

GRAZING FUTURES CASE STUDY



Collaborative decision-making process for improving landscape resilience

SUMMARY

The aim of this case study is to outline a collaborative model for long term land recovery that can be applied to vulnerable sites to build landscape resilience and where conservation and production can co-exist to also build grazing business resilience.

Outcomes achieved during the project include:

- Increase perennial dominated ground cover to protect soil;
- Increase pasture bulk for livestock production and habitat;
- Creation of a watercourse, riparian and flood out vegetated filter traps to reduce sediment loads moving downstream
- Improved ecosystem functionality through improved, metric based land management practices
- Resilience to changing climatic events with stocking rates better aligned to pasture bulk and groundcover
- Ongoing collaboration and commitment from all stakeholders to ensure recovery and longevity of the works

BACKGROUND

Prolonged drought, high grazing pressures and woody weeds have been major factors in loss of ground cover in western Queensland, thus reducing landscape resilience and increasing the risk of wind and water erosion by leaving the topsoil susceptible to erosion in large rainfall events.

The 2019 monsoonal rain event, occurring as it did following a prolonged drought and a failed wet season had a widespread impact across western Queensland and resulted in the extensive flooding resulting in the loss of vast amounts of topsoil, scouring and undermining of bed banks of watercourses, widespread distribution and germination of weeds and the loss of livestock.

Following this event, a section of the O'Brien's Creek stock route, located 80km north-west of Winton was prioritised for rehabilitation works based on drone reconnaissance work undertaken in the region. The stock route intersects O'Brien's creek which flows downstream into the Diamantina River and is also a critical access area for properties west of the creek. The flood caused waters to span 600m across the channels and scoured 10cm of topsoil which caused large sediment loads to enter the Diamantina and threaten ecologically important water holes downstream that act as dry season refuges for numerous species. Funding for the rehabilitation was provided by the Disaster Recovery Funds Arrangement, a joint Australian Government and State Government initiative, with Desert Channels NRM (DCQ) appointed as the project managers.

The nature of the soils, climate and access to materials and equipment at the site meant that a decision

"The loss of the topsoil was a huge blow to the area, we have lost not only the bulk feed we had but the pasture soil seed bank." – Landholder with permit to occupy stock route

was taken early in the design of the project that traditional structural solutions, commonly used in coastal watercourse rehabilitation projects would not be suitable or provide the necessary longevity of the project and so non-structural solutions, normally termed "soft engineering" solutions were planned and tested with stakeholders.



The Farm Business Resilience Program is jointly funded through the Australian Government's Future Drought Fund and the Queensland Government's Drought and Climate Adaptation Program.



Figure 1: Sediment across the road after the 2019 Monsoonal event

THE PROJECT

As the project site is part of a stock route, there were numerous stakeholders involved in the management of the site, each with unique priorities. Stakeholders included the project funders, DCQ, Department of Resources, Winton Shire Council and landholders with permits to occupy and graze the stock route. Led by DCQ the project concepts were tested with a stakeholder steering committee with DCQ also installing monitoring sites to test project assumptions and outcomes allowing the steering committee to make informed decisions based on the data collected in the field. DCQ continues to act as a neutral third party, maintaining the monitoring sites even post the project to ensure the outcome of landscape resilience prevails.

Due to the remote location, scale of works, low strength of the soils, seasonality and variability of rainfall the reliance on traditional engineering works was deemed logistically impractical and costly. A decision was therefore made to recover the site with wide vegetated zones which would act to slow the flow, promote deposition especially when coupled with informed grazing management of the sites. The management of key threats and the promotion of natural recovery was the preferred method to rehabilitate the area. This involved prickly acacia control activities to reduce woody weed competition and grazing management changes to improve ground cover, promote perennial pasture species and aid in natural regeneration of the area.

