

“Whatever you do will be insignificant, but it is very important that you do it.” – Mahatma Gandhi

What’s in a Name?

“Once upon a time, long, long ago...” In this case only as far back as mid 2007! The Natural History Society, with the help and generosity of Dr and Mrs Holt, acquired sections Q6, Q7, Q8, Q9 and S167 that comprised part of Portee Station. The 1:50,000 topographic map series labelled this area the “Twelve Mile Plain” – the historic name originating from it being some twelve miles from Blanchetown on the Murray River. Although it became part of Moorunde Wildlife Reserve, some of us began to refer separately to this newly acquired piece of land as the Twelve Mile Plain for good reason. From a land management point of view, I could see the need to keep the Twelve Mile Plain as a separate entity entirely and have it officially named as such. Many people started to speak of “New Moorunde” and “Old Moorunde” or “The Original Moorunde” and the “New Area of Moorunde”. It was becoming quite cumbersome and confusing to discuss, and if somebody just said “Moorunde”, one didn’t quite know what area or areas were meant. So I suggested we “rebadge” the whole area as two separate reserves and name them the “Moorunde and Twelve Mile Plain Wildlife Reserves” – to save us from this confusion. But no! Nobody else would hear of it.

However, this is my story, and to save confusion here on, I will use “Moorunde” to refer only to the original 2,000 hectare “L” shaped property and the “Twelve Mile Plain” to refer to the new extra 5,000 hectares.

Three Wishes – a fantasy story

This is my story of “what could have been”, which can now only be a fantasy. But remember, it *could* have happened!

In 2007, shortly after we acquired the Twelve Mile Plain, I walked through it and came across an old kerosene lantern with dirty, cracked glass, rusty fuel base, rotted wick and a brass label encrusted with dirt. Of course, one had to clean the label and read the inscription, so I spat on it and gave it a rub with



the palm of my hand. To my surprise, a genie suddenly materialised from inside the lantern.

“I am the Spirit of Pastures Past, Pastures Present and Pastures of the Potential Future”, announced the genie.

“I grant you three wishes in reward for releasing me from that rusty old lantern, however, there are some conditions attached!” continued the genie.

“Firstly, you must wish for something that you strongly want to come true, but not something for your own benefit. Secondly, you must wish for something that will be of great importance. Thirdly, you must wish for something that could actually happen in reality, if only the conditions were right! Are you prepared to accept the responsibility for these magic wishes?”

“Ahhh yes, I guess so” I replied.

“Then think carefully” said the spirit, “and make your first wish.”

“I wish,” I said “to have total, autocratic control of the management of these Wildlife Reserves. To bring about their recovery to a state as close as possible to how it was prior to European settlement, so that the wombats on them will be saved from dying out.”

“That,” said the genie “is a wish that I cannot grant, for it would be impossible, something that no one else has done in a land like this. And impossible to make all interested parties concede total control to you!”

“It is not impossible” I replied, “possibly absurd, ridiculous and unprecedented, but not impossible. If you grant me this wish - to have the Society’s Management Committee relinquish all reserve management decisions to me, and act under my direction, then I can restore most of the vanished native pastures of the reserve back to, or close to what they were like in 1840. I just need your magic to give me complete control and management of the restoration and I will take care of the rest!”

“Very well”, said the genie, “but this absurd and inconceivable desire will require the power of all three wishes. In addition, you will be cursed and haunted to live in four different eras: the past, the present, the potential future and the real future - a necessary burden for you to receive such a wish. Do you accept?”[†]

“Accept? Of course I accept!” I exclaimed, “I already live in these mixed up worlds and already bear the distress it causes to others! So grant me my wish and let’s get on with it!”

And he did! Then the spirit slowly faded from sight, saying as he did so “We will meet again eight years from hence, and I will see whatever you have achieved with your insurmountable task.”

As the spirit’s image disappeared I shouted defiantly, “You have granted me the impossible. I can and will achieve the difficult and ambitious. Some people will want to help me do this and they will!”

On returning to the Moorunde campsite for lunch with the other volunteers, I confidently announced that from now on, I was to direct the management of the Reserves! As promised by the genie, they all readily accepted this revelation. I also told them that as the work would require all the help we could muster, we would now be focussing our attention on the *cause* of the problem, not simply treating symptoms of the problem. No longer would we merely try to curtail the spread of weeds but we would now be treating the *cause* of the spread and the *cause* of the lack of native pasture.

Back to Reality – for a moment

Now it must be acknowledged here, that the Management Committee of the Society in 2007 is NOT the same as it is today (April 2015). Only two of the past usual attendees of the Management Committee of the Society and Reserves are still attending the present meetings. Since 2007, there have been progressive changes to the structure of the Society to permit democratic management and decision-making. A number of former management committee members have left the Society and have since been replaced by others. Some of these former committee members (self-appointed Fellows of the Society) had been “city conservationists” or emotional preservationists, who knew nothing about *real* conservation work. And some appeared to think that their university and academic qualifications (which generally had nothing to do with ecology) made them know more about land management than what a retired “farmer conservationist” could possibly know! While we still lack committee members with real land-care experience, or at least training in land management and ecology, these newer committee members (democratically elected since 2013) cannot be held entirely responsible for the slow start on the Twelve Mile Plain and the failed management policies of Moorunde in the past.

