"Payneham Vale": integrated whole farm planning

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IN 1908, Ron's grandfather, Issac Gray, took up an uncleared block of land 15 km north of Frankland in the south-west of Western Australia (see Fig. 1, Hobbs 2003). During that time he ran a few cattle in the bush and clearing of the native woodlands of Wandoo (white gum) *Eucalyptus wandoo,* Jarrah *E. marginata* and Marri (Redgum) *E. calophylla* was slow and tedious. Ron's parents took over the farm in 1947, and with the advent of the bulldozer, clearing of Watkin's property and surrounding district began in earnest during the 1950s. Clearing continued as fast "as money permitted", until almost the last natural vegetation was knocked down in 1978 (Fig. 1). Annual pastures with some cropping (for supplementary feed) were the main source of fodder for sheep and cattle.

In the 1950s, the 1 400 ha farm was divided into three to accommodate Ron's uncle and his brother's desire to go farming. This left the "home block" of 552 ha to which we returned in 1973. The division of the farm and the extensive clearing of the native vegetation were to have major influences on our management of the property (Fig. 1).

"GET BIG OR GET OUT"

Ron studied at Muresk Agricultural College near Northam in the 1960s and moved back to the farm during the period when farmers were being told by agricultural and financial advisers to "get big or get out". This was a time of assessment of our future in the district.

Farm productivity increased as a result of better management practices during the 1970s. However, in 1976, salinity began to affect the dam near the house and appeared on some of the oldest and most productive land on the property. This was the catalyst for the development of our *Integrated Whole Farm Planning.*

We had come to realize that it was time for change and to set a new direction for our farm. Carrying more stock than the property was capable of supporting or clearing native vegetation were not the sole causes of land degradation. In our farming, we had not taken into account that we were part of an ecosystem and that we needed to farm within the limitations of that system. The following were some of the indications of major and detrimental changes to the ecosystem as a result of the way we had been farming:

- surface water erosion from summer thunderstorms;
- water-logging from winter rainfall;
- salinization and rising watertables caused by too much water entering the sub-surface layers;
- wind erosion from pre-frontal autumn winds;
- exposure of livestock to cold winter and hot summer winds;
- disappearance of our native flora and fauna meant we could no longer wander through the bush during spring and enjoy the orchids and native animals;
- overgrazing of understorey vegetation and regenerating trees in remnant patches of native vegetation so that these patches would eventually die; and,
- the old trees in the paddocks were dying and the land was exposed to the full forces of nature.

INTEGRATED WHOLE FARM PLANNING

The management strategies adopted on "Payneham Vale" are based on the need to integrate many practices in order to have an impact upon the whole environment. The foundation of our management plan relies entirely on the need to control, store and use water which is our most precious resource (Fig. 1). The shape of the land determines where water can be collected, stored and used without further degrading the land.

Our farm has a mediterranean climate of hot, dry summers and cool, wet winters, with average annual rainfall of 580 mm. Eighty per cent of the farm falls within the confines of two ridges with a creek passing through the middle. There is a 60 m fall from the highest point to the lowest point on the farm and water from neighbouring properties impacts on the farm. The predominant, and most damaging winds come from the north-west, south-west (cold winter winds) and to a lesser extent the east (hot summer winds). The soils are predominantly duplex sandy, gravelly loams over clay.

Gravitational use of water is of prime importance so water is stored as high in the landscape as possible. This has involved the co-operation of three neighbours to control water

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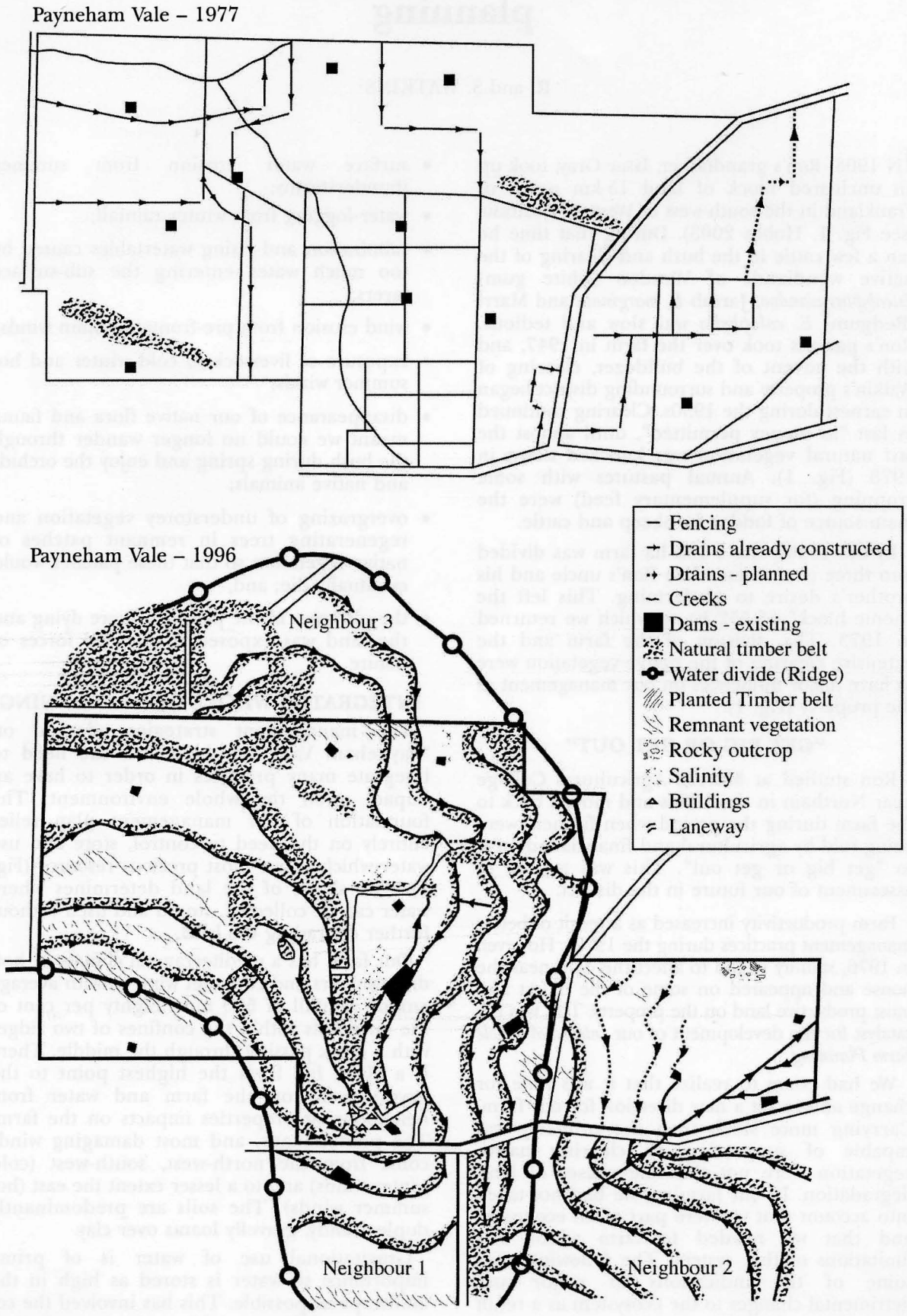

