

# Desert Uplands Committee Landscape Linkage Auction: An outline and evaluation

## Main Report

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## Executive Summary

- In 2006, the Desert Uplands Committee (DUC), in conjunction with the Queensland Environmental Protection Agency and Central Queensland University implemented a multiple bidding round conservation auction in the Southern Desert Uplands region. The focus of the auction was to improve the management of vegetation areas with high biodiversity values on privately owned grazing land, and where possible, to create a linkage across the region.
- The challenge of designing an auction for landscape linkage in the Desert Uplands had been the focus of one of the national market-based instruments pilot program (NMBIWG 2005). Funding to implement the auction was later secured from the Burdekin Dry Tropics regional NRM group.

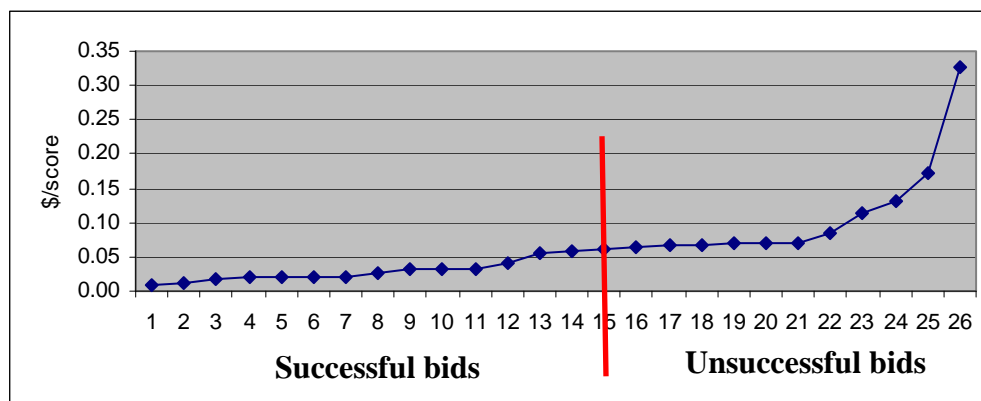
### Auction design

- The auction design included the use of multiple (three) bidding rounds:
  - This allowed landholders to learn about the bidding process and helped reduce some of the perceptions of the risk and uncertainty associated with this new type of incentive mechanism.
  - It was likely to result in competitive efficiencies.
  - It provided the opportunity to provide feedback about the location of other bid proposals. This meant that participants had the opportunity to adjust the alignment of their own bid area and improve their chances of success.
- Three broad categories were used to assess the environmental benefits of the individual proposals. A biodiversity score accounted for 33% of the total score; a land condition score (22%) and the linkage component comprised 44% of the total score.

### Auction participation

- Twenty six landholders (23% of those considered eligible) showed some interest in the auction either by making a request for further information and/or submitting an expression of interest.
- A total of 27 bids were received from 22 landholders:
  - 15 bids (15 bidders) were successful; and
  - 12 bids (7 bidders) were unsuccessful.
- There was a wide range in bids both in terms of the area offered and the bid prices. The distribution of relative bids values is outlined in the figure below.

**Figure E1. Relative bid values**

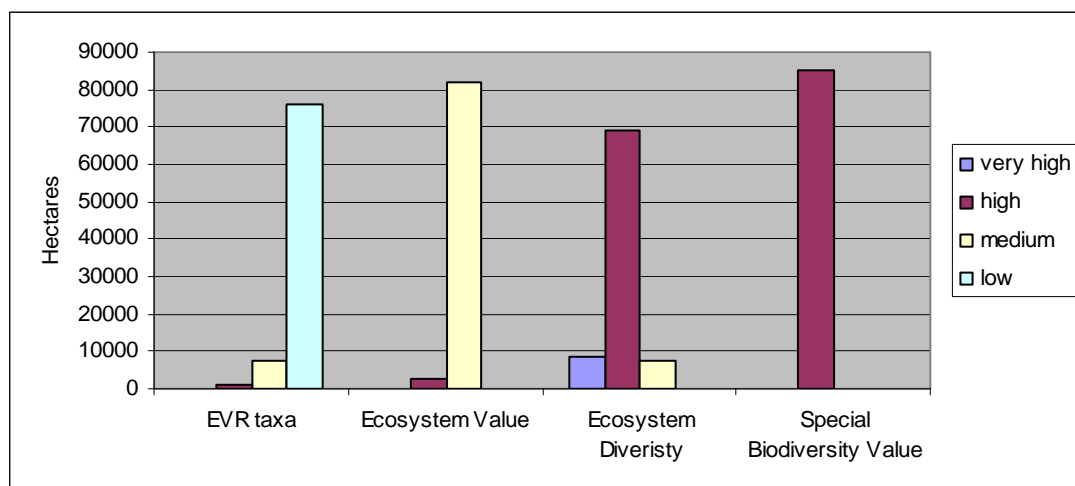


### Auction outcomes

- The 15 successful bids accounted for \$343,076 in funding for two year contracts and included **84,992 hectares of remnant vegetation**. This meant that the average cost of protecting biodiversity in areas of remnant vegetation was **\$4.04/ha or \$2.00/ha per year**.
- The linkage assessment score appeared to have been successful in achieving a linkage outcome. Eleven of the 15 successful bids were part of a group that formed a distinct corridor or landscape linkage with only single or part property gaps. The total bid area of this group was over 62,000ha (77% of the total bid area).
- Included in the successful bid areas were:
  - 1,286ha with “**high**” value **EVR (Endangered, Vulnerable, or Rare) taxa**;
  - 2,916ha with “**high**” value **Ecosystem value**;
  - 8,484ha with “**very high**” value and 68,983ha with “**high**” value **Ecosystem Diversity**; and
  - All 84,992ha had **Special Biodiversity Value** (only assessed as presence or absence).

Full details are presented in the figure below.

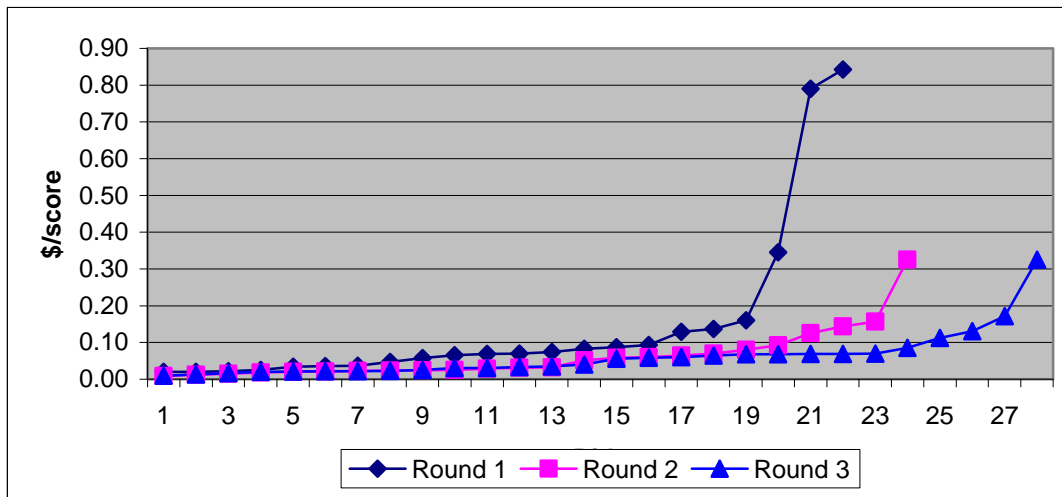
**Figure E2. Biodiversity values included in successful bid areas**



### Auction evaluation

- The Landscape Linkage auction was the first conservation auction in Australia designed to achieve the connectivity of individual project proposals to improve biodiversity conservation outcomes. Including a linkage score in the assessment metric provided sufficient encouragement to achieve the cooperation required between landholders.
- Implementing a system of multiple bidding rounds appeared to have some competitive advantages. There was a significant reduction in the relative bid values between the first and third bidding rounds as indicated in the figure below. Most of the efficiency gains were made in the first two rounds.

