grass was kept less than 20cm high it was a valuable pasture particularly in summer/autumn when other pastures are dormant or dead (Borg & Fairbairn 2003). An industry source advises that Tall wheat grass should be kept grazed to a height no more than 10cm to prevent rank and unpalatable growth (Stephen Pasture Seeds Company, 2005).

Tall wheat grass has the ability to increase the stocking rates from 0.5 to 8 DSE/ha if managed correctly. Comparisons made between species in South America, USA and New Zealand show that tall wheat grass is one of the most productive species (Nichols 2002).

Research has concluded that leakage under annual pastures is significantly higher than under perennial pastures (CSIRO 2002). By preventing the accumulation of salts on the ground surface, a perennial ground cover will reduce the wash-off of salts into waterways and the terminal lakes in the region, a major objective of the current Corangamite Salinity Action Plan.

5. MANAGEMENT OF TALL WHEAT GRASS

When establishing tall wheat grass it is important to undertake preparation correctly to ensure it withstands grazing in the future. Establishment depends on two factors, the first is the soil salinity level. If the soil salinity level is below 15 dS/m then tall wheat grass will only take about 6 months before it can be grazed. If the soil salinity levels are above 15 dS/m then it may be 12 months before it can be grazed. The other factor is water logging. If areas become inundated with water over winter it may take the seedlings six months or longer to germinate because of conditions such as cold soil temperature. The higher the soil salinity levels the more kilograms per hectare of seed you will need to sow (Borg pers comm).

Tall wheat grass must be grazed to maintain pasture at maximum of 10cm height to prevent rank and unpalatable growth (Stephen Pasture Seeds representative, pers. comm.). This also maintains its nutrition value for stock. Tall wheat grass will tolerate hard grazing once it has been properly established. The Department of Primary Industries has completed extensive studies with tall wheat grass and concluded that as long as pastures are kept short, vegetative and not allowed to seed it does not become a problem. A buffer of 20m between the tall wheat grass pasture and areas such as native grass populations, swamps, waterways and primary saline areas is recommended (Borg pers comm). Grazing should occur from spring, through to autumn and if this is not possible then slashing or burning should be undertaken.
Figure 3: Unmanaged drainage lines of the Kooraweera Lakes System at Leslie manor where Tall Wheat Grass is able to spread.

The benefit tall wheat grass can have on both primary and secondary sites is that it can reduce salt wash off. Landholders should learn about the characteristics of tall wheat grass to ensure they manage it properly and get the maximum benefit from it (Stephen Pasture Seeds. Pers comm)

The Department of Sustainability and Environment (DSE) recommendations include maintaining a 50-meter buffer from any native vegetation or crown land. This buffer must also be grazed to protect the area from any chance of becoming infested with tall wheat grass (McDougall pers.comm.).

Figure 4: A well managed Tall wheat grass paddock at Eurack, Victoria.
6. RISKS IN USING TALL WHEAT GRASS

Tall wheat grass is not declared noxious in any state of Australia, but it is recognised as being an environmental weed (Matters & Bozon 1995). It has the potential to become a problem because of its invasive nature and has the ability to alter the character of plant communities in naturally saline areas, as well as forming a monoculture under favourable conditions. Tall wheat grass could directly threaten a range of rare and threatened species of flora by out-competing and indirectly threaten fauna by changing the food source of a habitat (Keith Turnbull Research Institute 2001).

Introducing an invasive species into already threatened areas may result in the destruction of that habitat. An invasive species may by direct competition, alter a habitat, or change a wetland site, and put pressure and consequential harm on endangered and migratory species.

6.1 Spread into adjacent areas

![Farming Land](image)

Figure 5: Tall wheat grass was initially planted on the farming land and now is spreading around and onto a dry lake bed which feeds into Lake Terangpom (Ramsar Lake).

Off-site weed problems have been linked to some species that have been used for economic and salinity mitigation work including tall wheat grass. Despite its useful characteristics, tall wheat grass has shown signs of environmental weed potential in South Australia and Victoria (Bennett and Virtue 2004).