[†] This necessary burden is reflected in this essay, jumping back and forth between these worlds!

In previous articles[‡] I have explained that the Aboriginal people had preserved much of the last ice-age habitat of *Grasslands and Open Myoporium Woodlands with Tall Scattered Shrubs* intact (into the 19th century) by their management practice of targeted and strategic burning. This practice involved a high level of planning, knowledge, experience and work, and was far more extensive and sophisticated than we new arrivals have (in the past) been led to believe. A preserved “ice-age habitat” means that there are still ice-age animals, such as Hairy-nosed Wombats, dependant on these preserved habitats. The remnants of the once open vegetation communities (across the entire Murraylands region) are gradually but surely being smothered out by scrub growth (woody weeds), seriously threatening the long-term survival of these animals.

My earlier articles also explain that even when the First People were displaced and dispossessed of their land, the Grasslands and Open Woodlands continued to be kept intact by default, and in the absence of burning, because the grazing by sheep and cattle (introduced to the land in the 1840’s) essentially performed the same function as burning – at least for this particular habitat and vegetation communities of the Murraylands. In fact, it was the introduction and proliferation of rabbits, not sheep, which started the decline of these habitats.

While so-called conservationists (or rather preservationists), including the early managers of Moorunde, were blaming the sheep for the habitat decline, nothing was done to control the abundant rabbit numbers and the plant communities on Moorunde continued to decline. While congratulating themselves on fencing out the sheep from Moorunde around 1969, they failed to notice that there was still no regeneration of the original vegetation and that the native grasses were continuing to disappear altogether. Fortunately, the wombat population could survive on the Wards Weed that took the place of the grasses and they no longer had to compete with the sheep for this poor food substitute. By the 1990’s, virtually all the native grasses had disappeared from Moorunde!

When the rabbit numbers were finally brought under control with a yearly baiting program commencing in 1994, it was too late to save the native grass pasture on Moorunde. In contrast, I had planted and re-established native grasses on my property at

Cambrai (not far from Moorunde) for a number of years prior to 1994. Despite this fact, nobody on the Society’s Management Committee was prepared to listen to any suggestions I made. With the wombat population still with healthy numbers, the Tall Shrub invasion yet to come, and the plague of kangaroos still several years into the future; they presumably didn’t see the need to listen to my concerns – and I was just a recent “blow-in”, having only joined the Society in 1993). So I refrained from pressing my point. By now they probably don’t even remember what I was trying to tell them – that they had blamed the wrong animals (the sheep) for the decline in habitat health.

By the time of acquisition of the Twelve Mile Plain in 2007, the rabbit baiting on Moorunde and the absence of sheep, had allowed all of the Grassland and Open Woodland areas to become almost completely covered with Tall Shrubs (woody weeds) to the point where they were no longer “open” anymore. These woody weeds are continuing to become thicker, completely changing the pastureland (originally covered with native grasses but now replaced with Wards Weed) into Dense Shrubland. These areas can no longer be re-seeded with native grasses without being first “scrub-rolled”.

This is also happening on many other properties surrounding Moorunde. An increasing number of blocks are being sold off as “bush retreats” for city people and are consequently destocked. Combined with the impact of Rabbit Haemorrhagic Disease (calicivirus), vast areas of once pastureland are becoming no longer suitable for wombats to survive in.

But! The Twelve Mile Plain was (in 2007) still very much suitable to be reseeded with native grasses, as the sheep and some mechanical clearing of shrubs conducted in the mid 1980s had prevented most of it from being inundated with shrubs. And! Had the managers of the reserve been prepared to do so, at least 1,000 kilograms of native grass seed could have (by the spring of 2007) been harvested off my Cambrai property for free! I would have donated this seed and additionally, could and would have done the work of seeding. I could have shown that it is possible to seed large areas with the aid of machinery. Machinery allows large areas to be covered in a relatively short and manageable timeframe.

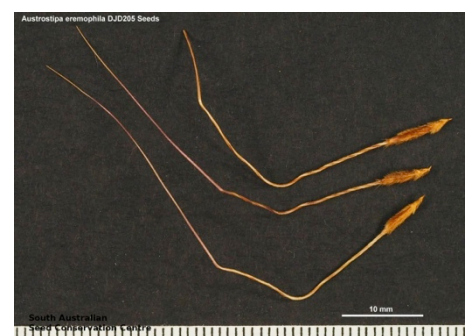
So, for the cost of a few hundred dollars, machinery could have been acquired and adapted to harvest enough native grass seed (mostly Spear Grass *Austrostipa eremophila* and some Wallaby Grass *Austroanthonia spp.* mixed with it) to sow 500 hectares at 2 kilograms per hectare, over the summer of 2007-08. As reported in “Spear Grass Seeding Trials and Results at Moorunde” I have demonstrated the use of a rabbit bait-layer as

a mechanical method of sowing native grass seeds.

Among the Society members is a qualified fabrication engineer. In my “fantasy” story of what could have been, at my request this member constructs a device that enables three rabbit bait-layers (on loan from the local Natural Resources Management or NRM board) to be towed together. With the “furling discs” of these bait-layers come seeders, each one metre apart, I tow the machinery over the Twelve Mile Plain with my four-wheel-drive ute!

