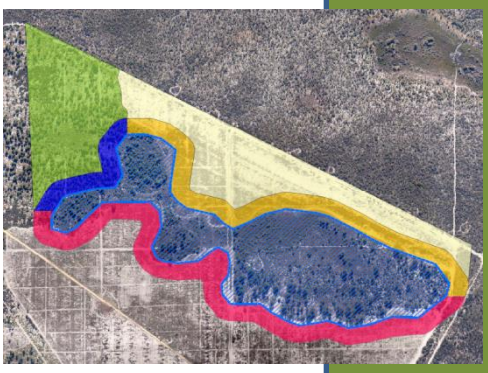
Department of
Parks and Wildlife

Malaga Wetland Offset Project

Reporting on the project management- For industry partners

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Executive summary

Biodiversity offsets and restoration projects are becoming more commonplace to allow land development in urban areas, particularly on the Swan Coastal Plain in Western Australia. Rehabilitation, monitoring and maintenance activities are components regularly included in offset strategies to ensure that achievable outcomes and the offsets are 'creating like, for like' habitat. The Malaga offset project was commenced in 2009 by the clearing of a wetland on Beringarra Avenue, Malaga, Western Australia and offset by restoring a wetland within in Gnangara State Forest (commencing in 2011). The project was detailed in the Wetland Offset Implementation Strategy (WOIS) as part of Condition 4 set in Ministerial Statement No. 817 to facilitate the industrial development of wetland on Beringarra Avenue. The WOIS details that the offset project be implemented by the Department of Parks and Wildlife through the provision of funds from the land developers. Many parties were involved in the offset strategy including, the owner of the area to be developed (Sandbourne Holdings Pty Ltd), environmental consultants that wrote the WOIS (Cardno (WA) Pty Ltd), land developers (QUBE Holdings Pty Ltd; the proponent) and restoration ecologists (Tranen Revegetation Systems). As the monitoring and management of the offset strategy required many parties, this report outlines not only the major outcomes of the offset project but even more so the project management to help guide future projects of a similar nature.

Introduction

In 2009 a conservation category wetland (CCW) on Beringarra Avenue, Malaga, Western Australia was designated for clearing and development. A wetland within Gnangara State Forest north of Perth metro area, Melaleuca Park wetland (proposed conservation estate), was chosen as the offset site for the planned clearing of the CCW. Ministerial Statement No 817, condition 4- clearing of native vegetation, was released describing conditions to be met for the proposed development by the proponent, QUBE Holdings Pty Ltd. Firstly, an offset strategy, Wetland Offset Implementation Strategy (WOIS) must be prepared to outline the wetland offset package. Secondly, funds must be provided to the Department of Environment and Conservation (now Department of Parks and Wildlife) to rehabilitate the offset site to a CCW. The WOIS (King 2010) outlined that removal of the threats and "modifications" of the wetland as well as, revegetation of the degraded areas would be carried out to increase the management category of the wetland from REW to CCW in line with completion criteria that would be monitored on a regular basis (King 2010).

Implementation

Revegetation of a "Resource Enhancement wetland" (REW; known as Melaleuca Park wetland; 21.4 ha), wetland buffer (16.2 ha) and dryland linkage (19.8 ha) through; weed control, fencing, pest control, pine removal, revegetation and maintenance over two years, was outlined in the WOIS and commenced in 2011. Tranen Revegetation Systems Pty Ltd carried out the weed control, revegetation and maintenance. The Department of Parks and Wildlife removed the majority of pine trees and fenced the offset site. All West Pest Management performed the pest control within the offset wetland. A project officer from the Department of Parks and Wildlife was employed to ensure these works were carried out as well as coordinating the funding. There were contributing offsets funded by the project including a research project on the development of rehabilitation techniques (PhD candidature), wetland inventory of the Gnangara pine plantation and a level two faunal survey including *Isoodon obesulus* (southern brown bandicoot) trapping. The last contributing offset would be monitoring of the below completion criteria to determine the success of the works and to guide the maintenance works in year two and three as well as for compliance and auditing purposes under the Environmental Protection Act.

