

**Natural Heritage Trust**  
**Competitive Regional Component**

**Sustainable Grazing Systems to  
Increase Productive Capacity and  
Biodiversity in Western Australia's  
Rangelands**

**A Proposal from the Rangelands Natural  
Resource Management Coordinating  
Group Inc to the Commonwealth-State  
Joint Steering Committee**

**24<sup>th</sup> October 2003**

## Proposal Title

Sustainable Grazing Systems to Improve Productive Capacity and Biodiversity in Western Australia's Rangelands.

## Name of Sponsoring Region

The project will take place primarily in Western Australia's Rangelands and is being sponsored by the Rangelands Natural Resource Management (NRM) Coordinating Group Inc.

The project will be managed by the Centre for the Management of Arid Environments (CMAE) on a contract basis on behalf of the Rangelands NRM Coordinating Group.

## Other Regions Involved in Project Implementation

The project covers each of WA's Rangeland sub-regions of the:

1. Kimberley;
2. Pilbara;
3. Gascoyne-Murchison; and
4. North East Goldfields-Nullarbor.

*primary focus on sheep (& goat)  
grazing lands?*

## Steering Committee

A Steering Committee to oversee the project will be established with representatives from the:

- pastoral industry/ community;
- Rangelands NRM Coordinating Group (Chair);
- Pastoralists and Graziers Association;
- Pastoral Lands Board;
- CMAE;
- Resource Consulting Services;
- Department of Agriculture; and
- Department of Conservation and Land Management (DCLM).

Also affiliated with the project and providing input to the Steering Committee are the:

- Department of Environment;
- World Wide Fund for Nature (WWF); ? ?
- Desert Knowledge Cooperative Research Centre (CRC); and
- Tropical Savannas CRC.

*RCS?*

## Project Description

### Context

A number of strategies have been adopted in Western Australia's Rangelands to protect, enhance and build pastoralist capacity to better manage their ecological resources. Some pastoral lands have been sequestered to protect biodiversity. The State and Commonwealth have jointly purchased whole pastoral leases that have high conservation value, and added

*acquired.*  
*17 whole lease*  
*& parts only of 15 more eg additions to*  
*Kennedy Rangeland Nat Lk.*

these leases to the Comprehensive and Adequate Reserve (CAR) system. The State has also amended the *Conservation and Land Management Act* so that it can resume leases which have high conservation value after 2015. These will also be added to the CAR system. In addition, government has purchased particular areas of high conservation value on existing leases as areas of off-reserve conservation.

12/11/00  
Pushes  
happened  
under  
Land Admin  
Act -

Apart from exclusion of areas that are transferred to the Department of Conservation and Land Management, there is a strong interest in strengthening the role of pastoralists as stewards of the natural resources managed under their leases. This can be accomplished through sustainable grazing management, without compromising pastoral livelihoods.

Over the past three years, new initiatives have been implemented to build pastoral capacity to practice NRM and biodiversity protection. Under the Gascoyne-Murchison Strategy (GMS), an Environmental Management Systems (EMS) has been designed for pastoralists and a guidebook prepared on planning and implementing an EMS. Environmental Management Systems developed for 3 pastoral stations are now being implemented.

but no  
mustering  
back-ups/  
incentives

pilot  
project

<sup>underpinning</sup>  
Complementing the EMS, the GMS also established the Ecosystem Management Unit (EMU) project. EMU assists pastoralists to develop an understanding of ecological processes occurring at the landscape scale, giving them the knowledge and confidence to change management practices to reverse or avoid degradation, particularly in ecologically sensitive areas. After several years of successful development in the Gascoyne-Murchison region, the Ecosystem management Unit is now being extended into the Goldfields-Nullarbor with an expanded team of trained staff.

At a practical level, specific tools have been developed that enhance a pastoralist's ability to control grazing animals, both domestic and feral, and improve station productivity. A key management tool is self-mustering yards around water points to achieve Total Grazing Management.

