Submission to the Senate Inquiry into the Lower Lakes and Coorong.

Senate Rural and Regional Affairs and Transport Committee

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Whilst touching on many areas, the points raised in this paper most directly relate to the following items in the Committee's Terms of Reference: 1 b ii, iii, iv, v
1 c
2 c, g

This submission is a discussion paper on the Lower Lakes and Coorong rather than a firm proposal.

This paper is based on the work of Peter Andrews at his previously owned property, Tarwyn Park, (now owned by his son, Stuart Andrews) in the Upper Hunter Valley region of NSW and extensive observations of the Australian landscape more generally.

My wife and I inspected Tarwyn Park with Peter Andrews last November. Over the course of a week we observed the extraordinary levels of fertility, in-ground water retention, high in-ground water pressure (evidenced by a well with water rising to 1m above the water table) and lush green vegetation whilst neighbouring properties were brown.

Peter Andrews had transformed Tarwyn Park from a degraded incised stream into a natural and agricultural oasis. I believe the principles he used there could transform the Murray Darling floodplains and restore the Lower Lakes and Coorong to health. Ramsar sites would be rescued and degraded areas would be converted into wetlands of world significance. In addition, urban water supplies would be secured.

Australia or Europe?

As Peter Andrews points out, Australia's approach to agriculture and irrigation has been 'euorocentric'. It has been based on the European model of freeze and thaw. But the Australian landscape was different from Europe. It relied on rain events. Water did not flow freely in incised rivers. It moved slowly through plants and ponds within the landscape, re-hydrating the soil, distributing fertility and preventing evaporation. This is the paradigm that Peter Andrews has replicated at Tarwyn Park. This is the paradigm that needs to be applied throughout the Murray Darling and in the entire Australian landscape if we are to address and reverse the water, soil and salinity crises we are experiencing today.

…/2

Lower Lakes and Coorong

How does this relate to the immediate issues of the Lower Lakes and Coorong?
A weir, albeit 'leaky', at Wellington is a proposed solution. A weir will arrest the flow of salt from Lake Alexandrina to the River Murray but it will accumulate river salts behind it, thus contaminating water earmarked for metropolitan Adelaide.

What might a Natural Sequence solution look like?

Instead of a weir we might see engineering works that would turn water on water, using the force of water itself to slow the flow. The slowly moving water would be directed to recharge areas via contours and newly constructed wetlands would feed agricultural areas through in-ground, non-evaporative percolation. Vast plantings of trees, shrubs, reeds, and grasses would provide huge retention of water through the **daily water cycle** of evapo-transpiration and dew.

The surface area of the Lakes would be reduced, thus reducing evaporation. The action of the daily water cycle would return water to the system via the natural action of plants. The presence of the plants would also cool the environment thus reducing evaporation. In addition, the extensive plantings of trees and associated plants would reduce the evaporative effect of winds sweeping across the lakes.

The Lower Lakes are relatively shallow but have a surface area of 81,000 hectares. Annual evaporation, on average, is 745 gigalitres. [Murray Darling Basin Commission Technical Report 2001/11 p2.]

This is approximately twice the annual water consumption of metropolitan Adelaide.

Hence, reductions in surface area, coupled with the other benefits of the Natural Sequence approach, could yield a net increase in water availability for ecological stability and require less draw-down from the River. A healthy (albeit smaller) wetland area at the lower end of the river system must augur well for the river's health and the quality of water for Adelaide. Hopefully the insidious crawl of salt going upstream from the mouth – to meet the salt-laden water coming down stream, could be ameliorated through the filtering effect of the wetland area whilst maintaining healthy turbulence and aeration where the water bodies meet.

The application of Natural Sequence principles at the southern end of the Lakes near the mouth, involving further major plantings, perhaps including mangroves, could further assist in the ecological health of the wetland system.

