

Managing flood damaged buffel pastures

Case studies from *Mellaluka, Lignum* and *Alinya* on the Belyando River disaster management contacts

Background

The Belyando floodplain from Alpha to Belyando Crossing experiences extensive flooding, with affected areas up to 25 km wide and pastures inundated from several days to weeks.

The main land types are brigalow/gidgee scrubs, clayey alluvials and box country. Major floods occurred in April 1990, January 2008 and December 2010 to January 2011. The pastures are buffel grass dominant and extensive mortalities occurred with each of these flood events.

The impact of flooding on pasture survival and production depends on the degree of flooding the land types and pasture species present.

Experience has shown that inundation for periods greater than two to three days usually results in extensive buffel grass mortalities. The 1990 and 2008 floods occurred in autumn and summer respectively and both resulted in high buffel mortality; so time of the year did not appear to have an impact on mortality rates.

While the buffel seed bank is reduced by flooding, there is often adequate seedling regeneration, particularly if the pasture was in good condition before the flood as was the case in 2008. The native perennial grasses golden beard grass, desert bluegrass, black speargrass and Mitchell grasses have not been affected by these floods; however they are usually only a small component of the pasture.

Silt deposition on the above ground parts of the plant as floodwaters recede detracts from recovery. The silt creates a physical barrier to sunlight and carbon dioxide uptake, reducing or halting photosynthesis. Falls of rain greater than 20 mm should cleanse the leaves and stems and hopefully plant growth will resume.

Burning is not recommended to address the silt deposition and stimulate growth. Burning adds further stress to the plant as it removes and damages above ground material that may still have living tissue. Growing points in the crown may also be further damaged by the burning. Removal of the ground cover leaves the soil subject to runoff and erosion. Maintenance of ground cover, even though it is dead provides suppression of parthenium establishment. Burning would also reduce the amount of buffel seed available for regeneration.

Buffel grass is the mainstay of land condition and productivity. Recovery has taken 12–24 months and during this period the soil is vulnerable to erosion and the land prone to weed invasion. Areas used for emergency fodder drops need to be vigilantly monitored for weeds.

Experiences from *Mellaluka* Bruce and Sam Cobb

Bruce and Sam Cobb have experienced several floods at *Mellaluka*, which is on the Belyando River west of Clermont. *Mellaluka* is 28,000 ha, with 12,000 ha that floods.

Bruce says ‘floods and buffel death hits you hard – both emotionally and financially. You need to assess your priorities and focus on re-establishing the buffel pasture. That’s your bread and butter!’



Bruce and Sam Cobb, Mellaluka

Summary of Bruce and Sam's recommendations:

- Maintain a good body of feed when the buffel is healthy to ensure good ground cover and a good seed bank
- When a flood kills the buffel, use plenty of spelling and graze judiciously to re-establish the buffel
- Short duration high density grazing helps to germinate seed
- Chemical control of parthenium in spring considerably assisted buffel establishment.

Bruce's experiences suggest that three days of inundation seems to be the critical time period for buffel. If the inundation is longer, there is significant mortality of buffel. The health and vigour of the buffel prior to flooding has an affect on post flood recovery so Bruce recommends conservative grazing to ensure a strong pasture with good ground cover and seed set to enhance recovery after a flood.

One week after the 2008 flood, 50 mm of rain fell and there was good growth of Flinders grass and hoop Mitchell grass. These native grasses assisted with maintaining good ground cover and providing competition to reduce parthenium growth and population. The buffel grass had good ground cover prior to the flood, and contributed to a viable seed bank. It was not necessary to reseed with buffel.

Bruce seeded a paddock with silk sorghum and some persisted for two years, however he would not recommend silk because of its competition with buffel grass for re-establishment.

In the spring following the January 2008 flood, Bruce controlled parthenium seedlings with a chemical application. Bruce thought that this was one of the most effective management strategies for enhancing pasture recovery. The big benefit was prevention of competition for establishing buffel.

Bruce manages with a conservative stocking rate to ensure a good body of feed, seed set and ground

cover, that is, good land condition, to enhance recovery of pastures after a flood.

Bruce Cobb is happy to discuss his experiences with flood damaged pastures. He can be contacted on 4983 5149.

The photos below show a flood site on Medway Creek, one month and 18 months after the 2008 flood. The period of inundation is unknown. Good land condition and grazing management have contributed to a good recovery of the buffel pasture.

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June 2009



Experiences from *Lignum*

Blue and Katie Luke

Blue and Katie Luke have experienced many floods over the last 40 years at *Lignum* on the Belyando River west of Clermont. The property is 18,600 ha, with 6000 ha that floods through the brigalow/gidgee scrubs land type. He says 'in the 1970s we just had to wait and see what happened when the floods came through the front gate. Now we are very fortunate with the communications and forewarnings we have.'

Summary of Blue and Katie's experiences:

- On Lignum, with good ground cover the buffel comes back well from existing seed
- After the 2008 flood, he would have been better off selling the cattle and better managing grazing, than to try and grow silk sorghum
- Short duration, high density grazing is critical to break up the silt layer and enhance buffel establishment.

