Submission No 76

INQUIRY INTO INTEGRITY OF THE NSW BIODIVERSITY OFFSETS SCHEME

Organisation: Deep River Group

Date Received: 31 August 2021

DEEP RIVER

BIODIVERSITY BANKING AND OFFSETS SCHEME (NSW)
RESEARCH & SUBMISSION

August, 2021

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Reference	**BBOS-Submission, Final**
Publish Date	**August, 2021**
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PRELIMINARY

01 INTRODUCTION TO DEEP RIVER GROUP

Deep River Group is a Sydney based company providing private clients, large institutions, and government with a range of property development services.

Precise Planning, a subsidiary of Deep River Group, is a town planning consultancy specialising in providing expert advice to private clients.

Deep River Digital provides innovative software solutions to aid clients with a range of development matters.

02 DISCLOSURE OF COMMERCIAL INTERESTS IN BBOS

Precise Planning regularly oversees the coordination and facilitation of credit generation, transfers and retirement under the Biodiversity Banking and Offsets Scheme.

Deep River Digital offers a secure, transparent, and reliable blockchain solution enabling a government to tokenise an offset scheme, delivering:

- A centralised marketplace which is measurable;
- Instantaneous credit generation;
- Instantaneous credit transfers;
- Instantaneous credit retirement;
- Automated compliance, audit, and enforcement reporting;
- Enhanced strategic capability through improved Analytics to ensure robust conservation of biodiversity;
- Improve market participation & adoption of offsets;
- Direct control of price & maintenance of the trust funds;
- Direct control over the marketplace;
- Simpler legal relationships.

03 RESEARCH QUESTIONS ADDRESSED BY THIS REPORT

The Deep River Group Biodiversity Offsets Scheme Report is an industry study into the NSW Biodiversity Banking and Offsets Scheme, commonly referred to as BBOS. The process utilised by the Deep River Group research team is a combination of primary and secondary research. The purpose of this report is to serve as a submission to the Parliamentary Inquiry into the NSW Biodiversity Banking and Offsets Scheme led by the NSW Legislative Council, Portfolio Committee No 7 - Planning & Environment.

The study undertook an extensive literature review to construct the NSW Biodiversity Banking and Offsets Scheme's background context. This context is vital to understanding the efficacy of the Scheme at a conceptual level.

Legislation and technical guidance documents served to provide further context regarding the implementation of the Scheme.

Deep River Group's research team contacted all current non-governmental credit holders and agreement managers via email to request participation in a survey. The purpose of the survey was, amongst other research outcomes, to collect information regarding how participants are using the BBOS system, attitudes toward the current BBOS system, and suggestions for improvements.

Deep River Group's research team interviewed select industry experts for further contextual information and case studies. Some of which are included in the report to demonstrate opportunities for improvement with the system.

The research questions this report seeks to address primarily include:

1. Is an offset/biobanking system conceptually an effective system for preserving biodiversity? (literature review)
2. Is the Biodiversity Banking and Offsets Scheme a practical implementation of a conceptually effective system? (policy review)
3. Is the user experience of the Scheme able to be characterised as “positive”? If not, what particular aspects of the Scheme present the most prominent pain points for users? (primary research)
4. Is the Scheme's marketplace operating at maximum participation? (primary research)
5. Is the SPOT pricing tool capably executing its purpose? (mixed approach)
6. Are the public registers executing their purpose? (mixed approach)
7. Is there a better interface that would address concerns?

PART II
SUSTAINABLE DEVELOPMENT POLICY

Term of Reference: "How effective the scheme is in preventing the loss of biodiversity, including threatened species and habitat"

04 PURPOSE OF THE BIODIVERSITY BANKING AND OFFSETS SCHEME

The purpose of the Biodiversity Banking and Offsets Scheme is primarily to address biodiversity loss. High extinction rates attribute habitat degradation and destruction as a historical key reason.

Like other offset schemes, the Biodiversity Banking and Offsets Scheme aims to exchange an undesirable activity in one circumstance with a desirable activity of equal or greater significance in another circumstance.

With respect to destructive activities (development, land clearing, etc.), the Scheme stipulates that an action must be a like-for-like action, i.e. a person must conserve the same species that person is destroying (or equivalent species). The scheme also requires that the conservation act is of equal or greater significance than the destructive act.

The purpose of the Biodiversity Banking and Offsets Scheme is to provide an economic incentive to those who conserve biodiversity through offsetting land and registering biodiversity agreements, thus generating credits. Equally, the scheme's design is to provide an economic disincentive for the destruction of biodiverse land.

There are mechanisms through the Biodiversity Conservation Trust which provide annual financial stipends for the ongoing maintenance of conserved land.

05 APPEAL OF THE BIODIVERSITY BANKING AND OFFSETS SCHEME

The Biodiversity Banking and Offsets Scheme primarily caters to two categories of participants: credit generators and credit retirees. The Scheme's desirability is less relevant for developers because a legislative requirement is to retire credits for specific actions.

On the matter of Scheme appeal, an expert ecologist Deep River Group interviewed suggests "developers find the Scheme par for the course". Furthermore, an expert town planner considers "most developers do not resent the use of the Biodiversity Scheme, the complaint lays squarely on how slow the Department is in processing transfers and retirements".

Primary research demonstrated that approximately 40% of respondents identify the Scheme as appealing to developers, and approximately 60% of respondents identify the Scheme as appealing to landowners. Conversely, only a single respondent indicated their belief the Scheme appealed to investors.

There are two distinct categories of investors: those investing for a direct financial benefit, and those purchasing for philanthropic or Corporate Environment, Social and Governance reasons.

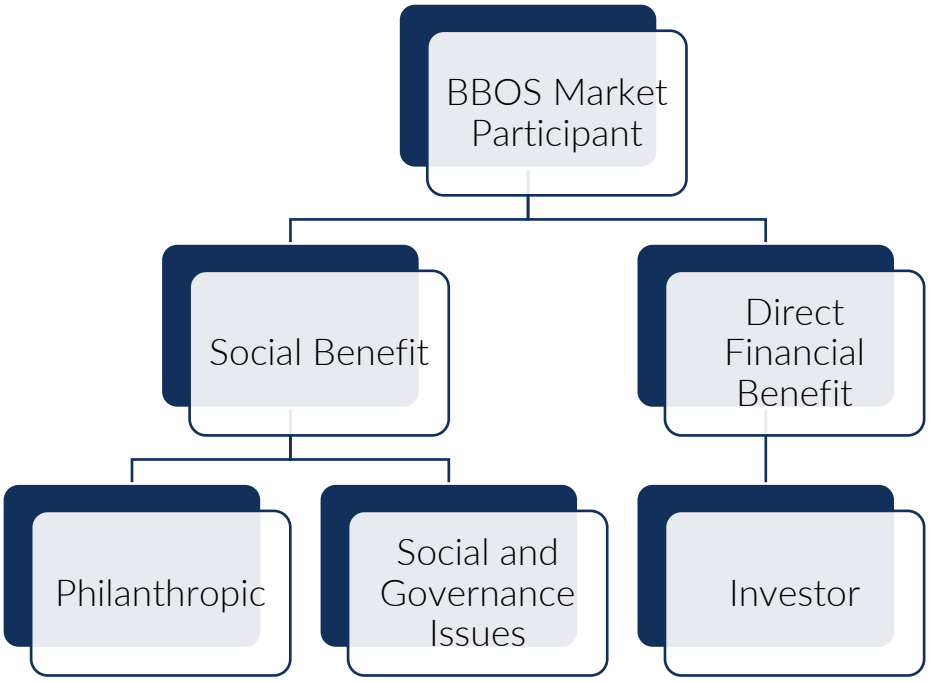


Figure 1: BBOS Market Participant Categorisation

All respondents to the primary research indicated that the Public Registers and the Biodiversity Offsets Payment Calculator served to the significant detriment of credit holders by complicated access to the credit market for would-be investors.

The security of the Scheme possibly limits the appeal to financially motivated investors. The Scheme has faced a significant number of government inquiries and hearings, which undermines investor confidence in purchasing intangible credit rights. One respondent suggested they were hedging their investment strategy on account of the distinct possibility of their "credit rights evaporating overnight, so to speak" on account of political turmoil.

Whilst the Scheme is open to third party credit custodians, an inability to exchange credits seamlessly is a significant detractor in the Scheme's mass appeal. A greater number of credit custodians would provide a financial uplift to the market, normalising pricing issues, increasing base rewards to conservers, and creating a financially beneficial incentive cycle of conservation. This study will investigate this issue in depth in section 14.

The Scheme does not appeal to third-party investors and private landowners (in a general context). Furthermore, the appeal fails to capitalise on the developed markets of investment institutions looking for property yield or the fledgling markets of institutional environmental, social, and governance policy searching for methods of increasing institutional sustainability.

Recommendation One: Broaden the Appeal of the Biodiversity Banking and Offset Scheme's Marketplace.

Deep River Group recommends that the Office of Environment and Heritage consider implementing solutions that would increase the broad appeal of the BBOS Marketplace.

Practically, this might include streamlining the credit exchange process to allow single credit purchases or partial credit purchases to occur rapidly.

Furthermore, a solution might consist of providing a more user-friendly public register that facilitates purchasers and vendors to connect more quickly and easily.

Finally, this might include a pricing tool that updates as transactions occur in real-time and benefits from market normalising functions to remove 'noisy' transactions.

06 THE BIODIVERSITY BANKING AND OFFSETS SCHEME

Biobanking refers to the commodification of intangible legal rights or obligations. These rights or obligations are then via an implementation of a marketplace facilitating two parties to buy, exchange or sell the rights.

The objectives of the Scheme have varied somewhat throughout time, reflecting the constant process of evaluation and improvement. However, in broad terms, the purpose of the Scheme remains to "address the clearing of native vegetation for urban development and the impact it has on biodiversity values, including threatened species".

The Biodiversity Banking and Offsets Scheme is currently effected by the Biodiversity Conservation Act 2016 No 63, Part 6 Biodiversity scheme provisions.