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To reduce surface area of the Lower Lakes is not a radical suggestion. Rather, it would return the status quo as documented by an early observer, Laurie Mincham (1885-1980) in his memoirs of the Meningie/Lake Albert/ Milang districts.
[Reference: *The Coorong and lakes of the Lower Murray* by Tom McCourt and Hans Mincham, 1987.]

He makes reference to ducks near Lake Albert… "in the tall grass,... reeds and bulrushes around Lake Albert. Weeds grew and covered the lake for a mile out in places, and in these weeds lived all sorts of snails and various kinds of insects … it was a great place for wildlife." p155.

"In those days the shore of Lake Albert was overgrown with lignum, reeds and many water grasses, and flags and fern weed used to cover thousands of acres around the lake." p155

Further, written in 1966: "I have often been asked what the large piles, out in the Lake from Meningie, were for. …years ago when the weeds grew out in the lake for three quarters of a mile, the steamers, coming three times a week to the jetty, kept a clear channel about a chain wide through the weeds." p162.

"Then later came the barrage … The barrage, which filled the lakes to flood level, did not improve conditions for fish and wild game, the high water keeping all low-lying swamp land covered. Instead of 50 to 100 yards of beach around the lakes, the water is now splashing and eroding the banks, and there is nowhere for ducks to rest or feed." p156.

Wetland
The whole of the Lower Lakes region could become a wetland of international excellence. Regional economies would flourish through agricultural and commercial vitality and tourism. The Ramsar sites of the region would become the focus of global celebration rather than international concern.

Relatively open areas could be preserved for boating and recreation, especially near Goolwa. However, the introduction of sea water into the Lakes would result in an environmental collapse. Evaporation and the lack of flushing would soon render the Lakes far too salty for marine life and they would resemble Lake Eyre within a few years.

Irrigation
The application of Peter Andrews' Natural Sequence Farming (NSF) principles to the floodplains would result in huge savings of water. Increased **soil organic carbon** would

…/4

in itself lead to more efficient water use. As noted by Dr Christine Jones, (with reference to the research of G.D. Morris), an increase of 1% in soil organic carbon at a bulk density of 1.2gm/cubic cm to soil depth of 30 cm results in extra water retention in the soil of 144,000 Litres per hectare. [ie 144 tonnes/ha or 14.4L/square metre]. A 2% increase would double the water retention and so on.
[Reference: Dr Christine Jones, 'Carbon, air and water – is that all we need?' Address given at the Katanning Workshop 'Managing the Carbon Cycle', 21-22 March 2007.]

It is reasonable to expect a 30% - 50% reduction in water use for irrigation using NSF principles. The temptation for growers would be to double their production to take advantage of the extra water, but this water should be preserved for environmental flows. Government controls would be needed to ensure compliance.

Bringing forward of Government funding for irrigation infra-structure should be a priority. Use of open irrigation drains and flood irrigation results in vast volumes of water being lost through evaporation. These practices are not viable in the current Australian landscape. Government legislation and, if deemed appropriate, assistance to growers to convert to more water-efficient methods, needs to be implemented as a matter of urgency.

Peter Andrews' NSF system also brings into play the powerful effect of the **daily water cycle.** This is a process that is virtually ignored in conventional farming systems. By setting up the conditions, through extensive increases in **green area** (trees, shrubs, understorey, grass and weeds) for enabling and catching dew, the NSF system significantly reduces water loss through evaporation.

Hydrology is another key element in the NSF system. Water moving below the soil surface carries nutrients and does not evaporate. This is how the Australian landscape functioned so efficiently for thousands of years. As stated in *Back from the Brink*, the loss of plants has reduced evapo-transpiration, with its vital rain-promoting effect, and has brought the Australian landscape to the brink of collapse through **salinity**. Peter Andrews argues that **plants** are the only way to control salinity.