DSE has strong concerns that tall wheat grass could damage nature conservation values in remnant indigenous vegetation and reserves.
Introduced perennial grasses have the potential in agricultural landscapes to become invasive weeds in neighbouring landscapes and are listed under the Flora and Fauna Guarantee Act as a potentially threatening process (Fleming 2005).

The main dispersal method of tall wheat grass seed is by water where seeds can travel hundreds of meters along streams, waterways and via flooding. Wind is only a small influence spreading seed short distances (Thompson et al 2001). There is a high risk that if managed poorly, tall wheat grass will seed and will invade adjacent areas. It spreads easily on crown land that is not managed by use of stock or personnel (GAV pers.comm.).

Another major ongoing risk cited by GAV is the frequent changeover of property management. New landholders and managers may not be aware of the management requirements of tall wheat grass to prevent its spread. Species that are planted close to wetlands and waterways are going to spread more easily via water and prove a bigger problem than when they are planted into an area that is surrounded by agricultural land.

A negative outcome of the use tall wheat grass is its potential to become an environmental weed. In many of the non-farming areas its distribution seems to have been from flooding of areas and via drainage lines. Tall wheat grass has been able to take advantage of these circumstances and establish, in areas some distance from where it was originally planted.

6.2 Sensitive Flora and Fauna

The Western District Lakes Ramsar sites include Lakes Beeac, Bookar, Cundare, Milangil, Murdeduke, Terangpom, Colongulac, Corangamite and Gnapurt. These lakes are recognised to be of international importance satisfying criteria regarding
their zoology, botany, ecology, hydrology and importance to waterfowl (DNRE 2002). They provide important feeding and roosting habitat for a large number and diversity of waterbirds including Eurasian coots, ducks, banded stilts, grebes, ibis and cormorants. Periodically, the Western District Lakes hold tens of thousands of ducks, swans and coots (The Ramsar Convention on Wetlands nd). These species rely on the present indigenous plant communities for their survival.

It is likely that the spread of tall wheat grass into Ramsar Wetlands is a result of poor management that has allowed plants to seed into drainage lines. Photo (Figure 3 & 4), shows tall wheat grass invasion along a drainage line.

The majority of the land surrounding Ramsar lakes is agriculture used specifically dairying, stock grazing and cropping. These practises have already introduce species to the area and cause some destruction (DNRE 2002).

Figure 7: Tall wheat grass has spread around the edge of this wetland that is part of the Kooraweera Lakes System. This site is not managed and the Tall wheat grass has become tall and rank.

The Western District Lakes have zoning and overlays that apply to the area. The Environmental Significance Overlays and Significant Landscape Overlays relating to environmental, landscape, built form and land and site management issues (DNRE 2002). As a signatory to the Ramsar Convention, Australia is obligated to conserve and manage its internationally important wetlands for their unique ecological value. These obligations are met through Commonwealth and State legislation. Any activity that is likely to have a significant impact on a Ramsar wetland is required to go through a rigorous environmental assessment and approvals process under the Commonwealth Environment Protection Biodiversity Conservation Act (EPBC Act).
The primary salinity or naturally saline sites within the Corangamite region are particularly sensitive to agricultural activities. These sites are important to threatened species such as the Orange-Bellied Parrot, the Blue-Winged Parrot and Spiny Peppergrass.

The Orange-bellied Parrot (*Neophema chrysogaster*) is a rare and endangered species that is present within the Colac-Eurack saline discharge target area. The parrot mainly feeds within saltmarshes where they favour plant species such as Beaded Glasswort (*Sarcocornia quinqueflora*), Sea Heath (*Frankenia pauciflora*), Austral Seablite (*Suaeda australis*) and Shrubby Glasswort (*Sclerostegia arbuscula*) (Department of Sustainability and Environment, 2004). The parrot uses different types of habitat at different times of the year. It relies on the saline areas where it feeds on beaded glasswort species *Sclerostgia arbuscula* and *Halosarcia halocnemooides* (Parrot Society 1997). These species are particularly vulnerable during winter from stock pressure. (DSE 2004).

