



ESRM Planning, delivering NRM action and direction through collaboration

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Abstract

The Ecologically Sustainable Rangelands Management (ESRM) process has evolved over the past 17 years, from a federally funded Western Australian Natural Resource Management (NRM) project to a commercial service available to land managers across the Australian rangelands. At its core is collaboration and innovation to deliver positive NRM outcomes for areas that are subject to multiple management motivations. To date, the process has delivered over 120 management plans for areas under pastoral, mining, indigenous and conservation management. The plans represent over 23,200,000 hectares in Western Australia (WA) alone, which equates to 10% of WA rangelands and 27% of the WA pastoral estate. ESRM is now the dominant environmental planning process within the WA rangelands, and the program is being extended to other states.

Grounded in science, the process maps and documents a land manager's own ideas and goals for the management of an area, and devises strategies and activities to help them achieve those goals, while maximising the positive NRM outcomes for the area. Where stakeholders have conflicting management ideas and goals, the process allows for frank discussions and identification of commonalities to generate a strategy that provides a sound compromise for all, whilst working within accepted best practice NRM frameworks. The process incorporates well-proven rangelands management with emerging technology to deliver a whole-of-landscape plan that is practically implementable.

This paper will outline the ESRM process, and how it promotes a collaborative approach to sustainable land management to maximise positive NRM outcomes while improving productivity and profitability.

Introduction: The evolution of ESRM

The rangelands of Western Australia (WA) encompass much of the arid and semi-arid zone, and accounts for approximately 87% of the state's total area (DPIRD 2022). Approximately 39% of the rangeland area consists of Crown land pastoral leases (DPIRD 2022), which are leased to pastoralists and gives rights to graze authorised livestock on the natural vegetation (Government of Western Australia 2023). The rangelands have seen extensive modification to the landscape function, soils, flora and fauna as a result of the long history pastoralism, particularly of sheep and cattle grazing (Brandis 2008). The pastoral industry contributes significantly to our economy however a legacy of significant environmental degradation from prolonged overgrazing since the mid 1800s remains to this day, from which many parts of the landscape have not fully recovered (e.g. Burnside et al. 1995; Alchin 2011; Tinley and Pringle 2014).

In January 2000, the federally funded Ecosystem Management Unit (EMU) extension program was initiated as part of the Gascoyne-Murchison Strategy, underpinned by the concepts of ecological management and biological conservation. This extension program involved over 120 properties from the Carnarvon coastal plain and Gascoyne, Murchison, and north-east Goldfields to the Nullarbor over a period of seven years before federal funding was terminated in 2006 (Tinley and Pringle, 2012 Pers. Comm.). A short time later, the Department of Agriculture and Food WA (now Department of Primary Industries and Regional Development (DPIRD)) established the Ecologically Sustainable Rangelands Management (ESRM) extension program, with its foundations and approach based on the EMU extension program, and an aim to improve the profitability and productivity of rangelands enterprises by improving grazing systems, resource sustainability and conservation (Tinley and Pringle, 2012 Pers. Comm.). Over a period of four years the ESRM program covered 40 stations in the Gascoyne, Carnarvon coastal plain and Pilbara.

These extension programs have demonstrated that improving productivity and profitability and maximising positive NRM outcomes can be achieved simultaneously. As the saying goes, ‘Look after Country, Country will look after you’ (Weir et al. 2011). If we are to minimise adverse impacts to the environment well into the future, we must continue to engage and collaborate with land managers and provide them with the knowledge and tools necessary to maximise positive NRM outcomes in such a way that also protects their bottom line. In recognising this, Contour Environmental and Agricultural Consulting have refined and developed the ESRM process into a commercially deliverable service. The process is highly adaptable with respect to location and the ability to integrate the findings of relevant scientific research and technologies, and broadly involves: a preliminary desktop assessment; a facilitated property visit involving the lessee/property manager; and the development and delivery of the ESRM Plan. To date, the process has delivered over 120 management plans for areas under pastoral, mining, indigenous and conservation management. The plans represent over 23,200,000 hectares in WA alone, which equates to 10% of WA Rangelands and 27% of WA Pastoral Estate. The service has been in constant demand in WA and is now being extended to South Australia, which is a testament to both the successful track record and adaptability of the ESRM process.

The ESRM Process

Preparing for an ESRM property visit

In preparing for an ESRM property visit a preliminary desktop assessment of the subject property is undertaken. With permission from the station’s lessee, any government-held information and spatial data relating to the property is accessed and examined, such as previous rangeland condition assessments, rangeland monitoring system and pastoral monitoring sites. Spatial infrastructure data and land system and/or vegetation mapping is used to prepare paper-based maps for markup during the property visit. Long-term median rainfall figures are compared to figures from the past 20 years to gain a more accurate understanding of more recent rainfall patterns, and the implications this has for land management and stocking decisions on the ground. A cumulative rolling rainfall graph benchmarked against the median rainfall for the subject station is created, with indicative cues for adjusting stock numbers based on the amount of rainfall received, relative to the median. This is presented to the land manager during the property visit as an additional tool which can be used to assist in making stocking decisions.