17.6km of fencing was erected to enclose the project sites and new water points installed away from

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the watercourse, with the landholder contributing to the costs. The new fence and water points, allow the landholder to implement changed land management practices, primarily wet season spelling. In the words of the landholder, “it was important to invest in this opportunity, improve the landscape for the future, being able to spell the area will give it the rest it needs for best potential growth.” Wet season spelling, particularly in the first 6-8 weeks of the growth season maximises potential growth of pasture grasses and provides seed heads for the future. Ongoing management will be crucial for recovery, which may take several years, therefore ongoing stakeholder commitment is required.

Five monitoring points were established from March 2020, to measure recovery of the area and test project assumptions, with data collection focused on ground cover and pasture biomass as key indicators for landscape resilience. Rain gauges and drone mapping provide additional supporting data. Data collected through legacy monitoring post the project has been funded by the DCQ foundation, is shared with relevant stakeholders in a quarterly report and is used to guide management decisions of the site, including when to spell the area.

Ground cover and pasture bulk thresholds have been agreed with both the Australian and State Governments and the quarterly reports test actual levels against the thresholds and allow DCQ to make recommendations to the stakeholders and the landholders grazing the area. By providing a data driven report with recommendations means that management decisions are able to be planned well in advance.

OUTCOMES

Since the initial monitoring in March 2020, there has been a significant improvement in the key indicators of ground cover and pasture biomass across the project area, with significant recovery of perennial grass species at the site, particularly in response to the above average rainfall over the last year (Appendix 2).

Over the last 3 years, total ground cover has doubled from an average of 38% to 76.5% in March 2023 (Figure 2) and average pasture biomass has increased by 1000kg/ha from 650kg/ha to 1650kg/ha (Figure 3). Relevant stakeholders are happy with the improvements to date, with the landholder stating, “The area is looking much healthier than it has for a long time and there is a decent amount of feed for the cattle. It’s great to be able to stock cattle there and not have to sell them.”



Figure 2. Changes in total ground cover at O’Brien’s Creek stock route.

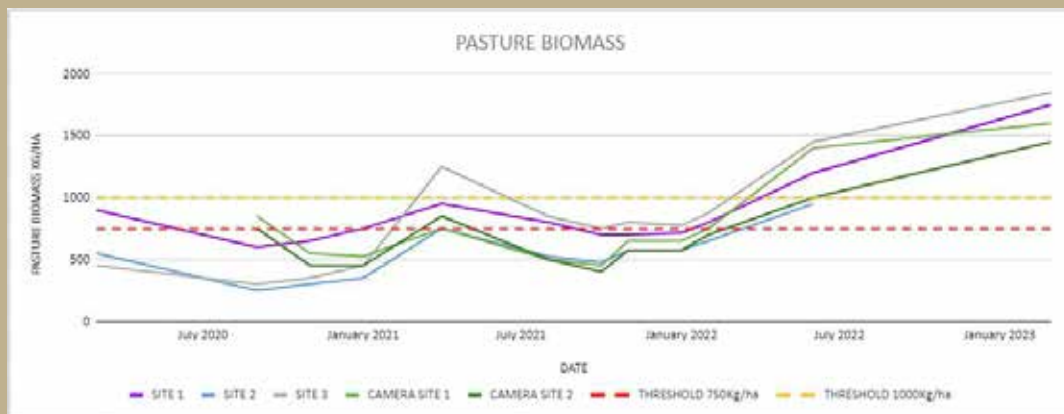


Figure 3. Changes in pasture biomass (kg/ha) at O’Brien’s Creek stock route.

Although there is an uneven spread of pasture grasses across the area, the ground cover is now predominantly a Mitchell grass perennial dominant cover interspersed with annuals and forbs. Over half of the measured monitoring sites have a greater than 30% Mitchell Grass cover and would be considered class A in the LCAT assessments while the remaining sites fall into class B. In recent monitoring, the tussocks seem healthy, producing above average amounts of seed and majority have enough bulk (>5cm diameter) to survive until the next wet season.

Additionally, other notable outcomes include reduced stream bank erosion and sediment loads into downstream watercourses and reduced infrastructure maintenance of the access road. Camera trap monitoring and on-ground assessments have also shown an increase in observed flora and fauna across the site.