Completion criteria over the three years included;

- Tree stem density to be the same as adjoining bushland at 0.05 stems / m2;
- Total native density (including trees) 1.6 plants / m2;
- Species richness within quadrats to be greater than 32.4 species in dryland areas, and 22.8 species in dampland areas;
- Maximum of 5 weeds per square metre;
- Maximum of 5% weed cover;
- No grass weeds to exceed 15 cm in height;
- No rhizomatous grasses, no bulbous, woody or noxious weeds; and
- Evidence of some species beginning to reach reproductive maturity (i.e. flowering / seed set).

The WOIS provided a strict budget to follow over the project duration, funded by cash contribution and bank guarantees through the proponent. A delivery committee oversaw the project for the three years until completion.

Outcome

Melaleuca Park wetland restoration occurred over the three years through the removal of pine trees and a reduction in other weeds, animal pest control (including rabbits), planting of over 429 810 seedling, direct seeding and fencing of the entire wetland area to reduce herbivory.

The revegetation at the offset site had to contend with some of the warmest and driest summers on record over the 2013/2014 summer. These less than optimum conditions made the revegetation's ability to reach the completion criteria difficult. Despite these difficulties two of the eight completion criteria were met; tree stem density (dryland; 0.17 stems / m^2) and weed stem density (3.5 plants / m^2). The criteria that were not met, native density, and average dryland and dampland species richness were close to being met at, 1.1 plants / m^2, 32.4 and 19 species, respectively. The percentage of weed cover was under the criteria levels for the entirety of the project, except in spring 2014 the percentage of weed cover increased to 23% (most likely due to no weed control occurring in autumn and winter of 2014). The criteria for grass weeds no higher than 15cm to be present and no presence of rhizomatous grasses, no bulbous, woody or noxious weeds, were not measured during the project due to their lack of measurability or feasibility as a criterion. However, no weeds were higher than 15cm, no rhizomatous grasses, bulbous, woody or noxious weeds were present except for tea tree or pine

trees were controlled in the early stages of the project of the Department through clearing. Lastly, evidence of reproduction maturity was present at all stages of the revegetation project (i.e. many species were planted with evidence of flowering) and not formally measured. It is assumed that without future disturbance such as fire, drought or aggressive weed invasion that the offset site will continue to flourish and improve (Tranen Pty Ltd 2014).

Botanical values of wetland sites within the Gnangara State Forest were assessed through a wetland inventory completed by researchers at Edith Cowan University. There were two sections to the inventory, firstly a desktop survey identified significant wetlands and lastly, a field survey reported on some of the wetlands from the inventory. The survey identified 123 wetlands of significance within the Gnangara pine plantation ranging from high to low quality. These wetlands were scored and ranked based a range of attributes including general landscape and land use attributes, habitat attributes and social-political values. Of the 123, 19 were assessed in the field (including wetlands with low, medium and high scores). This research demonstrated that the evaluation methodology was useful in ranking wetland quality but both desktop and field methods were required (Sommer *et al.* 2013).

The successful PhD research project that went forth was studying the water use strategies of native plants to improve ecological restoration efforts by the PhD candidate, Ana Muler from Edith Cowan University. The project has three aims including the characterisation of water use strategies and tolerance of water stress of adults and juveniles, to verify if a species facilitates water hydraulically by redistribution to drought stressed neighbours and to evaluate the importance of this phenomenon to seedling survival (Muler 2012). Currently Ana's work is moving forward with both glass house and field experiments and is due to be completed by the end of 2015.