Back to the Story...

It is 2007 the ground is not yet too badly damaged by wombats digging over the soil in their desperate search for toxic Thread Iris (nut grass) corms to survive on. In the next few years, this excessive digging during the dry months will hard-pan the surface, leaving a moonscape of moguls and potholes. But for the moment, I can still tow the machinery with a four-wheel-drive motor vehicle. The surface is not yet so rock-hard that a tractor is needed. With the three furling discs set one metre apart, we seed an area of one hectare after travelling 3.333 kilometres (3,333m x 3m = 10,000m² = 1ha). I have already prepared the Spear Grass seed, cutting off the awns (barbed shafts) by passing the seed through my chaff cutter and then mixing with oat grains to allow an even, measured seed delivery rate. Spear Grass seed awns are so barbed that they readily matt together and cannot be effectively sown individually with any conventional seeder – the matting simply blocks the delivery mechanism.



Austrostipa Eremophila seeds, note the long awns.



Austrostipa Eremophila seeds close up, note the barbed hairs on the seed head.

[‡] (1) “Spear Grass Seeding Trials and Results at Moorunde”, (2) “Rescue Me! Grassland Restoration on Moorunde Wildlife Reserve”, (3) “Repairing Hard-Panned Soil in a Semi-Arid Environment”, (4) “No Room for Complacency” and (5) “More Talk, More Trials and Still No Action”. Available on the internet at nhssa.com.au/perspectives/words-from-whistling-jack

The rabbit bait-layers have pre-set delivery rates for the oats they lay. The small quantity of combined Spear Grass seed is of little consequence to this. So in mixing the grass seed with the oats, we calculate the ratio of oats to grass seed to achieve our desired grass-seeding rate of 2 kilograms per hectare. Besides allowing accurate seeding rate calibration, the oats also assist in pulling the grass seeds through the delivery mechanism.

The furrows created by the bait layer allow enough soil to be washed or blown back into them (by rain or wind) to bury the grass seeds sufficiently for germination. Normally the seed requires the awn to aid self-burrowing into the soil. With the awns removed (to reduce matting), the furrows are necessary. Later I will invent a device that enables the seed to be separated from this matting problem and be blown out individually to self-burrow, thus eliminating both the need to remove the awns and to sow in furrows. Even if just two or three seeds are “locked” together by their barbs gripping each other, then this is sufficient to prevent self-burrowing. The barbs and the awn are essential equipment for the seed to self-burrow, but when handled and stored, any quantity of seed simply matts into a single mass. This has been the main problem thwarting other peoples’ attempts to sow Spear Grass on a broad scale.

Nonetheless, despite the extra work and time spent removing the awns with a chaffcutter and then mixing the correct quantity of seed with oats, the method of sowing in furrows with the bait-layer has several advantages over sowing by blowing out individual seeds:

1. Rainwater collects in the furrows, assisting germination and growth;
2. Furrowing breaks open the typically sealed duricrust surface allowing better moisture penetration into the soil;
3. In subsequent years the furrows capture natural wind-blown seed, assisting the grass to “thicken-up” more quickly – at least until the furrows fill with soil and vegetation litter. See photo 1.

So, by early 2008 (in my imaginary world), 500 hectares of the southeast corner of the Twelve Mile Plain is seeded down with native pasture.

However, from experience with re-pasturing my own degraded property with Spear Grass (for stock to graze on), I am aware of the dormancy period of the seed and know that it takes at least until the second season before it will germinate. This dormancy characteristic has evolved to adapt to the harsh semi-arid environment. The seeds will remain dormant until the right conditions arrive. In any case, 2008 is too dry, especially during the autumn germination period. 2009 is also too dry for Spear Grass growth and demonstrates that the dormancy characteristic is important for the plant’s survival. Then in 2010 there is



Photo 1: “Self sown” Spear Grass in unseeded furrows on my Cambrai property.

enough rain and it is early enough in autumn to germinate the grass seed. The rest of the year only gets better!

But, since 2008 and 2009 were so dry there is no seed to be harvested from my own property that would have allowed seeding to be conducted over the Twelve Mile Plain during 2009 and 2010. It is not until the spring of 2010 that another 1,000 kilograms of seed can be harvested – ready for sowing in 2011.

By this time, Moorunde and the Twelve Mile Plain have been afflicted by two disasters. Firstly, the kangaroo population has exploded to plague proportions and the macropods are eating out most of the Wards Weed

“pasture”. Secondly, this has forced the wombats to rapidly expand the areas where they dig for Thread Iris corms to feed on during the dry summer months. These untimely earthworks are leaving the ground pockmarked and pitted with contiguous craters up to 15cm deep. Not only does this leave the surface so undulant that I can no longer use my four-wheel-drive ute to tow the bait-layer, let alone a conventional vehicle or a quad-cycle, but it is also destroying the surface soil structure. The wombats dig the soil when it is bone dry. The dry soil is pulverised and subsequently set hard forming a hard-panned surface. Rainwater is unable to penetrate the surface and is lost to run-off



Photo 2: Thinned out and stunted, exotic Onion Weed struggling to grow on hard-panned soil.