Climate Change
In addition to the above points on water for the Lower Lakes and Coorong, it is important to recognize the significance of NSF in cooling the globe. Green plant area, in itself, will reduce atmospheric temperatures but the value of soil organic carbon goes much further. It has been suggested that the fastest way to reduce, indeed reverse global warming, is through the soil. Newly planted trees take many years before they lock up more carbon than they emit. As Dr Christine Jones puts it,

'Soil is the greatest carbon sink over which we have control.'

…/5

It has been estimated (Tim Wiley, Development Officer with Western Australia's Department of Agriculture and Food quoted in Ecos magazine Feb-Mar 2008, p29) that perennial pastures sequester 5 to 10 tonnes of CO_2 per hectare annually. He is advocating perennial pastures in the 2 million hectares of poor soil in the northern agricultural areas of WA. Wiley estimates that all WA's emissions could be soaked up by carbon-sequestering soils. By extension, such soil management practices, used widely across the world, could indeed reverse global warming.

Tarwyn Park is visible evidence of massive carbon sequestration. The weeds that Peter Andrews has encouraged and slashed, thus returning fertility and carbon to the soil, are a key to the speed of change that is possible. Weeds add diversity, minerals (brought up by deep roots), and soil-building exudates (sugars via photosynthesis) that enhance the water-holding capacity of the soil and lock up carbon.

It should be noted that the type of plants (many referred to as 'weeds') present in a landscape are an indicator of soil conditions. As these 'weeds' are slashed and allowed to break down in the soil, subsequent plant growth in that soil will reflect improved soil biology. This is in line with the research findings of Dr Elaine Ingham where she noted the successional movement of plant types as soil improves. Peter Andrews, for example, has seen weeds give way to higher order grasses and has observed casuarinas out-competing willows in a successional process. (The willows had provided the soil nutritional conditions for the casuarinas to thrive.) Major stands of Casuarinas have been endemic in the Lower Lakes area.

Australia is experiencing a crisis in water, soil and salinity. I believe the application of Peter Andrews' Natural Sequence Farming principles can bring about the most rapid, sustainable solution to this issue and I encourage the Senate to investigate this option as a matter of urgency.

I represent Peter Andrews in South Australia and would be happy to elaborate on this paper. I would also encourage members of the Committee to take up Peter's open invitation to visit Tarwyn Park where, under his expert guidance, the landscape itself best tells the story.

Key components of Peter Andrews' Natural Sequence Farming system:

Plants Hydrology Green area Daily water cycle Salinity
Soil organic carbon

…/6

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I draw the Committee's attention to a separate paper by Mr Duane Norris:

'Peter Andrews and Natural Sequence Farming Since 1974'.

Mr Norris has documented key information that is significant in relation to the implementation of Natural Sequence Farming principles and records the wide acceptance of Peter Andrews' ideas in the Australian and international scientific communities.

Peter Andrews and Natural Sequence Farming[1] Since 1974

Compiled by Duane Norris[2]

10th September 2008- UPDATED

Preamble

This brief is intended to provide some insight to the motives of Peter Andrews as it relates to his current dealings with the Federal Government. It provides an interpretation of some of Peter Andrews's theories and views and gives a summary of his encounters with science, government and the general community to this point. Finally, the paper provides recommendations for a potential way forward for Government, as a key stakeholder, in working with Peter Andrews and the emerging NSF movement in addressing sustainable land-use, water management and climate change issues. Information in this paper has been sourced from Department of Environment Water Heritage and the Arts file records and from discussions with key people, including Peter Andrews himself.

Introduction

Peter Andrews is a grazier and racehorse stud master from Bylong in the Upper Hunter Valley. Through a lifetime of observation and experimentation, Mr. Andrews has gained fundamental insights to the natural functioning of the Australian landscape that, many would argue, leave him almost without peer. He has applied these insights in restoring his and other properties to fertility levels that he says exceed those which existed before European arrival in this country.

Mr. Andrews has been well known in organic agriculture circles and the racehorse industry for many years. However, in 2005 he reached a national audience when he was featured on ABC's Australian Story over two episodes. These episodes were to become the most popular in the program's ten-year history. The following year he released a book introducing his many experiences and theories about landscape function to the public. To this point the book has sold nearly 50,000 copies, increasing at about 300 a week.