Fig. 1. Payneham Vale Farm in the southern wheatbelt of Western Australia. Little native vegetation remained in 1977 and salinity was beginning to affect production. Management strategies including extensive planting of timber were aimed at water management.

near the top of the ridges before run-off water gains volume and speed. The water collected from high in the catchment is our most useful water because it contains little salt. The water is harvested by 0.9 m deep drains which channel it into large, high storage ratio dams (Fig. 1). The design is such that when one dam overflows the water is collected and channelled into other dams via waterways down the landscape until all the dams are full and the excess flows safely off the farm via the main creek. The drains collect both surface water and seepage water from the top of the soil's sub-surface B horizon.

To the banks which line the drains we have added rows of trees which use water stored in the soil and help control the rising water table. The trees also act as windbreaks, wildlife corridors, and form paddock boundaries. All windbreaks along the drains are fenced and no stock are allowed to graze them. These corridors connect all remnant patches of native vegetation on the property (Fig. 1). Thus wildlife, including birds, can move throughout the farm without having to cross open agricultural land. As time and finances permit, all remnant patches of native vegetation will be fenced to keep out livestock. These patches will be encouraged to regenerate in order to maintain and improve wildlife habitat. We consider the maintenance of a diversity of plant and animal life is important for insect control. Use of the property by wildlife is further encouraged by fencing the large dams and providing islands on the dams for birds to nest, free from attack by predators such as European Fox *Vulpes vulpes* and Feral Cats *Felis catus*. Plantings of trees around the upper water level of the dams decrease losses from evaporation and enhances the breeding habitat of birds and other animals.

Macro-protection

The drains, trees and dams form the macro-protection system of this farm which improves the micro-climate and provides a much more pleasant environment in which to live. The creek, which is our main waterway, is fenced to prevent stock grazing there and has been planted with trees. Because the creek is more than 100 m wide, it is not only an important wildlife corridor and habitat, but it supplies wood and is integral to integrating our farming activities with nature conservation in an ecologically sustainable way. It also acts as a nutrient "sump", a farm laneway system, and may be the site of a large dam in the future, if our management system proves effective in addressing the salinity problem.

Sustainability

We believe our approach to managing our property is sustainable ecologically. Not only are we moving towards an ecologically sustainable farming system, we are creating one which is economically viable and better able to cope with climatic and market fluctuations.

We are dramatically lessening the damage caused by the extreme events of our environment (e.g., thunderstorms, long dry summers and very wet winters). In the process, we are creating the potential for more enterprises such as aquaculture, horticulture, floriculture, timber production, drought reserve fodder, honey production and irrigated crops to be developed on this property. All the while we have added protection for our livestock and the ability to incorporate perennial pasture species into the farming system. Our management design easily incorporates rotational grazing which is perceived as necessary for the survival of perennial plants. With a little long-term planning we are providing the next generation of farmers with a greater range of opportunities of how and what to farm. Our enterprises have originated from a desire to care for our environment better, but we have ensured that our enterprises complement better environmental management and are not at the expense of it.

Monitoring our activities is an important part of our farm plan. Monitoring of the salinity levels in the two main creeks that flow through Payneham Vale commenced in 1980. Bird counts since 1988 have shown an increase in the number of species of birds found on our property. In 1995, we began using the Land Management Society's Farm Monitoring Kit to monitor rising water tables, salinity levels, pH levels, soil structure, infiltration rates, minimum and maximum temp, wind speeds, rainfall, earthworms, ground cover, soil erosion and soil environmental health of our farm. Bird counts and the creek salinity readings continue to be part of the process.

WHERE TO?

At present the Frankland community is diminishing. We hope that by being able to make better and safer use of our natural resources we will encourage more people back into the area.

The view from our dining room table looks over a dam towards rows of meandering tree-belts with green pastures in between. We know that native birds are there because we can hear them calling. The cows are due to be shifted on to the next part of the rotational graze and if we get time we may even collect some fish or Koonacs (a native freshwater lobster) for dinner.

The future looks good from where we sit.

REFERENCES

Hobbs, R. J., 2003. The wheatbelt of Western Australia. *Pac. Cons. Biol.* **9**: 9–11.