Photo 3: Exotic Wild Sage plants with taproots bent at 90 degrees thanks to the hardened soil!

and evaporation. Root growth of herbaceous plants and grasses is inhibited. Even the Onion Weed struggles and becomes stunted and thinned-out by this hard-panning. See photo 2. Newly germinated Wild Sage weeds (plants that have a “taproot”) are found with their taproots bent at right angles just below the surface – even these plants cannot penetrate the hardened soil! See photo 3.

Tall Shrub Invasion

Another and even more serious long-term event is occurring. The Grasslands and Open Woodlands of the Twelve Mile Plain (now without sheep and rabbits) are gradually becoming covered by an ever-expanding corpus of Tall Shrubs or woody weeds. Despite being native plants, they are invading into areas that were maintained as open areas for thousands of years. Similar situations are occurring everywhere else in the district where sheep have been removed. Yes, the sheep were introduced recently, but their impact in this area has largely helped to maintain open pasture areas, by preventing Tall Shrub growth – a job once done by controlled fire. Open pastureland, dominated by grasses and forbs, is a vital habitat for wombats. An example of this is shown in photo 4 – a scene of land that only a few years ago had sheep grazing on it along with wombats. This property now belongs to somebody who has bought it to use as a “country bush retreat” and it is just one of many such properties in the district. Many of the owners of these properties have put “vegetation heritage agreements” on them to prevent future clearing and to create wildlife “sanctuaries”. Unfortunately, they probably don’t realise that the wombats on them require the land to remain as “open land” for pasture growth – something that has involved human intervention for millennia.

Even the Swan Reach Conservation Park is experiencing an invasion of its “open land” by Tall Shrubs as can be seen in photos 5 and 6. Since the NRM board commenced baiting for rabbits in the park and combined with the impact of Rabbit Haemorrhagic Disease, Tall Shrub invasion has been quite rapid. Photo 5 showing the “open land” that contributed Wards Weed “pasture” to the wombats’ diet was taken in January 1992. Photo 6 shows the area in April 2015. One can hardly recognise it as the same location!

It seems counter-intuitive. Shouldn’t we as conservationists be thrilled at the sight of the “native scrub returning”? Frankly, no! Because for many of these areas, the scrub is not *returning*. For many of these areas, this type of scrub was never there. It is now *invading* areas that were once “open native grass pasture”, areas that enabled Hairy-nosed Wombats to continue to survive *after* the end of the last ice age. Eventually, the closing in of these areas by Tall Shrubs and the subsequent disappearance of native pasture will have an impact on even the kangaroo population in

the district. They however, can move on to other locations to survive. The wombats need this country. Country that has a subsurface limestone layer (sheet limestone – or calcrete) for them to dig under, creating safe breeding burrows. Country that has not been ripped by bulldozers for the purpose of destroying their warrens to rid the farming land of rabbits.

So by 2011, it becomes increasingly important to get on with re-establishing native grass pastures on the Twelve Mile Plain, as eventually it will become the only “protected area” that can or will remain “open”.

Easy Come, Easy Go

I had released the “Ghost of Pastures Past, Present and Potential Future” from the old lantern back in 2007. A condition imposed on my wish to direct the management of the Reserves was to be cursed to live in four different eras, the past, the present, the potential future and the future of reality. Despite the notion of a curse, on one occasion this predicament was to my advantage! At least in my “fantasy story”...

Jumping ahead to early 2013 and I receive a telephone call from the late Dr John Holt, then the patron and staunch supporter of the Society. Dr Holt has contacted me on an unrelated matter, but following that discussion he begins to express his disappointment that some time earlier, members of the Society’s Management Committee had refused an offer from him to “pay for the material to fence off (from the kangaroos) a significant area of the Reserves.” – I still have a photocopy of a letter in reply to that conversation, regarding a kangaroo proof fence. Apparently this offer (of which I was previously unaware) was made several years before 2013 and I realised from our conversation that this was a significant part of Dr Holt’s reluctance to continue his regular yearly donations of \$5,000 to the Society. His disappointment was in addition to his concerns about the neglect of another matter – that being the original subject of his phone call to me. But I will keep that for another day.



Photo 4: A few years ago this was sheep grazing and wombat land. Now shrubs are invading it.



Photo 5: 1992, "open-land" at Swan Reach Conservation Park, ideal for restoring native grassland.



Photo 6: 2015, the same area as above at Swan Reach CP, now being invaded by Tall Shrubs.

Meanwhile, the Society's Management Committee was "doing nothing with the money being donated except putting it into the bank and not using it on projects to properly manage the reserves", said Dr Holt. Had I been made aware of this and of his earlier offer to pay for fencing material, at the time it was made, I would have insisted that we accept the offer. In desperation I wrote the letter mentioned above to Dr Holt (dated 12 April 2013) attempting to excuse the original decision by others to refuse his offer and went on to explain to him various details on managing the reserves in relation to re-establishing native grass pasture – in the positive hope of having him reconsider the offer. Towards the end of our telephone conversation I expressed a desire to speak with him in person about my ideas and on location at the Twelve Mile Plain. We planned to meet at the Open Day at Moorunde in October 2013. Sadly, Dr Holt past away just a few months after this conversation and

unfortunately we never had the chance to meet and discuss plans. The opportunity to fence off all but the extreme northeast area of the Twelve Mile Plain was lost.