**Figure E3. Relative bid values (\$/score) in the three bidding rounds**



- A key benefit of the multiple round process was the information feedback to participants between bidding rounds. This provided participants with useful information about a market of which they had no prior experience.

### Participant evaluation

- There was broad agreement amongst participants that the tender application process was reasonable. Some respondents had not liked having multiple bidding rounds, but half of them did not mind.
- All successful bidders expected to continue managing their properties in the same way after their management agreements expire, suggesting that the conservation agreement may help to change management practices over a longer period.
- The length of contracts were only for a two year period, but 71% of successful bidders indicated they would be willing to enter into longer, 15 year agreements and 6 people (43%) thought they would now be more likely to enter into a perpetual conservation agreement.
- Overall, the Landscape Linkage auction can be considered a success from the landholders' perspective as the majority of the active bidders (84%) thought that they would submit an application in any subsequent scheme and nobody said they would not. Some of the non-participants also indicated they would enter a bid in another scheme.

### Future directions

- While the auction process did result in some degree of landscape linkage, there are two important longer term implications to consider:
  - the corridor or landscape connection was incomplete and
  - contracts were only for two years.
- The first steps were taken in developing some linkage between protected areas but without any follow-up process these gains could be lost. Further research is required to explore this issue and develop a system that can:
  - be adapted to irregular sources of limited and short term funding;
  - lock in and build on the early gains in linkage formation; and
  - optimize the geographical connection to maximize the long term ecological outcomes.

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## 1. Introduction

In 2006, the Desert Uplands Committee (DUC), in conjunction with the Queensland Environmental Protection Agency and Central Queensland University implemented a multiple bidding round conservation auction in the Southern Desert Uplands region. The focus of the auction was to improve the management of vegetation areas with high biodiversity values on privately owned grazing land, and where possible, to create a linkage across the region.

There is increasing use in Australia of conservation auctions as a tool for natural resource management because of their potential to provide more cost effective environmental outcomes on private land, compared with the more traditional use of fixed-price grant schemes. In a conservation auction the focus is on providing environmental outcomes. Landholders who want to participate can nominate the area of their property to include in a management agreement and the price they wish to receive. They have the flexibility to decide how they want to manage the proposed bid area, as long as they provide the specified outcomes. This creates price competition between landholders as only the most cost effective bids are accepted until a specific budget limit has been reached. The relative value of all bids is assessed on the environmental outcomes as well as on cost. There is variation in the biophysical characteristics of different properties which in turn will affect the environmental outcomes that can be provided. As well, there is variation in the socio-economic characteristics of the different property managers which will affect the costs of providing the same outcomes. This means that relative bid values will vary making some bids more competitive than others. Competitive bidding pressure means landholders should keep their bid prices as low as possible to increase their chances of success. There is some risk of collusion in conservation auctions, so a key design task is to minimise opportunities and incentives for this to occur.

In the Landscape Linkage auction, landholder cooperation was a key element. The environmental objectives were twofold. First, there was a need to protect areas of high biodiversity value, and second was the need, where possible, to form a vegetation corridor to ensure landscape connectivity. To achieve the latter, landholders were encouraged to cooperate with their neighbours so that bid areas could be aligned across the landscape. The challenge was to design an auction process that encouraged landholder cooperation but still maintained price competition.

The challenge of designing an auction for landscape linkage in the Desert Uplands had been the focus of one of the national market-based instruments pilot program (NMBIWG 2005)<sup>1</sup>. This meant that both the DUC and partners, and some of the landholders in the region were familiar with the concept and keen to proceed with implementation. Once funding from the Burdekin Dry Tropics regional NRM group had been secured, the Landscape Linkage auction was implemented between August and December 2006. Landholders who submitted a bid proposal were required to maintain the land condition in their bid area to a specified minimum standard, which would ensure the required environmental outcomes (biodiversity protection) would be achieved. Full details of the auction design, outcomes and an evaluation of the attitudes of landholders who participated in the scheme are presented in this report.

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<sup>1</sup> The project resulted in a series of research reports available at <http://resourceeconomics.cqu.edu.au/>

## **2. Auction design - results from the MBI National Pilot**

The design phase of the project had identified a number of key results (Rolfe et al. 2005) with three key outcomes being incorporated into the design of the Landscape Linkage auction.

First, significant efficiencies in bid formation were identified with the use of multiple round auctions. The average bid price fell under the competitive pressure of successive bidding rounds, while the amount of biodiversity credits that could be purchased for a fixed budget allocation rose. This result encouraged the use of multiple bidding rounds.

Second, two approaches to encourage cooperation between landholders were identified. A 'limited cooperation' approach was found to be practical in designing corridors with a small number of participants. This model involved the cooperation of neighbouring landholders to plan a corridor location, and then submission of sealed bids for individual components.

An 'individual bid' model was also found to be practical in designing corridors, with some evidence that the model was more cost efficient than the 'limited cooperation' approach. An 'individual bid' model for corridor establishment only works with multiple bidding rounds. After an initial round of bids, participants are shown the location of other bids (including those of neighbours) in the area. Because bids will only be successful if they form part of a viable corridor, participants have clear incentives to change or add to their bid designs so that corridors line up at property boundaries. In this way there are incentives for individual behaviour that lead to positive group outcomes. Other key advantages of the 'individual bid' model are that they allow a large number of potential corridors to be identified (thus enhancing the competitive process), and there is more competitive pressure on individual participants (leading to more cost-efficient bids).

The individual bid model was adopted for the Landscape Linkage auction, but it incorporated elements of the limited cooperation model by rewarding landholders who directly cooperated with their neighbours with a joint bid bonus.

Third, there did not appear to be suitable metrics available for evaluating corridor bids. Two metrics were developed in the course of the project. One was a very simple one which was used in the workshop process, while the other was a technical design that could be used to evaluate bids very precisely. However, complicated metrics have disadvantages in terms of assessment costs, complexity and reduced transparency. In the Desert Uplands where biodiversity issues are not critical (large areas remain relatively undeveloped), it was considered advantageous to develop a relatively simple metric that would incorporate an evaluation of key biodiversity components as well as key linkage elements.

### **3. Designing the Landscape Linkage auction**

There are four principal components to consider in the design of an auction;

- the auction rules;
- the contract design;
- the bid assessment metric; and
- the auction process.

#### **3.1 The auction rules**

The rules of an auction will have an influence on participation and the potential outcomes that can be achieved. In the Landscape Linkage auction, it was important to encourage as many participants as possible to increase the opportunities for linkage, as well as trying to maximize economic efficiency to provide the most environmental outcomes for a given budget.

