

## Floodplain Grazing Management

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### BACKGROUND

The main areas of floodplains in the Top End of the Northern Territory are in the Sub-coastal Plain, Marrakai, Finniss and Littoral Land Systems. The Sub-coastal Plain Land System consists of flat areas of heavy-textured or peaty soils that are flooded deeply for several months each wet season. In the Marrakai and Finniss Land Systems there are extensive areas of plains on acid alluvial soils which are liable to shallow flooding each wet season for periods up to three or four months. These floodplains alternate with hills and undulating country. The Littoral Land System contains salt and mud flats liable to saline flooding. This land system has no grazing potential and will not be further considered.

### SOILS AND VEGETATION

The soils of the sub-coastal plains are predominantly deep, black cracking clay soils. For growing pastures these soils are quite fertile. Floodplain soils of the Marrakai and Finniss Land Systems are often mottled yellow duplex soils including solodics, soloths and solodised-solonetz. All surface horizons of these soils are inherently infertile.

The open plains of the sub-coastal belt are covered with *Oryza/Eleocharis* swampy grassland. The vegetation of the major plains and flats of the Marrakai and Finniss Land Systems consists mainly of *Themeda/Eriachne* grassland.



**Grazed and ungrazed floodplain**

## GRAZING POTENTIAL AND GRAZING PLANTS

In their natural state, the most productive areas of the floodplains are the low lying areas of the sub-coastal plains which are flooded the deepest during the wet season. These areas provide a bulk of feed and fresh regrowth during the mid-late dry season when all other feed has hayed off. They are dominated by stands of native hymenachne (*Hymenachne acutigluma*) and swamp rice-grass (*Leersia hexandra*). Next in value for animal production are the shallow floodplains which remain wet through to the mid dry season. Useful grasses include spiny mud grass (*Pseudoraphis spinescens*), awnless barnyard grass (*Echinochloa colona*), wild rice (*Oryza australiensis*, *O. meridionalis*, *O. rufipogon*) and scrobic (*Paspalum scrobiculatum*).

The shallow floodplain areas dominated by sedges are of little grazing value. Marrakai and Finnis Land Systems provide limited dry season grazing, mainly from perennial grasses such as kangaroo grass (*Themeda triandra*) and plume sorghum (*Sorghum plumosum*). Areas of these land systems dominated by kerosene grass (*Eriachne burkittii*) provide no useful dry season grazing.

The clay soils of the sub-coastal plains can be improved without the application of fertilisers, although nitrogen fertiliser at establishment stimulates early growth. The solodic soils of the Marrakai and Finnis Land Systems require initial fertiliser inputs of N, P, K, S to build up the fertility. After the initial inputs, the nutrients tend to cycle.

Ponding using shallow banks to control water can increase the productivity of the shallow floodplains. For the aquatic grasses, water ponded on the floodplains extends the growing season. Legumes on the other hand need the water to be kept shallow as they do not tolerate extended periods of flooding or inundation.

## GRAZING HISTORY

The floodplains of the Northern Territory have been subject to uncontrolled grazing by buffalo mainly, but also cattle and horses, for over 100 years, up until the mid 1980s.

The effect on the vegetation in general, and particularly on preferred grazing plants was severe. In the 1970s the best areas of hymenachne were outside those areas with historically high buffalo populations. In 1981, the areas of hymenachne remaining on the Mary River plain tended to be on the lowest points of the plain which flood the earliest, the deepest and the longest. The opinion at the time was that overgrazing in the late wet-early dry period was the major long term cause of the deterioration of native hymenachne stands.

With the controlling of the buffalo population, the dominant native perennial grass species such as hymenachne and swamp rice grass have now returned on the floodplains.