More than 20 years after first going public with his theories about landscape function, water conservation and sustainable agriculture, Mr. Andrews is now gaining significant traction with agricultural communities throughout Australia, as farmers and NRM professionals grapple with continuing drought and the prospect of dramatic climate change.

Tarwyn Park

In 1974, Mr. Andrews bought a run-down 2000-acre grazing property called Tarwyn Park, near Bylong in the Upper Hunter Valley. Taking an adaptive management approach, he then set about testing the theories that he had been developing virtually ever since he was a child, growing up on a station near Broken Hill in western NSW. Buoyed by the success of his Tarwyn Park experiment, Mr. Peter Andrews went public with his theories in 1984, claiming he had set up an example of a sustainable agricultural system. He subsequently bought two more properties adjoining Tarwyn Park, taking his holding to nearly 4,000 acres, and began to extend the model.

[1] Also referred to in file records as Natural Farming Sequence, NSF and NFS.
[2] The author has closely followed the progress of Peter Andrews and NSF since the beginning of 2005.

Principles of NSF

The model at Tarwyn Park was based on the principle of reinstating the natural landscape patterns and processes, as they would have existed in Australia prior to human settlement. This started with the:

- Reintroduction of the natural valley flow pattern, in particular reconnecting the stream to its flood plain and aquifer system, and;
- Managed succession of the vegetation (mostly weeds back then).

The reconstructed hydrology was maintained and enhanced with a diverse range of plants, native and non-native, edible and non-edible, and the continual improvement in the biological health of the soil. These efforts slowed the storm water and filtered nutrients, organic matter and sediment. The recovered nutrients were then able to be biologically and mechanically recycled throughout the property.

Mr. Andrews theorized that the health and well being of farm animals was directly related to the health of their environment, and the health of the environment was directly related to the relationship between hydrology and biodiversity. To test his theories about improved animal health and well being he measured various aspects of the growth and performance of thoroughbred race horses, such as bone density and ovary size.

Thirty three years after re-modeling Tarwyn Park based on NSF principles, the property has continued to perform outstandingly through several drought and flood cycles.

Issues

Regulatory issues

While Mr. Andrews is seen by many as a brilliant person, many have also crossed swords with him because of the strong views he doggedly defends. Not withstanding the potential for personality clashes; NSF also raises a myriad of policy issues at every level. In NSW for example, an application to do an NSF project could trigger no less than eight Acts. For example:

1. Rivers and foreshores Improvement Act (1949)
2. Water Management Act (2000)
3. Native Vegetation Conservation Act (2003)
4. Noxious Weeds Act (1993)
5. Fisheries Management Act (1994)
6. Crown Lands Act (1989)
7. Native Title Act (1994)
8. Land Planning and Assessment Act (1979)

The issues getting the most attention are;

- Water, e.g. impoundment and fish passage,
- Weeds, e.g. willows
- Engineering standard of erosion control structures

Social issues

There is potential for conflict between neighbours if due process is not followed when a project is proposed.

Capacity issues

NSF takes a whole of landscape approach. Therefore, its application crosses many legal, psychological and cultural boundaries. Irrespective of whether or not we are talking about NSF, in reality it requires a fairly major shift in thinking on behalf of the whole community to conceive of and then apply solutions to the ailing health of our watersheds. While Mr. Andrews's message is resonating with a growing audience, neither he nor his supporters yet have the capacity to satisfy the growing interest or to effectively address the policy and social issues that may stand in the way of the concept's uptake.

Scientific and Government Recognition for NSF

By 1989, Mr. Andrews's natural sequence approach to farming had come to the attention of CSIRO. Hydrologist and salinity expert, Dr Baden Williams, undertook studies at Tarwyn Park and felt that Mr. Andrews's insights "*could have far reaching applications in terms of increasing flood plain activity*."