##### **3.1a Number of bidding rounds**

Most of the conservation auctions in Australia have been in the form of competitive tenders or single round auctions. In this case, a multiple (three) bidding round process was applied for two main reasons. Running multiple bidding rounds has advantages because it allows landholders to learn about the process and can reduce some of the perceptions of the risk and uncertainty associated with this new type of incentive mechanism. Previous studies have shown that there are cost-efficiencies associated with multiple bidding rounds as relative bid prices tend to decline, with most gains being captured in the first two or three rounds (Rolfe and Windle 2006). In addition, there are needs in a linkage auction to maximize the likelihood of bid areas aligning with other bids in the area. For this it is important that participants are able to receive feedback and see the location of existing bids in between bidding rounds/before the final bidding round so that they can adjust the alignment of their own bid area to improve their chances of success.

##### **3.1b Sealed or open bids**

There are some advantages of having open bids as bidders are provided with information about other bids and current prices, which means they are able to learn more about the market they are entering. This could be very useful in a conservation auction where there has been no market for environmental services and landholders have no information about current prices. However, landholders are unfamiliar with conservation auctions and were considered more likely to participate if their bid details remained confidential. All bids were sealed.

##### **3.1c Discriminatory versus uniform pricing**

With discriminatory pricing, winning bidders get paid their asking level. With uniform pricing, winning bidders get paid the value of the second highest accepted bid. With uniform pricing, there needs to be more control over what actions are offered to avoid paying inflated prices for some activities. In addition, uniform pricing reduces the gains available to the funding body, although there is some debate about the relative economic efficiency of each system. A discriminatory price policy was adopted.

### **3.1d Reserve price**

It is important to set a reserve price so that over-priced bids are not accepted which could occur, especially if participation in the scheme is limited and competition restricted. It was hard to determine a realistic reserve price and no specific limit was specified. However, it was made clear to participants that the right to reject bids was reserved.

### **3.1e Equity and participation**

There was a need to both ensure an equitable distribution of funds and to maximize participation in the scheme. However, there is sometimes a tradeoff between these two objectives. A cap can be placed on bid amounts to ensure maximum involvement by landholders. If a maximum level is set, it means that there could be a larger pool of successful bids. Having no caps on bid levels means a small number of efficient bids may get most of the funding. It was decided to not set a limit on bid prices, but landholders were allowed to offer multiple bids which could increase their chances of success.

Equity is an important issue for the DUC and they wanted all landholders in the region to have access to auction funds. However, setting a minimum land condition requirement meant that landholders with properties already in good condition had the best opportunity of being accepted as they were most likely to submit the most cost effective bids. To give other landholders an opportunity, an improvement rule was introduced. If property bid areas were classified as being below “A” condition, then a certain percentage improvement was required (see Attachment 1 for details).

## **3.2 Contract design**

Some conservation tenders have involved high levels of security, such as covenants over land titles. Simpler agreements are more likely to be accepted by landholders, particularly in the trial of a new scheme. The contracts for the Landscape Linkage auction were simple management agreement contracts between the DUC and the landholder. The tender application was attached as a schedule.

### **3.2a Time period for contract**

It is unrealistic to expect to achieve environmental outcomes in a short time period and it is preferable to implement longer term contracts. However, there was a government constraint on the funding period available and contracts were only for two years, until December 2008.

### **3.2b Payment periods**

There were three payment points in the contract. An upfront payment (40%) was provided on contract establishment so that landholders who incur high initial costs, such as infrastructure or capital costs, were not disadvantaged or deterred by financial constraints. The remaining funds were performance based, so they could be withheld if required. A further 30% of funds would be paid half way through the contract and the remaining 30% paid before project completion. Having three payment points meant adequate performance checks were in place without excessive demands on additional administration.

### 3.2c Monitoring

A simple monitoring process was designed that did not place too many onerous requirements on either the participating landholders or the DUC. Photo points were established so that photographic evidence could be used to verify that the minimum land condition requirements (grass biomass levels) were being met. In addition, participants had to submit progress reports prior to the release of future payments. All participants were subject to random audits.

### 3.3 Bid assessment metric

While the objective was to form a vegetation corridor across the region, it was recognised that complete connectivity might not be achieved and that “gaps” might have to be incorporated. This meant that more landholders could be included in the pool of successful bidders. For example, landholders could submit a successful bid even if none of their neighbours decided to participate.

All bids were assessed and ranked on the basis of their relative bid value. The bids that represented the best value for money could then be accepted until the funding budget was exhausted. A bid assessment metric was designed for the purpose with the following objectives in mind:

- To maximize the use of desk top analysis;
- To keep the use of field site assessment to a minimum and therefore reduce potential differences between site assessors;
- To eliminate the need for bids to be assessed by an expert panel;
- To be transparent and easy to understand; and
- To be easy to apply.

Full details of the metric or scoring process were revealed to landholders so that they could adjust their bids to increase their chances of success.

Three main components were used to assess the conservation outcomes of each bid proposal:

1. Linkage assessment score (LAS = 44% of the total score );
2. Biodiversity assessment score (BAS = 33% of the total score); and
3. Condition assessment score (CAS = 22% of the total score).

Full details of how each component was assessed are provided in Attachment 1.

Applying these criteria would ensure that bids that contribute to landscape linkage in the region, and also were of high ecological value were more likely to be accepted. In addition, the current condition of a proposed bid area would also be assessed as this contributes to the biodiversity value.

The final assessment of bids was based on the relative bid value which was calculated by dividing the bid price by the total assessment score.

Total assessment score =

$$\text{Area}_1 \times (\text{LAS}_1 + \text{BAS}_1 + \text{CAS}_1) + \text{Area}_2 \times (\text{LAS}_2 + \text{BAS}_2 + \text{CAS}_2) + \dots$$

$$\text{Relative bid value} = \text{Bid price (\$/Total assessment score}$$

Some bids comprised of more than one area, in which case each area was assessed separately. In addition, if there were large areas of non-remnant vegetation included in a single bid area, these were also assessed separately. Non remnant areas were included because they had some linkage value, but only 20% of the area was scored to effectively reduce the weighting. These areas did not receive a biodiversity score but were assigned 75% of the condition score and a full linkage score.

### **3.4 The auction process**

A nine step process was implemented as outlined below.

#### **Step 1: Information and awareness campaign – August 2006**

This included:

- a promotional letter sent to all landholders in the region;
- media exposure; and
- three information workshops.

#### **Step 2: Expressions of Interest – closing date 25<sup>th</sup> August 2006**

All people interested in the scheme had to complete an Expression of Interest (EOI) and were then contacted by DUC to arrange a property visit.

#### **Step 3: Property visits – August/September 2006**

All landholders who submitted an EOI received a property visit which was designed to both deliver and collect information. Field staff supplied further details about the tender application process and provided landholders with information on how they might improve the attractiveness of their bids. Only very general advice was given about how participants should calculate their bid price. In addition, field staff made a land condition assessment of the proposed bid area/s.

#### **Step 4: Round 1 bids - closing date 15<sup>th</sup> September 2006**

Bids were assessed and feedback given within two weeks.

All participants were provided with the following information:

- (a) A map of the region with the bid areas from all participants outlined. This information was provided so that, if they wished, participants could realign their bid to connect with a neighbouring bid area.
- (b) Information was also given about the relative position of the applicant's bid in relation to other bids. This provided an incentive for some participants to improve their bid competitiveness. All participants were told in which quartile of the total bids their bid was rated.
- (c) General information was also given about how participants could improve their bid.

#### **Step 5: Round 2 bids – closing date 27<sup>th</sup> October**

All Round 1 bids remained current unless modified.

Assessment and feedback (same as round 1) provided within two weeks.

### **Step 6: Round 3 bids – closing date 21<sup>st</sup> November<sup>2</sup>**

All Round 2 bids remained current unless modified.