Spiny Peppergrass (*Lepidium aschersonii*) is listed as a threatened taxon under the Flora and Fauna Guarantee Act 1988 and occurs mainly in or around swamps and salt marshes on heavy black or clay soil. It was formerly widespread in Western Victoria, now only 14 stands exist in Victoria. Its main occurrence is on the eastern shore of Lake Beeac which is crown land, many other sites are on private property. Its disappearance is mainly due to the pressure of agricultural activities.

Other populations of Spiny Peppergrass on private property are generally subjected to grazing, trampling, cultivation and pasture development. It seems to have very specific habitat requirements and attempts to build up the population of the species have failed. Competition with other species also proves to be a problem. “At Lake Beeac introduced herbs and grasses including *Phalaris aquatica* (Phalaris) *Holcus lanatus* (Fog grass) and *Lolium perenne* (Perennial rye grass) have invaded the salt marsh community, suppressing Spiny Peppergrass plants and inhibiting seeding regeneration” (DSE Spiny Peppergrass, *Lepidum archersonii* 2000).

### 7. ALTERNATIVES TO TALL WHEAT GRASS

Alternatives to tall wheat grass can be divided up into samphires, saltbushes, grasses and legumes. All which all have different tolerances to salinity, waterlogging and different grazing potential.

Samphires (*Halosarcia pergranulata*) have a high tolerance to salinity (35 ds/m +) and waterlogging. They will survive moderate grazing but this is not recommended because the salt intake by stock will be to high if consuming only samphires. Continuous grazing will also kill the samphires (Malcolm n.d.). They have a high salt content and therefore need to be grazed with other feed types and plenty of available fresh water for stock (Barrett-Lennard 2003).

There are a few varieties of saltbush available such as Creeping Saltbush (*Atriplex cinerea*) and River Saltbush (*Atriplex amnicola*) (0.6-1.4ds/m). Saltbush does not tolerate long-term, continuous grazing and needs repeated rest phases to recover. Stock grazing saltbush also needs to be supplied with hay, stubble or understorey that has low salt content, to avoid consumption of too high levels of salt.
Small-Leaved Bluebush (*Maireana brevifolia*) will grow in areas of high salinity but does not tolerate waterlogging. It recovers well from grazing but other feed must be available such as pasture or stubble, to avoid stock poisoning from the oxalate contained in the leaves (Runciman & Malcolm 1989).

Salt tolerant native grasses such as Saltmarsh Grass (*Puccinellia ciliata*) will grow on saline (1.4-3.5ds/m) and waterlogged soils and will establish on bare patches. Puccinellia provides good feed during winter and early spring (Barrett-Lennard 2003).

Australian Salt Grass (*Distichlis*) is highly tolerant of waterlogging and has moderate to high salinity tolerance (1.4-3.5ds/m), although the value for grazing has not been well documented (Runciman & Malcolm, 1989).

Saltwater couch (*Paspalum vaginatum*) has a tolerance to waterlogging and a moderate tolerance to salinity, but must be grown where seepage keeps the area wet through summer. No information is available on the grazing of the species but areas would soon become pugged by stock if continually wet (Runciman & Malcolm, 1989).

Balansa clover (*Trifolium michelianum*) has a low tolerance to salinity (1.4-3.5ds/m) but is highly tolerant of waterlogging and is very nutritious to stock. Strawberry Clover (*Trifolium fragiferum*) (1.4-3.5ds/m) is able to grow in conditions which are wet or dry, alkaline or saline and will persist under heavy grazing (Barrett-Lennard, 2003).

*Melilotus alba* is suited to mildly saline and waterlogged sites and can produce large amounts of dry matter, and is highly palatable to stock in spring (Barrett-Lennard 2003). Results from trials done at Worndoo and Glenthompson by Agriculture Victoria suggest that *Melilotus alba* can produce the same quantity of forage as subterranean clover-ryegrass pastures growing in non saline soils (Evans n.d.). *Melilotus* can also be a suitable companion legume to tall wheat grass or *Puccinellia*.

