

Biodiverse Sandalwood

Using a leverage based approach to support sandalwood production and biodiversity outcomes.

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Final Report

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The National Market-Based Incentives Pilot Program (MBI) Stage 2

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The Biodiverse Sandalwood project has been carried out in accordance with the Objectives, key Performance Indicators and milestones. The project is complete and this report provides an accurate description of experience and learning as experienced by Greening Australia.



David Williams
National CEO
Greening Australia

Report scope

This report relates to the on-ground implementation of the Farming Finance Pilot Project “Biodiverse Sandalwood” with reference to the Land Innovation Fund where relevant.

All matters concerning the Land Innovation Fund and Round 1 of the Market Based Instruments (MBI) Pilot Program, including policy findings and cost effectiveness can be found in the following reports:

Hatfield-Dodds, Steve, Carl Binning and Bruno Yvanovich, 2006, *Farming Finance: Final Evaluation Volume 1 – Policy Findings*, Market Based Instrument Pilot ID46, Greening Australia / CSIRO, Canberra

Hatfield-Dodds, Steve, Carl Binning, Bruno Yvanovich and Peter Brandis, 2006, *Farming Finance: Final Evaluation Volume 2 – Project methods and narrative*, Market Based Instrument Pilot ID46, Greening Australia / CSIRO, Canberra

Executive summary

The magnitude of Australia’s natural resource management (NRM) challenges and the scale of land use change required to address them has prompted Greening Australia to look at new ways of delivering NRM outcomes. The MBI Pilot Program responded to Greening Australia’s proposal to investigate the potential for using ‘investment leverage’, and through the *Farming Finance* pilot invested in ‘Biodiverse Sandalwood.’

Investment leverage appears well placed to catalyse the changes in land use required by the scale and severity of Australia’s NRM challenges. Leverage approaches have advantages over alternative instruments in identifying, refining and testing innovative resource management options, particularly where the most effective land use changes are not well known to government, where significant innovations in resource management or enterprise structures are required or where actions provide both public and private benefits (rather than pure public good).

In a real world pilot of investment leverage, a 202 hectare sandalwood plantation has been established using over 45 native species as hosts. The biodiverse host system will remain in perpetuity after selective harvesting of the sandalwood in approximately 20 years. The revegetation of degraded farmland is contributing to the larger goal of restoring connectivity between the Stirling Ranges National Park and the Fitzgerald River National Park.

Biodiverse sandalwood provides a practical demonstration of the potential for leverage based policy approaches to complement existing policy tools by supporting innovation, promoting more sustainable industries and catalysing desirable landscape change. While it is too early to quantify either the ecological outcomes or commercial viability of the plantation, it is evident that:

- 202 hectares of biodiverse revegetation will contribute to restoring connectivity in a region that is recognised as one of the great biodiversity ‘hotspots’ globally.

- There are indirect and direct environmental benefits associated with the plantation.
- The commercial viability of the plantation will be enhanced through seed production and carbon yields.

There are a number of hurdles facing investors who may wish to participate in leveraged investment approaches. Further testing of a leverage approach should:

- Incorporate the use of a less complicated public investment vehicle and require the public funds to be included within the investment pool to reduce transaction costs and facilitate a return on public capital.
- Enhance the total public funds available for investment – allowing greater economies of scale within projects, enhancing the ability of the fund to engage with non-forestry based land use change, and allowing a greater diversity of projects with the fund.

The experience of the Land Innovation Fund and biodiverse sandalwood suggests that implementing a leverage fund could achieve significant environmental benefits for Australia that are unlikely to be achieved by existing policy approaches.

Background

In October 2003, Greening Australia was notified that its proposal for an innovative *Farming Finance* project under the Round 1 Market Based Instruments (MBI) Pilot Program was successful. The project sought to demonstrate the role of leverage investments in facilitating landscape-scale change through a 'Land Innovation Fund'.

The project selected for investment through the Land Innovation Fund and supported by Round 2 MBI Pilot Program was the 'Sandalwood production and biodiversity plantings, South-West WA'. This project is referred to as 'biodiverse sandalwood'.

Biodiverse sandalwood represents a 'real world' test of the investment leverage approach to securing NRM outcomes.