But! While that was the reality of what transpired, in my "fantasy story" the money on offer for fencing (\$185,000) is still available! And it is relatively straightforward to erect a kangaroo and rabbit proof fence because most of the posts and star-droppers are still there. Time and labour is no longer diverted to hand-weeding thousands of hectares of land and since we are now about to venture forward with a project of real conservation, extra volunteers can be rallied, organised and put to practical work. The kangaroo fence is erected before the end of 2009.

Just before the fence is finally completed, a team of volunteer "beaters" drive the kangaroos out of the enclosed 4,500 hectares, leaving the area free of excessive grazing

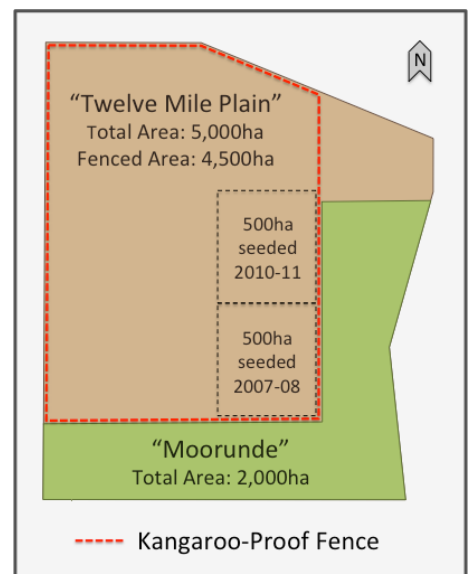
pressure. Only the wombats are to remain to eat the native grass that will soon be established.

Meanwhile, the season of 2010 sees the grass sown over the summer of 2007-2008 germinate in the early autumn and readily grow throughout the year. 2010 also has extremely heavy rainfall in December that allows the grass to not only "carry over" into 2011 but to set seed a second time through the summer. So the first 500 hectares of grass planted in 2007-2008 "thickens up" quite rapidly by 2012. Bearing in mind that grass seed (sown either artificially or naturally from existing plants) doesn't germinate until at least the second year, that is 2012, not 2011.

Once again I have on my property enough grass seed ripening in late spring of 2010, to harvest at least another 1,000 kilograms. This is used to "plant out" another 500 hectares immediately north of the 2007-2008 summer seeding area. We now have an area of 1,000 hectares seeded with native grass on the Twelve Mile Plain. The southern area is growing well and spreading into the gaps between the one-metre rows. The northern area germinates in the very favourable year of 2013. Which is followed by an even better year in 2014!

Another 1,000 kilograms of seed is harvested in 2011. The next 500 hectares planned for sowing is immediately north of the area that was seeded in the summer of 2010-2011. However it has large clay-pans that are heavily infested with the unpalatable Onion Weed, which at the time was still growing lush, thick and tall – unlike today! See photo 2 where even the Onion Weed has thinned out and is stunted because of "hard-panning" that will eventually lead to rising salt. This Onion Weed must be dealt with. A start to this is made in 2010.

The only known successful way to suppress Onion Weed is to (1) "disturb the soil" by cultivation to kill the existing plants and more importantly stimulate the dormant weed seeds in the soil to germinate. This takes two



years. Even if boom spraying is employed to kill the existing plants, the soil has to be disturbed by cultivation over two seasons to stimulate the dormant seeds to germinate so that they too can be destroyed. Essentially, we need to exhaust the weed “seed bank” to allow replacement grasses to become established.

In semi-arid areas, the timing of this cultivation is very important. It must be conducted when the soil moisture content is “just right”. That is, not too dry or the cultivation will cause hard-panning and potentially wind erosion, and not too wet, or many of the existing weeds will simply be transplanted. If moisture content is too high, there is also the potential for the soil to become “smeared” – another way that inappropriate use of cultivation can cause hard-panning. The ground must not be worked over too often either, for hard-panning and wind erosion again become potential problems.

In semi-arid climate areas, with low sporadic rainfall, where “soil soakage” is prevalent and conversely soil moisture evaporation is rapid, considerable experience and care is required of the person conducting or directing this type of soil treatment. While I feel that I have the necessary skill and experience to conduct such work, I am hoping to pass this knowledge on to a future generation of conservation workers. But as it happens (in my story) both 2010, when we start to prepare the third area for sowing, and 2011 are unusually good and relatively “simple” years to perform this task.

In fact, 2011 has good heavy rain in early autumn that enables us to get in that final Onion Weed cultivation, early enough to sow Spear Grass seed before winter. This means that the seeds will “experience” two seasons (to wear down their dormancy period) by 2013 – which, as it happens is another good year for Spear Grass germination. Even if some dormant Onion Weed seed is still present and germinates after sowing the Spear Grass seed in 2011, it can be killed off in 2012 by boom spraying – a process that will not affect the newly sown Spear Grass seed. There will always be some Onion Weed present, but Spear Grass is able to out-compete it as long as the Spear Grass is not grazed too heavily, beyond the point at which it cannot reseed itself. (It is worth noting here that the dormancy factor of Spear Grass seed can be “broken” when growing the plants in “tube stock”, where prior to the end of April, several seeds are placed in each growing tube and watered twice a day.)