At this stage tall wheat grass seems to be the best option to reclaim saline land. Alternative species such as native grasses that are non-evasive are years away from being commercially available.

**8. CASE STUDIES**

Many landholders in the Corangamite Catchment have been living with salinity on their properties for years and subsequently have been using tall wheat grass for some time.

**8.1 Case Study One – Beeac property**

A landholder at Beeac has had tall wheat grass (‘Tyrell’ variety) established since 1982. Prior to sowing, the site was saline with salt scalds and seepage. Sea barley grass and buckhorn plantain (see appendix) were growing on the site except on areas of severe saline scald (Missen pers.comm).
A paddock on the Beeac property planted with tall wheat grass in 1982 has had minimal to no spread, other than a few plants that have escaped onto the roadside adjoining the boundary. These may have established during the initial sowing of the pasture. Plants have not spread across the road or voluntarily seeded within the boundary of the fence. After the initial 12 to 18 month establishment period, the consistent grazing pressure from sheep prevents any further seedlings establishment. The absence of grazing pressure along the roadside is possibly the reason it has been able to disperse along the roadside in some areas (Missen pers comm).

To maintain tall wheat grass as a productive pasture, the landholder manages it according to its characteristics. The pasture is ‘mowed’ down like green grass, and hay and silage is made from it. Fertilizer is applied when required and has sub clover has re-established back amongst the tall wheat grass (Missen pers.comm.).

The roadside is slashed regularly, which prevents tall wheat grass from seeding and spreading into an area with no grazing pressure. Tall wheat grass should not be planted along streamside and defined drainage lines where stock do not have access to graze fresh seed.

The landholder would recommend tall wheat grass to other landholders with similar land management issues.

![Figure 8: Poorly Managed Tall wheat grass in the Leslie Manor area.](image)

The photo above (Figure 8) is an example of a poorly managed tall wheat grass area. It hasn’t been grazed regularly and has become rank and unpalatable to stock. Although it is patchy, it does support clover amongst the tussocks. This site would need to be stocked at higher levels or regularly slashed to prevent the growth becoming tall and rank. This large area may need to be fenced into smaller areas to ensure the pasture available is better utilised by stock. Mr Rhodes from Connewarre
has found that unmanaged tall wheat grass tends to grow quite clumpy and rough. This makes it difficult to drive over as well as hard on the machine to slash (Rhodes pers.comm).

8.2 Case Study Two

A landholder at Modewarre has planted tall wheat grass 20 years ago because areas of the property were bare and didn’t provide feed for the stock. The tall wheat grass is cut each year for hay and silage and grazed periodically to prevent clumpy growth (Smith pers comm).

The landholder has found that it can spread through manure but is easy to control through spraying with Glyphosate (KTRI 2001) or grubbing out. The landholder has also found that it does not do particularly well on productive soils, and it will not grow in wet or frequently flooded areas (Smith pers.comm).

9. RECOMMENDATIONS AND PROTOCOLS FOR USE

9.1 Greening Australia Recommendations

Greening Australia Victoria (GAV) does not recommend using tall wheat grass at all as it will contribute to an already increasing spread into vulnerable areas. In some cases it is already well established off-farm, and is therefore likely to maintain a presence in the environment. If tall wheat grass is to be used then GAV suggests that decisions be made on a ‘site by site’ basis. Aspects of the site, such as location, species present and closeness to waterways and drainage must be considered. Trials or selective breeding for traits that reduce its weediness should be carried out to prevent some of the problems we are seeing today (Greening Australia pers.comm.).


Below are the current protocols for use of tall wheat grass in the Salinity Action Plan that are implemented to reduce the risk of tall wheat grass becoming an environmental weed.

