

Logs give seedlings a leg-up

PARENT PLANTS don't care for their offspring as some animals do, notably humans. But some forest trees, after crashing to the ground, inadvertently provide tree seedlings with a good start in life, and not just because they leave a gap in the forest canopy overhead that lets in sunlight. Logs, it seems, are a great place for seeds to germinate and for seedlings to grow.

Botanists Helen McKenny and Professor Jamie Kirkpatrick, studying moist forests in Tasmania, found that seedlings and saplings of several rainforest tree species were more abundant on fallen logs than on nearby soil. For example, they counted many seedlings and saplings of myrtle beech (a handsome tree that once grew on the ancient continent of Gondwanaland) on logs, but few to none on soil.

The scientists looked at many possible reasons for this favourability of logs over soil. They concluded that litter cover was important. Soil had much more forest litter (fallen leaves, twigs, and the like) than did logs and, much as garden mulch keeps down weeds, this litter layer seems to reduce seedling numbers.

They also noticed that logs have fewer plant roots, which compete with seedlings, than do soils. The height and hardness of large logs would also protect delicate seedlings from lyrebirds and small animals that scratch and dig on the forest floor numbers.

So logs are an important part of forests. The little tree seedlings that thrive on these fallen giants soon grow up to fill the gap that is left when an old tree keels over.

McKenny HJA and Kirkpatrick JB (1999) The role of fallen logs in the regeneration of tree species in Tasmanian mixed forest. *Australian Journal of Botany*, 47:745–753.

Contact: Professor Jamie Kirkpatrick, University of Tasmania, (03) 6226 2834, email: Kirkpatrick@utas.edu.au.

Steve Davidson

Cam Crawford



These sassafras tree seedlings on a prone log have a better chance of survival than those on nearby soil.

Saving the dugong

FOR THE dugong to escape extinction, a conservation strategy that identifies and protects areas that support large numbers of the marine mammal is essential, say Australian scientists.

In the paper 'A conservation strategy for dugongs: implications of Australian research', in the journal *Marine and Freshwater Research*, Professor Helene Marsh and colleagues provide a context for conservation planning by reviewing the factors influencing dugong survival.

These factors include biological influences such as habitat, life cycle and diet, and 'threatening processes' such as habitat loss, pollutants, hunting mortality and entanglement in fishing nets.

The dugong's habitat range spans 40 countries and includes tropical and subtropical coastal and island waters from east Africa to Vanuatu. But the Torres Strait, the Great Barrier Reef and Shark Bay in Western Australia provide major seagrass feeding grounds for large populations of the mammal. Aerial surveys estimate that more than 85 000 dugongs populate the inshore waters of northern Australia.

Dugongs are particularly sensitive to anthropogenic impacts due to their long generation time (females bear

their first calves between the ages of 10 and 17 and have a 13-month gestation), and dependence on coastal seagrasses. So even a slight reduction in adult survival as a result of habitat loss (through poor catchment management, trawling, mining, pollution, cyclones and floods), disease, hunting by indigenous peoples, or drowning in nets, can cause a 'chronic decline' in dugong populations.

'Population simulations indicate that even with the most optimistic combinations of life-history parameters (low natural mortality and no human-induced mortality) a dugong population is unlikely to increase more than 5% per year,' Marsh says.

A conservation strategy that maintains dugong populations at present or higher levels and facilitates the recovery of depleted populations is essential. But Marsh says its development must involve all stakeholders and provide for the sustainable, traditional use of dugongs by Aborigines and Torres Strait Islanders, a Native Title right.

While Australia already has management regimes in place to protect its dugongs, recent reports of a decline in dugong abundance along the urban coast of Queensland, suggest a more directed approach is needed.

Marsh and her colleagues recommend that feeding and breeding areas that consistently support large numbers of dugongs should be set aside as sanctuaries. These sanctuaries should incorporate the home range of dugongs, allow for seasonal movement of the animals and gene flow between sanctuaries, should contain quality habitat and should have netting and mining controls.

Australia will play a key role in dugong conservation, and other countries such as Malaysia and the Philippines, have expressed a commitment to the cause.

Because of its large area requirements, conservation of the dugong will also assist the conservation of tropical coastal environments throughout much of the Indo-West Pacific.

'The dugong is thus of particular conservation significance globally, nationally and regionally,' Marsh says.

Marsh H Eros C Corkeron P and Breen B (1999) A conservation strategy for dugongs: implications of Australian research. *Marine and Freshwater Research*, 50:979–990.

Contact: Professor Helene Marsh, James Cook University, Townsville, (07) 4781 4111, email: Helene.Marsh@jcu.edu.au.

Wendy Pyper