Blue's experiences with floods make him believe that three days of submergence is about the critical level for buffel. Beyond this and there is extensive buffel death. However, if the buffel plant has some foliage above water, then survival is enhanced.



Buffel pasture killed by Jan 2008 flood on the Belyando



Blue and Katie Luke

The health and vigour of the buffel prior to flooding has an affect on post flood recovery so Blue recommends managing grazing conservatively to give a strong pasture with good ground cover and a large soil seed bank.

Blue reseeded some areas with buffel after the 2008 flood. After monitoring the recovery, he believes that the existing seed bank was adequate, and did not justify reseeding costs.

Fencing and water development on Lignum enables a rotational grazing system and good animal control. This allows Blue to manage pasture recovery using a high density animal impact for a short period, and then spell paddocks as necessary.

The high density animal impact is particularly important on Lignum to break up the deposited silt which forms a hard surface. The hard surface restricts establishment of underlying seed, as well as providing poor seed soil contact for seed on the soil surface.

Blue has had poor establishment and recovery from paddocks that did not have the high density short duration impact grazing. Paddocks are spelled after this treatment until the buffel grass is starting to set

seed. This may take several months. Grazing is then managed with a rotation.

Recovery to full production can take several years depending on the subsequent growing conditions. Recovery from the 2008 flood has taken two years with good summer growing conditions.

Some paddocks on Lignum only have a small portion flooded which can be a problem as the cattle will preferentially graze these areas with high grazing pressures resulting. The rotation system allows the whole paddock to be spelled until recovery is adequate.

The native grasses forest Mitchell grass, golden beard grass, hoop and bull Mitchell grass, and silky browntop recovered strongly after the flood. While buffel is the mainstay for productivity, Blue has had some success with Floren bluegrass, which has high flood tolerance.

Floren bluegrass established well from aerial seeding on the swampy country that is frequently flooded, and too wet for buffel to maintain a good stand. The Floren established on country usually dominated by buffel but the buffel eventually became dominant again.

Blue has found that maintaining good ground cover has a vital role in preventing thickening of woody weeds. Coolabah seedlings established wherever there was low ground cover associated with laneways, or cattle camps in the corners of paddocks. Also, existing sally wattle and coolabah regrowth has thickened after the flood.

Blue Luke is happy to discuss his experiences with flood damaged buffel pastures. He can be contacted on 4983 5413.

Experiences from *Alinya* Brett and Jane Kinnon

Brett and Jane Kinnon's *Alinya* property, west of Clermont on the Belyando River has very little high ground during a major flood. Buffel is the dominant pasture on the box country and the gidgee/brigalow scrubs land types.



Brett and Jane Kinnon

The 2008 flood came with no warning and left substantial damage to pastures, infrastructure and the stud cattle herd. Brett said 'It was like being in a tumble dryer. I didn't know when I was going to get out!' Fortunately, they were able to obtain agistment on a neighbouring property.

Summary of Brett and Jane's experiences:

- Recovery has taken 12–24 months with good growing conditions
- Overall, the stocking rate has been reduced by 25% since the 2008 flood, and this has been critical to the pasture recovery
- Reseeding with buffel has worked well
- Improved native perennial grass composition has been a positive outcome.

Recovery of pastures at *Alinya* since the 2008 flood has taken two years, and now most of the pastures are back to 90% of their productive potential. Two good growing seasons have been integral to the

recovery. Pasture recovery may take considerably longer if growing conditions are poor after a flood.

With nearly all of *Alinya* submerged during the 2008 flood, finding agistment nearby was critical for the welfare of the cattle and pasture recovery. Resting the pastures until the buffel had grown and set seed proved critical. Pasture spelling continued over the next two years with the average stocking rate reduced by 25%.

Reseeding buffel immediately after the 2008 flood has been beneficial at *Alinya*. While the full recovery took two years, the seeded paddocks got a head start and were able to sustain grazing earlier than the non-seeded paddocks. Brett observed the submerged buffel grass seed had gone mouldy on the ground after the flood, so it was quite likely that the seed bank was significantly reduced.

The Kinnons believe that one positive to come out of the flood has been an improvement in the native pasture composition. Desert bluegrass and golden beard grass survived the flooding well.



Belyando River in flood, January 2008

These native grasses then had a period when the growth was not restricted by buffel grass competition. Brett has one paddock where desert bluegrass is nearly half the composition of the pasture. Additionally, native millet, black speargrass and white speargrass are a lot more abundant.

Brett and Jane feel that this improvement in diversity will benefit production and sustainability. Native annual grasses and forbs have also been growing on scalded claypans that for the previous 25 years had very poor cover. Small buffel plants are also emerging and Brett is hoping that with time, perennial grasses will cover and stabilise the claypans.

Brett Kinnon is happy to discuss his experiences with flood damaged pastures. He can be contacted on 4983 5391.

Further information

Contact the Department of Agriculture, Fisheries and Forestry on 13 25 23, or visit the website www.daff.qld.gov.au

