CONSERVING BRIGALOW CORRIDORS
IN THE BURDEKIN

NQ DRY TROPICS

OVERVIEW

Landholders in the Northern Brigalow Belt region have been working to manage brigalow country while conserving and protecting the significant ecological values of these threatened communities.

They are achieving this through a range of practical strategies:

- fencing, to manage livestock access, to restore and protect remnant vegetation and to promote regrowth of brigalow in specific areas;
- installation of watering points to reduce livestock impact on vegetation; and
- control and eradication measures for weeds and feral animals.

Three properties have participated in the five-year Conserving Brigalow Corridors in the Burdekin project — neighbouring Moranbah properties and one near Glenden. NQ Dry Tropics worked closely with landholders to make sure the project benefited brigalow and wildlife at no cost to the grazing enterprise.

The project was delivered by NQ Dry Tropics through funding from the Australian Government's National Landcare Program. The pilot project ran from July 2018 to June 2019, with a four-year extension ending with a workshop for interested graziers in June 2023.

ECOLOGICAL VALUE OF BRIGALOW

The Brigalow Belt bioregion in Queensland is a unique environment, flanked by coastal tropical rainforests to the east and the arid and semi-arid wooded grassland interior of central Queensland to the west.

It is broadly split into two regions, the Brigalow Belt North, covering more than 13.5 million hectares with a semi-arid to tropical climate; and the Brigalow Belt South, covering 21.6 million hectares, of which 20 per cent is in New South Wales, with a sub-tropical climate.

In Queensland, brigalow is typically found on cracking clay soils in lowlands, plains, or riparian areas. Brigalow communities generally have tall brigalow (*Acacia harpophylla*) and eucalypt trees (9-25m), a moderately-dense shrub layer, and a sparse ground layer. Woody debris provides key habitat for the many reptiles and insects that call brigalow "home".

Brigalow communities provide habitat for 17 species listed as threatened in Queensland, or nationally, many of them rare reptiles. Species found in Queensland brigalow include the ornamental snake, brigalow scaly-foot, glossy-black cockatoo, painted honeyeater, spotted bowerbird, and the rare pale imperial hairstreak butterfly.

Brigalow country plays a role in sequestering carbon and improving soil health. As a legume, brigalow trees make nitrogen biologically available to other species through nitrogen fixation in their roots (Tunstall, 2005). As riparian ecosystems, brigalow communities can slow down water to facilitate soil saturation and reduce the risk of erosion.

Brigalow communities also facilitate deep drainage, which can prevent chloride leaching and salt mobilisation in at-risk soils (Bradley, 2006).

Brigalow corridors were identified along Eaglefield Creek from vegetation mapping and verified through field surveys. An Eaglefield Creek Management Plan was developed to determine the best strategies for protecting the habitat and the endangered species of the Brigalow Belt while maintaining grazing production value.

PASHA STATION

We've always been keen on our native environment so we're willing to control this area. We're not losing any production out of it and it's not having any impact on our financial operations. I think that most landholders, if they get involved in this sort of research, they would find it interesting.

John Heelan, Pasha Station
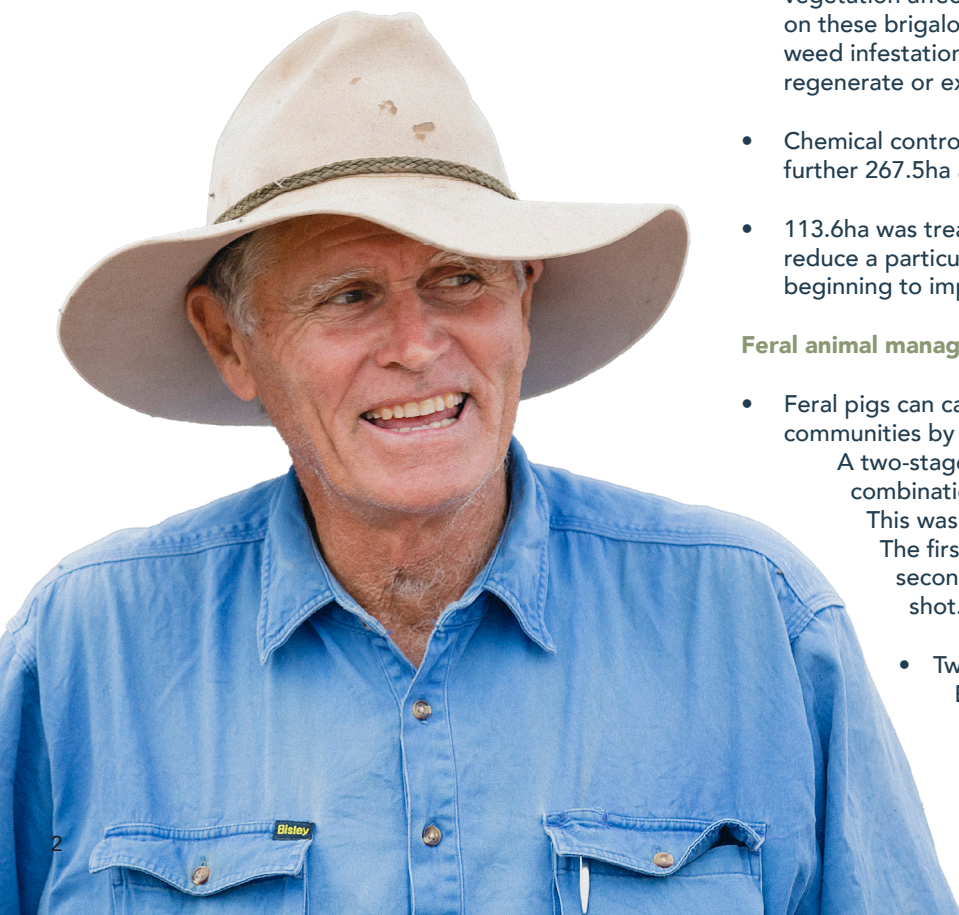
Brigalow grows along the creek bordering on paddocks including at Eaglefield Nature Refuge at Pasha. Vertebrate fauna and BioCondition surveys were conducted by NRA Environmental and Ecological Interpretations to determine the baseline condition of the area. A project plan was developed and implemented and included:

Fencing and water infrastructure to manage livestock:

- 10.7km of exclusion fencing protecting 400ha of high-quality brigalow along Eaglefield Creek. By moving cattle to areas with better pasture, vegetation recruitment has been encouraged and the understorey vegetation has been protected.