### Project Details

This project will examine the ways in which pastoralists can relieve grazing pressure on paddocks and improve ecological condition through strategic rest. One strategy for resting paddocks is flock aggregation and rotational grazing, which can be implemented at varying levels of intensity during specific seasons. Paddock subdivision may be helpful but is not necessary to establish rotational grazing. Improvement in ecological condition as the result of rest from grazing will be associated with greater forage production, and the ability to store paddock feed for critical periods such as mating and lactation.

The second pillar of sustainable grazing management is a rise in the overall plane of livestock nutrition. Forward planning based on food on offer and assessment of carrying capacity will facilitate adjustment of stock numbers to minimise negative impacts from drought. Providing supplementary feed at critical stages will increase reproductive performance.

The third feature of sustainable grazing management is a reduction in station operating costs. This derives from more efficient livestock handling made possible with self-mustering yards, plus the concentration of resources on fewer paddocks under rotational grazing.

Through participation in the EMU process, pastoralists also develop an appreciation of the full livestock management package that can be implemented as a result of the flock aggregation, rotational grazing and paddock resting.

EMU now Ecosystem Management Understanding  
process

*efficiency, hardpan  
etc. ground  
degradation*

The project will assess trend in vegetation cover, and relate biomass production to rainfall as a measure of water use efficiency. In WA Rangeland areas currently, water use efficiency is particularly low due to poor vegetation cover resulting in significant run-off and consequently poor infiltration. However, resting of paddocks provides opportunities for recovery of grasses and an improving trend in water use efficiency.

Other measures of successful implementation of sustainable grazing management are:

1. changes in species composition and abundance; and
2. soil surface condition and landscape function.

*Biodiversity  
Use*

The project will also address the impacts of climate variability on grazing management decisions. The project will be linked to CVAP which will provide pastoralists with a better understanding of climate variability and how to adapt to climate change. This component of the project will assist pastoralists in developing drought management plans and contingencies for dealing with exceptional circumstances.

### Activities and Expected Outcomes

The projects key activities will be to:

1. establish and evaluate alternative sustainable grazing systems in the rangelands to achieve improvements in both productivity and biodiversity.

The key outcomes for the project will be:

1. increase in productive grazing capacity (and consequently turn-off rates); and
2. improvements in rangeland biodiversity associated with increase in native grasses and vegetation cover.

*context?*

Once flock aggregation has been introduced, pastoralists can exercise a number of management options and obtain production benefits not available or feasible under set stocking. The production advantages attributed to flock aggregation and rotational grazing are:

- Anticipation of feed-on-offer in ungrazed paddocks and the ability to plan ahead for feed requirements and/ or seasonal stocking rate adjustments.
- Creation of forage reserves for flushing, joining, mid-pregnancy, lambing, and off-shears (Croker and Kelly 2002).
- Infrastructure maintenance (chiefly for stock water) restricted to the paddock containing stock and the next paddock to be grazed, conferring substantial savings in operating costs.
- Cleaner and more efficient musters when animals are accustomed to moving to new paddocks, facilitated by self-mustering yards.
- Frequent inspection of sheep to spot diseases, before a serious problem develops, and opportunity for timely treatment.
- Predator control focussed on the paddock containing sheep, with tactical trapping and baiting.

These management practices should increase weaning percentage to 80% or more, assuming minimum loss to predators. Adjusting stock numbers based on food on offer and seasonal forecasting, together with improvement in ecological condition due to rest from grazing, will minimise adverse impacts during droughts.

