Proc. Eleventh Ann. Conf. Grassld. Soc. NSW, 1996, pp. 34-40

NATIVE AND NATURALISED GRASSLANDS:

Thinking holistically on the saltbush plains

Mark Rowe

"Fernbank", Colleambally

Summary: The theme of this conference, "the art of grazing management" is very apt at this point in our history, because farmers worldwide are facing enormous economic and environmental challenges to survive The truly great artists creat masterpieces from within. Now is the time for us as farmers to opt into this inner wisdom and unleash the power of creativity that we all have, to find real answers to these challenges. Holistic Resource Management offers a model of goal setting and decision making that can assist us to focus on our real purpose.

There is little doubt that the Riverina has a vastly different ecosystem from that which existed only one hundred and sixty years ago. No doubt it was also different then from prior to settlement by the aborigines. I see little point in arguing about what might have been because we cannot turn back the clock and start again. What we need to do is draw on all the knowledge available as well as our inner wisdom to create ecosystems that are bio-diverse, productive and ecologically sustainable.

Who pays? I believe the whole community should provide some input into restoration of biodiversity that was mined many years ago, not just the current tenants. Perennial species are the key ingredients of such an ecosystem and native perennial species require grazing as well as periodic rest from grazing for their survival. Old Man saltbush has an important role to play in a balanced pasture.

Holistic Resource Management (HRM) offers a decision-making process that aids as a very powerful focussing tool. HRM operates on the principle that nothing in nature exists in isolation, rather that all beings are interrelated in complex series of wholes.

There is a growing trend for consumers to source clean/green food, fibre and other products. The Australian rangelands are uniquely situated to produce some of these products. Great caution needs to be exercised if such promotion is used, to ensure that products are genuine and not just pseudo-clean. One of the reasons farmers throughout are experiencing financial difficulties is because food is too cheap and this may be one way for some farmers to add some value to their produce.

Our planet is being subjected to enormous duress and sometimes we might think that the problems are too big for us to influence. Not so! We can all create change, but nothing changes until we do and if we are not a part of the solution then we are part of the problem.

Returning to Original Condition

Benson (1996) states that "botanical studies of the native lowland grasslands of south-eastern Australia reveal that little remains in original con-dition and they rank among Australia's most threatened ecosystems". This is quite likely the case but what in fact is this "original condition" that we should be striving for? Is it the condition before Europeans with their grazing animals or pre-aborigines with their fire? There is probably little to be gained by arguing either way because so much has changed since either time especially in relation to the introduction of exotic plants and animals. I believe the best we can aim for is an ecosystem that is as biodiverse as possible, encouraging the native species, especially perennials, allowing production but ensuring ecological sustainability.

Historical records seem to give contradicting views of the Riverina but perhaps that is an indication of the diversity of the region or maybe just different perceptions of the same region? For example, Oxley, in about 1817, doubted that "...these desolate plains would ever again be visited by civilised man", describing the region somewhere between Griffith and Rankins Springs (Green 1974). And Sturt stated "... nothing could exceed the apparent barrenness of these plains or the cherrlessness of the landscape." But, interestingly he adds "... soil upon them was soft and yielding..." (Green 1974).

However, Gammage (1986) recalls some very different views ..."Early white settlers found the Eastern Riverina 'a pastoral paradise, worth the ransom of a thousand kings', with kangaroo grass waving to the flaps of their saddles, the bush alive with flowers and game, the seasons softened by native grasses shielding the plains from the summer sun, and swamps and springs giving clear water even in droughts. As late as 1877, for example, the 'lagoons' along the Yanko and Colombo Creeks were thought more valuable than the creeks themselves...".

But there is also evidence to suggest that destruction of the existing ecosystem after the introduction of sheep and cattle was rapid and extensive.