- The installation of six troughs, six water tanks, and a solar pump ensures conservation of this brigalow patch.

Weed control:

- Invasive plant species, specifically Parkinsonia, have altered the plant species composition and the structure of native vegetation affecting the quality of habitat for animals that rely on these brigalow communities. By removing the high-density weed infestation, the brigalow has an opportunity to regenerate or expand.

- Chemical control was applied to 236.3ha, and followed up in a further 267.5ha along Eaglefield Creek.

- 113.6ha was treated by aerial application of herbicide to reduce a particularly dense Parkinsonia infestation that was beginning to impact the threatened ecological community.

Feral animal management:

- Feral pigs can cause substantial damage to brigalow communities by destroying young plants and disturbing soil. A two-staged on-ground control program included a combination of shoot, bait and trap for feral animals. This was carried out twice during the life of the project. The first stage was carried out across 506ha, the second across 524ha. No animals were caught or shot.

  - Two aerial shoots were conducted in the Eaglefield Creek catchment, the first round across 68,076ha, second round across 74,725ha, eliminating 378 feral pigs.

RUAN STATION

Parkinsonia grows on the best country we've got. We've been spraying it which costs a lot of money, and hasn't really been working. We're willing to give something new a go, if it means finding a solution. Success would be seeing the infestation reduced to a point where we can use the land.

Owen Scott, Ruan Station

Parkinsonia up close

Weed control:

A dense and widespread Parkinsonia infestation on Ruan was the highest priority action recommended by the Eaglefield Creek Management Plan. A vegetation assessment was completed by NRA Environmental to determine the baseline condition of the area.

In November 2020, NQ Dry Tropics partnered with Bioherbicides Australia and Jangga Traditional Owners to trial Di-Bak Parkinsonia, a biological herbicide.

DiBak application

A capsule containing a combination of naturally occurring fungal pathogens is injected into the trunk, inducing dieback disease to kill the plant. The fungus enters the root systems and can spread across dense infestations, causing a natural dieback that extends well-beyond the initial application of the fungus. The fungus does not impact any native species.

This method has been effectively used across northern Queensland, but this was the first use in the Burdekin dry tropics area. More than 4000 trees across 10 hectares were treated, and smaller nearby infestations were also treated through several aerial and basal bark herbicide applications across 181 hectares.

From field observations, the bioherbicide is inducing dieback in the Parkinsonia.

William Fordyce, Hillalong Station

Hillalong Station, brigalow-belah

HILLALONG STATION

The landholders installed fencing to reduce grazing pressure in the intact brigalow, and carried out chemical control of Mother-of-millions (Bryophyllum delagoense), a category 3 restricted invasive plant which is poisonous to stock.

A vegetation assessment was conducted to determine baseline condition of the unique brigalow-belah mix that occurs on Hillalong.

Fencing and water infrastructure to manage livestock:

- To mitigate livestock trampling and grazing which reduces important leaf litter and woody debris, plant recruitment and understorey vegetation, 7.82km of fencing was installed to exclude cattle from a 498ha area of high-quality brigalow-belah scrub.

- Livestock have been moved to areas with better pasture availability.

Pest weed control:

- A contractor carried out chemical control of a 15.6ha infestation of Mother-of-millions in brigalow adjacent to the Suttor Creek anabranch to prevent further infestation. From field observations, the weeds have been reduced.

THREATS TO BRIGALOW

Historically, brigalow was encouraged, and in some cases required, to be cleared as part of the 1960s Brigalow Land Clearing Scheme. Significant resources were invested in identifying the most effective ways of removing brigalow in order to support productive pastures for grazing. The scheme was so successful that the 10 million hectares of pre-settlement brigalow country was reduced to around 1 million hectares by 2013. Today, the Australian Government is required to protect brigalow due to the effectiveness and impact of historical clearing, and is looking to protect and conserve the remaining high-quality brigalow habitat in the region.

'Brigalow (*Acacia harpophylla* dominant and co-dominant)' was listed as Endangered in 2001 under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) (Department of the Environment, Water, Heritage and the Arts 2008a). All 16 of the regional ecosystems (REs) that comprise the listed brigalow ecological community in Queensland are listed as Endangered under the *Vegetation Management Act 1999* (Qld)

The greatest threats to brigalow today are fire, weed incursion, and pest incursion. Brigalow is vulnerable to intense fires because its naturally sparse ground layer would typically only carry low intensity fires. Incursion by introduced grasses, leads to high-intensity fires that can vastly alter the community. Risk of fire can be reduced using techniques such as cool-burn and grazing to reduce the fuel load. Pests and weeds can also have an adverse impact on the abundance of native flora and the quality of habitat available to native fauna.

Bradley, M. (2006) Integration of Brigalow (Acacia harpophylla) vegetation with dryland cropping in south east Queensland: Agronomic, hydrological, ecological and Goethean perspectives. Doctor of Philosophy, Griffith University, Gold Coast.

Tunstall, B. (2005) Effects of Native Plant Species and Soil Type on Soil Nitrogen Mineralisation.

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