Context

Australian sandalwood (*Santalum spicatum*) is a widely distributed tree species from South Australia to south-western Western Australia. It is a parasitic species that receives its moisture and nutrients from a range of host species but photosynthesises its own carbon. There is strong international demand for sandalwood products but supply from natural sources in Asia is declining and is strictly regulated in Western Australia. This has led to a rising price for sandalwood resources over time.

The natural sandalwood resource is limited and the key players recognise that plantation grown supply will be required to make the industry sustainable. The time frame for harvest is long, estimated between 15 – 20 years.

The overarching environmental context for the sandalwood project is the Gondwana Link project. This project has been developed over a number of years with extensive

regional and Western Australian based scientific input. South-western Australia is recognised by the United Nations as one of the world's top 25 biodiversity hotspots. It is the richest biological corner of the Australian continent, and holds the earliest fossil traces of life on Earth.

Within that zone, Gondwana Link is an ambitious project that aims to restore ecological connectivity from Kalgoorlie to the Karri, focusing initially on connecting two areas of extraordinary biological diversity – the Stirling Ranges and the Fitzgerald River National Parks on the central south coast. This will secure the ecological systems that support an array of vulnerable species in this region.

The Gondwana Link project explicitly has recognised the environmental and economic significance of native sandalwood and the opportunity it creates to restore connectivity through a biodiverse plantation. Further information on Gondwana Link can be found here: <http://www.gondwanalink.org>

Project scope

The project scope is to facilitate investment in the establishment and management of biodiverse sandalwood plantations and help tackle significant threats to the region's extraordinary, internationally recognised ecological assets.

A mix of some 45 native host species has been established to support the parasitic sandalwood. The plantation has been established using tried methods on cleared cropping land in priority locations to create new habitat and buffer threatened ecosystems.

The plantation fits with the immediate priority of the Gondwana Link project to reconnect the Stirling Ranges National Park with the Fitzgerald River National Park.

Financial and governance

Total investment

\$1.5 million

Public investment

The Australian Government has invested \$500,000 (over 1 year 06/07), through round 2 of the MBI Pilot Program.

Private investors

A private US-based philanthropic foundation with interest in 'venture' projects with the capacity to deliver long-term environmental benefits was identified and has invested \$900,000.

A local WA based investor with commercial experience was prepared to invest \$100,000.

Legal structure

A project company was formed as a subsidiary of Greening Australia, Greening Australia – Sandalwood Australia Co. Pty Ltd (GASAC). This entity holds the rights to 100% of timber and carbon assets.

Plantation management

Spicatum Resources Australia (SRA), the plantation manager, has considerable technical knowledge of sandalwood silviculture and has the required experience, expertise and commitment to deliver. Land separately secured through the Gondwana Link project has been leased by GASAC and a management agreement has been entered into with SRA to provide a comprehensive management service including planning, establishment, management and maintenance of plantations and reporting of commercial and environmental outputs.

Achievement of project objectives

Demonstrate the commercial potential of establishing a sandalwood plantation based on a biodiverse host species

This objective is to test whether biodiverse sandalwood is capable of producing near commercial returns (i.e. with leverage funding) in addition to delivering public good outcomes.

Plantation establishment

The funding provided through the MBI pilot program has largely been used to establish the biodiverse sandalwood plantation. The Yarrabee plantation, 42 ha and an 85 ha section of the Peniup plantation has been successfully established, with the germination and survival of over 45 species. The density, distribution and diversity of this newly established vegetation has been assessed and no supplementary sowing of host plants is required to meet project milestones.

The germination, summer survival, distribution and density of sandalwood have also been assessed in areas sown in 2007 and is sufficient to meet project objectives (300-500 germinates per ha). The abundance, distribution and balance of host species is also sufficient in all areas, with sandalwood exhibiting excellent early growth, indicating successful root connections with a range of host species.

Both plantation sites are currently exhibiting silvicultural characteristics that will allow excellent sandalwood growth rates to be sustained, delivering profitable yields.

The 75ha site has been prepared and seeded using best practice, adopting a very similar sowing prescription (soil depths and seed rates) to the previous year, but also incorporating lessons learned from the 2007 experience to further address risks. Significant chemical fallow was used in the lead up to sowing as a strategy to maximise the store of soil moisture at depth.

Ability of plantation to deliver commercial outcomes

These plantations will deliver wood yields at the upper end of the spectrum for sandalwood production from plantations and will meet the conservative projections used to determine the IRR. It is important to note that the projected returns from the project do not include the embedded optional returns offered by carbon sequestration or perhaps more significantly seed production, the harvest and sale of which has the potential to improve cash flow from year 4 of the project and ultimately the return to investors.