The Act effects an offset scheme with key elements involving;

1. The establishment of biodiversity stewardship sites on land by means of biodiversity stewardship agreements entered into between the Minister and the owners of the land concerned. Management actions will be required to be carried out on the sites by the owners under those agreements and will be funded from the Biodiversity Stewardship Payments Fund.
2. The creation of biodiversity credits in respect of those management actions to be held initially by the owners of those sites following a report by an accredited person on the biodiversity value of those management actions.
3. A system for those biodiversity credits to be traded (and thereby enable them to be acquired by developers or other persons who have an obligation to retire biodiversity credits under the scheme). When those credits are first transferred (or retired by the owners of the sites without being first transferred), the Biodiversity Stewardship Payments Fund is to be reimbursed for the payments to be made in future to fund the required management actions on the site that enabled the creation of those credits.
4. In relation to proposed development above a threshold prescribed by the regulations under this Act or proposed clearing of native vegetation not authorised without approval—biodiversity assessment and reports by accredited persons about the biodiversity values of the land concerned and the impacts on those values of the proposed development or clearing, and of the biodiversity conservation measures (including the retirement of biodiversity credits) proposed to offset the residual impact on biodiversity values after action that is required to be taken to avoid or minimise that impact. Those biodiversity assessment reports are to be taken into consideration in the determination under relevant legislation of the grant of (and biodiversity conservation actions required under) planning approvals for the proposed development or vegetation clearing approvals for the proposed clearing.
5. In relation to environmental impact assessment of proposed activities under Part 5 of the Environmental Planning and Assessment Act 1979—the option for proponents of those activities to use those biodiversity assessment reports and offsetting measures to comply with their obligations under that Part.

6. In relation to future development in an area—biodiversity assessment and reports by accredited persons about the area and biodiversity certification of that part of the area where future development may be carried out without further biodiversity impact assessment. The impact on biodiversity values of the clearing of native vegetation and the loss of habitat in the area of future development is to be offset by the retirement of biodiversity credits or other conservation measures in connection with the remainder of the area or other areas (or both).
7. As an alternative to any requirement under the scheme to retire biodiversity credits—the payment into the Biodiversity Conservation Fund of an amount equivalent to the cost of acquiring those credits determined in accordance with an offsets payment calculator. The Biodiversity Conservation Trust will be under an obligation to later secure biodiversity offsets from the money paid into the Fund.
8. The establishment of a biodiversity assessment method for use by accredited persons in biodiversity assessment and reports under the scheme.
9. The determination in accordance with principles prescribed by the regulations under this Act of serious and irreversible impacts on biodiversity values. The determination of such an impact by the relevant decision-maker will prevent the grant of planning approval for proposed development, but the determination will only be required to be taken into consideration in the case of State significant development or infrastructure, in the case of environmental impact assessment of certain proposed activities or in the case of proposals for the biodiversity certification of land.

Source: Biodiversity Conservation Act 2016 No 63

Conceptually, the design of the Biodiversity Banking and Offsets Scheme operates such that:

1. A developer seeking to achieve development consent for a project likely to degrade biodiversity participates in the Scheme by obtaining a biobanking statement from the Minister for the Environment.
2. The Minister may, utilising a "rule-based biodiversity assessment tool" (biodiversity assessment methodology), determine the number of credits required to reconcile the "debit" incurred by the development project.
3. The statement essentially constitutes "base-load demand" for the Scheme.
4. An illustrative purchaser may include a developer seeking to offset a project's impact on biodiversity.
5. Landowners may establish a "biobank site", which retains or provides biodiversity value.
6. The Minister establishes a biobank site through the inception of an in-perpetuity agreement, "biobanking agreement", provided only to a suitable person and in exchange for conservation in accordance with a management agreement.
7. The agreement will entail mandatory actions required for the generation of credits and ongoing compulsory management requirements.
8. The agreement and adherence to the management requirements enable the generation of "Credits" that effectively market-enabled commodities.

9. The funding for management actions comes from the Biobanking Trust Fund. At the time of a first transaction (or retirement if no transaction occurs), a credit vendor must pay a prescribed amount of money to the fund from the purchasing of credits.
10. To calculate the minimum trust deposit required on transaction zero, a purchaser utilises the present value of the annuities formula with a set discount rate and actual estimated management costs.

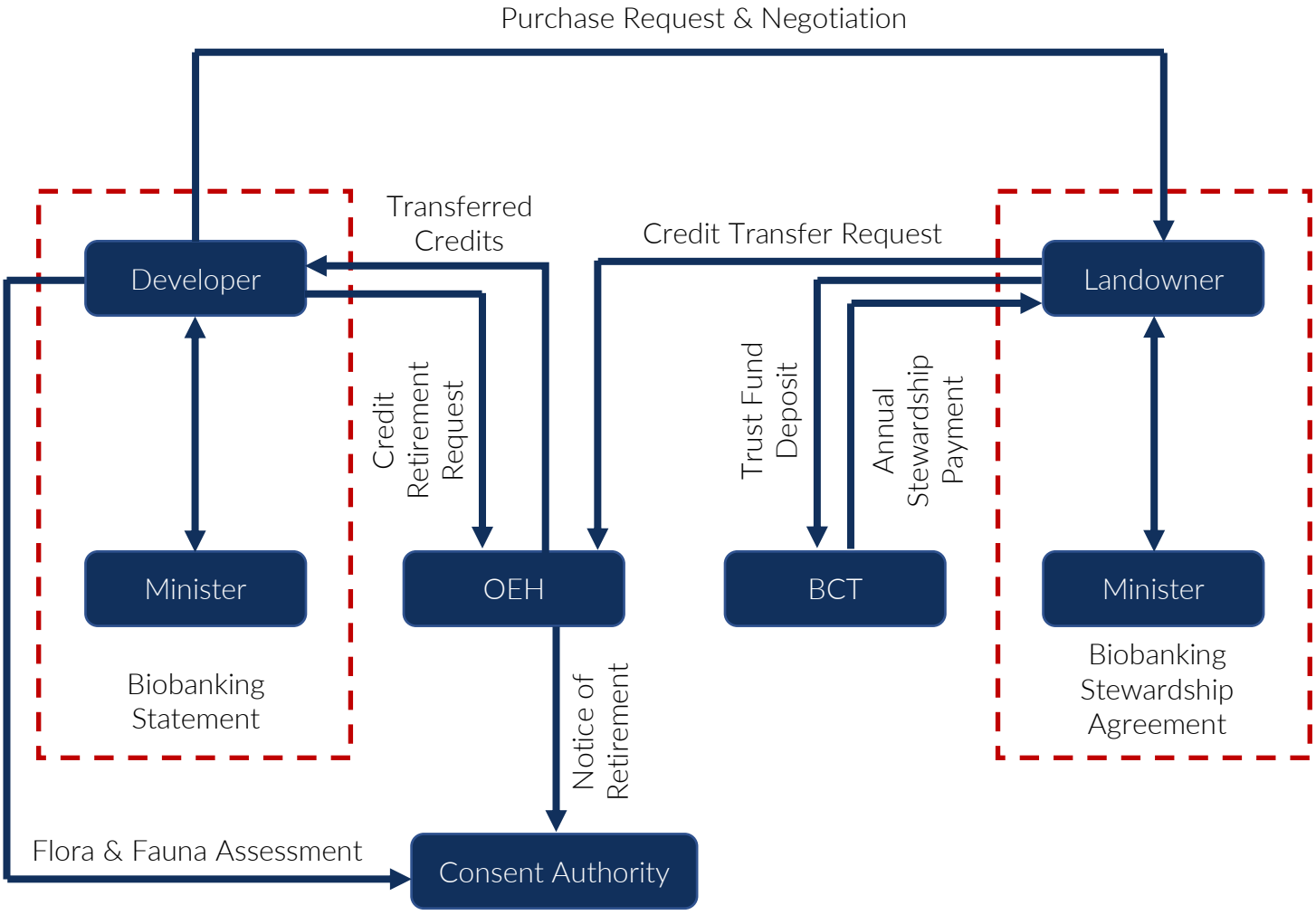


Figure 2: NSW BBOS Participant Interaction Map

In practice, the Scheme's implementation is far more complex. For a simplified understanding of the generational and transactional topography, refer to the above figure.

The Scheme's market mechanics are highly inefficient due to the low transaction volume and the distinct disparity between market participants in market literacy and gross transaction size.

Market efficiency could be increased exponentially by adopting tools that enable market participants more profound insight into the system.

Recommendation Two: Increase market insights and transparency into the transactions of the Biodiversity Banking and Offset Scheme's Marketplace.

Deep River Group recommends that the Office of Environment and Heritage consider implementing solutions that would increase market insights and transparency into the transactions of the BBOS Marketplace.

Practically, this might include adopting an interactive transaction register that provides real-time or near real-time transaction data, graphically representing pricing, volume, and market depth information—in addition, explicitly noting transactions between related parties (or non-arms-length transactions) and those that are extraordinary to a public market's usual operations.

Furthermore, the adoption of market augmenting functions may prove beneficial by limiting the inclusion of certain transactions (related parties, non-price-sensitive governmental transactions, etc.) in the credit pricing matrix.

Finally, we suggest that the SPOT pricing tool is entirely deficient for a market participant to be adequately informed. The process to become informed is so overtly complex it requires the operation of "credit-brokers" whose understanding of market pricing, according to our primary research, are mostly heuristic, not analytical.

The Office of Environment and Heritage maintains a public transactional register which is available and manipulable via spreadsheet. The public registers are updated to reflect previous transactions, current agreements, current credit holders, and expressions of interest.

The register intends to provide some degree of transparency for market participants and to provide essential market information for buyers and sellers. The register does not record transactions that involve the right to purchase credits in the future, which is a common occurrence for state significant development or state significant infrastructure.

The register does not have an intuitive method of matching buyers to sellers, nor does the Office of Environment and Heritage particularly facilitate the introduction of non-market buyers (e.g. philanthropic buyers).

Case Study:

The market participant signed a biobanking conservation agreement in late 2011. In the process, an ecological assessment identified five different ecological communities, 3 of which the NSW legislation lists as threatened ecological communities, in addition to the presence of a number of threatened communities and animals.

One such example is the **Buttercup Doubletail (*Diuris aequalis*)**. The site enjoyed 431 individual plants. Prior to this assessment, merely 200 individual plants from in excess of 20 scattered sites were known. As a result, this site represented two-thirds of the known population on the planet. Therefore, the generation of 1243 ecosystem biodiversity credits and 910 Buttercup Doubletail species biodiversity credits occurred.

The market participant expected to sell the Biobanking biodiversity credits was to an environmental philanthropist or a large corporation looking to raise its environment profile by supporting the conservation of both the vegetation communities. Unfortunately for the market participant, there is no available mechanism to contact environmental philanthropists or large corporations other than publicly accessible avenues.