As I have been granted “magical power” over the Reserve’s Management Committee and they are therefore unable to refuse any direction from me, in 2009 I instruct the Committee to purchase a second-hand tractor and an appropriate set of cultivation implements, specifically chosen for use with



Photo 7: The four-furrow disc plough made from scrap metal towed by my 4WD ute (at left).

the soil and climate conditions of the Twelve Mile Plain (approximately \$20,000-30,000 for the used tractor and second hand implements)⁵. This acquisition is funded by the Society’s own funds and other donors, who, pleased to see that practical management projects are now underway on the Reserve are glad to be providing continued support to the Society. In any case, everybody is impressed with the results of the grass that was sown in 2007-2008 and is now growing well by 2010.

Meanwhile, on my own property, Spear Grass is becoming a weed – despite being grazed by the sheep! My harvesting method is not very efficient and only collects about half the available seed, with the rest “spilling out”. I find it necessary to plough out the grass in areas that I wish to keep free of it! To do this I make a four-furrow disc plough out of scrap metal and tow it with my 4WD ute (see photo 7). If Spear Grass was not so palatable to grazing animals, then being such a “vigorous grower and self-spreader” it would be the worst weed in the entire Murraylands region. The only plants that it cannot outcompete are native shrubs!

A Quick Reality Check

How to separate and spread individual Spear Grass Seeds on a broad scale? As I alluded to earlier, I eventually design and construct a spreader machine based on a garden blower. The seed can be blown out from the back of a ute or a trailer towed by a suitable vehicle. In my “fantasy story” I construct this device in 2011. In real life however, due to numerous obstacles created by the Society Management Fellowship, there was no need (since there

was no agreement on whether to commence revegetation activities at Moorunde), for me to start construction of the device until 2014, by which stage there was growing acceptance of the need to revegetate native grasses, and not to forget that the Society’s management structure had dramatically changed by this time. In the intervening time, I spent considerable time attempting to demonstrate the feasibility of and practical methods for native grass restoration at Moorunde. On the other hand, the Management Fellowship spent \$10,000 from a research grant for advice (including a written report which I was eventually able to read) from apparent experts who alas, had never actually grown grass themselves, let alone in a semi-arid environment like Moorunde. In my mind, while this was an excessive fee for what amounted to superficial advice, there was some value in the spend in that eventually, some years later, the Society’s managers would see the information for what it really was, and somewhat shake their faith in “experts”.

Back to what *could* have been in 2011

In my “fantasy world”, with my authority over the Moorunde land-management, and no problems convincing others of my plans, I construct the seed blower device in time to use it prior to autumn of 2011. Although not quite as good as the bait-layer method, it saves considerable time and labour, and eliminates the expense of purchasing oat seeds (which are used as the transport medium in conjunction with the bait-layer). With the blower device, it is currently difficult to accurately measure the quantity or rate of seed and requires two people – one to drive the vehicle and one to operate and feed the blower. But no doubt, a clever mechanical

⁵ Remember this is just a story and no such equipment has yet appeared!

engineer could improve on the principle and fix these problems.

2012, 2013 and 2014 are all good years for seed to be harvested and by 2013 this can now be done from the plants growing in the first area that was seeded. 2011 sees all of the area east of Centre Track seeded. During 2012 and 2013 all of the areas west of Centre Track where the scrub isn't too thick are seeded. So *all* of the fenced section of Twelve Mile Plain that can be seeded (without clearing areas of Tall Shrubs that have become too thick for pasture) is seeded with native grass by 2013! About half of the area west of Centre Track germinates in 2014 with the rest waiting for the 2015 autumn rains – which come on the 5th April 2015 and continues for three days! Will there be a “follow up rain” in time? In actual fact, rainfall during April-May 2015 was about 70mm – an ideal amount and very timely for Spear Grass germination

Meanwhile! In the autumn of 2014, the first 500 hectares that were sown in the summer of 2007-2008 is becoming too thick! With only wombats now grazing on it, it is not being “kept down” and is starting to develop a “thatch” which suppresses subsequent germination. This would also have occurred in years past when the First People actively controlled kangaroo numbers (by harvesting them). Their solution was to periodically burn areas of grass to reinvigorate it *and* to stop the Tall Shrub encroachment. And so shall we! With the tractor and an appropriate implement we “cut firebreaks” around the 500 hectares. We also create firebreaks around delicate vegetation within this area that we do not want to have burnt.

Then, after the summer bushfire season is over, and with the aid of the Country Fire Service (CFS) who are willing to donate their time and equipment to attend a “training fire”, we “target burn” the heavily thatched areas of grass. This is timed to be ready for the first autumn rains following the end of the bushfire season, the “follow up rain”. Using the tractor and implement to cut firebreaks, the task of defending delicate areas is easier for us than it was for the Aboriginal people. They had to achieve the same by the laborious process of careful “back burning” first. The grass burns at this time of year because it consists largely of dry stalks and leaves – unlike chenopod shrubs (saltbushes) that need full summer heat and wind for the fire to run.