The plantation manager remains committed to ensuring the project provides a powerful demonstration of the profitability of biodiverse sandalwood production systems and their ecological value. Monitoring of the plantation is ongoing with permanent survey plots established and mapped. The management operations including the application of herbicides, thinning and pruning operations will be scheduled and conducted in a timely manner to optimise long-term wood yields.

The project will need to reach year 4 and demonstrate seed and carbon yields in order demonstrate true commercial viability.

Secure on-going biodiversity and water quality benefits through revegetation and longterm conservation of land and habitat

The developing plantation system is taxonomically diverse and will become spatially and structurally diverse over time. Every effort has been made to source seed from local sources where available, within the seasonal time-frame applicable to the project. Most of the species seeded in 2007 are regionally local and have been sourced from populations within a 50km radius of the sites. The additional lead-time for 2008 seeding has allowed the inclusion of a higher proportion and some additional key local species to be used that have been sourced from the immediate surrounds. A number of species considered to be Priority 3 species for conservation by the WA Department of Environment and Conservation have been incorporated into the host species mix.

Contribution to landscape scale restoration

Conservation strategies and targets to guide investment in ecological outcomes for the Fitz-Stirling landscape have been developed through a Conservation Action Plan (CAP).

The key ecological assets identified (2007-2012) to be protected and enhanced through priority strategies and actions include:

- Creeks.
- Proteaceous rich communities.
- Tammar and black-gloved wallabies.
- Mallet and moort woodlands.
- Flat-top yate (*Eucalyptus occidentalis*).
- Freshwater occurrences.

Strategic objectives for the Fitz –Stirling include:

By 2012:

- 60% of all creeks to be condition B or greater (Pen-Scott).

- 70% of the native vegetation being managed to protect commercial values.
- 15,000ha increase in area under native vegetation (local species).
- 50% increase in area of proteaceous communities.

By 2017:

- 20% increase in wallaby population.

Revegetating 202 ha of degraded farmland to re-establish connectivity between the Stirling Ranges and the Fitzgerald River National Parks is contributing to achieving the strategic outcomes for the Fitz-Stirling and the priority goals of the Gondwana Link project.

A robust monitoring and evaluation framework has been established and is closely linked with the CAP for the area. Whilst monitoring achievement of targets will not differentiate between the individual project elements, such as biodiverse sandalwood, any findings will be clearly relevant to biodiverse sandalwood.

In addition the biodiverse sandalwood project will provide:

- Direct benefits
 - Creation of developing food sources and habitat for invertebrates, followed subsequently by birds and other vertebrates.
 - Fruiting characteristics of the species from the Mimosaceae and the Proteaceae plant groups will ensure a bulk food source is provided over an extended period of time for critical and iconic species such as mallee fowl.
- Indirect benefits
 - Stabilisation and restoration of the hydrological and nutrient balance on an area impacting directly on the adjacent remnant vegetation associated with the Peniup Creek reserve.
 - The interception of run-off and recharge water is expected to ameliorate the impact of an area of saline discharge which has caused the death of vegetation in an area that straddles the property boundary.
 - Stabilise a number of areas of active soil erosion.

Demonstration of public good

In simple terms, the NRM outputs can be represented as 202 hectares, secured, restored and protected in perpetuity for \$500,000 of public money. This equates to \$2,475 per hectare. This compares very favourably with Greening Australia's experience in the region where average costs for these identical NRM outputs is currently \$4,800.

Additional learnings since June 06

Repeatable

The Land Innovation Fund has developed and implemented a repeatable model for operating an arms length leverage fund to identify, refine, assess and implement

projects offering both environmental benefits and financial returns. *Farming Finance: Final Evaluation Volume 2 – Project methods and narrative* tells the 'story' in terms of what happened, when, by whom and the outcomes, thus facilitating the repetition of the Land Innovation Fund process.

In terms of evaluation, the Land Innovation Fund pilot identified that replicating the leverage approach would involve:

- The establishment of one or more arms length not for profit entities that are able to receive public funds and invest these in different ways to secure environmental benefits over time.
- The investment body having (or having access to) sufficient acumen to assess proposals from a commercial and environmental perspective and to monitor project performance.