After a decade of participating in the Biobanking scheme in late November 2018, the market participant received their first enquiry to purchase 30 biodiversity credits for the NorthConnex project. Throughout 2019 the market participant completed the sales of a total of 46 Snow Gum - Mountain Gum tussock grass-herb forest of the South Eastern Highlands biodiversity credits.

The transactions occurred for a discount price of $2,000 per credit. The market participant suggests that they were unaware of the actual market value of their credits. Part of the deal included a media release in order to generate further publicity, ultimately facilitating additional credit transactions.

The finalisation of the sales occurred in November 2019, the media release was unsuccessful, and the participant had no further remedy available to ensure the specific performance of the media release.

The participant in March 2020 applied to the BCT to sell biodiversity credits to them under their new State Wide Biodiversity Credit Open Fixed Price Offer (BCT-OFPO). The participant successfully sold 46 Narrow-leaf Peppermint – Mountain Gum – Brown Barrel moist open forest biodiversity credits for $6,000 per credit.

The negotiation of the Biobanking Agreement in 2009 - 2010 determined a Total Fund Deposit of $1.74m, returning $50,000 - $60,000. Changes to market conditions, underlying costs, and other factors result in a Trust Fund Deposit deficiency of $250,000.

Simply, the market participant does not have enough of their own funds to increase the trust funds under management, nor do they have enough value in their credits.

The market participant remarks that the BCT acts in a manner contrary to the goal of facilitating transactions at a cost base high enough to ensure adequate funding for the Trust Fund Deposits.

Our primary research indicates market participants demonstrate a high degree of dissatisfaction with the current registers. Furthermore, over 90% of respondents suggested that they perceived the register as either the most significant or one of the most critical issues with implementing the Scheme.

Some respondents presented an issue where the BCT acts as a direct competitor to landholders, particularly regarding connecting credit holders with philanthropic entities. This study will investigate this issue further in section 13.

Recommendation Three: Improve the public register by increasing update frequency, improving information contained, and providing an interactive, well-marketing transaction portal.

Deep River Group recommends that the Office of Environment and Heritage consider implementing a solution that would improve the public registers by increasing update frequency, improving information contained, and providing an interactive, well-marketing transaction portal.

Practically, this might include enabling real-time or near-real-time updates on the register and establishing an interactive marketplace that facilitates matching buyers and sellers in a user-friendly manner. We suggest this solution may form a single marketplace with the market described in recommendation one.

Finally, we suggest that it is essential that the Office of Environment and Heritage engage a domestic and international marketing campaign to boost the awareness of the Scheme, such as to attract corporate, institutional and philanthropic investment.

07 SUPPORT FOR THE BANKING OF OFFSETS

Ecologists and the development industry strongly support the theoretical application of offsetting biodiversity impacts through a biobanking scheme.

Summarily, developers greatly appreciate the reliability of a legislatively prescribed process and a predictable marketplace. In addition, there is direct evidence from ecologists which supports the success of an offset scheme.

Our primary research demonstrates that Landowners are supportive of the scheme.

Offset schemes are not limited in scope to the mandatory conservation prescribed for developers. Environmentally conscious corporate institutions, investment institutions, and philanthropic organisations alike are underrepresented in the NSW Biodiversity Banking and Offset Scheme presently; however, there is a clear opportunity to expand this market for both environment and financial benefit.

Deep River Group Research notes apparent political criticism for the scheme, particularly in regards to the potential for wrongdoing. However, there is little merit to this concern - not only has the NSW Scheme occasioned few fraudulent transactions, but the fault also did not lie with the banking of offsets conceptually, instead the fault, if any, rests with the oversight framework. This study will further address this issue in section 08.

08 ISSUES WITH THE BANKING OF OFFSETS

Whilst Deep River Group's primary research has identified marked public support and substantial academic evidence for the success of biobanking and offset schemes generally, there are a number of issues with the implementation of the NSW Biodiversity Banking and Offsets Scheme.

The primary issues with banking offsets conceptually revolve around the efficacy and scope of conservation through biobanking and offset schemes. Significant local (to New South Wales), domestic (Australia), and international literature demonstrates that biobanking is an effective tool as a mitigation technique.

Without hesitation, the entire survey group and the select interviews Deep River Group Research conducted supported the efficacy and ethics of the NSW Biodiversity Banking and Offsets Scheme.

Deep River Group's primary research indicates that market participants are concerned with public trust and the possibility of corrupt (or less-than-legitimate) transactions occurring.

The realisation of this concern has occurred with recent media reports of illegitimate transactions occurring by a market insider for a significant personal windfall. However, it is worth noting that there are process and systematic solutions to the concern of trust and corruption.

Some critics of biobanking and offset schemes posit that conservation land never held development potential, and thus the conservation is rendered effectively moot.

Deep River Group research would suggest this concern is unfounded on three logical grounds;

1. The act of conservation is an active act, requires manual intervention (e.g. weed spraying and pest control), not a passive process. Unmanaged land will not retain or improve biodiversity value; only through direct and deliberate actions can biodiversity be preserved or enhanced.
2. The Scheme requires like for like, which provides a natural handbrake and does not allow the clearing swathes of land if the biodiversity value is not equal or improved.
3. At a minimum, the economic cost to developers/land clearers slows the rate of clearing, as it provides a financial incentive to consider alternative, less harmful projects.

Furthermore, as astutely noted by an interviewee, the value of conservation is necessarily less than the development value, on account that development pricing is a function of BBOS Credit pricing. However, Deep River Group's primary research notes both from the survey and from the economic instrumentation study, the price capping functionality of the BCT results in a significant hindrance to the inception of new biobank sites.

Deep River Group's research notes that the Government as a purchaser of BBOS Credits is a contentious issue. The two concerns are that firstly, public and private industry should be on a level playing field when it comes to development - thus, there are many supporters of the Government purchasing BBOS Credits.

However, there appears to be a practice of tendering to the open market for BBOS Credits awaiting proposals from landowners, then making offers to purchase land to establish biobanking sites in place of purchasing credits. The request for the purchase of land is often orders of magnitude less than the equivalent purchase in credits. This mechanism reduces the price of projects; however, it entirely circumvents the marketplace. This practice results in investors placing a higher risk premium on the credit market and thus achieves a lower overall value for the entirety of the credit market.

Market participants intimated that equivalency statements are too confusing for the average landowner to understand, thus creating the opportunity to defraud landowners. Furthermore, allowing large developers and state-led infrastructure projects to offset using equivalent (but not requiring the same) credits results in a dramatic reduction in value to credit holders in premium credit markets.

Generally, Deep River Group's primary research found that understanding and knowledge of the system is significantly too low. Some respondents posited this is a result of the system changing too frequently due to political shifts or that the system was over-engineered, and a return to free-market economics may defuse the system's complexity.

The marketing and presentation of the Scheme are complex and legalistic. For many reasons, this reduces market participation and adoption. Improving the documentation by consolidation and improved clarity in presentation would eliminate this issue entirely.

Recommendation Four: Transition the NSW Biodiversity Banking and Offsets Scheme to a free-market model.

The BCT operating as a pricing ceiling impedes materially and significantly on the success of the NSW Biodiversity Banking and Offsets Scheme. Deep River Group recommends that the Office of Environment and Heritage consider solutions that transition the Scheme to a free market. The economic instrumentation of a capped market significantly reduces the price (the main incentive for establishing the biobank sites). Ultimately this only benefits those who are partaking in biodiversity lowering activities.

Deep River Group acknowledges that the free market model may result in pricing spikes in particular credits and the difficulty of the BCT in purchasing credits where a party requiring the retirement of credits has deposited into the BCT for future credit purchase.

We suggest that the management of pricing spikes is articulable by natural market forces; simply, if the price rises beyond a critical point, then the market will reply by providing more supply (by landowners who wish to make a profit).

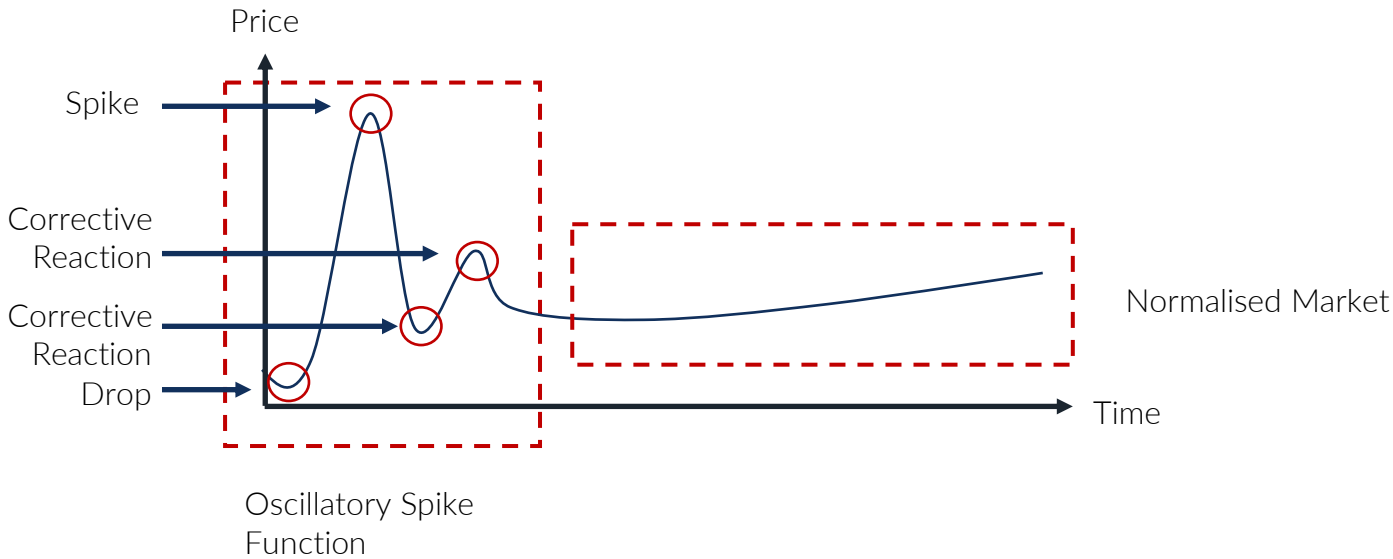


Figure 3: Market Price Supply/Demand Normalisation Example

Furthermore, we suggest that the BCT as a sophisticated market participant hedge the cost of future purchases by incepting a credit swap market. This functionality would allow sophisticated investment institutions to profit from volatility and likely attract further investment into the Scheme. Moreover, developers or landowners who wish to hedge their own risk may engage a financial expert to set up credit swaps. Capping prices is both anti-competitive and unnecessary.