By 1992, Peter Millington, Director General of NSW Department of Water Resources had praised Mr. Andrews for his work suggesting that "*the overall concept was very much on the right track.*"

In 1994 an article appeared in the Farm Journal entitled – 'Unconventional Water Management that really works. – Raising water tables and slowing river flows.' The article begins with – '*If Peter Andrews is right, much of Australia's current water management practices are wrong.*' The article challenges the established view that rising watertables cause salinity. It introduces the idea that prior to European settlement watercourses in alluvial landscapes ran flush with their banks, not in deep gullies. 'Explorer Sturt's journals show that the rivers we know today as the Macquarie, Bogan, Castlereagh, Barwon, Darling and Murray, once flowed flush with the surrounding land, not along gullies.' Sturt's description of a pristine Murray- "*These are not rivers as we would know them in England." "We are constantly held back by reed barriers.*" The article says that '*though Peter Andrews has been commended by CSIRO, NSW Agriculture, The Office of the Minister of DEST, Ros Kelly and NSW Water Resources Director, Peter Millington, no institutional research focus has been brought to bear.*'

In 1995, Principal Planner for the Murray Darling Basin Commission, Professor Haikai Tane, wrote a minute to the Chief Executive, saying that he is so impressed with Mr. Andrews's natural farming sequence that "*a letter of commendation should be sent to him for his efforts*." Prof. Tane goes on to say that "*In the jargon of planning theory, Tarwyn Park is being developed to a stepped threshold, diffusion model of integrated land and water systems, designed to operate within clearly defined landscape systems.*" Prof. Tane found it interesting to discover fundamental similarities between Peter Andrews's definition of landscape systems and those represented in traditional aboriginal representations of floodplain ecosystems.

In late 1996, Mr. Andrews received the accolade of best land and water manager in the world at the 2nd International Conference of Ecological Engineering held in China. Of 110 submissions Mr. Andrews's was one of only two to receive a high commendation.

Syndicated R&D through AusIndustry

In 1995 Mr Andrews entered into a syndicated, AusIndustry endorsed, R&D program aiming to affirm the principles of NSF and to set up a framework for the rollout of the technology. The program was funded by corporate dollars and backed by generous tax concessions. Mr Andrews argues that it was successfully completed; yet a large part of the R&D funding was withdrawn forcing Mr Andrews to declare bankruptcy and causing his family serious financial and emotional hardship as a result.

Deputy Prime Minister John Anderson and CSIRO Expert Panel Report

In 2002, the then Deputy Prime Minister, the Hon. John Anderson, was invited to visit Tarwyn Park. Also invited were the Chief of CSIRO Land and Water Division, and Wentworth Group member, John Williams, Ray Martin from Channel 9, Gerry Harvey and others.

At Tarwyn Park that day, Ray Martin tried to nail Mr. Anderson on why Natural Sequence Farming had not been adopted by governments if it could be seen to be working. Mr. Anderson said there were a lot of legislative and bureaucratic hurdles, mainly at the state level. He also said that trials should be set up that could demonstrate NSF more widely. Everyone agreed there has been a lot of talk and no action.

Mr. Anderson, a farmer himself, commissioned CSIRO to undertake a desktop study of Natural Sequence Farming and provide him with recommendations. CSIRO assembled a scientific panel that included expertise in the fields of dryland salinity, shallow aquifer groundwater hydrology, catchment and stream hydrology, erosion processes and nutrient transport, riparian vegetation, aquatic ecology, soil and nutrient management, general farm management and farm economics.

By mid 2002, CSIRO had delivered its recommendations to the Deputy Prime Minister. CSIRO agreed that Peter Andrews had set up a successful and sustainable farming system at Tarwyn Park. The panel recommended that "*to see the full benefit of Peter Andrews's work being applied widely, requires the establishment of a suite of demonstration sites which are monitored and subject to on-going scientific analysis*." The report also referred to the extension benefits the establishment of demonstrations would provide.