In relation to the implementation of biodiverse sandalwood, the plantation methodology is replicable and repeatable. The commercial methodology whilst repeatable faces some hurdles for investors at this time. These issues include:

1. Environmental standards.

As has been experienced in the carbon biosequestration sector investors are easily confused when comparing degrees of biodiversity. Standards relating to what constitutes biodiverse sandalwood will need to be developed and communicated to the market for projects such as this to demonstrate quality and credibility.

2. Attractiveness of sandalwood verses carbon sequestration to investors.

In the present investment market it is clear that carbon biosequestration captures the imagination and excitement of investors more than biodiverse sandalwood. There are numerous reasons for this situation and it may or may not be short lived. Biodiverse sandalwood will struggle to attract significant investment as a single product. Recent modelling of a combined product using sandalwood plus biosequestration of the host species produces superior return and is likely to be more attractive to the market.

3. Efficiency of transaction costs.

For the purposes of this analysis we have limited our consideration to repeatable investment by a consortium of 'sophisticated' investors and a public investment vehicle. The establishment, investment governance and ongoing legal / finance compliance issues relating to a separate legal entity are significant. Learnings from this project and similar fundraisings show an initial set up cost of approximately \$300,000 and on-going costs of approximately \$35,000 per annum. Assuming an industry standard of 1.5% MER this indicates a fund of at least \$2.5 million. Any fund smaller than this amount begins to incur excessive transaction costs. In the case of public investment vehicles, the involvement of experts and intermediaries would require a minimum capital raising of a minimum of \$10 million dollars.

Further testing involving a less complicated public investment vehicle and comparison to existing approaches is required before conclusions can be made about transaction costs. The larger scale and more customised nature of the investments developed through a leverage fund involves higher transaction costs per outlay but in turn the scale of environmental benefits offered per outlay is high, even before accounting for indirect

benefits. The governance and legal structures established for the biodiverse sandalwood project are robust and would be more cost effective for projects of a much larger scale.

Extendibility of policy approach

The central purpose of the MBI Pilot Program was to contribute to the development of approaches that complement the existing suite of policy tools, particularly in relation to encouraging more innovative, ecologically sustainable and commercially viable land uses. The focus has been to explore mechanisms for facilitation of resource management actions that provide public good benefits but impose net costs on the individuals that undertake them. The leverage approach has explored different ways of overcoming the 'incentive gap' through providing financial support for desired actions to commercially motivated land managers. The leverage approach is an alternative and complementary approach to existing approaches aimed at overcoming incentive gaps which include:

- Uniform support.
- Devolved grants.
- Competitive tenders.

The leverage approach used by Land Innovation Fund has 3 main features that distinguish it from existing policy tools:

1. Staged due diligence

Involving the collaborative development of investment proposals and progressively more detailed external assessment of environmental and financial merit. This incubator approach contrasts with the arms length purchaser provider model used by governments for most grant processes.

2. Co-investment

Projects must provide environmental and financial returns to both private and public investors. Investment in near commercial projects (rather than pure public good) allows the net level of public support to be based on actual rather than predicted outcomes. Contrasting to competitive tenders or devolved grants where government requirements are calculated in advance and treated as once off inputs to secure public benefits with no ongoing ownership or interest in long term performance.

3. Large scale

Investment leverage generally allows a larger scale of operation than a normal grant based approach.

The rationale behind these findings are discussed in depth in Hatfield–Dodds et al, Vol 1, 2006.

The biodiverse sandalwood project has highlighted a potential disincentive to undertaking a leverage approach in the current policy and legislative context. During the establishment and investment phase of this project, the Australian Government was clear that it didn't wish to hold equity in the plantation or investment vehicle. The lack of flexibility to effect the injection of Australian Government funds into a commercial

venture has meant that the only mechanism available to the Australian Government is the use of a standard grant agreement.

Greening Australia received Australian Government grant funds and used these funds for the initial phases of the plantation establishment. The partially completed plantation was then formally sold into the investment fund for \$500,000. This complexity and lack of commerciality in its approach concerned the private investors.

The resulting need to hold separate and report on the application of the Australian Government funds added significantly to the cost and complexity of the overall transaction.

It is recommended that any further trialling of the leverage approach mimic the standard of financial accountability and reporting as required by commercial investors. This would require the Australian Government to place their funds in the investment pool and acknowledge that their funds will be expended by the investment fund proportionally.