09 CONCLUSION & RECOMMENDATIONS

To conclude, Deep River Research supports the NSW Biodiversity Banking and Offsets Scheme.

We consider that the Scheme is a consistent approach with sustainable development, recognising the critical interdependence of financial success and biodiversity protection.

The instrumentation and interface to the public may have notable points of improvement; however, the Scheme conceptually is an excellent economic instrument for promoting (and realising) the value of biodiversity.

The complexity is overt in the system adopted by NSW; the approach to implementation has likely increased the complexity beyond the original ideations for the Scheme. Most likely, the cause for the increase in complexity is indeed technological, resource-dependent and due in part to previous schemes.

The current Biodiversity Banking and Offset Scheme requires a multitude of disciplines to function day-to-day, including legal, ecological, planning, and financial. There is some benefit to having this degree of interdisciplinarity, a more integrated approach to preserving biodiversity value. However, as previously identified, there is a material lack of clarity in regards to the Scheme, one interviewee describing the process as "clear as mud at midnight", and existing literature stating "one expert who attended a briefing on the scheme, yet found 'the briefing almost unintelligible'."

Recommendation One: Broaden the Appeal of the Biodiversity Banking and Offset Scheme's Marketplace.

Recommendation Two: Increase market insights and transparency into the transactions of the Biodiversity Banking and Offset Scheme's Marketplace.

Recommendation Three: Improve the public register by increasing update frequency, improving information contained, and providing an interactive, well-marketing transaction portal.

Recommendation Four: Transition the NSW Biodiversity Banking and Offsets Scheme to a free-market model.

PART III
TRANSPARENCY, SECURITY, SECURITISATION & ADMINISTRATION

The role of the Biodiversity Conservation Trust in administering the scheme, including its transparency and oversight."

10 COMMODITISATION & SECURITISATION OF ENVIRONMENTAL RIGHTS

Economic & Financial Instruments

Biodiversity Credits are fundamentally economic/financial instruments that act as tools to manipulate consumer (developer) behaviour artificially.

The instruments commoditise environmental rights into intangible, tradeable "credits". As discussed in section 09, there are some ethical concerns regarding the commoditisation & securitisation of ecological rights.

Despite the design of economic instruments, the BBOS Credits have not seen a mass adoption with the general public.

Markets Overview (1/7/20 – 1/7/21)

The market has an annual depth (volume of annual transactions) of 99 transactions representing 41,320 credit transfers.

The annualised dollar volume of the market is AUD $32.91m.

Ecosystem credits carried a Weighted Average Price of $6,496.70, and Species credits carried a Weighted Average Price of $45.58.

The trajectory of the market volume and price is below described.

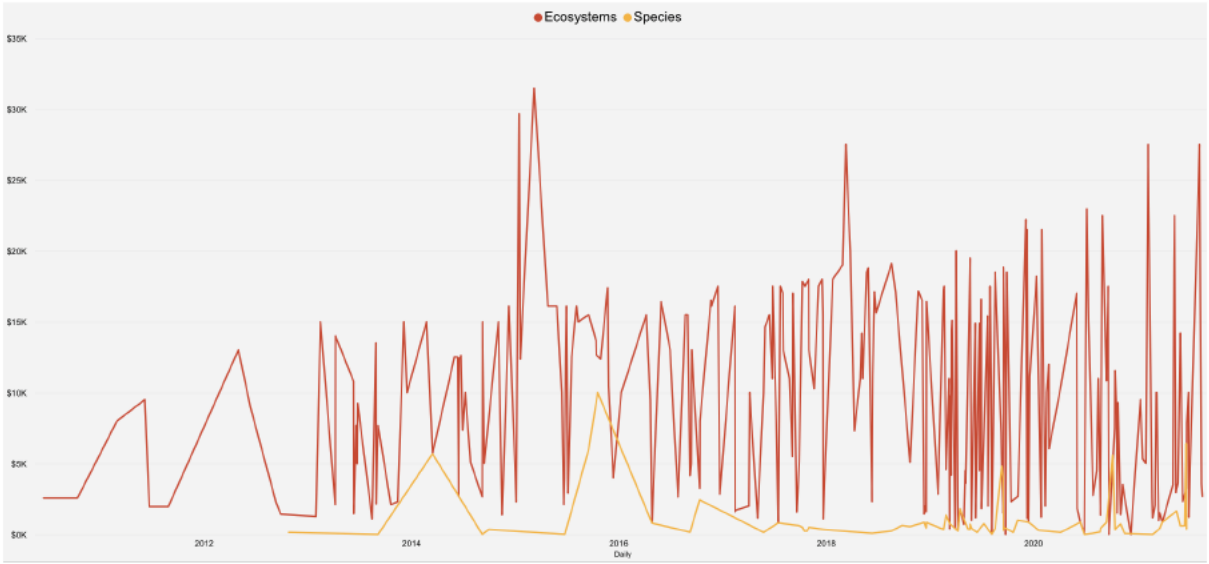


Figure 4: Market Trajectory

Participation in the market

There is a relatively poor market participation rate due to legal risks and complexities described in-depth in section 08.

Long Term Credit Availability & Pricing

The offset scheme is not viable long term in the scheme's current design. As the scarcity of credits increases, so too will the price. The scarcity will increase as a non-linear function of time.

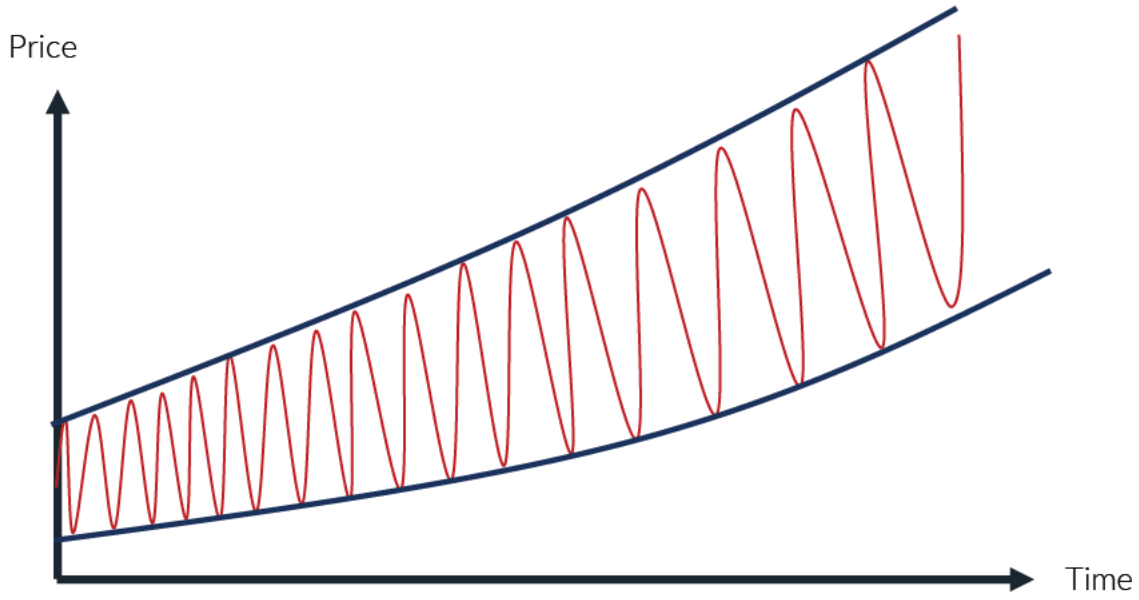


Figure 5: Illustrative Diagram of Non-linear Raised Price Floor on Account of Reducing Finite Asset Type

11 THE IMPACT OF GOVERNMENT AS A PURCHASER IN THE MARKET

The government entering the market as a credit purchaser materially impacts the market. Depending on which capacity an individual participates in the market tended to dictate the support of the government as a credit purchaser.

Some respondents would consider the government to directly support the BBOS marketplace, providing baseload demand via the continual commitment to infrastructure projects.

However, numerous adverse outcomes that strongly contribute to the artificial scarcity of credits in the scheme.
For example, the Western Sydney Airport:

Credit Type	Credits Required	Available Credits on Market	Credit Balance after WSA Purchase
HN528	7,906	807	(7,099)
HN529	1,946	2,772	826
HN526	2,140	2,312	172
HN512	358	25	(333)
HN630	873	12	(861)
HN524	0	443	443

Table 1: WSA Credit Balances

Source: Table 16-17 Ecosystem credits for impacts on the natural environment, p 343, Western Sydney Airport - Environmental Impact Statement

The supply market comprising 16 credit holders, in the case of three types of credit (HN528, HN512, HN630), fell significantly below the demand of the one government purchaser.

The basic laws of supply and demand apply to the credit ecosystem; with the dramatic decrease in supply, the price increases in a non-linear fashion.

The result of these actions is indirectly controlling the supply of small to medium development. Larger developments can absolve higher costs in the volume of produced property. Private landowners, smaller developments, and medium developments cannot absorb the costs and thus will not proceed.

Most significantly, the problem remains that public purchasers are not equally price sensitive to private purchasers. For example, a public purchaser will not sacrifice a project for the sake of an ineffectually priced credit market - a private purchaser (generally) does not have that same luxury.

12 GENERATION OF CREDITS

The process to generate credit is complex, un-user friendly, and fraught with legal terms, rendering biodiversity credits an unattractive asset class.

The Department of Planning, Industry and Environment outlines the process as follows:

Step 1: Landholders determine whether they meet relevant eligibility criteria for a biodiversity stewardship agreement.

Step 2: An accredited assessor applies the Biodiversity Assessment Method to calculate credits generated.

Step 3: The landholder enters into a biodiversity stewardship agreement with the Biodiversity Conservation Trust and sells credits on the open market.

Step 4: Landholders receive annual payments and manage the biodiversity stewardship site.

The process appears at a macroscopic overview to be user friendly and reasonably simple. However, the steps as they materialise in reality are vastly more complex than the outline.