### **Step 7: Bid selection**

Final bids were assessed and participants notified

### **Step 8: Contracts signed**

Successful participants were sent a contract to sign which set out details of the tender application and the management conditions that applied as well as the payment schedule and monitoring conditions.

### **Step 9: Payment schedules and monitoring – to be completed by end of 2008**

Three payments were to be made – 40% on contract establishment, 30% in December 2007 and 30% in December 2008 at project completion.

## **4. Landscape Linkage auction outcomes**

There are about 260 properties in the southern Desert Uplands, but many properties do not have personal addresses and there are a number of owners who have more than one property. One hundred and twelve landholders were specifically identified and targeted as eligible participants (sent personal invitations to participate in the scheme). Twenty six landholders showed some interest in the auction either by making a request for further information, submitting an expression of interest and or submitting a bid. A total of 27 bids were received from 22 landholders. One bid was eliminated as the area involved was incorporated in another, more cost effective bid from the same landholder.

- 15 bids (15 bidders) were successful; and
- 11 bids (7 bidders) were unsuccessful.

The 15 successful bids accounted for \$343,076 in funding for two year contracts and included **84,992 hectares of remnant vegetation**. This meant that the average cost of protecting biodiversity in areas of remnant vegetation **was \$4.04/ha or \$2.00/ha per year**.

There was a wide range in bids both in terms of the area offered and the bid prices. Total bid areas ranged from 1,286 hectares to 19,760 hectares, but this included some areas of non-remnant vegetation and the areas of remnant vegetation ranged from 1,286 hectares to 16,250 hectares. Some landholders submitted large parts of their property which included non-remnant areas. Two of the successful bids included 18,201 hectares of non-remnant vegetation, comprising more than half the bid area in both cases. Only the outcomes from the remnant areas are discussed in this section.

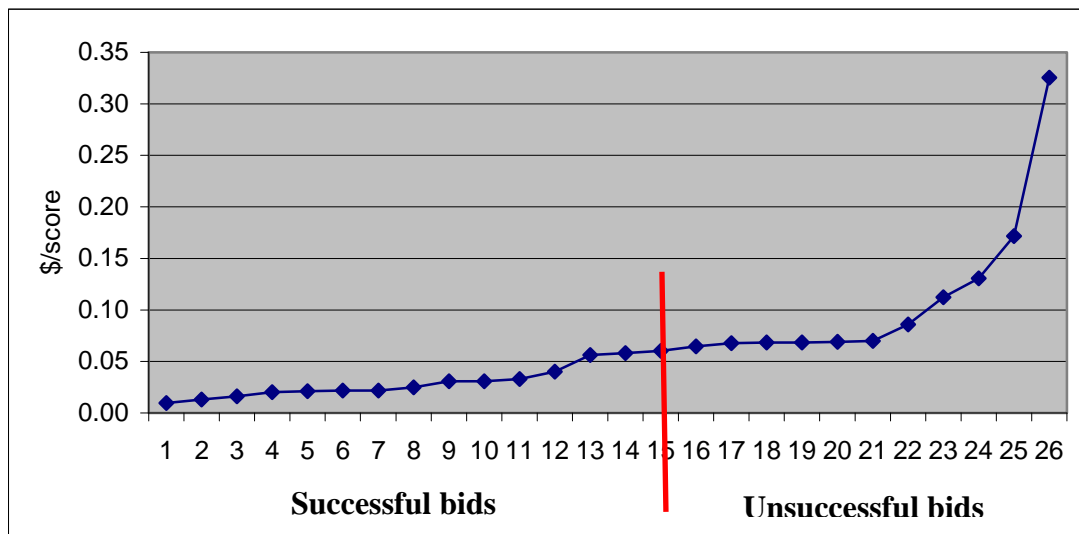
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<sup>2</sup> The initial intention was to hold two bidding rounds, but there had been insufficient time to complete all the field visits before Round 1 bids closed. These participants were told they could enter a bid in the second round and there were seven new entrants in Round 2. This meant that Round 1 bidders did not have full information about these new entrants. As a result, a third bidding round was included so that after the second round all participants had full information.

In the third and final bidding round, bid prices ranged from \$4,400 to \$100,000 and from \$1.51/ha to \$41.23/ha for remnant vegetation. Bids were ranked on the basis on their relative bid values or the relative cost per unit of environmental benefit. After the 14<sup>th</sup> ranked bid had been accounted for there were still some surplus funds, but not sufficient to accept the 15<sup>th</sup> bid as it stood. After some negotiation the landholder agreed to submit the same area for a reduced budget, which effectively made it the 13<sup>th</sup> most competitive bid.

Some consideration was given to the need for invoking a reserve price, but this was not considered necessary as the successful bids were well within the lower ranges before there was a sharp increase in relative bid values after the 21<sup>st</sup> bid (Figure 1).

**Figure 1. Relative bid values**



Three components were used to assess the environmental benefits of the bids and the outcomes of each are outlined in more detail below.

#### 4.1 Linkage scores

The linkage assessment score appeared to have been successful in achieving a linkage outcome. Eleven of the 15 successful bids were part of a group that formed a distinct corridor or landscape linkage with only single or part property gaps. One bid was isolated from other bids but was connected to a National Park. Two bids were connected to each other with a property gap between them and the other successful bid.

##### 4.1a Structure of the bid area

The structure of the bid area was rated according to the width, length and total area. All successful bids areas were quite large and none were too small to provide an ecologically viable linkage area. All successful bids received the maximum score for length (over 2km) and width (over 300m). The total remnant area of the successful

bids averaged 5700ha, ranging from 1300ha to 16,000ha. Only two bid areas did not receive the maximum area score (over 2000ha).

#### **4.1b Current connection**

There were two opportunities to receive a current connection score. A “high” score was given if the bid area was connected to a National Park, Nature Refuge or Resource Refuge and a “low” score if it was connected to a stock route or road reserve. Two of the successful bids received a high score; one adjoined a National Park and another a Nature Refuge, and four bids received a low score.

#### **4.1c Potential connection**

This element in the linkage score was divided into four categories:

- i) Joint bid bonus
- ii) No of direct connections with other bid areas
- iii) No of indirect connections
- iv) Strategic placement

##### ***i) Joint bid bonus***

Twelve (80%) of the successful bidders submitted a bid in cooperation with one or more landholders:

- 7 submitted in cooperation with two or more landholders;
- 5 submitted in cooperation with one other landholder; and
- only three bids were submitted without any cooperation with neighbours.

##### ***ii) No of direct connections with other bid areas***

The cooperation between landholders meant that there were many direct connections between bid areas.

- 4 bids areas were directly connected to two other bid areas;
- 8 bid areas were directly connected to one other bid areas; and
- only 3 bid areas were not directly connected to any other bid areas.

##### ***iii) No of indirect connections with other bid areas***

This score related to the presence of other bids within a 40km radius from the centre of the bid area:

- 2 bids areas were indirectly connected to three or more bid areas;
- 10 bid areas were indirectly connected to one or two other bid areas; and
- 3 bid areas were not indirectly connected to any other bid areas.

##### ***iv) Strategic placement***

This was an additional score allocated on the basis of the potential contribution to develop a landscape corridor. Nine bids were allocated a score in this category which included three of the successful bids.