*Integrating area  
veg cover; component 7*

In addition, the project will have a major focus on how resting paddocks can improve the establishment and survival of native grasses and woody perennial vegetation in the rangelands, which in turn improves the region's biodiversity and ecosystem function. *A untested hypothesis*

The biodiversity benefits attributed to flock aggregation and rotational grazing are:

- Ecological recovery of areas damaged by continuous grazing.
- Improved control over grazing pressure from feral animals where access to water is denied in de-stocked paddocks.
- Improved water use efficiency and reduced soil erosion. *?*

## Claims Against Eligibility Criteria and Assessment Principles

### Eligibility Criteria

#### Cross-jurisdictional or multi-regional approach

*sheep only*  
The project covers the entire Rangelands region of Western Australia, encompassing the Kimberley, Pilbara, Gascoyne-Murchison and North east Goldfields-Nullarbor sub-regions. This combined area accounts for 90% of Western Australia's land mass.

*spell out*  
Through the involvement of RCS, the project will involve stations involved in rotational grazing in Queensland and New South Wales. RCS is currently working with clients adopting sustainable grazing systems in these States which will contribute to learning outcomes of the project.

#### Collaboratively Developed by Regional Organisations

### Environmental Sustainability Measured Against Regional Targets

The Rangelands NRM Coordinating Group is yet to set regional targets; however, it has established a framework for:

1. identifying key natural resource assets;
2. defining community, industry and government objectives for these assets;
3. setting targets for the desired resource condition of these assets;
4. identifying management actions targets to achieve the desired level of resource condition; and
5. establishing a process for monitoring and evaluation.

The framework is based on a resource use model whereby natural resource assets are identified according to resource use areas. For example, tourism, pastoral land use, *no verb* conservation and Aboriginal land use and management.

*~*  
Under this model Rangeland vegetation will be a key natural resource asset for which multiple objectives will need to be met. This project will provide these multiple objectives through improving productive capacity and contributing to biodiversity.

*~*  
The project will assist the process of developing resource condition targets for Rangeland vegetation, and provide a framework for monitoring and assessments of vegetation condition over time.

*biodiversity targets*

## **Consistency with NHT Investment Conditions**

The project is consistent with each of the Trust's three overarching objectives of:

### **Biodiversity Conservation:**

The project has strong emphasis on protecting and enhancing regional biodiversity through rotational grazing and paddock resting to improve overall vegetation condition. Additionally, through the use of EMU the project will improve pastoralists' understanding of ecosystem function and the need to implement grazing systems that support these systems.

The improvement of vegetation condition through the use of sustainable grazing systems on stations will contribute to existing biodiversity protection achieved through off-reserve and CAR conservation measures.

*need  
more  
substance*

### **Sustainable Use of Natural Resources:**

The project's major aim is to establish a sustainable grazing system that is based on the carrying capacity of the Rangeland's natural resources. The project will demonstrate a system that allows land managers to maintain productivity and profitability, and also ensure that the region's vegetation resources are not overgrazed and can support ecological processes in the longer term.

### **Community Capacity Building:**

The Project will improve community capacity in several areas. Through the EMU process land managers will learn the importance of ecosystem function in the Rangelands, the importance of monitoring natural resources, and that ecosystem function and animal production can co-exist with sound management.

Through the involvement of RCS, land managers will learn the importance of holistic planning at the station scale and matching stocking rates to carrying capacity. Through training and on-ground support RCS will assist land managers to develop business decision making skills to achieve environmental and productivity based outcomes.

RCS is also keen to establish a leadership group of pastoralists involved in the project and provide them with high level training and support. This leadership group will then be able to encourage other pastoralists to adopt the major principles of sustainable grazing systems.

Community capacity will also be improved through increased understanding of climate variability and its impact on carrying capacity. Consequently land managers will be able to identify critical decision points in relation to carrying capacity and stock movement.

## **Assessment Principles**

### **High Priority, Targeted Investment which Contributes to Natural Systems**

The Coordinating Group believes that widespread adoption of sustainable grazing systems is a high priority in the Rangelands.

