Agnote

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Floodplain Grazing Management in the Northern Territory

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BACKGROUND

The floodplains in the Top End of the Northern Territory are in mainly 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 black 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 mud flats liable to saline flooding. This land system has little or no grazing potential and will not be discussed.

SOILS AND VEGETATION

The soils of the sub-coastal plains are predominantly deep, black cracking clay soils (Vertisols). These soils are quite fertile for growing pastures. The open plains of the sub-coastal plains are covered with Oryza/Eleocharis swampy grassland. The vegetation on these floodplains is often a mosaic, with species changing with changes in micro-topography, particularly with changes in water depth and duration of flooding.

Floodplain soils of the Marrakai and Finniss Land Systems are often mottled yellow duplex soils including solodics, soloths and solodised-solonetz (Hydrosols). All surface horizons of these Hydrosol soils are inherently infertile. The vegetation of the major plains and flats of the Marrakai and Finniss Land Systems consists mainly of Themeda/Eriachne grassland.

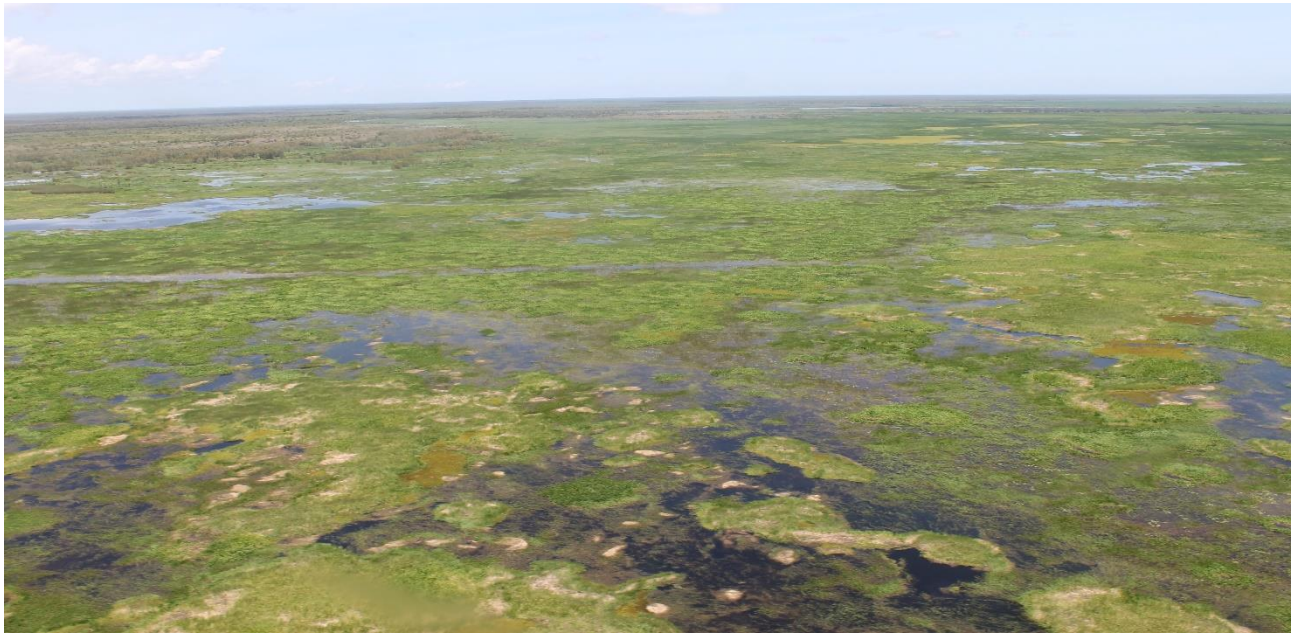
Information on the floodplain soils and their distribution can be found in the Soils of the Northern Territory factsheet (Soils of the Northern Territory factsheet).

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 green feed and fresh regrowth during the mid-late dry season as floodwaters recede. At this time of year, all other feed has hayed off and the pasture quality is low.

These floodplains are dominated by stands of native grasses, including Hymenachne (*Hymenachne acutigluma,* Native hymenachne) 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.



A Coastal floodplain during the wet season

In their native state, Marrakai and Finniss Land Systems provide limited early 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.

A Solodic floodplain near Adelaide River, NT

Introduced grasses can be grown on the clay soils of the sub-coastal plains without the application of fertilisers, although nitrogen fertiliser at establishment stimulates early growth. The solodic soils of the Marrakai and Finniss Land Systems require initial fertiliser inputs of N, P, K, S to build up the fertility as introduced grasses will not grow on them in their native state. After fertiliser inputs in early years, a peat layer builds up under the grasses. The nutrients tend cycle through the pasture. Nutrients are not lost down the profile as there is no internal drainage in these soils.

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 over 3 months.

GRAZING HISTORY

The floodplains of the Northern Territory had been subject to uncontrolled grazing by buffalo mainly, but also cattle and horses, for over 100 years. This lasted 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 Native hymenachne were outside those areas with historically high buffalo populations.

In 1981, the areas of Native 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 long-term overgrazing in the late wet-early dry season period was the major of the deterioration of Native hymenachne stands.

Controlling of the buffalo population and fencing of the floodplains to prevent stock access during the wet season has allowed native perennial grass species such as Native hymenachne and Swamp rice grass again become dominant on the floodplains.

Cattle moving to a Top End floodplain

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 (*Urochloa mutica*).

These areas are now saved almost exclusively for dry season feed. Domestic stock are excluded from the floodplains during the wet season by fencing. Most of the floodplains on pastoral properties have been further sub-divided 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 pasture cultivars to increase productivity and to provide competition for mimosa (*Mimosa pigra*) seedlings.

Cultivars sown or planted include para grass, Tully (*Urochloa 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. Aleman grass (as *Echinochloa praestans*) was introduced in the 1890s, and para grass was introduced in the 1920s. Most of the spread of para grass has been by deliberate human intervention for pastoral purposes on pastoral properties.

Olive hymenachne (*H. amplexicaulis*) was sown on a number of Top End pastoral properties. It has been declared a Weed of National Significance (WONS) and now cannot be sown or planted.

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

GRAZING MANAGEMENT FOR SUSTAINABILITY

The key to sustainable grazing of the floodplains is to 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 so that the pastures 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.

Introduction of cattle onto the flood plain during the dry season must be staged. Cattle number must be matched to the available feed. Numbers can be increased as the floodplains dry out and more grazing area is available. Cattle generally follow the floodwaters out as the water recedes. The reverse happens the following wet season, after early rains and the floodplain begins to fill with water, and cattle graze regrowth in front of the rising floodwater.

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 most of the dry season, recent thinking in the department 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 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 the 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. Native 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.

Each floodplain is slightly different. The mixture of grasses changes from one floodplain to the next. Each season can be different as flooding is to different depths and for different periods of the year. The depth and duration of flooding controls how many cattle can be put on a floodplain in any year. Producers need to be familiar with the characteristics of their particular floodplain.

The shallow floodplains which dry out earlier and are grazed for longer are susceptible to invasion by woody weeds such as mimosa (*Mimosa pigra*), Sicklepod (*Senna obtusifolia*) and Malachra (*Malachra fasciata*). These weeds form a shrub land on some 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 Finniss 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.

KEY POINTS

- 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 of floodplain during the dry season grazing period.

- Shallow floodplain areas will need ponding banks constructed to improve the moisture conditions and extend the length of the growing season.

- Infertile areas will need initial nutrient inputs to build up fertility 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 to road sides. This information in this Agnote is specific to the Northern Territory. Some of the pastures listed in this Agnote are not permitted in other States.

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