- Tall wheat grass will not be sown in areas that are not going to be grazed.
- Tall wheat grass will be kept below a height of 40cm. It must not become rank and allowed to seed.
- When grazing is not an option, tall wheat grass must be mown, slashed, mulched or cut for hay to prevent seeding.
- Tall wheat grass must not be sown adjacent to or in environmentally sensitive areas including riparian zones, areas of primary salinity, coastal and inland wetlands, breeding or feeding habitats for native fauna and areas containing threatened species.
- Buffer zones of at least 50 metres from any creek or waterways and 50 metres from any remnant vegetation or revegetation works.
9.3 Protocols for tall wheat grass use in the Corangamite Region

To ensure landholders get the maximum benefits from tall wheat grass while minimising environmental risks, the following points must be considered.

- Tall wheat grass must be planted at a safe distance from native vegetation, roadsides, watercourses and swamps. DSE recommends that a buffer of 100m is created between the site to be planted with tall wheat grass on any Environmental Significant Overlay. Plantings should be 50m from public land, including road reserves and crown land containing remnant vegetation and 100m from a watercourse or floodplain. Glenelg Hopkins Catchment Management Authority recommends 10-20 m buffer zones.

- Limit seed production and dispersal by:
  - intensive grazing, mowing or burning of plantings,
  - routine surveys and control of seedlings that spread from plantings,
  - only plant species with effective control techniques; and
  - land not being managed by grazing should be burnt, slashed, mulched or cut for hay prior to seeding. (Bennett and Virtue 2004).

- Tall wheat grass must not be grazed for at least 12 months to ensure successful establishment and then regularly undertake rotational grazing. Soil testing should be undertaken to ensure the correct fertiliser application and sowing density for each area.

- Management guidelines for each tall wheat grass site must be developed such as adhering to minimum planting distances from primary saline sites and waterways, implement a grazing plan, to include routine monitoring to determine grazing and spraying of escapee plants. Plants must not be allowed to escape across fence lines into unmanaged areas.

- Many benefits are associated with species such as tall wheat grass. Species selection and breeding programs should be run to select for traits that are not seen as ‘weedy’. For example: “the new tall wheat grass cultivar ‘Dundas’ should be less invasive that ‘Tyrell’ providing higher palatability and lower biomass allocation to reproduction” (Bennett and Virtue 2004). The suggestion only Dundas should be recommended and available needs to be considered.

- Refer potential tall wheat grass sites to DSE provide flora site information or undertake flora surveys in vulnerable areas prior to tall wheat grass being sown.

- Investigate through trials the use of native or non-invasive species as an alternative.

- Only sow tall wheat grass on agricultural land, it should only be established where it will be managed as a viable pasture and grazed regularly.

- Risk assessments undertaken on each site, prior to recommending tall wheat grass, to ensure landholders are alerted to the limitations with using this species.

10. CONCLUSION
Tall wheat grass is both profitable, agriculturally but also poses an environmental risk, but at the same time has environmental benefits by preventing erosion, reducing run-off and assisting in salinity amelioration.

In the past we have found that introducing plants that are potentially going to spread add to the ongoing problem of weeds and biodiversity issues on farms and in the environment. Can we afford to ignore the introduction of plants with proven high economic and environmental benefits, especially when dealing with the ever-increasing problem of dryland salinity, erosion and loss of soil structure.

When intending to plant tall wheat grass the precautionary principle needs to be considered. The characteristics we want in our pasture species unfortunately make them inherently weedy. Each situation, site and proposal needs to be treated and analysed individually to ensure the environment and biodiversity values are not adversely affected and that tall wheat grass will be managed appropriately and in particular with any government incentive grants.

Options presented need to be evaluated for their contribution to Salinity management and on farm management objectives. The question arise as to whether the benefits of introducing or continuing to plant tall wheat grass in agricultural areas for production and land management purposes, outweighs the potential risks of its invasion into natural ecosystems (Bennett and Virtue 2004).
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(pers comm)

Missen
Smith
Shone
Stephen Pasture Seeds
Rhodes
Borg
McDougall
12. APPENDIX

Figure 9: Buck’s Horn Plantain *Plantago coronopus.*

Figure 10: Round-Leaf Wilsonia *Wilsonia rotundifolia.*

Figure 11: Samphire *Halosarcia pergranulata*

Figure 12: Sea Barley Grass *Critesion marinum*