The complexity of generating credits is a limiting factor for potential credit generators. Furthermore, price instability and a relatively unknown market depth contribute to the suppression of would-be generators from participating in the market.

The "expression of interest register" is of some assistance but provides little to no clarity about the demand for a generator. There is no capacity to secure pricing prior to completing the generation process.

Recommendation Five: Simplify the process of generating Biodiversity Banking and Offsets Scheme Credits on biobank sites.

Deep River Group would suggest that the Office of Environment and Heritage consider solutions that allow a more robust and potentially automated framework for generating credits.

Practically, this might include using a step-by-step software solution, which automates specific tasks and processes with a live tracker of what progress the Office of Environment and Heritage makes and what obligations the landowner must fulfil.

13 SOURCING CREDITS

Sourcing credits is a challenging experience for participants searching for a single or a small volume of credits.

Case Study

A private purchaser, a small developer, was seeking a single PCT 849 Credit. The Flora and Fauna Assessment their development consent relies upon identified the requirement of 0.8 credits which rounds up to 1 credit. The rounding of credits itself is problematic. However, it is not central to this issue.

The market price of PCT 849 at the time of this study was $27,500, and the BCT BOPC price was $37,067. In other words, a 34.78% premium is chargeable for utilising the BCT instead of sourcing credits in the market.

The market was unwilling on account of complexities and administrative costs, meaning that releasing a single credit was simply not a worthwhile business case.

Therefore, this particular purchaser must engage with the BCT and pay the premium; otherwise, they cannot continue with their development project.

This mechanism effectively rewards more significant destruction of biodiversity values by penalising purchasers with significant premiums to utilise the BCT, which minimises the credits they require.

14 FACILITATING TRANSACTIONS OF CREDITS

The legal transactional topography described above in section 06 creates a significant market inefficiency. Furthermore, this study has described other issues above with sourcing credits.

The non-standardisation of contracts presents numerous issues and rather unnecessarily multiplies the risk of purchasing credits. The difficulties begin with two-party negotiation relying on one party being responsible for the entirety of risk.

For example, a sale of credits may require a purchaser to pay prior to the release of an application to transfer to the Office of the Environment and Heritage. In this situation, the purchaser has no security or guarantee that the Department will action the transfer of credits. The vendor may choose to keep any money paid, as there is limited legal capability to contract around the actions of a non-contracted third party.

Alternatively, the vendor may release an application to transfer to the Office of the Environment and Heritage, and once the credits are received by the purchaser, the purchaser will make funds available to the vendor. The risk, in this case, lies entirely upon the vendor.

Neither case presents an ideal level of risk and requires the parties to trust one another.

The inability to instantaneously transfer credits presents difficulties for investors if they wish to invest for short periods of time or want to change their portfolios quickly. Whilst this issue has been discussed at length by this study and will continue to be investigated, instantaneous transfers boast a raft of positive outcomes.

There is no capacity to determine transferability without either engaging a professional broker or submitting a request to the Office of Environment and Heritage. The ability to assess transferability would significantly reduce the risk to purchasers and vendors.

Recommendation Six: Prepare a standardised contract framework and integrate the contract with a rapidly deployable or instantaneous transfer capability.

Deep River Group recommends that the Office of the Environment and Heritage consider solutions that allow a standardised contract framework and integrate the contract with a rapidly deployable or instantaneous transfer capability.

Practically this might include an automated contract framework, there are many in existence, but a tokenised approach may lend to more straightforward adoption.

15 SECURITY & SECURITISATION OF LAND WITH CREDITS REGISTERED

The manner in which the NSW Biodiversity Banking and Offsets Scheme generates credits creates an environment that is challenging to facilitate mortgage documentation to unlock equity value in credits without first making a sale.

The non-uniqueness / non-serialisation of BBOS credits makes the credits very difficult to describe in legal terms for the purpose of securing credits.

Assuming credits have a relatively stable market value and adequate legal protections to incentivise a lender to provide a mortgage against the security of the credits. It is difficult for a lender to secure a mortgage.

For example, suppose a lender appraises the value of a property as $1,000,000 with the capability of generating a further $4,000,000 in BBOS credits. In that case, a lender should only lend up to their maximum loan-to-value ratio on the $1,000,000. The rationale for only lending to the maximum loan-to-value ratio of the land value is that a person could generate the credits and sell them in the market at any time, reducing the value of the property from $5,000,000 to $1,000,000.

Equally, a lending institution appraising a biobank site value cannot adequately secure the credits because they do not exist at this point in time. As a result, the lending institution would be providing finance over and above a recoverable amount (if the generation of credits was unsuccessful), which provides an unacceptable risk profile.

Therefore, most lending institutions consider funding land purchases for the generation of biodiversity credits unsecured lending, attracting higher interest prices, and requiring more strenuous / less favourable loan terms. Suppose further that the above property is for sale for $4,000,000 (allowing a maximum profit of $1,000,000), a lender providing an 80% loan-to-value would render merely $800,000 (or 20% of the purchase price).

Securing credits generally is a difficult task, even in the case of transferring existing credits from one provider to another. This study discussed the issue at length in section 13.

On account of the biodiversity stewardship agreements existing between the landowner and the BCT, a third-party mortgagee has no right to the originally generated credits. Furthermore, in a typical credit transaction, a mortgagee would have no right to prevent a transaction, even if it were to the significant detriment of the lender.

The inability to securitise BBOS credits makes a credit a highly illiquid instrument, locking up significant capital for an investor. Reduced liquidity significantly reduces the attraction for investors and third parties in the Scheme. For smaller landowners, this would create prohibitively restrictive financial positions.

Case Study:

A market participant had purchased a property and then generated a variety of types and volumes of BBOS credits. This particular generator had purchased the site with a private mortgagee.

The generator began to sell the credits without informing the mortgagee. The funds received from the sale of the credits were not directed to repaying the mortgage.

Because the perceived security diminished in value, the mortgagee called the loan (though there was a dispute on whether this was a condition of the mortgage). This action rendered the generator's company in administration.

The administration forced the generator to refinance its debt in a short period of time. As a result, the refinancing occurred at an extremely high-interest rate.

The only possibility of covering the interest incurred by the refinancing was the generator fire selling its credits for sub-market rates.

This case study raises a number of pertinent issues. The first of which is that the generator was unable to access the equity of their credits without selling the credits. With adequate access to equity, the generator would have had the capacity to have bridged the finance without losing the underlying asset. Secondly, the fire selling of the credits negatively impacts the entire market. Because the generator sold at sub-market rates, the overall SPOT price for credits necessarily decreased.

Recommendation Seven: Enable Biodiversity Banking and Offset Scheme Credits to become securitisable.

Deep River Group recommends that the Office of the Environment and Heritage consider solutions that enable the ability to secure and securitise credits.

Practically this might include serialising credits or making credits tangible and describable. This change to BBOS credits would enable mortgaging, leasing and securitising credit.

Furthermore, establishing an interactive marketplace with the above-recommended characteristics.

This study notes that this would create several new marketplaces, which ultimately facilitate better biodiversity conservation outcomes.

The new markets are no longer limited to simple equity asset purchases (purchases of credits or sites with credit capability) but also more sophisticated financial instruments.

For example, a change of this nature would allow directional trading. For instance, leasable credits would enable a market participant that believes the price of credits may decrease to allow an activity similar to shorting the credit in the market. Equally, it would allow standardised call options for a market participant believing that the credit value will increase.

Furthermore, this would enable volatility-based strategies, such as option straddles (purchase of both a call and a put option). Those participants who buy staddles believe that the volatility of a credit in the market will increase, whereas those market participants who are selling expect the volatility will go down.

Ultimately, there is an opportunity for the BCT to open up the marketplace to capitalise on more sophisticated financial instrumentation and investors.

16 RETIRING CREDITS

This study has discussed at length the complexity of the legal topography in the BBOS credit arrangements.

The primary complaint among respondents in regards to the process of retiring credits was the significant delay in processing time. A delay in retiring credits can prohibit the execution of certain contracts, and in the context of real estate sale contracts with sunset clauses, can cause significant financial losses.

Furthermore, this study notes that some consent authorities afford some projects (particularly state significant development and state significant infrastructure) development consents which allow, for a variety of reasons, credits to be retired progressively.

Recommendation Eight: Enable consent authorities to retire credits at their discretion with landowner consent.

Deep River Group recommends that the Office of the Environment and Heritage considering solutions that allow a retiree to enter a deed, authority, or contract for the above-recommended serial for a credit that enables a consent authority to retire the credits at their discretion.

An additional benefit would include greater transparency and increased robustness of the biodiversity preservation process.

17 TAXATION OF CREDITS

Deep River Group are not accountants and are not providing financial or legal advice of any kind.

The biobanking process is not a tax-efficient enterprise.

There are several capital gains tax (CGT) events in the biobanking process.

The first of which is a CGT event type D41 when a landowner enters into a Biodiversity Stewardship Agreement. For the purpose of calculating the taxable amount, the capital proceeds are equal to the value of the biodiversity credits. The BCT and a landowner must agree on the market value of the biodiversity credits. The BCT will ask the landowner to provide an estimated market value to achieve a common market value. The BCT will generally agree on the proviso the BCT considers the estimate plausible. The basis of plausibility is the current or expected market prices for the types of generated credits.

A CGT event type A12 occurs upon the sale of biodiversity credits. In the transaction between credit purchasers and credit vendors, the contract shall state a vendor is entitled to the total amount of the agreed sale price of the biodiversity credits, including the Trust Fund Deposit (TFD). The vendor will retain the obligation to pay the TFD. The cost base of the biodiversity credits should include the amount required to be paid by a vendor as a TFD (to enable a successful transfer of credits).

Capital Gains Tax events may provide a capital gain or a capital loss.

Income tax is applicable to Biodiversity Stewardship Agreement holders. Payments from the BCT to the Stewardship holders are consideration for the contract's specific performance (i.e. in return for one party taking certain actions, there is monetary payment); thus, the income is assessable for income tax purposes. There may be some deductions for which a landowner will be eligible.

There are several goods and sales tax (GST) events in the biobanking process.

At the point of entering a biodiversity stewardship agreement between the BCT and a landholder, the landholder makes a taxable supply (by virtue of entering the agreement), and the BCT makes a taxable supply of biodiversity credits. Therefore, these non-monetary transactions are taxable supply. Consequently, both parties are required to pay GST for their respective supply, calculated on an estimated value of the credits. However, both parties can claim an input tax credit in respect of the tax invoice received from the other party.

