

# **Rotational grazing systems based on landscape position and seasonal variation for the Goldfields of Western Australia: a preliminary model for discussion**

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## **Introduction**

There is mounting evidence that continuous grazing management suppresses recruitment of important pasture species and may favour the emergence of less palatable and nutritious species {Wilcox 1960 #4140}{Hunt (submitted) #670}{Hunt 1995 #660}. This situation is particularly serious in bottomlands because they support palatable perennial shrub species that confer resilience of food supply to stock in inevitable prolonged dry periods.

If stock are to be moved regularly, then it makes sense that this should be done in relationship to classes of stock and their nutritional and other habitat requirements, as well as landscape variability and seasonal variation. In this paper we present discussions of Bill Gorrie's experiences growing up in on a ram stud in central Queensland, and work as a station hand and then manager of properties in the Goldfields and Nullarbor Plain of Western Australia. In particular, we present a model for resting landscapes that Bill and other successful pastoral managers used to use in the Goldfields.

## **The essence of the model**

The first differentiation is between 'wet' (reproductive ewes and lambs) and 'dry' (non-reproductive ewes and neutered males – wethers) stock.

### **Wet flock rotations**

Wet stock are rotated between chenopod (saltbush and bluebush species) "bottomlands" and "up-slope" (various mulga associations) landscapes. Dry stock are rotated among paddocks dominated by up-slope landscapes. The manner in which these rotations are conducted is presented in Figure 1. The major musters are undertaken in February/March and August/September.

While reproductive ewes are mated in the New Year in up-slope landscapes and are shawn in autumn, they undergo the major gestation, lambing and lactating phases in the most productive seasons and landscapes. Rams and weaners (depending on seasonal conditions and their condition) are removed in spring, as ewes are moved up-slope. Weaners are scattered amongst dry flock paddocks until rams are removed from the wet flock at the next mustering for shearing in autumn the following year.

Wet flocks are rotated through collections of two bottomlands paddocks and a number of up-slope paddocks that together provide an equivalent carrying capacity. Given that paddocks are often of similar size, but those with bottomlands usually have substantial areas of less productive and preferred pastures, there may often be a 2:2 set of four paddocks in a rotation. In that

case, a relatively simple rotation can be implemented in which bottomlands paddocks are stocked only every second winter, while up-slope paddocks are stocked only every second summer (Figure 2). This means that bottomlands are rested for two summers and a winter before next being stocked. Given that most winters are successful seasons in the area and that between a quarter and a fifth of summers are successful, bottomlands are likely to experience a successful winter season in most rest periods, and a successful summer season as well at least every second rest period. Up-slope paddocks are likely to receive successful seasons in both winter seasons of a rest period and a successful summer season every third or fourth rest period.

### Dry stock rotations

Dry stock are also rotated, but in a more complicated manner. The rule of thumb is that paddocks of similar carrying capacity should be stocked in summer at only two-thirds of the stocking rate for winter periods. Given that up-slope paddocks are unlikely to vary in carrying capacity to the same extent as in wet flock paddocks, a simplified model of rotations is depicted in Figure 3. This means that every paddock gets rested for one winter at least, and for two winters every second rest period. Forty percent of paddocks are rested every summer, only receive two summer rest periods in succession every second rest period.

### Overall stock numbers

This model requires that paddocks are in a healthy state after three seasons of rest and it is time for them to be grazed again. This requires that stock numbers are conservative, rather than speculative, as paddocks are managed on a time cycle of at least two years. However, the underlying assumption is that carrying capacity should (at least) not decline with seasonally and landscape-orientated rotations and resting. Indeed, the aim of this system is to improve production and regenerate and/or preserve the productivity of landscapes' capacity to support livestock and native plants and animals.

### Quality of stock

There is no point in developing a sophisticated model of livestock and landscape management if the stock are of poor quality in terms of what the market demands. This approach depends on capacity to muster stock at least twice a year. This may require some form of trapping (if only to reduce costs of doing so). However, the handling of stock also allows for multiple chances of flock improvement through the capacity to cull at such times.