REVEGETATION

THE MAGIC OF MOISTURE - HOW CAN WE MAKE THE MOST OF IT?

Rosemary Jasper

If only there was a formula for getting bush to regenerate! Sometimes regeneration will happen magnificently, other times there seems a stoic resistance to any form of renewal. Yet understanding how to achieve good regeneration and successful revegetation is critical if small patches of vegetation are to have a future, and if we are to achieve worthwhile revegetation on farming properties. This is particularly an issue in the drier parts of the agricultural area.

There are various disturbance events which are known to trigger regeneration in natural systems. These include fire, destructive windstorms, drought, soil upheaval and flood. This article is about the significance of flooding as an agent of renewal in the area in which I live and work – the Lake King to Esperance region.

I continue to see regeneration that occurred in low-lying areas right across this region after the floods of January 2000. Now, five years since the flood, the growth is almost always healthy and dense. One of the best examples is on the Salmon Gums golf course where the swamp yates, *Eucalyptus occidentalis*, came up thickly in a big area on one of the fairways: as if there weren't enough hazards in 'the rough'!

I have looked in some detail at the regeneration that occurred as a consequence of the 2000 flood in some swamps which are in an internally-draining catchment between Ravensthorpe and Lake King. In this area, 281 mm of rain were recorded for January 2000, almost certainly the highest January rainfall for 100 years; the average January rainfall being about 23 mm. It was a very significant event and caused massive flooding at the time, with surface water persisting in some wetlands for more than two years.

As a consequence of this flooding there has been large -scale regeneration around the wetlands in the catchment. The species composition of the regeneration reflects the before-flood vegetation. In one wetland the paperbark, *Melaleuca strobophylla*, is dominant in the regeneration, while in another Kondinin blackbutt, *Eucalyptus kondininensis*, and *Melaleuca acuminata* are the dominant species. The photograph shows the density at which the *M. strobophylla* grew. After 3.5 years the melaleucas were between 0.2 and 1.6 m tall, indicating that germination continued well after the initial flood. The typical density was approximately 150 stems/m2, a density that it is assumed will reduce as individual plants become dominant in the stand. It is also noteworthy that there were no weeds in the regeneration despite being in the middle of paddocks.

Given that regeneration is shown to occur in this situation for these species and has also been recorded for swamp yate, swamp mallet, *E. spathulata*, and salmon gum, *E. salmonophloia*: what can we learn from this to assist in large scale regeneration and revegetation?

Firstly, if the task is to revegetate a swampy area, one could wait to commence the revegetation until the site is judged to be as wet as it is going to get in that season. Seed of a species that would have been common at the site, and is expected would still be suited to the site, could then be introduced. Consider ways

Flooding, January 2000. (Photo: Main Roads WA)

Melaleuca regrowth , September 2004. (Photo: R. Jasper)

continued on page 6

REVEGETATION

continued from page 5

that you could imitate the process of seed falling from established plants onto the water surface, and the seed floating to the edge or high watermark. The seed could be introduced on several occasions as the water level drops, aiming for a broad band of regeneration and maximising the possibility of success.

Second, and more challenging, is the possibility of adapting the flood experience to the task of revegetation in the drier parts of the landscape. It is well established that by creating water-holding patches the chance of successful establishment of plants is improved: witness the healthy growth of vegetation often occurring in the table drains of roads.

In western NSW the Soil Conservation Service of NSW have shown that the creation of large-scale, shallow, water-holding ponds on scalded land was an effective land treatment for achieving revegetation. These ponds provided a more lasting effect in relation to water retention and vegetation establishment than ploughing or furrowing. Their work was focussed on the establishment of saltbush species (*Atriplex, Maireana* and *Sclerolaena)* and may have relevance to the reclamation of badly degraded land in WA, if not general revegetation work.

Other research in Texas, USA, (400 mm annual rainfall) has demonstrated the advantage for revegetation of creating small micro-catchments which catch and hold water. The micro-catchments used were 1.5 sqm and 10 cm deep. Not only did the seedlings planted in these micro-catchments survive and grow better, their healthy growth resulted in an increase in soil organic matter and a better recruitment of other plants by natural processes. The concentration of water, organic matter, nutrients and seeds in these micro-catchments resulted in the re-establishment of natural processes in an otherwise degraded environment.

To concentrate available water in some way is logical when working in a low or unpredictable rainfall area and the issue may become critical in a wider area given climate change. To capitalise on the availability of moisture requires anticipation and preparation - to have chosen a strategy of action and done the necessary work (collecting the seed, growing the seedlings, fencing the area, creating some water-holding micro-catchments, or whatever). There is some fine-tuning to be done in the manipulation of water availability, but it seems an aspect that is important to focus on if working in areas where water is not plentiful and arrives unpredictably.

If you are in the south-eastern areas of the wheatbelt and south coast and would like to discuss what you could do to 'prepare' your remnant patch for a possible flood regeneration event, or to create water-holding regeneration areas, contact me on (08) 9838 1890 or rosemaryj@calm.wa.gov.au.

Rosemary Jasper is LFW Officer at Ravensthorpe.