The BCT will issue a BCT GST invoice and Recipient Created Tax Invoice on behalf of the landholder when the BCT issues the registered biodiversity stewardship agreement to the landholder. The BCT will use the above-described process of determining the market value of the credits for the purposes of these invoices.

GST Registered Landowners

The net position of the generation of credits, because the GST-payable and the input tax credit are of the same value, should be zero (for clarity, no GST payable or receivable). Whilst no payment is required, the BCT and a landholder must record these transactions on their business activity statements (BAS).

GST Unregistered Landowners

The BCT will issue an invoice to the landowner at 1/11th of the market value of the credits to pay a GST liability.

The sale of credits is a taxable supply of goods.

If the vendor has registered for GST (or are required to register for GST), the vendor must charge GST on the sale of the biodiversity credits. If the vendor has not registered for GST, the vendor shall not be paid GST by the purchaser of the biodiversity credits.

In the same manner, the supply of stewardship services by a landholder in return for payment of the annual biodiversity stewardship payment attracts income tax; the relationship incurs GST.

Payments from the BCT to the Stewardship holders are consideration for the contract's specific performance (i.e. in return for one party taking certain actions, there is monetary payment).

The supply of stewardship services is a taxable supply, and where a landowner has registered for GST (or are required to register for GST), the BCT will issue a recipient created tax invoice and include an amount for GST when making the annual payments for stewardship purposes. The landowner, according to their circumstances, shall pay a GST liability to the ATO.

Where the landowner has not registered for GST, the annual payment will not include an amount for GST. In effect, a landowner may have a GST deficit where they have paid for goods or services in relation to the management actions, which are not claimable as an input tax credit.

Certain GST-registered contractors or professional service providers may complete certain management actions on behalf of a landowner, or a landowner may purchase goods (e.g. weed killer), where any GST payable on those goods or services may be claimable as an input tax credit to reduce the GST liabilities of a GST-registered landowner.

Land that is the subject of a biodiversity stewardship agreement is exempt from land tax under section 10(1)(p) of the Land Tax Management Act 1956.

Funded Conservation Agreements

There are some differences in the taxable status of items between a funded and non-funded conservation agreement.

The first annual payment payable to the landowner under a Funded Conservation agreement does not form part of the capital proceeds for entry into the Conservation Agreement.

Landowners entering into a permanent or in-perpetuity conservation agreement may be entitled to a deduction; the ATO covers this issue more extensively.

Recommendation Nine: Facilitate a more tax-efficient structure/instrumentation for administrating biodiversity credits.

Deep River Group recommends that the Office of the Environment and Heritage investigate restructuring the BCT such that it provides greater tax efficiency or that the Department lobby the federal government for special tax considerations.

Practically, this might look like administering the mandatory trust fund deposits in another manner. For example, requiring a landowner to hold funds in a special purpose trust with the ability to distribute earnings without attracting any additional GST.

Otherwise, Deep River Group recommends that the State Department lobby for the special treatment of biodiversity-related income. The social benefits of preserving biodiversity significantly outweigh the benefits of the additional tax revenue.

Furthermore, it is the position of this study that the majority of landowners who preserve biodiversity through the NSW Biodiversity Banking and Offsets Scheme will only ever generate a modest profit or a loss. Therefore, to encourage market participation, the Department should investigate avenues and pathways which may facilitate a more tax-efficient marketplace.

18 EQUIVALENCE STATEMENTS

Deep River Group's primary research indicates equivalence statements as an extremely contentious component of the Biodiversity Banking and Offsets Scheme.

Whilst notionally, there should be no change in value, there is an additional cost for transacting across biodiversity credit systems. Furthermore, the premium charged on credit owners detracts from consumer confidence and market participation.

Case Study:

A market participant generated a number of credits. They proceeded to sell some credits as BBAM and then sold a number of credits as BAM credits with the required equivalence statement.

A period of time without any transactions transpired, and the participant wished to trade further BAM credits.

This particular market participant was in competition with another credit owner (credit owner 2) who owned BAM-equivalent credits.

The transaction in question was to deliver HN556 credits to a developer.

Credit owner 2 quoted $17,500 per BAM-equivalent credit, and the market participant quoted $16,000 per BBAM credit.

The developer was unable to determine, without contacting the biobanking team to request a new equivalence statement (which is not possible without purchasing the credits) which offer was a better financial deal.

In the end, the market participant was unsuccessful in providing credits, despite their quote equating to $10,000 per credit (a fair market price) and the quote by credit owner 2 equating to $12,000 per credit (a 20% markup).

Recommendation Ten: Allow the market to trade between credit systems, do not require an equivalence statement.

Deep River Group recommends that the Office of the Environment and Heritage consider implementing a solution that allows market participants to trade their BBAM and BAM credits with one another on the open market.

Once all BBAM credits have been exhausted and retired, the Office of the Environment and Heritage should instate a fixed transitory rubric of noted conversions for development consents.

Providing certainty by way of a free market and fixed rubric pricing aids in promoting transparency and trust.

PART IV
EFFECTIVENESS OF SCHEME INTERFACES

"Offsetting costs and the ability for private landowners to engage in the scheme will also be examined."

19 PRIVATE LANDOWNER PARTICIPATION

62.50% of landowners describe the Biodiversity Banking and Offset Scheme as "Hard to use" and rate the SPOT pricing tool as an aggregate average a "2/10" when rating how difficult the tool is to use.

Ultimately, the issue continually identified by respondents, experts and interviewee's is that Private landowners are not adequately informed.

Private landowners rated the Public Registers a "4/10" in effectiveness for sourcing vendors and buyers.

The issue is plain; the manner that the financial industry makes the distinction between retail and sophisticated investors has no equivalence in the NSW Biodiversity Banking and Offsets Scheme.

The expectation is that private landowners seek expert ecological, legal, tax, and financial planning advice. However, the reality is that most private landowners do not understand what they do not know.

The full implications of entering into a biodiversity stewardship agreement are usually unknown until the landowner attempts an activity (such as selling credits).

This study notes that Indigenous Australian's own significant amounts of privately conserved land. However, several Indigenous interviewees suggested they were not informed of the implications until several decades later, with one such case described above.

There is a particular question of ethics, where one party enters into an agreement with a significant disparity in understanding to the other, especially where the legislative protections for the landowner are modest.

Recommendation Eleven: Increase understanding by simplifying the rights and obligations for landowners.

Deep River Group recommends that the Office of the Environment and Heritage consider simplifying the rights and obligations for landowners and providing simplistic advice, which allows a landowner considering entering a biodiversity stewardship agreement to benefit from a holistic understanding.

Practically, a solution might include creating a one-sheet advice that covers all rights and obligations and ensuring that the language of such advice maintained simplicity and conciseness.

20 INTEGRATION WITH OTHER COMMODITY MARKETS AND TOOLS

The NSW Biodiversity Banking and Offsets Scheme does not presently have the capability to integrate natively with existing commodity markets and investment tools.

Investment institutions and investors generally utilising a very select set of common frameworks for investing. The BBOS failing to integrate natively dissuades investors away from engaging in the Scheme.

This paper has suggested some of the many benefits in increasing market participation, which this section will not revisit.

Streaming the current pricing, market activity and allowing notifications of future market activity would increase the transparency of the Scheme and foster increased financial engagement in the Scheme.

21 THE POSSIBILITY OF UNDERSUPPLY, PRICE SPIKES AND OVER-SECURITISATION

With greater participation in the NSW Biodiversity Banking and Offsets Scheme marketplace, the demand for credits increases, and as a natural market, so too will the price.

However, due to the market effect, price increases will only be temporary because as prices increase, the desire to become a credit generating market participant increases.

Free markets, the preferred form of market for both surveyed developers and landowners, normalise price spikes exceptionally quickly. The opportunity for price-arbitrage attracts savvy landowners.

Over-securitisation is not a concern for the BBOS market; the artificial base demand of biodiversity (the requirement to retire credits by development consents) credits provides a base layer of protection. Beyond that protection, securitisation comes with well-known and understood investor risks.

22 ISSUES WITH DETERMINING THE PRICE OF CREDITS

The SPOT pricing tool is not an effective tool for determining the current market price of credits.

Respondents identified that the SPOT pricing tool is challenging to find and "not useful" for their purposes.

The price is not real-time; in a delayed market, this is not particularly an issue. However, it remains a frustration for those who are trying to value their credits in the context of recent sales.

The pricing tool does not normalise or provide rectifying mathematical functions to render useful pricing information. There are a plethora of trades that occur between related parties or under specific parts of the act, which result in lower than arms-length market pricing. As a result, the SPOT pricing tool does not function as intended to determine current market pricing.

23 ISSUES WITH THE BIODIVERSITY OFFSETS PAYMENT CALCULATOR (BOPC)

87% of respondents identified that they "Strongly Disagree" that the Biodiversity Offset Payment Calculator generates prices that are accurate.

This study will not go into detail regarding the accuracy or inaccuracy of the Biodiversity Offset Payment Calculator. However, this study would note the apparent unilateral agreement that the BOPC fails to work as intended.

Generally, respondents provided two criticisms of the BOPC.

The first criticism considers the ability of credit purchasers to engage directly with the BCT, bypassing existing credit vendors, a significant detriment to the NSW Biodiversity Banking and Offsets Scheme.

The second criticism is that the BOPC acts in an anti-competitive nature, restricting the upper sales price of credits. As a result, the BOPC provides downward pressure on credit pricing, resulting in poorer outcomes for credit generators and holders.

One respondent suggests a purchaser "should be able to go to BOPC and pay the highest that credits type has ever sold for plus a premium".

24 THE NEED FOR A CENTRALISED MARKETPLACE

Deep River Group proposes that many of the above-described issues require the Office of the Environment and Heritage to implement a centralised marketplace.

The marketplace should maintain a liquidity pool, a centralised exchange, and a futures market.

The purpose of a liquidity pool is to allow market participants to enter and exit the market in an efficient manner. A new market of BBOS Credit "stakers" enables the maintenance of a liquidity pool. Stakers provide three different kinds of stakes, term stakes, at-will stakes, and in-perpetuity stakes.