In this context, the Australian Government would be an investor rather than providing an outlay of funds. Investments are generally expected to provide a financial return, including a return on public capital. At the simplest level this implies that some portion of the public funds invested could be recovered and reinvested in activities providing environmental benefits.

Robustness of learning

Real world testing of the leverage approach through the biodiverse sandalwood pilot has reaffirmed the key learnings of Land Innovation Fund, (Hatfield-Dodds 2006), and provided a sound starting point for future policy consideration.

Biodiverse sandalwood has provided a vehicle to undertake some limited testing of the findings made by the Land Innovation Fund as well as revealed some additional learnings. Further testing of the leverage approach would require enhancing the total public funds available for investment – allowing greater economies of scale within projects, enhancing the ability of the fund to engage with non-forestry based land use change, and allowing a greater diversity of projects with the fund.

Demonstration of required public accountability

The design and operation of the Land Innovation Fund required two important governance and accountability issues to be addressed: managing potential tensions between private and public outcomes sought by the Fund and avoiding conflicts related to in-house involvement in the development of proposals which may then be invested in. These issues are discussed in detail in Hatfield-Dodds, Vol 1, 2006.

In relation to biodiverse sandalwood a project company was formed as a subsidiary of Greening Australia, Greening Australia – Sandalwood Australia Co. Pty Ltd (GASAC). This company was established and conducted to be consistent with legislative and prudential requirements.

In relation to biodiverse sandalwood copies of legally binding contracts with investors have been submitted and accepted (Milestone 1: Finalise Agreements). Funds have been received, banked and reported to the Australian Government and private investors.

Summary and Conclusions

Greening Australia considers that the Land Innovation Fund and subsequent investment in biodiverse sandalwood has made a valuable contribution to the exploration of practical issues in implementing an investment leverage approach.

The Land Innovation Fund pilot highlighted a number of important findings for policy makers:

- Leverage approaches have advantages over alternative instruments in identifying, refining and testing innovative resource management options providing environmental benefits.
- Leverage approaches are likely to be more cost effective than grant based approaches where innovation and implementation risks are significant, or where financial returns to public investors is close to or above the long term bond rate.
- Leverage approaches are repeatable and have significant advantages in supporting landscape level change.
- Leverage approaches are able to demonstrate robust governance and appropriate levels of confidence in the benefits provided.
- Investment leverage provides a valuable addition to the set of NRM policy tools available to governments.

The real world testing of the leverage approach through the biodiverse sandalwood project has highlighted that leverage investment can overcome the 'incentive gap' through providing financial support for innovative projects aimed at delivering commercial and environmental outcomes. While it is too early to quantify either the ecological outcomes or commercial viability of the plantation it is evident that:

- 202 hectares of biodiverse revegetation will contribute to restoring connectivity in a region that is recognised as one of the great biodiversity 'hotspots' globally.
- There are indirect and direct environmental benefits associated with the plantation.
- The NRM outputs can be represented as 202 hectares, secured, restored and protected in perpetuity for \$500,000 of public money. This equates to \$2,475 per hectare.
- The commercial viability of the plantation will be enhanced through seed production and carbon yields.
- There are a number of hurdles for investors who may wish to participate in similar leverage agreements presenting issues in terms of replication at scale.
- The lack of flexibility to invest Australian Government funds into a commercial venture has lead to increased complexity and costs.
- The costs associated with the establishment of financial and governance arrangements are fixed and independent of scale.

The experience of the Land Innovation Fund and biodiverse sandalwood suggests that implementing a leverage fund could achieve significant environmental benefits for Australia, that are unlikely to be achieved by existing policy approaches. The following

refinements would allow the Land Innovation Fund to operate at scale and enhance the outcomes achieved:

- Signal to the market for public investment by establishing a mechanism for identifying and refining quality investment options over longer time frame.
- Enhance the total public funds available for investment – allowing greater economies of scale within projects, enhancing the ability of the fund to engage with non-forestry based land use change, and allowing a greater diversity of projects with the fund.
- Allow a public investment share above 40% for specific projects which offer public benefits but involve higher levels of innovation and financial risk (noting that the level of public investment in any project would continue to be based on benefits provided relative to the public opportunity cost).
- Ensure public investor confidence by establishing robust mechanism for judging the environmental merits of potential investments such as through the use of an independent panel to oversee the environmental assessment.
- Increase the options for investment of Australian Government funds to align with standards of accountability and reporting as required by commercial investors.