Fauna surveys for the site were aimed at determining the presence of *Isoodon obesulus* (southern brown bandicoot) and inspect the area for presence of other fauna species in accordance with the Environmental Protection Authority's Guidance Statement No.56 Terrestrial Fauna Surveys for Environmental Impact Assessment In Western Australia (Level 2 Fauna Survey), as well as suite of fauna species present before and after the offset. Overall the fauna surveys had great results over four trapping and survey sessions between 2011 and 2015. *Isoodon obesulus* were noted in all four years from tracks, diggings and actual captures, including a mother with pouch young. Adjacent vegetation in Melaleuca Park contains a known population of *I. obesulus* which will allow for connectivity

between the wetland and reserve (Moore 2011). Other native reptiles, mammals, amphibians and birds were noted in the wetland and when compared to previous studies the abundance and species richness of the native fauna was better than expected for a young restoration site. This was most likely a product of existing native vegetation within and adjacent to the offset site, providing better than average habitat for fauna at this restoration age. In terms of feral animals, the wetland had plentiful amounts, as the nearby vegetation and pine plantations are unbaited for feral animals, leading to their movement into the wetland offset site. As the restoration ages and a canopy is formed, hopefully the faunal diversity will increase (Moore *et al.* 2015).

Many aspects of the project ran smoothly, however, some required better planning and forethought.

What elements of the project worked well

- Provision of a strategy by the proponent: The WOIS was developed and provided by the proponent was detailed and included estimated costs. Without this being provided to the Department it would have taken longer and cost more for the offset to be implemented and may not have been as strategic.
- Delivery committee included the proponent: The delivery committee worked well together and made sound decisions for the project. Inclusion of the proponent throughout implementation allowed for regular communication as well as the ability to get changes to the plan or budget approved in a timely manner.
- Contract arrangements undertaken by the proponent: This allowed work to begin without being held up by the government procurement process.
- Flexibility with the PhD and Wetland Inventory: There were no strict guidelines on the research outcomes and that allowed the Department and researchers to plan and design projects that were deemed to be appropriate by the department
- Research- The PhD and wetland inventory was able to research future restoration methods and sites which will aid in future projects.

What elements of the project did not work well

- Budget: Costs estimates in the WOIS were used as a strict budget. A more flexible budget with room for errors and unexpected costs would be more ideal and practical. There were also many missing costs in the WOIS budget that caused problems. These missing costs included; overheads (only 22%, not 44%), uniforms, ArcGIS licence, vehicle use for site visits, courier for the return of bank guarantees and the allowance within salary for training and assistance at fires.
- Budget: A concise format for budget monitoring, noting of paid/unpaid invoices and balance sheets should have been identified at the beginning to allow for the Department and the proponent to have a consistent approach to budget monitoring and reduce costing errors.
- Budget: GST costs were not included in the WOIS. If contractors were paid by the proponent then GST was removed from the total budget. The budget would not have been reduced by GST costs if the Department had paid invoices (i.e. if we had gone through the procurement process, GST costs could have been avoided). However, the procurement process is time costly for the Department.
- Invoicing: The proponent had to approve all invoices. This slowed down payment and works.
- Time schedule: The time between planning and implementation was too short. This may have led to rushed decisions and costing errors. More time for planning and proof reading is required in future projects before on ground works commence.
- Unexpected events: No contingency plan was designed as a fall back if unexpected events occurred as such wildfire. With two individual fires threatening the offset site in 2014 and 2015 this point is particularly relevant.

Conclusion

Despite the knowledge that biodiversity offsets are becoming commonplace, they are still in their infancy requiring much testing, planning and consultation. With the current knowledge and experience the project was instigated and managed well by all. Many of the down falls of this project could not have been predicted without having conducted a project like this. The foremost recommendation for future offsets and projects like this one is the production of an offset strategy such as the WOIS. This time saving document ensured that the project ran smoothly, to an achievable time line and budget and all those involved were understanding of their individual roles. Additional, future recommendations from this report include more thorough proof reading and checking of the budget, ensuring all costs, expected and unexpected are planned for, that the schedule allows adequate time for planning and contingency plans are created.

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