## **4.2 Biodiversity scores**

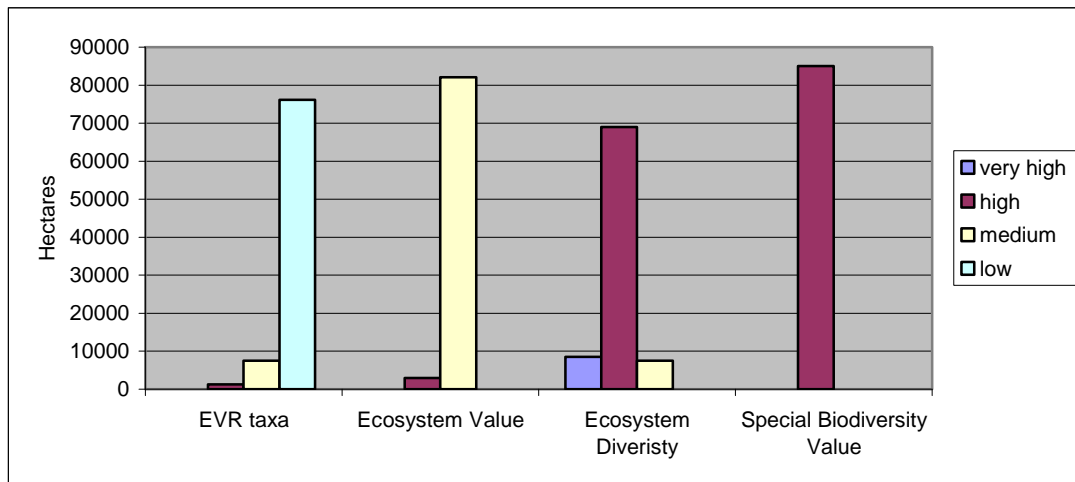
The second component of the total assessment score was designed to ensure areas with high biodiversity were more likely to be successful. There were 84,992 ha of remnant vegetation included in the successful bid areas, which included:

- 1,286ha with “**high**” value and 7,525ha with “**medium**” value **EVR taxa**;

- 2,916ha with “**high**” value and 82,076ha with “**medium**” value **Ecosystem value**;
- 8,484ha with “**very high**” value; 68,983ha with “**high**” value and 7,525 ha with “**medium**” value **Ecosystem Diversity**; and
- All 84,992ha had **Special Biodiversity Value** (only assessed as presence or absence).

Full details are presented in Figure 2.

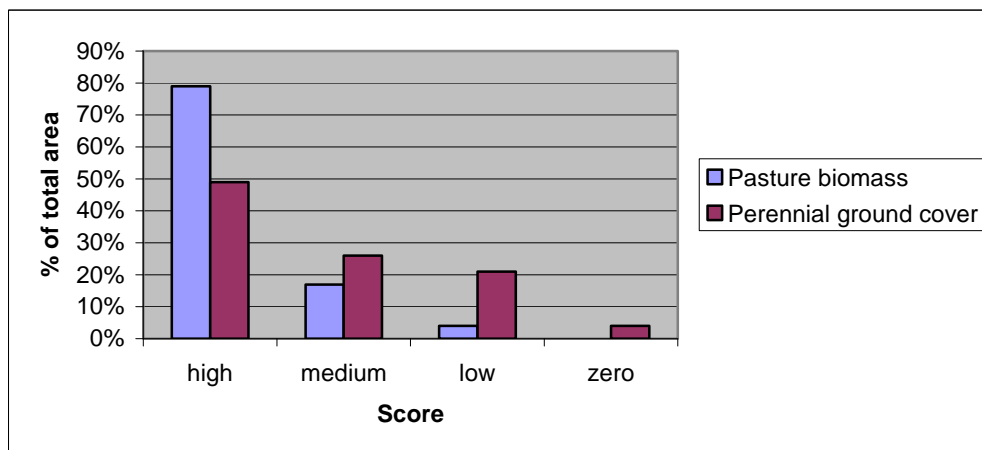
**Figure 2. Biodiversity values included in successful bid areas**



### 4.3 Land condition scores

Most of the successful bid areas were maintained in good condition and because these areas had not been extensively developed, all bid areas scored maximum points for an absence of weeds and for having Buffel in less than 30% of the area. Details of the pasture biomass and ground cover results are outline below and in Figure 3.

**Figure 3. Pasture biomass and ground cover scores**



#### For pasture biomass levels

- 11 bids (79% of the total bid area) had high scores (over 2000kg/ha);
- 3 bids (17% of the total area) had medium levels (between 1000-2000kg); and

- 1 bid had between 500-1000kg).

For **perennial ground cover**

- 7 bids (49% of the total area) had high scores (over 70% cover);
- 5 bids (26% of the total area) had medium scores (30-70% cover);
- 2 bids (21% of the total area) had low scores (10-30% cover); and
- 1 bid (4% of the total area) had less than 10% cover.

These scores are quite high but they were estimated at the field visits. Grass samples were taken to formulate accurate estimates of grass biomass levels which would be applied in the contractual agreements to reach specified standards.

#### **4.3a Management conditions**

Twelve of the successful bidders had their land condition rated as “A” condition and they were only required to maintain that standard. Two participants had their bid areas rated as “B” condition and they were required to make a 5% improvement. One other participant had been given a “C” classification and was required to make a 10% improvement.

## **5. Landscape Linkage auction assessment**

The main aim of the Landscape Linkage auction was to not just protect areas of remnant vegetation with high biodiversity values in the southern Desert Uplands, but to go one step further and develop a corridor or linkage across the landscape which would improve the sustainability and long term biodiversity values in the region. The idea was innovative and the challenge two-fold with both a practical and more theoretical focus. It was the first time the Desert Upland Committee had implemented a competitive incentive program, and it was the first time an auction had been implemented in Australia which required landholder cooperation to ensure geographical connectivity.

### **5.1 Auction outcomes**

The auction was successful in achieving its aims both in terms of protecting areas of high biodiversity and in achieving landscape linkage at a very cost effective price. The majority of this area was in good condition which ensured the integrity of a wider range of overall biodiversity values and not just the elements measured in the auction. The management agreements meant that these conditions would either be maintained or improved. In other words, the area was protected from the pressures to intensify production in a way that adversely impacts on biodiversity and conservation values.

This came at a cost of \$2.00/ha per year, which is a very cost effective outcome just based on the biodiversity values alone, and without considering the linkage benefits. A similar incentive scheme (competitive tender) conducted by the Fitzroy Basin Association (FBA) in the neighbouring region earlier in the year, had protected areas of high biodiversity (without linkage) for an annual cost of \$6.40/ha/yr. The FBA biodiversity tender was assessed as being good value for money based on three criteria:

1. It was less than the broadbrush figure of \$10/ha/yr that the Environmental Protection Agency uses in their estimation of the average annual cost of managing National Parks in Queensland.
2. The total cost was less than the calculated public benefits; and
3. The area protected in the biodiversity tender would have cost 30% more if it had been priced under their Stewardship Scheme.

(Windle and Rolfe 2006)

The linkage outcomes from the Desert Uplands project were also very noteworthy with 11 of the successful bids being part of a broad group that connected across the landscape with only a single or partial property gap between them. The total bid area of this group was over 62,000ha (77% of the total bid area).

The other bids also provided good linkage value with one being connected to a National Park and the other three being connected by a single property gap. The last three bids were located in the northern part of the region, far from the southern corridor group and represented the potential to create an alternative corridor connection. This is an important consideration as from the outset this auction had budget constraints which meant it was unlikely to be able to achieve a full east west corridor linkage (the initial target in the design project). Consequently, this auction could be considered as the first step in a continuing process. All bids could be considered both in terms of the value they provide for the current linkage area and the potential as stepping stones and/or part of another corridor that might emerge in the future if an extension of the scheme is supported.