The Coordinating Group acknowledges the high priority of this issue for this issues as recognised by the Pastoralism for Sustainability Working Group established by the State Government. Recommendation One of the Working Group's report is:

*Research into improved grazing systems is required to assess the impacts of new grazing techniques on productive capacity, impacts on pasture condition and biodiversity. This research should be conducted in partnership with the industry.*

### **Delivery of Environmental and Production Outcomes**

#### **Delivery of Public Benefits**

The project will deliver public benefits through enhancing the Rangeland's biodiversity.

#### **Relevance to Geographic and Thematic Areas of Interest**

The Rangelands are identified as one of the Commonwealth's geographic areas of interest.

The project has relevance to the Commonwealth's thematic areas of interest. In particular biodiversity hotspots identified by the Australian Government Endangered Species Advisory Committee. [A pilot for the project is to take place in the Carnarvon Basin??? - not sure about this].

*Up comply*  
The project also has relevance to the Commonwealth's thematic area of interest of fire management. The project is linked to the Tropical Savannas CRC's work on fire management.

#### **Project Timing**

The project will run for five years commencing in 2004.

#### **Budget Summary**

#### **Financial and Other Support**

NHT funded Sustainable Agriculture Officer

The EMU project.

#### **References**

Crocker, K., and R. Kelly. 2002. Toward higher lamb percentages. Bulletin No. 4562. Department of Agriculture Western Australia.

Johns, M., and K. Croker. 1999. Teasing ewes for early breeding. Farmnote No. 132/99. Department of Agriculture Western Australia.

Morrissey, J.G. 1973. Animal production and reproduction in the mulga zone of Western Australia. Tropical Grasslands 7:163-168.

Morrissey, J.G. 1981. Sheep reproductive behaviour and performance in the Western Australian shrublands. Misc. Publ. 23/87. Department of Agriculture Western Australia.

Pastoralism for Sustainability Working Group. September 2003. Report to the Minister for Planning and Infrastructure. Government of Western Australia

White, K. Total Grazing Management yards – a cornerstone for improved station profitability. Farmnote, Department of Agriculture Western Australia. (in press)



**From:** "Morgan, Luke" <LMorgan@agric.wa.gov.au>  
**To:** "Lewis, Mark" <mlewis@agric.wa.gov.au>, "Brennan, Greg" <GBrennan@agric.wa.gov.au>, "Watson, Ian" <iwatson@agric.wa.gov.au>, "Bartle, Rosemary" <rbartle@rcs.au.com>, "Pringle, Hugh" <HPringle@agric.wa.gov.au>, "O'Connor, Roderick" <roconnor@agric.wa.gov.au>, "Norton, Ben" <b.norton@cmae.curtin.edu.au>, "Hopkins, Angas" <ahopkins@dpc.wa.gov.au>, "Mason, Bill" <b.mason@cmae.curtin.edu.au>  
**Date:** 10/10/03 2:07PM  
**Subject:** RE: Rangelands Sustainable Grazing Systems Project Meeting

Hi all,  
 this is still an early draft but is a start for us to work from on Monday.

Would appreciate it if you each have a look over it and see where your respective areas of expertise would best fit and what additional information you can provide for inclusion.