Settlement of the Narrandera/Hay regions took place between 1835 qnd 1845. "With the extension of fencing (in the 1870's and 1880's) there was a substantial increase in sheep numbers in the Riverina" (Buxton 1967). "The demands of this ever-increasing stocking rate together with the drought years of 1883-85 and 1890-94 and the heavy rabbit infestations from the late 1870's to the mid 1890's resulted in exploitation and substantial degradation of saltbush and grassland pasture. Clearing of eucalypt and white cypress pine woodlands was a feature of the period from 1860 to 1894" (Leigh and Noble 1972). There were once five pine sawmills operating in Deniliquin, there are now none!

Gammage (1986) quotes Rolf Boldrewood who wrote in 1865 that...."kangaroo grass fed stock well even when withered, but that by then almost none was left...". "Within a decade of the coming of the white men the grasses which brought them were disappearing."

"Both cattle and sheep destroyed the other valuable feed, saltbush - it grew east of the Shire area (Grong Grong, Galore) in the 1830's, was confined to the Shire's western third by the 1950's, and barely reached the Shire's boundary in 1986" (Gammage 1986).

"Within fifty years an extraordinary degradation had occurred." Valuable perennial grasses had been replaced by less nutritious annuals that were almost useless in the summer. "Summer, once the time of maximum stocking rates now (1884) set the limits of carrying capacity." "By the 1930's summer handfeeding was common." "The pastures had been made seasonal as in Europe..." (Gammage 1986).

A similar picture has been painted by Bean (1910) of the Cobar region..."In the years 1880 and 1881, before this district was stocked... the country was covered with a heavy growth of natural grasses - kangaroo grass, star grass, blue grass, mulga, and other grasses. The western half of the district abundant with salt- and cotton-bush, together with the grasses mentioned. The ground was soft, spongy and very absorbent. One inch of rain, in spring or autumn then produced a luxuriant growth of fresh green grass ...Ten years later twenty inches of rain might fall but that vegetation sprang no more"

And in reference to the Hay district "... gradual but wholesale destruction of native grasses by heavy stocking year after year without rest, was reported in 1882 and subsequently the rabbit plague came to complete the devastation" (Green 1974).

And Ronald (1960) "... at the present time the plains grow only grass and herbage where perennial bush grew in the early days, I do think that even now the most distinctive features of the country are plains and saltbush" (p. 162).

These accounts as well as the very detailed observations provided by Kiddle (1931) of the change in vegetation on "Steam Plains" indicates how the greatest changes (in terms of area affected) to vegetation in the Western Riverina have been caused by grazing management not by ploughing and I suggest that this will continue to be the case, something that SEPP 46 and the Grasslands Management Plans don't address. It is clear now that early graziers were mining bio-diversity that had accumulated over many years prior.

Variabilty of Seasons and Soil Types

It has often been said that the only reliable aspect of rainfall in the Western Riverina is that it is totally unpredictable in terms of quantity and distribution, and the so-called annual average is just a mythical number contrived from a random collection of numbers!

This variabilty creates an enormous challenge and I think the most difficult decision I faced as a manager in the Western Riverina was deciding on a suitable stocking rate. Unfortunately, stocking rate decisions are made on a short-term basis eg keep or sell 6 year-old ewes or wether lambs, or perhaps take on agistment cattle, but seasonal fluctuations occur on a much longer term basis, where droughts tend to build up over a number of seasons. So, perhaps in good years maybe the temptation to add more stock should be resisted to allow the build-up of biological capital that will help stabilise production some years hence.

One of the positive aspects of variability in the Riverina is the range of soil types that are present and which often change frequently in a single pad-

dock. Different soils respond in different ways to rainfall events and this leads to a greater diversity of plant species overall.

I suspect the best way to cope with the variable rainfall is to encourage more deep-rooted perennial plant species which are able to respond to even small falls of rain at virtually any time of the year and have the ability to draw moisture from a much greater depth than shallow-rooted annuals.

Should we get rid of the stock altogether?

Some people suggest that removing all sheep and cattle forever will ensure the return of all the wonderful perennial species. They are right, in the short-term, but for long-term survival and prosperity perennial grasses need animals just as much as animals need them.