## **5.2 Auction design**

### **5.2a Multiple bidding rounds**

The auction was designed with multiple bidding rounds for two main reasons. First, it provided an opportunity for landholders to see where other bid areas were located and provided them with an opportunity to adjust their own bid area if necessary. Second, more than one bidding round allowed bidders to explore the market and was likely to result in cost efficiencies. The second aim was more successfully achieved than the first.

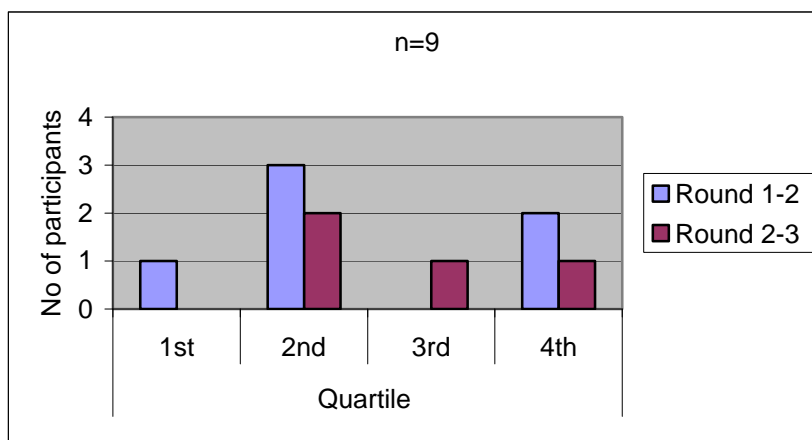
Very few landholders adjusted their bid areas to better align with others after the first round. Most landholders had cooperated with their neighbours and knew in advance the location of neighbouring bids. In addition, some landholders submitted large areas of their property that suited their current management regime and there was little need to adjust such areas.

Participants knew at the start of the bidding process that there would be more than one bidding round. This meant they could submit their first bid knowing that they would have the option to adjust it in a subsequent round if they wished. This gave them an opportunity to test the market before finalising their bid price. The key mechanism used to provide them with information about the market was the feedback provided to all participants at the end of each round. In particular, they were told in which quartile their bid was ranked. It was likely that bidders in the first quartile would be reasonably confident that their bid would be successful. Some might even have considered increasing their bid price, either out of concern that they had under priced

their real costs or because they believed they were in strong market position. Bidders in the second quartile would be reasonably confident but could not assume that all bidders in this bracket would be successful. Bidders in the third and fourth quartiles, particularly the latter would have to consider adjusting their bids to increase their chances of success.

Six of the nine bidders who dropped their price were first round entrants and had two opportunities to adjust their bids. However, only one of them took this opportunity and dropped their price more than once. The bidder was ranked in the second quartile in both rounds. It is unclear the extent to which information feedback on bid ranking influenced the decision to adjust bid prices. There was no clear relationship between bidders' relative ranking and whether or not they adjusted their bid (Figure 4).

**Figure 4. Participants who dropped their bid price and their relative ranking**



To use the market information to the best advantage, bidders would learn more from the feedback if their bid was relatively close to their true bid price. This would account for bidders in the second quartile adjusting their bids. However, it appears that some bidders might have been taking a “shot in the dark” as some of the reductions in bid price were quite substantial. The average reduction of bid prices in the fourth quartile was 51% compared with an average reduction of 25% in the second quartile. Overall, reductions ranged from 10% to 72%, with an average reduction of 34%.

Six of the nine bidders who dropped their bid price had winning bids, representing 40% of successful bidders. There was another group of bidders who did not change their bids between rounds. These participants may have initially made detailed costing and their first bid price represented their true cost. This is supported by evidence from the participant evaluation survey which indicates that there were two broad groups of bidders, half of whom made a detailed estimation of their bid price and half who made a more general estimate (see attachment 2). Only two participants offered completely new bids in subsequent rounds.

The different bidding strategies of the 22 bidders included:

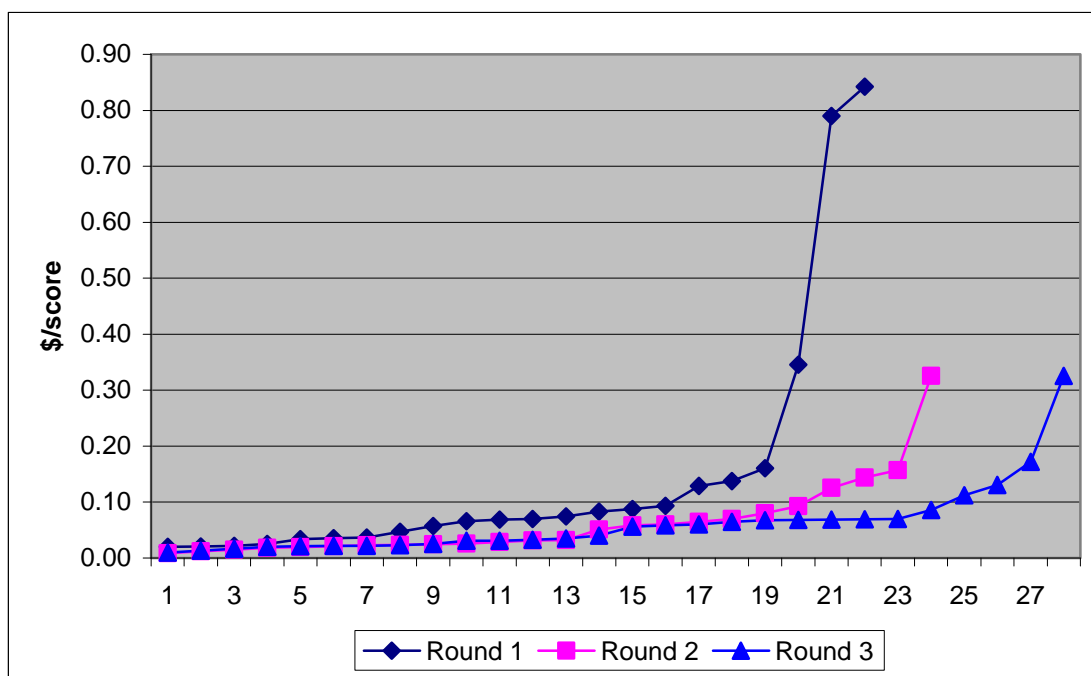
- 11 bidders who did not change their bids at all;
- 6 bidders who reduced their bid prices but kept the same area;

- 2 bidders who reduced their price and made small adjustments (reductions) to the bid area;
- 1 bidder who reduced the price and increased the bid area; and
- 2 bidders who changed both their bid areas and bid prices.

DUC field staff indicated that some bidders had difficulty in deciding which area/s on their property to submit in their bid and some bidders also had difficulty in calculating their bid price<sup>3</sup>. In some situations, there were parts of the property that were not utilized, such as heartleaf poison bush country (*Gastrolobium grandiflorum*) or were only very lightly stocked. These areas now had a “value” as a part of a vegetation corridor, but there was little cost associated with meeting the management conditions. Some of the initial bids were probably based more on what landholders thought they could get and in a multiple round auction they were able to “safely” explore the market. Feedback on relative bid position provided between rounds provided them with strategic information they required.