ESRM property visit

Discussions with the lessee typically commence over the prepared paper-based maps and a cup of tea. This serves several purposes; it facilitates open discussion, allows mapped spatial data to be checked with the land manager for accuracy, highlights areas of interest which will give direction to the inspection of the property, and starts to ‘build the story’ to be told in the ESRM plan. The lessee is asked to draw out: current tracks and infrastructure present and state of repair/disrepair; stock numbers and distribution across the property; mustering areas; productive/overutilised grazing areas; areas of conservation or cultural significance to the lessee; and areas with specific issues or concerns such as track erosion, scalding, fire, weed invasion, stray cattle/feral herbivore ingress. The lessee is also asked to map out planned future works for the lease, such as infrastructure or conservation areas, including any ‘wish list’ items which fit with their overall production and NRM goals for the lease. Existing alternative enterprises occurring within the lease, or opportunities for

potentially suitable alternative enterprises (such as carbon farming projects or eco-tourism, for example), are also discussed. This ensures that all aspects are captured to develop a cohesive ESRM plan, where recommended future management activities are complementary and aligned with the lessee's goals for the property.

Depending on the size of the property, an inspection is undertaken ideally over a period of days. For both parties, maximum benefit is derived when the lessee is present for the inspection with the facilitator. This allows for any issues or concerns raised during the mapping exercise to be ground-truthed and explored in-situ. Potential remedial actions can also be considered in a specific context and how they may be implemented. Potential Case Study Areas are selected from points of interest traversed during the inspection, with the intention that remedial actions be trialled at a small scale with minimal investment of resources, and then applied to other areas of the property if proven successful or revised if unsuccessful. There is also opportunity for the facilitator to raise issues or concerns which the lessee may be unaware of. The scale of some issues which affect landscape condition and function, such as erosion, may not be obvious or visible from the ground, and may not even be occurring from a trigger point on the subject property, in which case there may be a need to address the issue at a larger scale over multiple properties, or the wider catchment. In the past aerial surveys of a property were often undertaken by plane or helicopter to cover large areas in a short amount of time, however the risk exposure and costs associated with this method can be prohibitive. With recent advancements in technology, aerial surveying has become far more accessible and efficient through the use of drones, which are becoming an increasingly powerful tool for landscape assessments. Characteristics of the vegetation and landscape condition and function are noted and photographed on the ground and by drone where appropriate during the inspection. Global Positioning System (GPS) coordinates and photographs are also taken at waterpoints and points of interest, which may include areas experiencing issues with erosion, overutilisation/underutilisation, productive/unproductive areas, fire-affected areas, and conservation or other areas of cultural significance to the lessee. Covering as much ground as possible in the allotted time is desirable for developing a robust whole-of-landscape ESRM plan.

Development and Delivery of the ESRM Plan

The ESRM plan is a synthesis of all information collated prior to the property visit and of the discussions, photographs and GPS points collected during the property inspection. It then presents suggested remedial management actions and strategies, tailored to the circumstances occurring on the property. The plan assigns a suggested priority and outlines a timeline for implementation based on the land manager's current situation and aspirations. Case Study Areas selected from the property inspection are mapped and annotated images are marked up to outline the current situation, and the proposed works needed in these specific areas to remediate the issue. Remedial works are described in detail and approximately costed to give the lessee an indication of the investment required.

The plan also captures the lessee's current land management strategies relating to grazing, stocking rate and fire where applicable, and introduces proposed strategies for each, while giving consideration to future plans for the property. This ensures that management strategies are not temporally restricted in their application. A key focus of the ESRM process is to develop a proposed grazing and stocking strategy that puts rainfall into context of the carrying capacity for the property in its current condition. Carrying capacity estimates are made for the entire property and individual paddocks/grazing areas, based on the land systems/vegetation in their current condition, and are converted to stock days and a recommended stocking rate per 10 or 100mm of rainfall, which has been benchmarked against the median rainfall for the property.

Any alternative enterprises discussed during the property inspection are worked into the overarching strategy for the property. If alternative enterprises, such as carbon farming for example, have not yet been implemented but are being considered by the lessee, an assessment is undertaken and commentary made on the suitability and feasibility of such an enterprise.

Fire is a natural and important part of landscape ecology. Where fire management on a property is necessary, the proposed management strategy breaks the property into fire management zones, which are allocated a burn order or are designated no-burn areas, based on their position in the landscape and other management priorities for the property. Land managers are encouraged to engage with the regions' Indigenous Ranger groups, or other Indigenous groups with connection to the land by way of Native Title, to support them in fire management capacity building.

A proposed monitoring programme and monitoring schedule is provided to the lessee, which includes specific locations where photographs and condition changes should be repeatedly recorded, and at what time intervals, to track the success or otherwise of any remedial works undertaken.

After being reviewed and agreed upon by the lessee, the final ESRM Plan is delivered along with a poster which summarises the proposed works outlined in the ESRM Plan. Displaying the poster in a visible location increases motivation to implement the proposed works, and is a quick way to cross-check works completed and those yet to be completed.

Conclusion

A primary goal for pastoralism is about managing a '...profitable livestock business, while maintaining the land and vegetation in good condition' (DPIRD 2022). This is no easy feat, given that many pastoralists are already managing the rangelands under challenging and often unfavourable conditions. Many are still suffering to some extent from the consequences of historical overgrazing by sheep and cattle over many decades, while also contending with the effects of a highly variable climate, such as prolonged periods of drought. It is essential that pastoralists continue to be provided with the tools and up-to-date knowledge necessary to achieve their goals and to make the best decisions for managing their business and land in a sustainable way; the ESRM process is one such way this can be achieved. The ESRM process promotes a much-needed collaborative approach to sustainable land management, bringing pastoralists, ecologists and other field experts together to maximise positive NRM outcomes while improving productivity and profitability.

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