<<SGS Proposal NHT draft 3.doc>>

Thanks again - Luke

> -----  
 > From: Morgan, Luke  
 > Sent: Thursday, 9 October 2003 16:37  
 > To: Lewis, Mark; Brennan, Greg; Watson, Ian; 'Bartle, Rosemary';  
 > Pringle, Hugh; O'Connor, Roderick; 'Norton, Ben'; 'Hopkins, Angas';  
 > 'Mason, Bill'  
 > Cc: 'Baldock, Kel'; 'Sercombe, Nigel'  
 > Subject: RE: Rangelands Sustainable Grazing Systems Project Meeting  
 >  
 > Hi all,  
 > I have arranged a phone conference for Monday afternoon at 1:00pm to  
 > discuss the SGS proposal. Details are as follows:  
 >  
 > \* Angas, Ben, Greg, Hugh, Bill in the Acacia Rm at CALM on 9442 0320.  
 > Angas you need to arrange to have the conference phone set up in that  
 > room. The person you need to see about getting hold of the phone is John  
 > Skillen.  
 > \* Ian Watson at Northam on 9690 2128.  
 > \* Rosemary and Mark at Carnarvon in Mark's office on 9956 3315.  
 > \* Roderick and me at Geraldton on 9956 8513.  
 >  
 > Ben I suggest that you Chair the conference.  
 >  
 > Some issues for discussion could be:  
 >  
 > \* Progress to date.  
 > \* Lobbying support for the proposal.  
 > \* What input is necessary and who will provide it.  
 > \* Logistics and costings.  
 >  
 > If there are any problems or questions please let me know.  
 >  
 > Regards and look forward to chatting on Monday - Luke  
 >  
 > -----  
 > From: Morgan, Luke  
 > Sent: Wednesday, 8 October 2003 17:13  
 > To: Lewis, Mark; Brennan, Greg; Watson, Ian; Pringle, Hugh;  
 > O'Connor, Roderick; 'Norton, Ben'; 'Hopkins, Angas'; 'Bartle, Rosemary'  
 > Cc: 'Baldock, Kel'; 'Sercombe, Nigel'  
 > Subject: Rangelands Sustainable Grazing Systems Project

> Meeting

>

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> Sustainable Grazing Systems Project to be funded under the extension of  
> NHT through the Competitive Regional Component. The project proponents  
> will be the Rangelands NRM Coordinating Group and the project (if  
> successful) will be managed by the CMAE.

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> The proposal needs to be completed and sent to the Commonwealth-State  
> NHT Joint Steering Committee by 24 October. Consequently timeframes are  
> tight so hopefully we can have something pretty solid by the end of this  
> week/ early next week. Ben and I have made a start and Ben is adding more  
> technical information as we speak. I suggest we get as far as possible  
> with a draft by Friday and then people can provide comment and additions  
> as necessary.

>

> I propose we get together for a meeting next Monday afternoon to go  
> through details and what other additional input is needed before  
> submitting to the Joint Steering Committee.

>

> I understand that several of you (Angas, Hugh, Ben, Bill, Greg) are  
> meeting together in Perth on Monday morning regarding the EMU project so  
> while you are all in a room together I reckon we should have a telephone  
> hook-up. If everyone is amenable please let me know what numbers you will  
> be on so I can make arrangements. I think we only need to chat for an  
> hour so suggest we are on the line from 1:00 - 2:00pm.

>

> Mark and I will be on our way to Perth so will stop in with Roderick  
> O'Connor in Geraldton.

>

> Any comments or questions please let me know.

>

> Regards and thanks for your help,

>

> Luke Morgan

> Development Officer

> Department of Agriculture

> South River Road

> PO Box 522

> CARNARVON WA 6701

> Phone: (08) 9956 3319

> Fax: (08) 9941 8334

> Mobile: 0428 778 033

>

>

CC: "Baldock, Kel" <kelvin.baldock@greenbase.com.au>, "Sercombe, Nigel"  
<nigels@calm.wa.gov.au>

**From:** "Morgan, Luke" <LMorgan@agric.wa.gov.au>  
**To:** "Lewis, Mark" <mlewis@agric.wa.gov.au>, "Brennan, Greg" <GBrennan@agric.wa.gov.au>, "Watson, Ian" <iwatson@agric.wa.gov.au>, "Bartle, Rosemary" <rbartle@rcs.au.com>, "Pringle, Hugh" <HPringle@agric.wa.gov.au>, "O'Connor, Roderick" <roconnor@agric.wa.gov.au>, "Norton, Ben" <b.norton@cmae.curtin.edu.au>, "Hopkins, Angas" <ahopkins@dpc.wa.gov.au>, "Mason, Bill" <b.mason@cmae.curtin.edu.au>  
**Date:** 10/9/03 4:36PM  
**Subject:** RE: Rangelands Sustainable Grazing Systems Project Meeting