Benson (1996) in his comments on managing native grasslands states that "Without disturbance, species diversity is lowered." This certainly appears to be the case from my observations of two former Soil Conservation Service exclusion sites at Paradise (south of Hay, est. 1951), and Tchelery (north-east of Moulamein,est. 1952) where there is not a very diverse range of species. Bladder saltbush has assumed dominance and is obviously better adapted to almost total rest (native animals and rabbits are not excluded) than perennial grasses.

This intermittent disturbance as suggested by Benson is probably why the majority of stock routes in the region have a good diversity of species despite carrying at times very large numbers of stock. I see a real danger in the trend in the Hay and Deniliquin regions of stock routes becoming revenue raising agistment paddocks rather than travelling stock routes. There is a likelihood that stock will stay too long and eventually deplete the bio-diversity of the routes.

Benson (1996) also highlights the lack of knowledge about when and how this disturbance is required. Probably the reason for this is that such research would have to be conducted on a very large scale across a range of different sites for a long period of time to ascertain which were merely seasonal influences and which were in fact management induced.

Benson also believes the main challenge in obtaining landholders' co-operation in native grassland management is to persuade them to appreciate the importance of native grasslands for both production and conservation.

I believe he is right but the key to succesfully achieving this would be to demonstrate that the two (production and conservation) need not be opposing parameters but rather complementary ones, meaning that a more bio-diverse ecosystem would be beneficial from a conservation viewpoint but would also provide more stable and ecologically sustainable production and probably increased production in the longer term, if well managed.

Grazing management systems

It is widely acknowledged that there is a need for a greater bio-diversity of living organisms in our ecosystems and especially the value of deep-rooted perennial plant species, in ecologically sustainable production in the Riverina, but it seems there is little advice available about how to encourage these species.

Wilson (1984) and Lodge (1995) discuss at length whether or not a grazing system (other than set-stocking) is desirable. I think they have both missed the key point which is described in Wilson's Principle 6 "... that grazing systems favour perennial species and continuous grazing favours annual species."

Because of this observation, it seems to me to be not an issue of whether or not a grazing system is needed but in fact which grazing system is most suitable.

"The type of grazing system that is needed for a range will be one that gives the appropriate rest from grazing for the desirable species. However in most cases we do not yet know the timing or length of rest period that favours the growth of these desirable species" (Harrington *et al.* 1984). And I would suggest that the timing will be different every year because of seasonal climatic variations.

A grazing system that permits grazing of a small portion of a property for only a few days, followed by a long rest will expose a much smaller quantity of desirable grasses to risk of damage at a critical time that we may not be aware of until after the event.

Wilson (1984) also states that "the wide advocacy of one system for all range types (*e.g.* Savory 1978) should be rejected." My understanding of Savory's Holistic Resource Management (HRM) system is of a series of guidelines that need adapting to individual properties or regions. A critical part of the HRM model is constant monitoring, controlling, and replanning if necessary. The HRM system offers a total package to teach ourselves in the real

world and is about doing, not waiting for some scientific experimentation that may never come and may be meaningless to our part of the country anyway.

Holistic Resource Management

The HRM model is a decision-making process that does not start with assesing grazing systems, or animals or even land, it begins with a definition of the "whole" that is being managed and then the key to the whole system which is the formulation of a three-part holistic goal. To create this goal it is necessary to dig deep within to ascertain your innermost values and also list forms of production and the future resources base, to complete the three parts.

All decisions are then tested against this goal with seven questions, the last of which relates to Society and Culture - how do you feel about the impact of this decision. I believe this part of the HRM model is an extremely powerful focussing tool, not just for use in grazing , but in any business, and indeed for any individual to ascertain their life's purpose and direction.

This goal-setting technique also encourages us to 'get out of the head and into the heart and soul' to really address our values. Unlike most motivational and goal-setting training where you come home from a seminar all fired up, for a week, or a month, then it all gets filed in the bottom drawer and maybe dragged out once a year for a quick look, HRM becomes part of your everyday life where decisions are constantly tested to determine whether in fact they will lead you towards your goal.