Figure 4: O'Brien's Creek Stock route in the aftermath of the 2019 monsoonal event and March 2023

Although the key indicators of landscape resilience are improving at the site, recovery is a slow process. DCQ trials have shown that while wet season spelling accelerates recovery, the reintroduction of perennial grasses without intervention can take 6 years, depending on climatic conditions and available seed source. Collaboration between relevant stakeholders and grazing management will continue to be an important factor for recovery at the site.

CONCLUSION

Following the 2023 flooding event, the resilience and effectiveness of the works put in place along with the grazing and land management techniques were fully tested and shown to have met original project aims. Sediment loads were significantly reduced and watercourse resilience was rated as high. To ensure longevity of the project, the improved landscape management needs to be continued along with ongoing stakeholder engagement and data driven decision making. The landholder, now an investor in the site, has committed to maintain the area however investment in data collection needs to be maintained for some time yet. The benefit is not only improved landscape and habitat resilience, but reduced infrastructure maintenance costs while still maintaining or improving business resilience.

APPENDIX 1 - Monitoring Sites

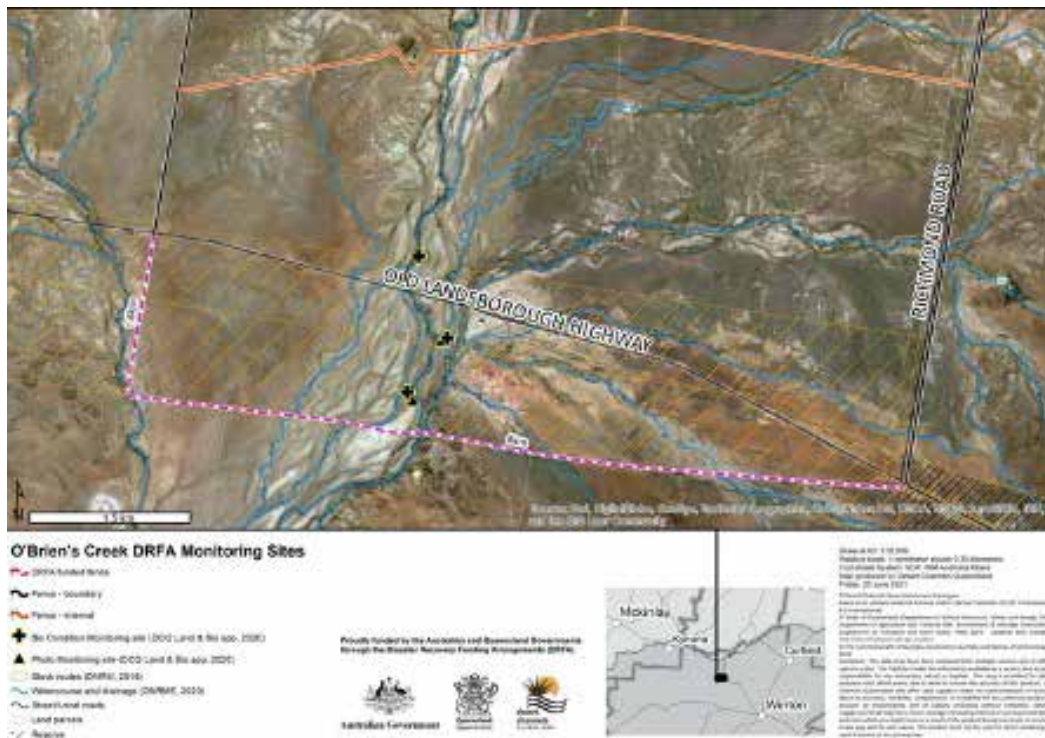
SITE 1



SITE 3



APPENDIX 2 - Map of O'Brien's Creek stock route treatment site



APPENDIX 3 - Monthly Rainfall at O'Brien's Creek stock route