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Regards and look forward to chatting on Monday - Luke

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 > Sent: Wednesday, 8 October 2003 17:13  
 > To: Lewis, Mark; Brennan, Greg; Watson, Ian; Pringle, Hugh; O'Connor, Roderick; 'Norton, Ben'; 'Hopkins, Angas'; 'Bartle, Rosemary'  
 > Cc: 'Baldock, Kel'; 'Sercombe, Nigel'  
 > Subject: Rangelands Sustainable Grazing Systems Project Meeting

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>  
> Any comments or questions please let me know.  
>  
> Regards and thanks for your help,  
>  
> Luke Morgan  
> Development Officer  
> Department of Agriculture  
> South River Road  
> PO Box 522  
> CARNARVON WA 6701  
> Phone: (08) 9956 3319  
> Fax: (08) 9941 8334  
> Mobile: 0428 778 033  
>

**CC:** "Baldock, Kel" <kelvin.baldock@greenbase.com.au>, "Sercombe, Nigel"  
<nigels@calm.wa.gov.au>

**From:** "Morgan, Luke" <LMorgan@agric.wa.gov.au>  
**To:** "Lewis, Mark" <mlewis@agric.wa.gov.au>, "Brennan, Greg" <GBrennan@agric.wa.gov.au>, "Watson, Ian" <iwatson@agric.wa.gov.au>, "Pringle, Hugh" <HPringle@agric.wa.gov.au>, "O'Connor, Roderick" <roconnor@agric.wa.gov.au>, "Norton, Ben" <b.norton@cmae.curtin.edu.au>, "Hopkins, Angas" <ahopkins@dpc.wa.gov.au>, "Bartle, Rosemary" <rbartle@rcs.au.com>  
**Date:** 10/8/03 5:12PM  
**Subject:** Rangelands Sustainable Grazing Systems Project Meeting

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Mobile: 0428 778 033

**CC:** "Baldock, Kel" <kelvin.baldock@greenbase.com.au>, "Sercombe, Nigel" <nigels@calm.wa.gov.au>

**From:** "Morgan, Luke" <LMorgan@agric.wa.gov.au>  
**To:** "Hopkins, Angas" <ahopkins@dpc.wa.gov.au>  
**Date:** 10/8/03 12:01PM  
**Subject:** NHT Project

Hi Angas,  
there is an opportunity under the current interim round of NHT to attract some funding for a project in the rangelands.

The proposal in summary is a large scale sustainable grazing project looking at improving productive capacity and biodiversity through rotational grazing and paddock resting. The project will build on the Ecosystem Management Unit project as a planning framework and have links to projects dealing with climate variability and potentially fire management. There is also the potential to link it with other projects in other states which we are working on.

I guess at the moment the project is at the conceptual stage and we are fleshing it out. It is apparently something that has been a high priority in WA for some time and this current funding round presents us with an opportunity. I even note that recommendation one of the Pastoralism for Sustainability Working Group's report referred to the need for this type of research/ project.

Ben Norton of the CMAE and Hugh P will have the primary role of providing technical input and I am coordinating the proposal and giving it a NHT flavour. We are planning a meeting next Thursday to go through the application and I think you should probably be involved...you and I were going to meet Thursday morning anyway so it will hopefully fit in. The meeting will be at the Dept of Ag EMR 1.