This fire kills off the excess Tall Shrub growth that had been (both in my fantasy world and more seriously also in the real world) rapidly spreading and smothering grass growing areas. Left another year or two and too many areas would not have had enough grass to “run a fire” during the cool weather day chosen for the job – it would be almost impossible to run a fire in shrubland at this



Photo 8: Good land on Portee Station, east of Moorunde, land that has not yet been hard-panned.

time of year as the shrubs would have thinned out the grass.

As it had rained a few weeks prior to the burn, and again relatively soon after, the grass quickly shoots away again. For the short time before the grass pick is available for the wombats, they manage well with the small unburnt patches, as they have been able to build up reserve fat on their rumps from the plentiful grass that was available prior to the burn.

Since the seeding of 2007-2008, there has been some considerable interest generated within the conservation, farming and grazing communities. So much so that we are inundated by visitors coming to inspect the burnt area after the rains “green it up”. We have a large area of native grass growing that provides an example to local farmers and graziers of what could be achieved on their properties, for primary production (sheep grazing). Farmers and graziers, being “practical people” are more receptive to information if an example is created and displayed to them on a scale similar to what they would want to do themselves – a demonstration that native grass can be easily and economically sown, with the use of accessible machinery, over large areas that are significant to a grazing business, as opposed to small scale hand sowing methods. Perhaps one of them is so impressed with our efforts that they decide to become a regular sponsor for more of this work to be done and donate enough money for the Society to purchase an additional 3,200 hectares of Portee Station adjacent to Moorunde’s eastern boundary?

A Brief Digression

I recently inspected this section of Portee Station (from the road that runs along its

southern boundary) and can only hope. It is land that once grew enough grass that (up until the 1990’s) it carried the densest population of Southern Hairy-nosed Wombats in the Murraylands district (and possibly the whole country). Land that at present is still mainly free of Tall Shrubs and therefore would be ideally (if fenced off from kangaroos and the rabbits baited) to be seeded with native grasses immediately and without any prior soil preparation required. As, although the soil here has also been extensively dug over by wombats digging for Thread Iris corms, the soil clay content is lower and hence it hasn’t yet been hard-panned (see photo 8). In any case, it is not important to eliminate the weeds as they protect the ground, and if furrows are cut prior to using the seed blower, the native grasses will readily establish and choke out the weeds – if grazing pressure is minimal during establishment. Soil preparation is only aimed at breaking up hard-panning and not weed suppression – that is a secondary benefit. As such, soil preparation would not be required in this area.

To the best of my knowledge this land is still for sale (as of April 2015) and it would be ideal to see it under the protection of an organisation prepared to have it revegetated with native grasses. Since the 1990s, this land now has the lowest population density of wombats in the Murraylands; but with minimal work, it could be relatively easy to reverse that. But this would need to be conducted before it becomes covered and smothered by woody weed shrub growth as is happening to too many other properties in the district, purchased as “country retreat” blocks and wildlife sanctuaries by people well-intentioned but possibly not well versed in the appropriate land-management and traditional pre-European land-use of this area. See photo

4 that shows land, which only a few years ago, was open pasture.

Back to “My Story”

So, by the spring of 2014, The Twelve Mile Plain has native grass back on it, using methods that produced the grass on my property as shown in photo 9. Only I don't have to burn mine because the few sheep I keep do essentially the same job! And that's how I know the problem of the “Pastures Present” is brought about predominantly by kangaroos and rabbits – but what to do about it? “Well... what would YOU do if your mother asked YOU?” (*The Cat in the Hat*, Dr Seuss).

As for the genie that said he would see me again in 2015, what does he have to say?

“John, you were dreaming!”

The most difficult part in conservation is getting people who may think they know what to do, to acknowledge somebody else that not only does know, but has also done it and is willing to demonstrate and teach others what to do. So the reality of “Pastures Future” is that the Twelve Mile Plain pasture and grasslands areas are already being encroached on by Tall Shrubs (Woody Weeds) and like the original area of Moorunde, it is only a matter of time before there will not be enough land not smothered by shrubs, to even grow enough Wards Weed for wombats to survive on, let alone highly palatable native grasses. In the case of the hard-panned claypans, these areas will eventually become too heavily saturated with rising salt to grow anything.

Photos 10 and 11 show some of my homemade equipment that I originally used to establish native grass pasture on my property at Cambrai. In photo 11, the square metal plate is attached to one side of a truck tyre, which acts as a rolling hopper. The other



Photo 9: Abundant native Spear Grass on my Cambrai property in 2014 – something that could have been on the Twelve Mile Plain!

side of the tyre has been left open so that seeds can be poured into the bottom of the tyre. The ripper attached to the tractor (and in front of the tyre) “breaks open” the hard-panned soil. As the tyre rolls along behind it, seed falls out through holes made in the outer edge of the tyre. It was found that seed was being distributed too fast, so every second hole was plugged with a bolt. I later turned these bolts around the other way, so that they stuck out further, causing the tyre to be lifted just clear of the ground and prevent the open holes from becoming blocked with soil, but still allowing the tyre to roll as it was pulled along