International Reference Panel on Natural Sequence Farming (IRP)

In 2003 a NSF Steering Committee and an International Reference Panel were formed. The members of the steering Committee were drawn from a range of interested parties in national, state and local government organizations, private enterprise, research scientists and other interested parties. It was chaired by Adjunct Professor David Mitchell of Charles Sturt University and had its first meeting in Newcastle in 2003. The International Reference Panel was made up of independent research scientists with internationally recognised appropriate expertise from Australia and Europe and was chaired by Dr John Williams Chief of CSIRO Land and Water. Emphasis was given to people who had NO commercial interest in the information they were to access and they were to remain independent. Its first meeting took place in Canberra in 2004. The **current membership** is made up of Dr John Williams (Chair) NSW Natural Resources Commissioner, Professor David Mitchell of Charles Sturt University, Professor David Goldney from University of Sydney, Professor Wilhelm Ripl University of Berlin, Germany, Dr Jan Pokornỳ, ENKI, Czech Republic, Dr Bill Hurditch, Fifth Estate and Mr Peter Andrews. Their role is to oversee the science of NSF and give both comment and apply scientific rigor to the claims of the originator. The IRP can provide advice to Government because they are experts in their own fields.

Gerry Harvey

In 2005 after the Australian Story on Peter Andrews was shown, Mr. Gerry Harvey seconded Garry Reynolds from the Australian Government Natural Resource Management (AGNRM) Division to help facilitate dialogue with the huge public interest caused by the program and to disseminate critical information about NSF to the Federal and State bureaucracies information. Mr. Reynolds was engaged for a period of 12 months and Mr. Harvey paid his salary and all expenses. At the end of his contract with Mr. Harvey, Mr. Reynolds returned to the Public Service in Canberra. The bureaucracy should be congratulated for their foresight in sending a member of the NRM to facilitate.

Australian Government funded NSF demonstrations

Since publication of the CSIRO report, the Australian Government has committed around $1 million towards further research into NSF and support for the establishment of more demonstrations, mainly in NSW. This includes:

- *2004 - Natural Sequence Farming Demonstration and Analysis*, Baramul Stud, Hunter Valley. Australian Research Council, Linkage. Approx. $450,000 over three years. Southern Cross University, Australian National University, Newcastle University.
- *2005 - Natural Sequence Farming Demonstration,* Gumlu, North Qld. National River Recovery. Greening Australia, Natural Heritage Trust. Approx. $80,000 over three years.
- *2006 - Mulloon Creek Natural Sequence Farming Demonstration,* Bungendore, NSW. National Landcare Program, Community Support. Approx $150,000 over three years. Southern Rivers CMA, Upper Shoalhaven Landcare Council.
- *2006 - Lake Cowel NSF Demonstration,* West Wylong, NSW. National Landcare Program, Innovation Grants. Approx $150,000 over one year. Lake Cowel Foundation, Lachlan CMA.
- *2006 – Tallawang NSF Demonstration,* Willow Tree, NSW. Namoi CMA Regional Investment with Liverpool Plains Land Management Committee. Approx. $20,000.
- *2006 - Frogrock Wines NSF Demonsration*, Mudgee, NSW. Central West CMA Regional Investment. $50,000 over one year. Central West CMA.
- *2007 – Jacqua Creek NSF Demonstration,* Bungonia, NSW. Envirofund. $50,000 over one year. Jacqua Creek Landcare Group.

Since Australian Story

Since Australian Story, Mr Andrews has been an invited guest in almost every one of the 56 NRM regions in Australia. He has been the focal speaker at well over 100 events in the last two years, including field days, workshops, seminars, conferences and demonstrations, where he consistently draws large crowds. He continues to tirelessly travel the length and breadth of Australia, often at his own cost, generously giving his time and commitment to help farming communities see a better way of managing the Australian landscape.