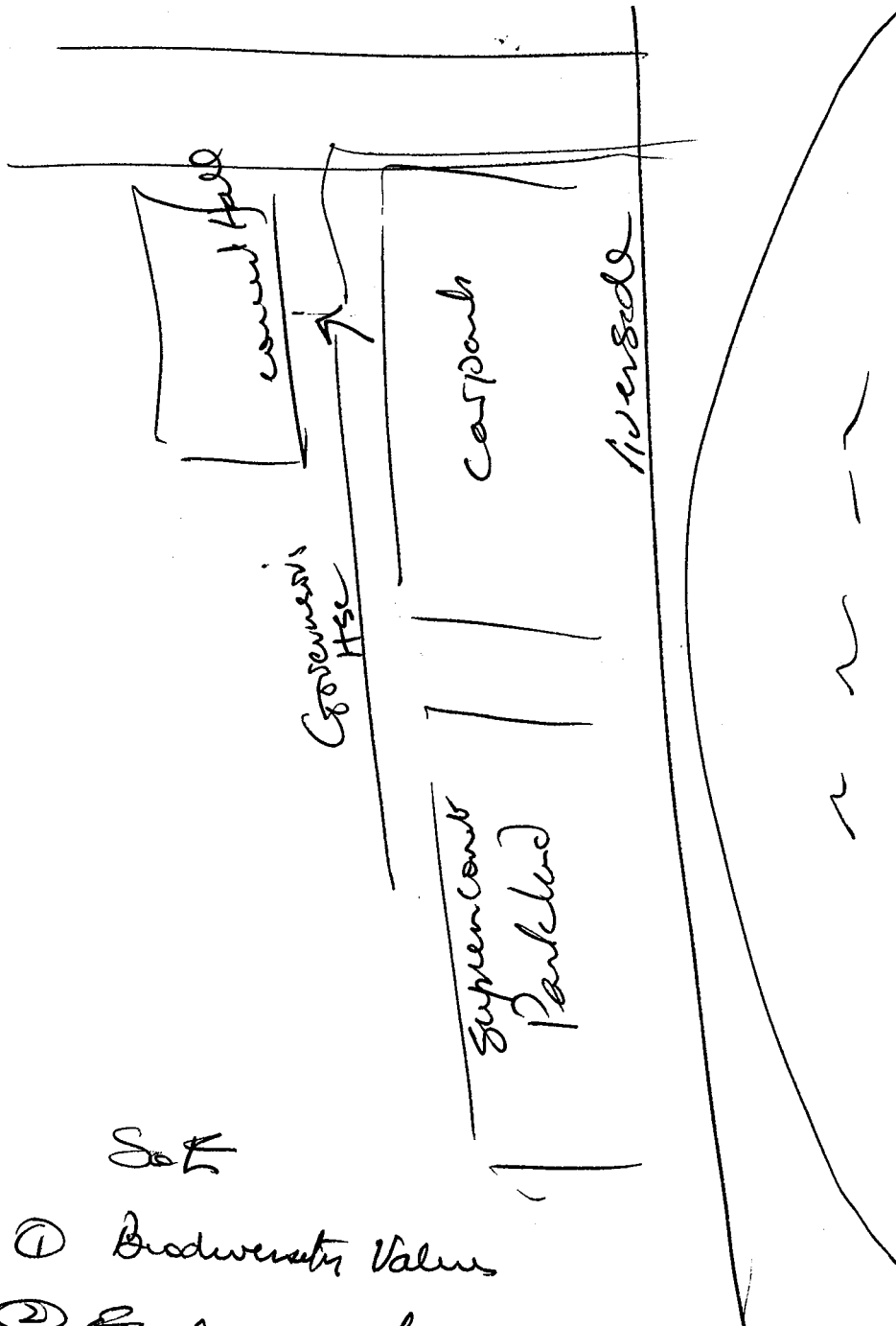
There was also mention from Mark and others of linking WWF and the Cons Council somehow into the project. You may have some ideas about how we could do this. Can we chat about it when you get some time...? Preferably today or tomorrow as timeframes are tight. The proposal has to be in by 24 Oct.

The Rangelands NRM Coordinating Group will be the proponents and it is intended that the CMAE will manage the project on its behalf.

Regards,

Luke Morgan  
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USK



SoK

- ① Biodiversity Value
- ② Ecological functioning
- ③ Natural capital eg soil, water
- ④ Resource Value eg the best  
favour  
livestock habitat--