Later, I also made the “six row” seeder by modifying a large gas bottle (cylinder) and

fitting it between two tyres (see photo 12). In addition to sowing Spear Grass seed, I also used this seeder to sow oats for growing hay. Seed was placed inside the cylinder and distributed as the machine rolled along. The rectangular metal boxes attached to the cylinder are devices I made to facilitate an even flow of seed regardless of how full the gas cylinder was. When sowing Spear Grass seed, light gravel, limestone cat litter or even oat seed could be used as a transport medium to allow calibration of seed distribution rate and to draw the seed through the holes as the cylinder rotated. The purpose of the “arrangement” in front of the gas cylinder is to cut small grooves in the soil for the seed to fall into. However, for this device to work, the soil needed to be softened by cultivation first. At times, after first sowing oats, I would go back over the ground with Spear Grass seed, to provide a grass pasture for the following year.

I had tried sowing the two together (oats and Spear Grass), with the desire for the oats to germinate and grow for hay, not simply as a transport medium, but the Spear Grass seed had to be sown into open grooves and left for the weather to bury it. Which meant the cockatoos ate too many of the large exposed oat seeds before they could germinate and grow. On the other hand, the dormancy period of the Spear Grass seed meant that it would not germinate until the following year so would not have to compete with any of the annual oats that had survived the cockatoos. Hence it made an acceptable transport medium.

If Spear Grass was not so palatable, it would readily become a major weed! Meaning that it grows readily and spreads easily – so why isn't



Photo 10: Home made implement towed by tractor, sowing native grass seed. See next page for close-up.



Photo 11: A square metal plate is attached to one side of a truck tyre to form a rolling hopper. Holes are drilled in the outer surface of the tyre to allow seeds to fall through. Some holes are plugged with bolts.



Photo 12: My "six row" seeder made with a large gas bottle fitted between two tyres.

it growing or being grown on Moorunde and the Twelve Mile Plain?

Of "Pastures Past"

One final note on the "Pastures Past" of Moorunde and the Twelve Mile Plain. Since the Society established Moorunde Wildlife Reserve in 1968, there have been three periods when Spear Grass grew in such abundance that during following summers the "tall dry grass posed a serious fire risk" [Taylor]: 1973-1974, 1978-1979 and 1983-1984. In the summers following each of these periods (1974/75, 1979/80 and 1984/85), Ranger Duty on Moorunde had to be suspended due to the risk of car exhausts setting fire to "the tall dry grass".

The early managers of Moorunde put 1 and 1 together and came up with 2. They believed that it was the unusually wet winter seasons alone that caused the grass to grow like this.

There was however, another factor involved. They failed to put 2 and 2 together and come up with 4! "1982 experienced severe drought conditions, but good rains came the following year; so much so that in the summer of 1984/85 native grasses again created a fire hazard resulting in some access tracks being closed to vehicles." [Taylor]

Each of these periods when grass grew in abundance was *preceded by a severe drought!*** This means that the rabbit population would have been decimated. Following such declines, rabbits are slow in recovering their population densities; taking several years. They also require fresh green growth to stimulate breeding activity [Coman]. So these three particular events, that were exceptionally wet seasons,

** In particular, 1972, 1976-1977 as well as 1982 as indicated by Taylor.

coincided with low rabbit density as well as low kangaroo and wombat densities (also reduced from the drought period) – a combination of factors that allowed the grass to grow in great abundance.

However, above average rains *are not required* to germinate Spear Grass and get it going. All that is required for germination is good early autumn rain to arrive before the ground gets too cold, and any average year of rainfall is sufficient for it to grow – provided that the grazing pressure is not too high and the plants can seed down in spring. For *Austrostipa eremophila* (Desert Spear Grass, the most important species of native grass for wombat breeding and recruitment [St John & Saunders]), rainfall any time after the first week of February and before the end of the first week of May is the crucial event for germination [Personal observation and research]. Grazing pressure must then be controlled, as excessive grazing pressure keeps the plants low and prevents them from running up seed.

The Outlook

The early managers of Moorunde Wildlife Reserve used the observations of the three extraordinary wet season events to discount my advice whenever I talked about restoring the native pasture grasses, suggesting that we had simply not had the rainfall events subsequent to those particular occasions, necessary to see grass on Moorunde. Citing these anecdotal accounts, with little or no supporting evidence has further generated mistrusts in the minds of others about the potential for native grass restoration and negatively impacted proper decision-making. For this reason, I feel that the primary threat to the native pasture of Moorunde and the Twelve Mile Plain Wildlife Reserves, together with Brookfield, Swan Reach and Ridley Conservation Parks plus all of the private sanctuaries, is people. People (for whatever reason) allowing kangaroo numbers to get too high, people not controlling rabbit numbers and people believing that the invasion of open areas by shrubs is a "good thing" for conservation.

Unfortunately, the casualties of these actions, inactions, attitudes and decisions by people, will, in the long term, be the Southern Hairy-nosed Wombats of at least the Murraylands region. Their population is already rapidly declining to the classification of "vulnerable" in their former most abundant areas. They will, I believe (as do some others), soon become "endangered" and in the long term probably extinct in this area.



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