A staker provides an equal value of cash and credits for one of the above-specified terms. For example, a staker may deposit $1.7 million and 100 HN529 (PCT850) credits. This pool allows a credit purchaser who needs access very quickly to credits to buy from the BCT maintained liquidity pool. The purchaser will pay a premium to the BCT, which will partially go to reimbursing the staker. Equally, a credit seller who needs cash very quickly can sell to the BCT maintained liquidity pool. The seller will receive a discounted value on their credits. Market transactions generally incur fees, which assist in the repayment of stakers. Staking is a form of passive investing.

The centralised marketplace exchange facilitates real-time pricing and instantaneous matching of buyers and sellers. Credit vendors and purchasers alike can partake in an automated (or at least semi-automated process), which allows the credits to become increasingly transactional. Should the BCT capitalise on the new market transactions, there is substantial revenue generation possibility.

The futures marketplace generates a new source of income for the BCT without creating additional paperwork. The transactional nature of this market is a financial marketplace with a degree of abstraction from the core assets. This paper will not go into depth regarding the benefits and opportunities of opening a futures market.

The analytics and data streams generated by the centralised marketplace and increased transaction volume will increase the Office of the Environment and Heritage's understanding of Credit needs. Furthermore, analytics will provide a vital tool in maintaining and preserving biodiversity. The mechanism allowing notification of future market events allows the Department and other market participants to prepare for significant events (for example, the registration of a substantial number of credits, the release of credits to the market, or a large development project).

The benefits of the centralisation of the BBOS marketplace would provide the Office of the Environment and Heritage with more effective tools for Compliance & Enforcement. This paper will discuss the matter further in a later section.

The centralised marketplace will facilitate increased reporting and audit (including for taxation purposes). This functionality results in a multitude of benefits for private landowners, particularly in regards to taxation. Furthermore, the Department can utilise

the audit capability to ensure adherence to biodiversity stewardship agreements. This paper discusses the functionality further in a later section.

Centralising transactions and directing them to an exchange allows the BCT or the Department where necessary to control the market, especially where pricing is concerned. In the same manner, traditional stock exchanges have failsafe mechanisms or automatic trading halts; the same would apply to a credit marketplace.

Finally, the tokenisation of credits would allow for more straightforward transactions and legal relationships; this issue is discussed above in the section regarding the securitisation and security of credits.

PART V
RECOMMENDATION: CENTRALISED MARKETPLACE

25 INTRODUCING DEEP RIVER DIGITAL MARKETS

Deep River Digital Markets is a blockchain-enabled technology that delivers tokenised asset markets to government and large institutions. The implementation of Deep River Digital Markets would enable the Office of the Environment and Heritage to bring the Biodiversity Banking and Offset Scheme into the modern world.

The product Deep River Digital Markets offers replaces all existing interfaces (including the public registers and the SPOT pricing index) and creates many new interfaces.

Deep River Digital Markets enables a multitude of features, including:

- An interactive marketplace where offers and acceptances can occur in real-time;
- Instantaneous generation, transfers, and retirements, with automation facilitating OEH staff;
- Futures, swaps, volatility and contract-based trading;
- Security management (the ability to take liens over credits);
- Automated compliance and audit;
- Integration with existing investment management tools;
- Direct market pricing controls; and
- Notifications of significant market activities to the entire marketplace.

The marketplace boasts consistency and security; because of the system's technology, the marketplace will never go down and is unhackable, therefore remaining entirely indefeasible.

The Deep River Digital Markets Marketplace is transparent and measurable, allowing the BCT, OEH, and market participants to invest and trade in real-time with access to pricing, market trends and other information.

26 IMPROVE COMPLIANCE & ENFORCEMENT

With tokenised credits, the process of compliance is enforceable with significantly reduced staffing overheads. In addition, Deep River Digital Markets facilitates authorities to communicate with credit originators and credit holders and require certain actions to occur prior to further trading activities.

Deep River Digital Markets enables a discretionary transparent record log for compliance and enforcement purposes. The log allows for permissible users to view compliance records to bolster assurance of the transparency process.

27 IMPROVE ANALYTICS TO ENSURE ROBUST CONSERVATION OF BIODIVERSITY

Part of the evaluative framework is a constant revision from analytics to improve your operating modus operandi. Deep River Digital Markets increases analytical insights such that at the discretion of government authorities, certain parties, which may include independent experts, may monitor the analytics feeds to ensure the robustness of the Biodiversity Banking and Offsets Scheme.

28 IMPROVE MARKET PARTICIPATION & ADOPTION OF OFFSETS

By simplifying the way an investor can interact with credits, the Office of Environment and Heritage could improve market participation and adoption of offset credits.

The easy to use mechanism and integration with existing market tools will facilitate more significant investment in the Scheme. Retail investors, sophisticated institutions, superfunds, and corporate entities businesses alike will be able to engage in a more convenient manner.

It is conceivable that investors will consider owning credits as essential to an environmentally balanced portfolio.

29 DIRECT CONTROL OF PRICE & MAINTENANCE OF THE BCT FUND

A centralised marketplace provides controls that simply do not exist in a decentralised market. The Office of the Environment and Heritage will gain the capability to restrict specific trades and sales, controlling asset flows and other moderation controls.

Through the instantaneous market, the BCT can maintain the Fund's credit position in a more effective manner.

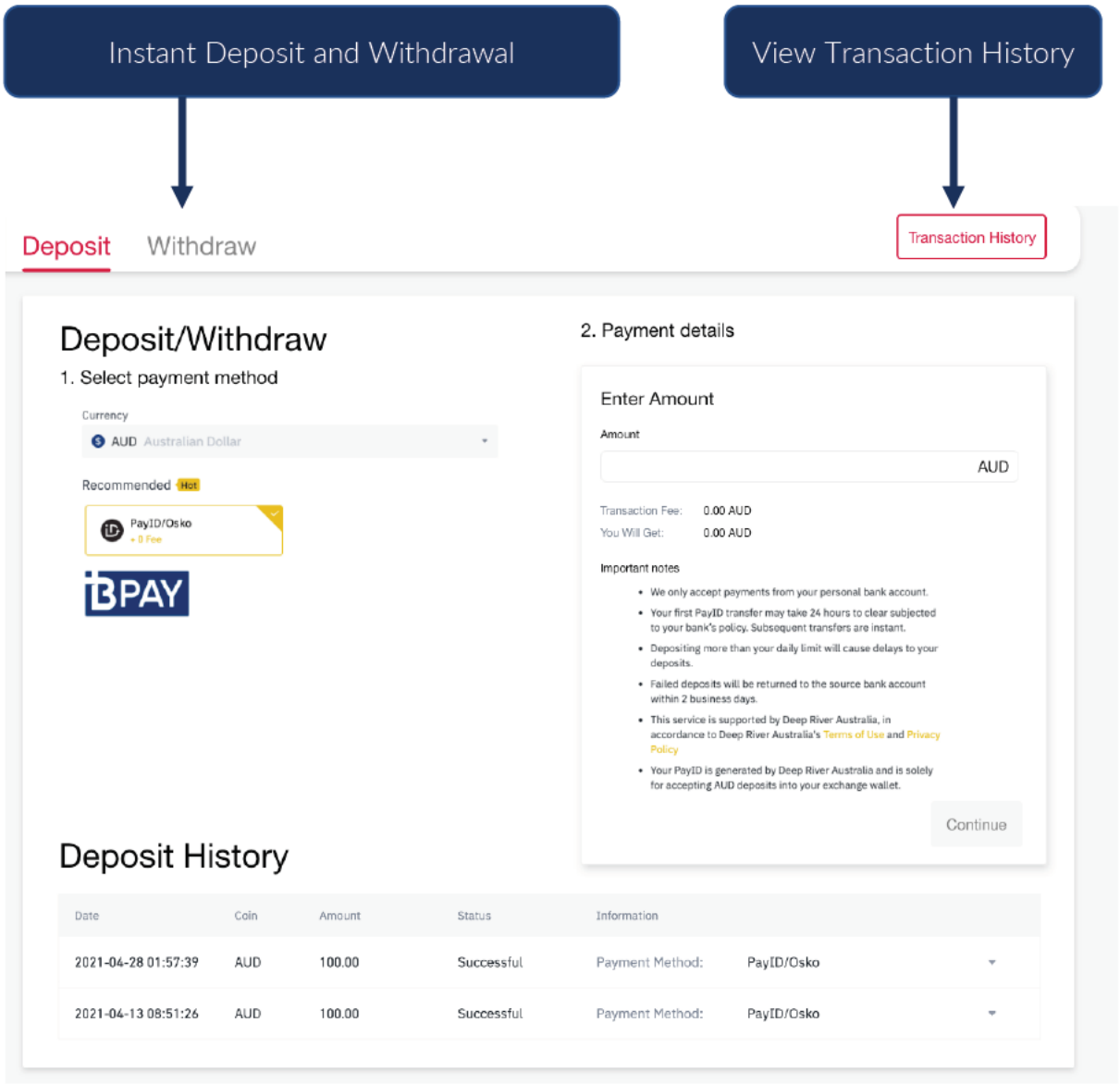
30 DIRECT COMMUNICATION WITH THE MARKETPLACE

Deep River Digital Markets allows the Office of Environment Heritage or the BCT to communicate with the entire market with a simple contact mechanism. There is the ability to supply one-directional information or to invite two-way feedback.