One of the arguments against using a grazing system is that greater management skill is required to avoid disasters. I would say this is not correct, provided "normal" stocking rates are maintained (in the short-term at least). What is needed are different skills, especially the ability to focus attention more on plants and soils than on grazing animals. Healthy soils grow healthy plants which produce healthy animals.

An aspect that I think should warrant us to look hard at Savory's views is that his recommendations have evolved from his observations of nature. Although trained in botany and zoology he eventually refused to conduct "scientific" experi-ments because he came to the conclusion that immediately a boundary is drawn in nature the "whole" has been altered and any outcome from the experiment has been tainted.

Savory doesn't believe that he has all the answers, far from it, all he is offering is a model for people to use to break out of conventional decision-making processes and to create the environment for new ideas to sprout and grow and help to overcome the global degradation that is currently taking place (Savory, *pers. comm.*).

I do not have a vested interest in promoting HRM, I just believe it may help us find some answers. It is not a complex system which should also be in it's favour because the best solutions are usually the simplest.

A very good example of a lack of a holistic approach can be drawn from the observations of Bull (1956) "... there were many different species of birds before the rabbit poisoning campaign. Wheat, pollard and water were all poisoned so naturally the deaths among them were terrific. The wild turkeys disappeared altogether; they were large in numbers previously... I consider the birds were of great value in keeping down the insect pests, damage done by grasshopppers, *etc.*, being negligible in those days before poison was used."

It could be that this loss of bird life enabled the boree grubs to overpopulate and destroy large numbers of boree trees and led to a complete change in thought of their value as a tree. Kiddle (1931) comments "... though there is an abundance of young boree trees growing, which would soon reforest the counry if protected from sheep, such precautions would only result in fostering them for the benefit of the caterpillar."

Most responsible land managers aim to *leave the land in a better condition than they found it*, but most have got no plan of how they will achieve such a goal. Most energy is consumed in short-term economic survival. The HRM model offers assists in focussing our energies.

It is worth remembering a quote attributed to HRH Prince Phillip "... we do not inherit our time on this planet from our parents, we borrow it from our children."

One of the problems I have had in writing this paper is that my thoughts are changing rapidly at present and once committed to paper are at risk of becoming locked in a time warp. Having been written neartly three months prior to the Conference it is very likely that my view will have shifted some more by then. In fact even while writing this I realised that my choice of title could have been better because we have to go beyond logical thinking to find the real answers. Perhaps another title could have been "Being Holistic..."?

Savory makes a similar point that he was reluctant to set his ideas in concrete (*i.e.* write a book) despite repeated calls for him to do so, because he is constantly updating his thoughts and ideas as new information comes to hand. However by 1988 he considered he had a good solid nucleus to commit to print and he has developed a very comprehensive quarterly newsletter that provides updates of the latest knowledge.

Different ideas will always attract criticism especially from those who may have spent a lifetime developing and promoting a contrary view. At the end of the day we each have to decide our own truth.

Old Man saltbush

Old Man saltbush (OMS) has an important role to play in the rehabilitation of the Riverina because of its versatility and durability (if grazed correctly). It seems to be able to colonise and produce adequately on all soil types, ranging from sand to cracking grey clays.

OMS has crude protein levels of 10-17%, digestible dry matter of 65-70%, and reasonably high metabolisable energy (Scholz, 1996). Apart from its nutritive value it can provide excellent shelter, soil surface protection, and a phenomenal drought reserve.

While the cost of establishing OMS using seedlings appears very high it could be a matter of perception because if this capital cost is factored over the one hundred or more years expected life of the plant (with nil running costs as well), the perception may change.

However I believe that establishing OMS from seed is more possible than we are led to believe. It may take a little longer to achieve the desired density of plants but what is a year or two when we are talking one hundred years of production. The big advantage over using seedlings would be that vast areas could be established for minimal cost, especially if you harvested the seed yourself. This way there could be saltbush scattered through all paddocks as welll as special purpose hi-density areas.