Peter Andrews has almost single-handedly changed the NRM debate in Australia at a conceptual and a very practical level. For example, while the concept of slowing stormwater flow, so it can soak in, sounds like common sense to many people, achieving this outcome is technically and legislatively very complicated. Mr Andrews's techniques have shown how this can be done

inexpensively and (so far) sustainably. As a result of his efforts, his theories, demonstrations and assertions are now part of mainstream discussion and action amongst farmers and environmentalists alike. They are generating increasing debate amongst scientists and NRM professionals and are even beginning to influence NRM policy, in particular at a State and regional level. University lecturers are now teaching his theories. An ever-worsening water crisis and the threat of climate change is also mobilising the grass roots to support Mr Andrews in his efforts to communicate and to implement his theories.

Yet Mr Andrews, personally, has received very little Government or official recognition or support for his efforts. For all the Government money that has been spent on NSF to this point, virtually none has gone to Mr Andrews, or has recognised what he considers to be the model of primary importance – Tarwyn Park. Most of the funding has gone towards research in which he is not formally a part and towards standard onground items such as fencing, native vegetation, instream structures and monitoring at each of the demonstration sites.

Scientific Research

Before Mr Andrews passed Tarwyn Park on to his son, Stuart, he continuously monitored the progression of the NSF model from when he first set it up. He has detailed records of the hydrology and salt movement throughout the property and beyond its boundaries. He has studbook records that chart the progress of his bloodstock herd. There is also a well-documented environmental history of the property and surrounding valley, and strong anecdotal evidence supporting the claim that the property was very degraded before Mr Andrews took it on.

Academics from several universities have shown considerable interest in Peter Andrews and NSF over the years and can verify the actions he undertook and the outcomes he achieved. The universities include; ANU, Sydney Uni, Macquarie Uni, Uni of Western Sydney, Charles Sturt Uni, Newcastle Uni, Southern Cross Uni, University of WA and probably several others. Academics in the fields of geomorphology, landscape ecology and agricultural science, in particular, have taken great interest in Mr Andrews's theories.

However, written-up research directly relating to NSF is limited to a Masters thesis written during the time of the syndicated R&D program at Tarwyn Park, and papers associated with the research currently being undertaken by the ARC consortium at Gerry Harvey's Baramul Stud.

There remains enormous potential to write up scientific papers based on the primary model at Tarwyn Park, and also based on the results that are emerging from the other more recently set up demonstrations.

Landscape Rehydration Alliance Watersmart Bid

In mid-2006 a consortium of business people, along with three universities and some NGOs submitted a $17 million proposal to the National Water Commission aiming to trial and scientifically monitor NSF on 21 properties from North Queensland to Victoria. The bid also proposed to engage the fresh food industry in the marketing of produce grown under NSF systems. The bid did not include any further development or investigation of the system operating on Tarwyn Park. After drawn out negotiations, the bid was ultimately rejected in about March 2007. A revised bid of about $6m was also rejected in August 2007.

NSF Workshop – Defining the Science and the Practice

In November 2006, The Australian Government committed $50,000 in sponsorship for a Southern Rivers Catchment Management Authority (SRCMA) hosted workshop entitled; 'Natural

Sequence Farming – Defining the Science and the Practice.' This workshop brought together over 100 professionals, including more than 40 scientists, to discuss the science underpinning NSF, to debate its merits as a landscape management approach and to develop strategies for its broader implementation. The proceedings for this workshop are still to be finalized.

The Natural Sequence Association (NSA)
In March 2007 a grass roots organization officially formed, called The Natural Sequence Association (The Peter Andrews System) Incorporated, to support Peter Andrews's vision of further research, enhancement and implementation of his life's work. The NSA was set up as a two tiered structure with a national overseeing committee and local groups operating in a similar way to, or in some cases are, Landcare or sub-catchment groups. Five local chapters have now incorporated, covering an area of more than 50,000 km^2 on the NSW Southern Tablelands, Central West and Avon and Mid West regions in WA. Several others throughout Australia are planning to form over the next few months.