31 SIMPLER REPORTING & AUDIT

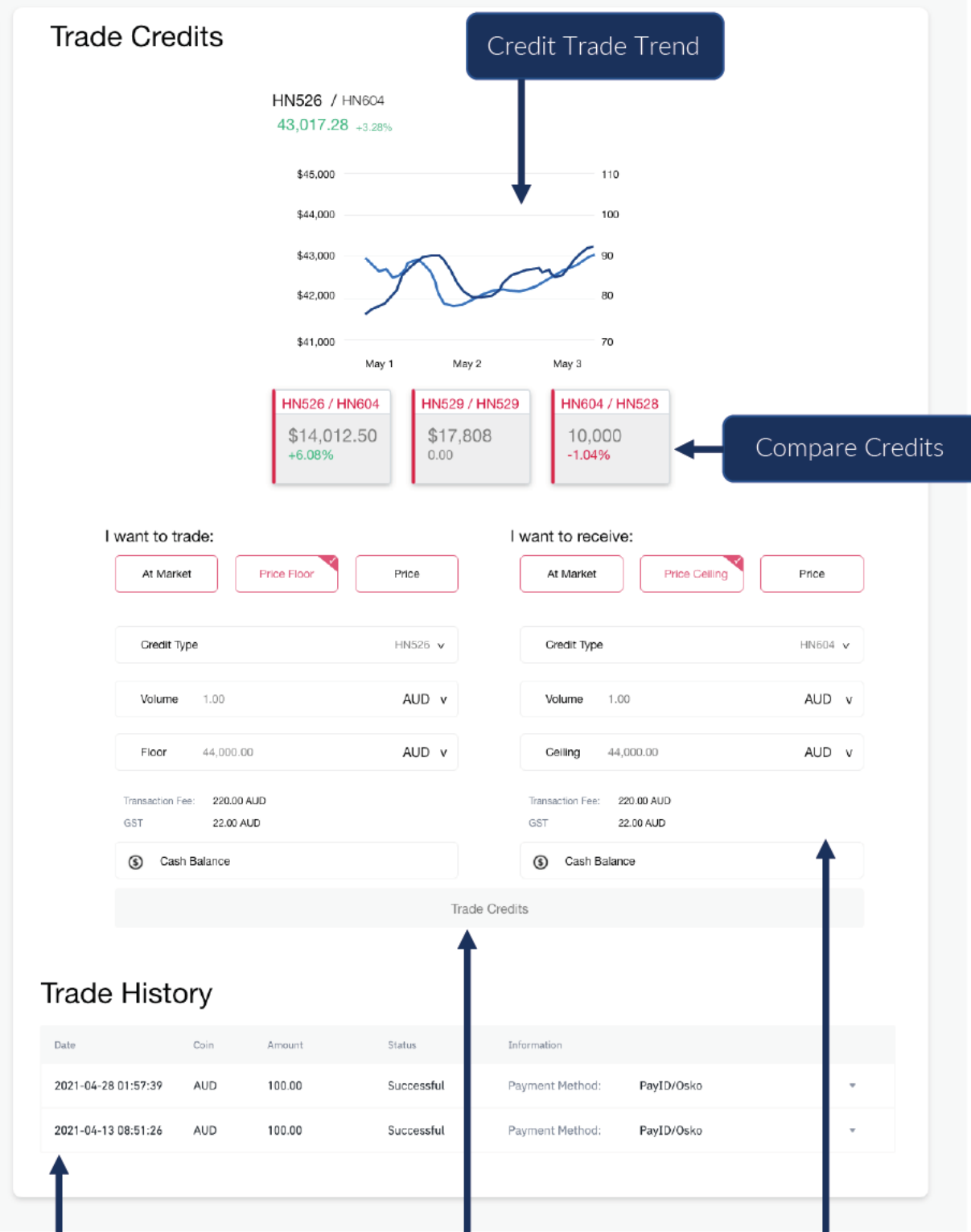
The Deep River Digital Markets system enables reporting and audit via SMART contracts without the need for significant overheads.

32 SIMPLER CREDIT TRANSACTIONS




Credit Price Trend
Set max ($) spend
Credit Price
Number of Credits
Buy Credits
HN604 / AUD
43,017.28 +3.28%
$45,000
$44,000
$43,000
$42,000
$41,000
110
100
90
80
70
May 1
May 2
May 3
HN526 / AUD
$14,012.50
+6.08%
HN529 / AUD
$17,808
0.00
HN604 / AUD
10,000
-1.04%
Buy Credits
Spend
1000 - 10,000,000
AUD
Buy
0.00
HN604
Transaction Fee:
0.00 AUD
GST
0.00 AUD
Select payment method
New Debt/Credit Card
Cash Balance
Other Payments
Purchase Credits
Purchase History
Date
Coin
Amount
Status
Information
2021-04-28 01:57:39
AUD
100.00
Successful
Payment Method:
PayID/Osko
2021-04-13 08:51:26
AUD
100.00
Successful
Payment Method:
PayID/Osko
Compare with other Credits
Purchase Credits Instantly
Purchase History
Choose Credit Type


Credit Price Trend
Credit Sale Type
Credit Price
Credit Sale Volume
Sell Credits
43,017.28 +3.28%
$45,000
$44,000
$43,000
$42,000
$41,000
110
100
90
80
70
May 1
May 2
May 3
HN526 / AUD
$14,012.50
+6.08%
HN529 / AUD
$17,808
0.00
HN604 / AUD
10,000
-1.04%
Sell Credits
At Market
Price Floor
Price
Credit Type
HN529
Volume
1.00
Floor
44,000.00
Transaction Fee:
220.00 AUD
GST
22.00 AUD
Cash Balance
Sell Credits
Sale History
Date
Amount
Status
Information
2021-04-28 01:57:39
100.00
Successful
Payment Method:
PayID/Osko
2021-04-13 08:51:26
100.00
Successful
Payment Method:
PayID/Osko
Compare with other Credits
Sale History
Sell Credits Instantly
Credit Type


Trade Credits
Credit Trade Trend
HN526 / HN604
43,017.28 +3.28%
$45,000
$44,000
$43,000
$42,000
$41,000
110
100
90
80
70
May 1
May 2
May 3
HN526 / HN604
$14,012.50
+6.08%
HN529 / HN529
$17,808
0.00
HN604 / HN528
10,000
-1.04%
Compare Credits
I want to trade:
At Market
Price Floor
Price
Credit Type
HN526
Volume
1.00
AUD
Floor
44,000.00
AUD
Transaction Fee:
220.00 AUD
GST
22.00 AUD
Cash Balance
I want to receive:
At Market
Price Ceiling
Price
Credit Type
HN604
Volume
1.00
AUD
Ceiling
44,000.00
AUD
Transaction Fee:
220.00 AUD
GST
22.00 AUD
Cash Balance
Trade Credits
Trade History
Date
Coin
Amount
Status
Information
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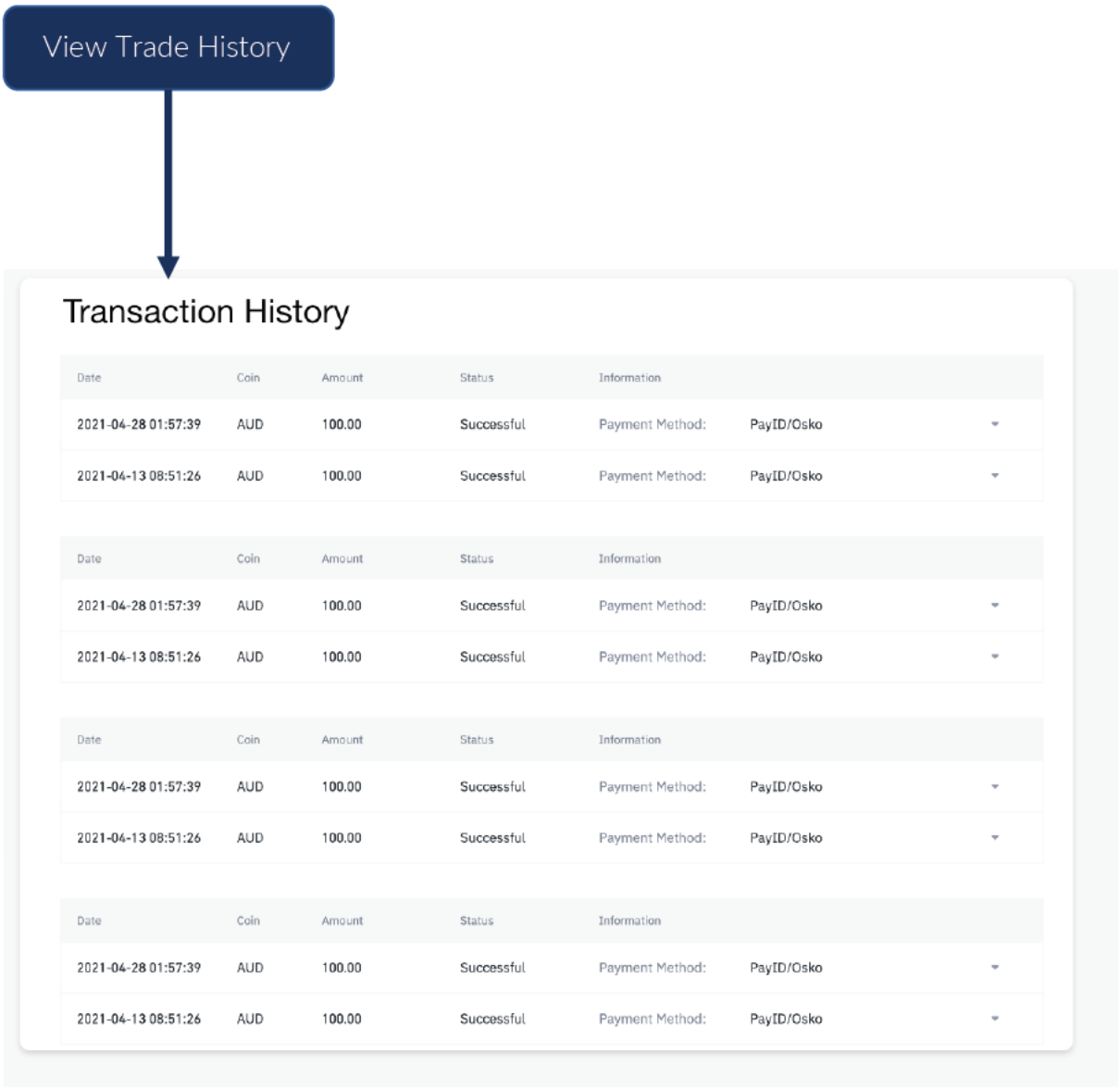
AUD
100.00
Successful
Payment Method:
PayID/Osko
2021-04-13 08:51:26
AUD
100.00
Successful
Payment Method:
PayID/Osko
Trade History
Instant Trade
Trade Type


View Trade History
Transaction History
Date
Coin
Amount
Status
Information
2021-04-28 01:57:39
AUD
100.00
Successful
Payment Method:
PayID/Osko
2021-04-13 08:51:26
AUD
100.00
Successful
Payment Method:
PayID/Osko


Market Value of Holdings
Example Company Pty Ltd
$430,017.28 AUD
+3.28%
Buy
Sell
Trade
Assets
Activity
HN526 3.00 >
HN529 2.00 >
HN528 1.00 >
HN604 9.00 >
Add Credit
Import Credits
Credit Type
Credit Volume
View Details

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