It is often stated that a germination event for OMS only occurs one year in fifty. I have been able to find seedlings every year for the last five years so I suspect the one in fifty belief has been influenced by other beings (*e.g.* rabbits and sheep!)

Clean and green

I see artificial chemicals in food and fibre and animal welfare as two sleeping giants that will awaken sooner rather than later, and cause chaos for unprepared farmers. We need to be proactive and anticipate the likely challenges in these areas because problems are already emerging and the trend will be to escalate not to disappear. For example, I am not sure how we can justify locking hens in cages with an area equivalent to a small dinner plate (450 cm^2) to live in ,where sunlight is never seen, to produce eggs for one dollar ($1.00) per dozen less than a free-range equivalent, (Coles 1996 retail prices).

High input farming and grazing is not sustainable on simple economic grounds let alone considering the long-term ecological (and ulti-mately economic) consequences of poisoning our soils. For example superhosphate is made from a finite resource that will eventually run out. When supplies start to deplete and the price increases ten fold you can bet the returns being made will not have increased ten fold.

Australia needs to be very careful in promoting ourselves as clean, green producers, because our farming methods are no better than those elsewhere, it just happens by accident that we are further away from the heavily polluted densely populated areas of the globe. But we should certainly harness this geographic advantage and produce these clean products that the will be in greater and greater demand world-wide. However we must be very careful that these products are in fact clean or the advantage will vaporise.

Stafford-Smith (1994) comments that graziers in the rangelands are ideally placed to produce these clean products, free of chemicals obtained sustainably from lands which do not compete with more intensive agricultural regions. He suggests that there may be a need to decrease stocking rate to maintain reliable continuity and quality of supply. A higher price for the products as well as a more stable ecosystem (and business) would be the rewards. Co-operation over vast areas would be needed to guarantee sufficient marketable quant-ities.

'Value-adding' is a well worn phrase, but still one we need to heed to survive in agriculture. The wool industry will not prosper until those involved in all sectors of the wool pipeline break out of the paradigm that wool must remain a bulk commodity, just another industrial fibre! All sectors must really focus on the unique qualities of wool and work with these to develop products like no other so that consumers are prepared to pay a handsome premium for them.

Elite, chemical-free wool and meat are products

that could easily be produced from the rangelands, as well as a huge array of native foods. Tourism is already an important contributer to the economy of rangeland areas but could be developed to a far greater extent. But we should also be wary of limiting ourselves to "conventional" production methods.

Cheap food and fibre

One of the reasons why farmers world-wide are in serious economic trouble is because food and fibre is too cheap. Most consumers wouldn't agree with that statement but that is because much of the cost of their purchases has been added by processing, packaging, marketing, distribution, etc., and a very small proportion is to pay for the agricultural raw materials within.

We need to find a way of returning more revenue to responsible farmers so that they can put more resources back into their environment and take a little less out.

Intuition

"Doing is understanding." "Of course we make mistakes; it's how we learn. We're all in training. Life can be difficult; what an opportunity!" (Millman 1980). It is in difficult times that we can learn the most, unfortunately it often takes a crisis for things to get difficult enough to learn the lesson.

Perhaps one of the reasons I have been drawn to HRM is because, like Savory (1988), I believe the answers to our demise lie with nature. For too long we have manipulated and abused her thinking that we know better, than her, but we are now finding that much of this manipulation is turning against us (*e.g.* salinity and acid soils). If we are prepared to listen, look, feel and trust our intuition, the answers will appear.

It appears to be a vicious circle with economic pressures pushing us further away from nature and further away from real solutions. A simple example is the evolution of the motor-bike taking over from horses for mustering because of the need to achieve greater productivity per labour unit. Some of my fondest memories are as a jackaroo heading out before sunrise on horse-back in the summer to do some mustering and walking along with a horse behind a mob of sheep in the autumn or spring enjoying the scenery and listening to the birds singing.

No doubt the marketing gurus would say I should have had a walkman with me with a motivational tape explaining how I could improve the productivity of this inefficient system. Well, I wasn't into marketing at the time, but it happened anyway, soon enough with motor-bikes replacing the horses.