While the bid price was probably the most important element from the landholders’ perspective, the bids were assessed on their relative bid value which included both price and environmental outcomes. When the relative bid values are compared between rounds (lower values are preferred), there is a noticeable reduction in the number of outlying bids that are very expensive and the bid curves flatten out (Figure 5). The relative bid values in the third round have shown a marked improvement from those in the first round. A paired sample T test confirms there is a statistically significant difference between the two.

**Figure 5. Relative bid values (\$/score) in the three bidding rounds**



<sup>3</sup> Evidence provided by landholders in the evaluation survey indicated that this was not a general problem and only three participants said they would have liked more assistance in calculating their bid price (Attachment 2: Table 4-b)

Overall, implementing a system of multiple bidding rounds did appear to have some competitive advantages, but there is no way of knowing if the results are more cost efficient than with a single round of bidding. However, given there are other benefits of holding more than one round and not just those associated with price competition, then two rounds would have been sufficient.

### **5.2b Landholder cooperation**

There was good cooperation between landholders and this element in the auction was more successful than anticipated. Feedback from DUC field staff indicated that a range of methods were used to contact neighbours, including phone calls and letters.

## **5.3 Process assessment**

Overall, the auction process was relatively simple, did not entail excessive paperwork and appeared to work well. Feedback from both landholders and DUC field staff was positive.

Extending the bidding rounds from two to three was not well received by everyone.<sup>4</sup> Most of the efficiency gains were captured in two rounds, so the third round provided very little additional benefit. The gains made in the third round were reflecting the improvements from the seven new entrants in Round 2 and only a few Round 1 improvements. Everyone knew there would be two rounds and the third round was only included because the field visits had not been completed before the close of the first round. A better option could have been to extend the closing date for first round bids.

In future, if there are limited resources to employ extra staff, then a longer period needs to be allocated for field visits, particularly in a remote region like the Desert Uplands with lengthy travel times.

### **5.3a Property visits**

The property visits were the main format for detailed information exchange and an essential component in the auction process and were important for the following reasons:

- The auction process could be explained in detail to landholders and information provided on how they might improve the attractiveness of their bids.
- Field officers had property level maps which outlined areas of high biodiversity significance and were able to discuss the location of bid areas and potential management options with landholders.
- A land condition assessment was made by DUC staff that would form part of the bid assessment score. Photos and grass samples were also taken for verification.
- The management improvement options were outlined.
- The location of future monitoring points was discussed and negotiated with landholders.

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<sup>4</sup> The evaluation survey indicated 26% of participants did not like having more than one bidding round (Attachment 2: Table 4-c)

Over 80% of participants in the evaluation survey indicated their support for these field visits.

## 5.4 Participation

There was a need to maximize participation in the auction in order to increase the opportunities for connectivity between bids and to develop a continuous vegetation corridor across the region. There had always been some concern that participation rates in the auction were likely to be quite low because the scheme was new and the Desert Uplands is a large and remote region. Many landholders in the region operate independently with little if any contact with regional NRM groups such as the Desert Uplands Committee. In addition, some property owners are not resident in the region.

Four elements had been incorporated into the auction rules that were specifically designed to encourage participation.

1. Participants were allowed to submit multiple bids.
2. There was an improvement rule to enable landholders with land in good and poor condition to participate.
3. The notion of “stepping stones” was incorporated to provide an opportunity to landholders with non-participating neighbours.
4. There had been an intention to provide a participation incentive in the form of a contribution to a local community group for every landholder who entered a bid. However, this was not actioned.

While these rules were designed to increase participation, all elements of the auction process had been designed to be attractive to landholders in the region and not to deter them in any way. A recent report which identifies the barriers to participation in conservation auctions identifies a five step framework for identifying barriers to participation describing:

1. **Alignment:** “getting into the landholder decision set”
2. **Opportunity:** “what’s in it for me?”
3. **Engagement:** “easing the way in”
4. **Contracting:** “mutual agreement”
5. **Post-participation:** “impact of experience on future involvement”.

(Whitten et al. 2007: iii)

The framework is used to identify factors which are likely to influence participation at various stages in the competitive tender process and develop a series of recommendations for increasing participation rates. The Desert Uplands Landscape Linkage auction is one of the case studies presented in the report and the following summary is presented (Table 1).

**Table 1: Factors influencing participation in the Landscape Linkage auction**

Category	Influence on landholder participation
<b>Alignment</b>	
• Backed onto MBI pilot	+ Strong history of local ownership
• Prior talks about concept & need	+ Known management issue
• Driven by high credibility local group	+ Local group better placed to encourage cooperation for corridors
• Also aligned to biodiversity management goals	- Know must cooperate to achieve corridor
• 2 year contract	+ Short term “trial”
<b>Opportunity</b>	
• Compensation for opportunity costs	- Knowledge of biodiversity
• Must have biodiversity and opportunity to cooperate / or adjoin strategic area	+ Flexibility – no prescribed management actions
• Incentive to coordinate with neighbours	+ No cost/s constraints
• \$330,000 in incentives – no cap on bids	? Likelihood of winning given feedback info
• Built in corridor width, length, & area minimums (no issue)	+ Variable start (no entry standard) = more potential
• Flexibility to meet specified targets (re: start point) but mandatory achievement required	- Must believe can achieve benchmark
	? Likelihood of coordination given neighbours
<b>Engagement</b>	
• Targeted mail-out to all landholders, radio, local press	+ Targeted communication
• Direct contact as landholders in DUC	+ Workshop training
• Workshops/trial auction	+ Ability to get information at no risk (EOI – site visit + workshop)
• Non-binding EOI (post workshop)	+ Direct one-on-one contact at site visit
• Site visit	+ Feedback but can lead to “gaming”
• 3 round process with feedback on bid quartile & all bid locations	- Coordination uncertainty
• Property maps provided (Sat image) + regional ecosystem map, + biodiversity significance map	+ Property maps
• Metric info given	- Transaction cost of multiple round bids; bids can remain unchanged.
<b>Contracting</b>	
• 2 year contract – performance based	+ Contract with local group
• Contract with DUC	+ Simple standard contract
• Payments 40:30:30	+ Simple clear monitoring (non intrusive)
• Specified risks (fire , weeds)	- Possibility of unsuccessful bid
• Simple contract	- Risk on achieving outputs
• Monitoring – progress report, photo points and random audits (2 weeks notice)	

Source: Whitten et al. (2007: Appendix Case study 2)

## 5.5 Participant evaluation survey

A total of 26 landholders (23% of eligible landholders) showed some interest in the Landscape Linkage auction and only four of these did not enter a bid. After the auction had been completed and contracts signed, all participants were contacted and asked to complete a questionnaire survey to assess their opinions of the auction. Full details are provided in Attachment 2 and summary details are presented below.

The auction was designed to provide environmental (biodiversity) outcomes and successful bidders were required to either improve or maintain their land condition depending on their current status. This generally meant reducing the grazing pressure in selected areas. Properties in the Desert Uplands are large (average 17,000 hectares) and many have not been extensively cleared (most respondents indicated that less than 20% of their property had been cleared). In general stocking rates are quite low, particularly in the poorer vegetation types and where heartleaf occurs. 84% of respondents had rated the fact they already had low stocking rates as an important reason for submitting a bid (Table 3-b). This meant that some participants were able to achieve the minimum standards required in the auction with little change to their management system. The survey results indicated that only seven out of the 19 bidders had to change their management practices. However, it is unclear if respondents considered a reduction in stocking pressure as a change in management practice. It is also unclear if participants were making an accurate assessment of their current grass biomass levels and the need to reduce stocking pressure.