## CURRENT SITUATION

About one half of the Sub-coastal Plain Land System area in the Top End of the Northern Territory is on pastoral properties. The productivity of a number of these Top End pastoral properties has been enhanced by the availability of good dry season feed from areas of native hymenachne, swamp rice grass, *Paspalum* spp. and *Echinochloa* spp. and areas of sown, planted or naturalised para grass (*Brachiaria mutica*). These areas are now saved almost exclusively for dry season feed, with domestic stock excluded from the floodplains during the wet season by fencing. Over the last 15 years, most of the floodplains on pastoral properties have been further subdivided to control access to the areas of the floodplain which need to be grazed at different times of the dry season.

In recent years, small areas of the floodplains on pastoral properties have been sown or planted with a range of introduced improved pasture cultivars to increase productivity and to provide competition for mimosa (*Mimosa pigra*) seedlings. Cultivars sown or planted include para grass, Tully (*B. humidicola*), Amity aleman grass (*Echinochloa polystachya*), native hymenachne, Olive hymenachne (*H. amplexicaulis*) and Kazungula setaria

(*Setaria sphacelata*). Two grasses have been present on the floodplains for considerable time without taking over. Aleman grass (*Echinochloa praestans*) was introduced over 100 years ago, and para grass about 90 years ago. Most of the spread of para grass has been by deliberate human intervention for pastoral purposes on pastoral properties.

Almost all of the Marrakai and Finnis Land Systems are on pastoral properties. They are largely undeveloped, and in their natural state unproductive, providing only limited dry season grazing. These areas are highly productive if planted with improved pastures.

## **GRAZING MANAGEMENT FOR SUSTAINABILITY**

The keys to sustainable grazing of the floodplains are control of access, duration and intensity of grazing. The floodplains, whether the better areas on the sub-coastal plain, or the less fertile and less productive areas further inland, should be fenced off from the surrounding upland country so that access can be controlled and they can be spelled during the wet season. The floodplains should not be grazed in the late wet/early dry season and should be lightly grazed early in the wet season.

The floodplains should not be grazed too heavily, cut or burnt late in the dry season or early in the wet season, as rapid inundation or flooding may drown grasses. Duration of grazing is important. It is critical to keep the stock off the floodplains, particularly low lying areas until they dry out. The low lying areas generally have a water table or moisture close to the surface. Hymenachne areas provide some good quality fresh regrowth during the late dry season. Productivity of the shallow floodplain areas depends on regrowth from early wet season storms.

Stocking rate is critical to the long term sustainability of grazing on the floodplains. In the 1970s Departmental staff thought that the extensive areas of native hymenachne and para grass could carry one beast per 0.8 - 1.2 ha for the dry season. While there is evidence that the better areas of the floodplains carry one beast per hectare for some of the dry season, recent thinking in DBIRD is that a stocking rate of one beast per 1.5 - 2 hectares over the duration of the dry season will be sustainable in the long term. Recent observations of stock numbers and areas of floodplain grazed on some properties approximate this figure.

The shallow floodplains which dry out earlier and are grazed for longer are susceptible to invasion by woody weeds such as mimosa, sicklepod (*Senna obtusifolia*) and malachra (*Malachra fasciata*). These weeds form a shrubland on many parts of the floodplain. Stocking rates need to be controlled so that grasses present are vigorous and can compete with these weeds. Infestations of these weeds are unlikely to diminish once established. Some of the shallow floodplains of the Sub-coastal Land System and the floodplains of the Marrakai and Finnis Land Systems will not support sustainable grazing regimes unless they are ponded using shallow banks to hold water longer to grow grasses such as para grass and aleman grass. These floodplains also require initial inputs of fertilisers to stimulate the growth of improved grasses.

## **CONCLUSION**

The better areas of the floodplains will continue to be productive in the long-term if they are spelled by fencing off the areas during the wet season and if stocking rates average one beast per 1.5 - 2 ha during the dry season grazing period. Shallow floodplain areas will need ponding banks constructed to improve the moisture conditions required and infertile areas will need initial nutrient inputs to allow pastures to remain productive and sustainable.

## **WARNING**

Pasture plants have the potential to become weeds in certain situations. To prevent that, ensure that pasture seeds and/or vegetative materials are not inadvertently transferred to adjacent properties or road sides.

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