There are many other examples of our continued manipulation of the environment which can only lead to a loss of productivity in the long-term (*e.g.* herbicides, pesticides).

Farmers/graziers have the perfect opportunity to get closer to nature to find the answers, but most of us don't allow ourselves the time. We must learn to trust our intuition. The great artists and performers created their works from the soul not from the head. Eventually there will emerge great artists of grazing management, perhaps history will record that Savory was one?

I have no doubt there is much yet to be learned from the writings of great philosophers like Rudolf Steiner. The wisdom he left with us on a huge range of subjects is quite awesome. The bio-dynamic farming system he describes involves working in harmony with nature's forces and rhythms and utilising these unseen elements to help produce food and fibre in an ecologically sustainable way.

Conclusion

The vegetation in the Riverina has changed dramatically over time. There is no point freeze-framing a particular period in the past and trying to emulate the ecosystem that was present then. Too much has changed. What we can do is draw on all the knowledge that is available, both past and present to create ecosystems that are biologically very diverse and are capable of ecologically sustainable production.

There is a need for more native perennial species in the rangelands. Perennial grasses and shrubs respond favourably to periodic rests from grazing, so there is a need to develop grazing management systems that include rest periods, unlike conventional set stocking.

Holistic Resource Management is one grazing system that is a complete package and can be adapted to any individual or business. The real power of HRM lies in the goal setting and the decision making process.

Table 1. Production from Auustralian Rangelands (1991/92) from Stafford-Smith (1994).

	$(billions)
Pastoralism	0.8
Tourism	3.0
Mining	10.0

Australia's rangelands offer unique global conditions for the production of clean and green products that the world is beginning to demand. Farmers throughout the world are facing enormous challenges, with food too cheap and our our constant manipulation of nature beginning to have devastating results. We have to get closer to nature and look within to find the answers to these challenges.

References

Bean, C.E.W. (1910) On the Wool Track, Angus & Robertson, Sydney. p. 48

Benson, J. (1996) Conserving native lowland grasslands in south- eastern Australia. A paper presented at the 'Conservation outside nature reserves' conference held at the University of Queensland, Feb 5-8, 1996.

Bull, W. (1956) Menmoirs of the late W.T. Bull:- 1867-1956 p.14.

Buxton, G.L. (1967) The Riverina 1861-1891-An Australian Regional Study, Melbourne University Press, Melbourne.

Gammage, W. (1986) Narrandera Shire. Bill Gammage. Australia, p. 222-3.

Green, R.R. (1974) Untitled paper delivered to Hay Historical Society, Unpublished.

Harrington, G.N., Wilson, A.D., Young, M.D. (1984) Management of Australia's Rangelands. CSIRO.

Kiddle, R.G. (1931) Observations recorded in the Pastoral Review.

Leigh, J.H. and Noble, J.C. (1972) The Riverine Plain of NSW - Its pastoral and irrigation development. CSIRO.

Lodge, G.M. (1995) The role of grazing management in sustainaing the pasture community. *Proceedings of the tenth annual conference of the Grasslands Society of NSW*, p. 34-40.

Millman, D (1980) Way of the Peaceful Warrior. Kramer, California, p. 211.

Ronald, R.B.(1960) The Riverina - People and properties. Cheshire, Melbourne, p.68.

Savory, A (1978) A holistic approach to range management using short duration grazing. Proc. First Internation Rangeland Congress, Denver. 555-557.

Savory, A (1988) Holistic Resource Management. Gilmour, Zimbabwe.

Scholz, G (1996) The Nutritional and Grazing Value of Saltbush. Department Land & Water Conservation NSW Technical Bulletin.

Stafford Smith, M (1994) Sustainable Production Systems and Natural Resource Management in the Rangelands. Outlook Conference 1994.

Wilson, A.D. (1984) Principles of grazing management systems. *Proceedings of the Second International Rangelands Congress*, Adelaide. p. 221-5.