The bidding process in the auction was designed to encourage price competition and as only the most cost effective bids were accepted, this would lead to the purchase of more environmental outcomes for a given budget. However, the majority of respondents were not concerned that their bid price would be competitive compared with other applicants and only six out of 19 bidders kept their bids as low as possible to improve their chances of success. This is a concern because it suggests that if there had been more price competition there may have been more cost efficiencies to be gained. There are several possible explanations.

- Bid prices were calculated to be as low as possible.
- Participants had a high expectation about their chances of success as more respondents thought they would be successful than those who did not (Table 4-m). This might also have been associated with the linkage element of the auction and five of the seven respondents who had cooperated with their neighbours expected their applications to be successful.
- Another reason may have been a product of having multiple bidding rounds. Participants knew that after they submitted their initial bid they would get feedback about their relative standing in the auction and have the opportunity to adjust their bids.

Nearly all respondents (19 people) agreed that investments by landholders in conservation practices is important to ensure future profitability (Table 1-f), and 17 people agreed that landholders have many options to implement practices that are economically viable and protect the environment (Table 1-e). In contrast, half the respondents (10 people) thought that there is little financial benefit from conserving natural resources such as remnant vegetation or wetlands (Table 1-d). However, when asked about their expectations of the financial impacts of their management agreements, 71% of the successful bidders thought they would be financially better-off and nobody thought they would be financially worse off (Figure 6). Furthermore, half of the successful bidders thought the project agreement would mean an increase in production on their property (Figure 5). Clearly, for at least half the successful participants, achieving the environmental outcomes (increased grass cover) would lead to an improvement in their economic performance.

There was broad agreement that the tender application process was reasonable and in particular the information workshops and the field visits had been helpful and informative. Some respondents (5 people) had not liked having multiple bidding rounds, but half the respondents (9 people) did not mind. The length of contracts had only been for a two year period, but 71% of successful bidders indicated they would be willing to enter into a longer, 15 year agreement and 6 people (43%) thought they would now be more likely to enter into a perpetual conservation agreement.

While it is unlikely that long term environmental outcomes can be observed in a short period such as two years, short term contracts can be used as a trial period where participants:

- may be convinced that improving conservation practices can have production benefits (in certain situations); and
- can consider the implications for longer term agreements.

Overall, the Landscape Linkage auction can be considered a success from the farmers' perspective as the majority of the active bidders (84%) thought that they would submit an application in any future scheme and nobody said they would not. Some of the non-participants also indicated they would enter a bid in another scheme. Only two people (non-bidders) indicated that they still would still not be interested (Figure 8).

## **6. Summary**

The main objectives of the Landscape Linkage auction were to improve the management of areas of high biodiversity value and where feasible, to connect these areas in a linkage across the southern Desert Uplands region. Both these objectives were successfully achieved.

The auction managed to ensure the improved management of 84,992 hectares of remnant vegetation for a two year period. This was achieved at an average cost of \$2/ha per year. Included in the protected area were:

- 1,286ha with “high” value and 7,525ha with “medium” value EVR taxa;
- 2,916ha with “high” value and 82,076ha with “medium” value Ecosystem value;
- 8,484ha with “very high” value; 68,983ha with “high” value and 7,525 ha with “medium” value Ecosystem Diversity; and
- All 84,992ha had Special Biodiversity Value

The management conditions specified in the contracts would ensure the land condition in these areas would be maintained in good condition and protected from the growing pressure to intensify agricultural production in the region. There would be an improvement in land condition in areas that were not already in “A” class condition.

The auction was also successful in achieving landscape linkage. Eleven of the 15 successful bids were part of a group that formed a distinct landscape corridor with only single or part property gaps. One bid was isolated from other bids areas but was connected to a National Park. Two bids were connected to each other with a property gap between them and the other successful bid.

While the auction process did result in some degree of landscape linkage, there are two important longer term implications to consider. The corridor or landscape connection was incomplete and contracts were only for two years. The question needs to be asked about what happens in the future. The first steps were taken in developing some linkage between protected areas but without any follow-up process these gains could be lost. Further research is required to explore this issue and develop a system that can:

- a) be adapted to irregular sources of limited and short term funding;
- b) lock in and build on the early gains in linkage formation; and
- c) optimize the geographical connection to maximize the long term ecological outcomes.

Evidence from the evaluation survey indicated that all successful bidders expected to continue managing their properties in the same way after their management agreements expire. This suggests that the conservation agreement may help to change management actions over a longer period. However, this optimism needs to be treated with some caution as circumstances and expectations may change. It is also possible that some participants have unrealistically high expectations about their ability to achieve the management conditions outlined in their contracts.

The second issue to consider in terms of achieving the linkage outcomes is whether there was a tradeoff between competitive efficiency and linkage outcomes, and if an auction is the best method of achieving landscape linkage.

The bidding process in the auction was designed to encourage price competition, but the majority of respondents were not concerned that their bid price would be competitive compared with other applicants. Only six out of 19 bidders kept their bids as low as possible to improve their chances of success. It is likely that landholders who had cooperated with their neighbours knew they would receive a high linkage score, which would increase their chances of success. This was confirmed in the evaluation survey as five of the seven respondents who had cooperated with their neighbours indicated that they had expected their applications to be successful.

The length of contracts were only for a two year period, but 71% of successful bidders indicated they would be willing to enter into longer, 15 year agreements and 6 people (43%) thought they would now be more likely to enter into a perpetual conservation agreement. To ensure the future viability of landscape connectivity, it might be more efficient for the Environmental Protection Agency to negotiate more specifically with these individuals.

From a technical perspective the use of multiple bidding rounds had induced price competition and the relative bid values were significantly lower in the last round compared with the first<sup>5</sup>. A key benefit of the process was the information feedback to participants between bidding rounds. This provided participants (first time entrants) with useful information about a market (for environmental services), of which they knew nothing. There were few efficiency gains to be made with the third bidding round and two would have been sufficient. An extension on the closing date for the first round would have been a better way of completing all the field visits in time.

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<sup>5</sup> There was also evidence that the multiple round process had inflated the price of some initial bids.

Another technical consideration was the use of short term contracts. While it is unlikely that long term environmental outcomes can be observed in a short period such as two years, short term contracts can be used as a trial period where participants:

- may be convinced that improving conservation practices can have production benefits (in certain situations); and
- can consider the implications for longer term agreements.

The outcomes of the auction could have been improved if there had been a larger pool of participants. However, the allocated funding budget was limited and a third (32%) of the bidders were unsuccessful. Without any increase in the budget, further entrants would have only increased the proportion of unsuccessful bidders and potentially jeopardised participation rates in subsequent schemes. In general, the design and implementation of the auction was well received by most landholders and provided more opportunities for, rather than barriers to, participation.

Results from the evaluation survey indicated that for at least half the successful participants, achieving the environmental outcomes (increased grass cover) would lead to an improvement in their economic performance.

- 71% of the successful bidders thought they would be financially better-off and nobody thought they would be financially worse off as a result of their management agreements.
- Half of the successful bidders thought the project agreement would mean an increase in production on their property.

There was broad agreement that the tender application process was reasonable and in particular the information workshops and the field visits had been helpful and informative. Some respondents had not liked having multiple bidding rounds, but half the respondents did not mind.

Overall, the Landscape Linkage auction can be considered a success from the landholders' perspective as the majority of the active bidders (84%) thought that they would submit an application in any future scheme and nobody said they would not. Some of the non-participants also indicated they would enter a bid in another scheme.

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## Attachment 1. Metric design

## Attachment 2. Participant evaluation survey results