PRACTICALITIES

EROSION CONTROL ON KINGS PARK SCARP

Bob Dixon and Peter Moonie

EVER wondered what is going on in Kings Park bushland when you drive along the freeway or Mounts Bay Road and see large bare areas covered in grey and brown? As part of a 3 year research project funded by WMC, trials were carried out to establish a process to stabilise slopes greater than 45 degrees after exotic plants were removed. This research led to the present situation where large areas are covered in jute and coconut fibre matting.

The intention when using the matting was to provide an organic material that allows rainfall to penetrate as well as a stable surface you can walk on that will hold the soil together for at least 2 years, thus allowing easy access for maintenance without erosion problems. Though some grades of matting help to suppress weeds the cheaper grades used in Kings Park do not. The grey looking matting is made of jute and is supposed to last 2 years, in reality it often only lasts for 1 year before it starts breaking down, this may in part be due to its use on wet shady sites. This material is originally brown in colour but quickly fades to grey, spraying with green vegetable dye was tried but the colour faded within 3 weeks. The brown material is coconut fibre which is more expensive but retains its colour for at least 2 years and takes longer to break down. Some of these materials are made locally and others are sourced from the eastern States. Costs vary according to brand, weight (thickness), quantity purchased and materials used.

The main aim of the restoration program on the limestone scarp is to remove most exotic species including large sugar gums and pines, some heritage plants are retained, and revegetate with indigenous plants whilst protecting the indigenous fauna in particular rare snail and trapdoor spider populations. These populations are located and marked on the ground as well as using a global positioning system for future reference. Kings Park takes a holistic approach regarding managing natural ecosystems, you cannot in the long term have a self sustaining ecosystem without both plants and fauna.

The pines in particular, many were leaning precariously towards pathways and roads, destabilise the scarp as their roots fissure the rocks adding to rock falls. Research has indicated that the naturally occurring tuarts do not destabilise the soil with their deep root system. Some other indigenous species such as Conostylis or cottonheads which have high tensile roots should help to hold the soil together and are therefore extensively used in the restoration areas.

The implementation process

Stabilisation begins with cranes up to 400 tonne removing the large trees. To reduce erosion and to protect indigenous plants and fauna, all contractors have to submit a works and fauna protection plan. All other environmental weeds are then removed taking care to protect the indigenous species. Timing of the removal of weeds is important in this situation to avoid periods of high rainfall in steep situations where it is likely to cause severe erosion.

Fibre matting is then laid in spring to autumn in preparation for the winter planting season. The matting is laid out following the lay of the land running downhill, it is much easier this way, and pinned with 300 and 600 mm steel pins to get the material as tight as possible. Long pins are preferred as they hold the matting far better, shorter pins are used where the limestone is close to the surface. Always make sure you have a good overlap when using another roll and make sure any edges are dug into the soil at least 15 cm deep. All indigenous plants are left in place as holes and slits are cut in the matting to accommodate them.

Now it is ready for planting when the soil is moist enough. Where appropriate we blanket spray, avoiding any indigenous plants, with glyphosate about a week before planting to control any weeds that are present. Slits are made with a knife at the appropriate spots to accommodate the plants. When you need correct species diversity and are being assisted by volunteers, (though we now also do it for experienced staff because it is more cost effective), we make sure we prepare the day before planting and lay the appropriate plant species beside the slit.

No. 2 Rotunda planting day. DEP, Perth Zoo, BodyShop, Works Team, Work for the Dole Team.

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New materials and methods are being trialled all the time to improve efficiency and reduce costs. We are now trying new anchor pegs that are made of starch, they are more expensive than the steel pins but have a large head and are easier to hammer in. They vary in length from 150-300mm, are strong but will shatter when you hit rock, but are good on sand as they break down. They are new on the market and the manufacturers estimate they last at least 12 months and cost about half as much again as metal pins.

The jute matting is also being used in dune restoration and is working well. However, be aware when using metal pins they quickly rust leaving rusty ends sticking up just below the sand, therefore make sure the area is fenced off to prevent people with bare feet entering and injuring themselves.

Take note that the cost of using these materials is very high. In Kings Park we use 1000 gram per square metre coconut fibre at a cost of about $185 for 50 square metres, the same weight of jute matting costs around $160 though we sometimes go for the 1200 gram material. There are a number of mesh backings (scrim); we use hessian, avoiding plastics which take much longer to break down and may also cause problems with fauna getting caught in the mesh. The cost of the pins is also very high for each 50 square metres we use 250 to 300 pins at a cost of about 30 cents each for 300 mm and 35 cents for 600mm. The cost of laying the materials is also expensive, in easy sites on the scarp it takes 2 people 2 hours to lay 50 square metres, but can take four times as long in difficult areas.

For more information on the restoration of the scarp, research findings etc., refer to Mt Eliza escarpment restoration plan, pub. WMC Resources Ltd, written by Dr Kathy Meney, available for $25 from Kings Park and Botanic Garden.

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