Coalition Federal Election Promise

Following a meeting between Mr Andrews and the then Federal Minister for Agriculture in September 2007, the Minister expressed interest in helping him out. The Minister subsequently asked for an informal brief describing a program, which may be able to be funded.

The brief set out a $6m program over three years for the rollout of NSF, which included:

- setting up nation-wide, community-based on-ground demonstrations,
- development of an education and training program targeting farmers, NRM professionals and investors, and
- scientific monitoring and review.

During the Federal election campaign a media release on the 10th November 2007 announced a promise of $6m for NSF should a coalition government be re-elected. The announcement was made only one day before Mr Andrews featured on the Nine Network's Sunday program, hosted by Ray Martin.

What is Driving Mr Andrews?

The fallout from the syndicated R&D program resulted in Mr Andrews's son, Stuart taking over the ownership of Tarwyn Park. Stuart continues to operate the property based largely on NSF principles. Mr Andrews has since been released from bankruptcy but he still has no formal control over Tarwyn Park.

The unfulfilled R&D program at Tarwyn Park, therefore, continues to form a backdrop to Mr Andrews's liaisons with government, science, business and the general community. It is his belief that the objectives of the program were met and he should, therefore, be compensated for his efforts. He believes the skyrocketing public interest for his theories and demand for his skills is vindication of this.

Mr Andrews believes that there is still much R&D to be done as it relates to NSF and to holistic landscape function. After 30 years, and several drought and flood cycles, observations show that productivity at Tarwyn Park continues to improve. However, Mr Andrews believes it is still a sub-optimal model of NSF, though far exceeding anything he has put in place since.

Mr Andrews is a complex individual with a deep and genuine passion for, and knowledge of the Australian environment that is fuelled by an even deeper concern for its long-term health. This passion drives him to communicate his theories to anyone who will listen. However, the difficulties faced by most individuals and organisations that want to work with Mr Andrews to broaden the approach stem from his belief that, without the primary NSF model at Tarwyn Park to refer back to, any new demonstration is potentially compromised. Quite simply, Mr Andrews sees Tarwyn Park as his laboratory, his reference library, and therein is contained many long term NSF experiments, which he feels obliged to continue monitoring and developing.

The main point that is highlighted in the long-term NSF model at Tarwyn Park is that the effective linkage of hydrology and biodiversity has manifold benefits in terms of fertility, water quality, water availability, carbon cycle management, climate management and overall system resilience. Their decoupling, on the other hand, is causing our natural systems to collapse at an accelerating rate.

Summing Up

While scientists continue to question Mr Andrews's theories, his appeal with the Australian public continues to grow. He now has the support of two national television networks, several high profile business people and a growing army of farmers and other concerned citizens. Mr Andrews is fast becoming a national NRM celebrity who will not compromise on the objectives he has been working towards for the past 30 years. My experience in working with Mr Andrews is that he will not accept the notion of leaving past grievances behind him, as he believes the past (i.e. the Tarwyn Park R&D model) is linked to the future. **Without a satisfactory resolution to the R&D issues of the 1990s, he and the concept of NSF will move forward in a less effective manner.**

The Way Forward therefore is:

1. Investigate the authenticity of the original information contained in the NFS R&D program by assessing the numerous reports and investigations that have been conducted over the last 11 years.
2. Make sure that a commercial linkage is established between government funds and the release and availability of this information.

In the past numerous people have attempted to encourage Mr. Andrews to install these landscape water and fertility management strategies, without the co-operation of Government authorities, but I know he has personally resisted that.

It has now reached the stage where a thorough understanding between government regulators and the information that relates to the Australian landscape functions needs to be clarified. As a scientist I have researched the literature and the information is thoroughly consistent with all current sustainable landscape practices where sustainable practice means evidence that is consistent with pre-historical and historical evidence.

The Rudd Labour Government could facilitate all of this, to its lasting credit.

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