New forestry for conservation

Australian forestry science is assisting in a new and tactical approach to saving precious Malaysian rainforest.

Can a vast monoculture of acacia plantation really be at the forefront of biodiversity protection?

That's the question posed by two of the world's leading science publications: the journal *Nature* and the US popular science magazine *Discover*. Both were excited about the Planted Forest Project in the Malaysian state of Sarawak. *Discover* described it as one of the six most important experiments in the world. *Nature's* editorial said, '[subject to caveats] ... the project holds considerable promise as a model for biodiversity conservation in a southeast-Asian timber industry that badly needs one.'

So what is this experiment, and what's the Australian connection?

'Around the world we've seen that conservation in developing countries will only succeed if there's something in it for the local communities,' says David Boden, leader of the CSIRO team assisting the Planted Forest Project.

Boden describes it as visionary, pointing out there have been many efforts to address the problem but nothing as bold as this initiative.

The vision grew from the work of biologist Robert Stuebing, who in 2004 was appointed as the head of conservation for Grand Perfect, the Sarawak Government's logging contractor. The plantation was already underway – it started in 1996 – but, looking at the areas still to be planted, he saw that with careful design, the undisturbed regions could be linked with wide preserved forest corridors, interspersed with plantation areas, allowing disturbance impacts to be managed. The design elaborated from that idea.

He then brought in teams of researchers to survey the flora and fauna in the project area so that the long-term impact of this corridor plantation arrangement could be measured.

Under the ambitious Planted Forest Project, Grand Perfect are planning to employ 5000 Malaysians, the majority of them local. Grand Perfect

The Sarawak State Government has allocated half a million hectares or 5000 square kilometres to the project. One-third of the land will be set aside as a biodiversity conservation zone, one-third for the traditional ethnic communities to harvest and farm, and one-third for plantation forestry.

'But that oversimplifies the elegance of the plan,' says Boden. 'All of the area is now being managed so that it works as a whole.'

Groups that are more often seen as mutual enemies are working together: forestry companies, conservation scientists, indigenous tribes and government. And they all have strong motives for wanting to see the project work.

The Sarawak Government and the forestry companies have hundreds of millions of dollars at stake. The conservationists, meanwhile, know that the battle to save tropical rainforest is being lost worldwide. Twelve million hectares disappear every year. A new approach is desperately needed.

The indigenous tribes too are trying to strike a balance. On the one hand there are the potential benefits of development: infrastructure, jobs, education and health. On the other hand, there are the problems of development and the threat to a traditional lifestyle.

Sarawak's tropical rainforest is particularly high value. It is a recognised biodiversity hotspot, rich with undescribed species, and endangered animals such as our primate relative the orangutan.

The Planted Forest site itself is still being carefully surveyed. Already more than 400 vertebrate species, including bears, civets, macaques, leopard cats, mongooses, pangolins and porcupines, have been identified. Researchers even discovered 18 new species of snail.

'Our conservation plan is designed so that the plantations are dissected by the wide game corridors of undisturbed forest to help ensure that wildlife does not become isolated and in-bred,' says Glen MacNair, Project Manager, Sarawak Department of Forestry. 'Timber will be processed locally, bringing more jobs. And, because it's all under government supervision, illegal clearing and logging has been greatly reduced.'

CSIRO's role is in supplying technical expertise to assist the project to create the highest quality plantation possible with the available technology.

'The Sarawak Government has chosen selected *Acacia mangium* from Papua New Guinea and Queensland for the plantations,' says David Boden.

Critics have argued against the use of a

foreign species. But Boden says the case for acacia is clear.

'A hectare of acacia plantation can produce more wood than 10 hectares of forest that had been logged and regrown naturally. That step up in production could be the difference that makes the whole project viable,' he says.

'CSIRO has a long history in developing tropical acacia forestry plantations,' says Warren Ellis, General Manager of Grand Perfect. 'They're supplying technical support to a variety of our research programs, from tree improvement to forest health, silviculture and forest management.'

So far, 90 000 hectares have been planted. The target is 2000 hectares a month – with the tree nurseries producing 2 to 3 million seedlings every month. Grand Perfect plans to harvest the trees when they are seven years old. When the project is complete, its timber production will be half of Sarawak's current total. It will supply an on-site pulp and paper mill, sawmills and plywood factories. The million dollar questions are: will it be sustainable; and how will the wildlife be affected?

Conservationists are split in their views. Peter Ashton, an expert on Sarawak forests, told *Nature* that the Sarawak lowlands contain some 3000 species of trees, supporting insects and microorganisms that account for most of the forest's biodiversity. Others are concerned that the road building and increased fire risks will have a wider impact. Nonetheless, many scientists have welcomed the scheme as a step in the right direction.

A Grand Perfect seedling farm. The Planted Forest Project's vaunted sustainable operations aim to coexist with Sarawak's threatened species such as the orangutan. Grand Perfect

While the conservation budget is only two per cent of the overall project, it is a significant investment with a comprehensive monitoring program developed with the help of the Smithsonian Institute.

In April, Grand Perfect reported the first ever sighting of brown Malaysian sun bears in the country. The identification was made by a remote camera as part of a five-year 'camera trapping' program to monitor animals in and around the plantations. Twenty 1-km sites are being studied over a five-year period to 2012.

CSIRO's David Boden sees the project as a new beginning. 'As I travel in South-East Asia I'm used to seeing the damage caused as rainforest is cleared for oil palm and other cash crops. This project offers a new direction: well-managed, profitable and sustainable forestry that also delivers for conservation and for the local people.'

As *Discover* magazine concluded, 'If [they're] right, sustainable developers around the world may copy this strategy as they struggle to balance the needs of humans and wildlife.'

● **Niall Byrne**

The Planted Forest vision

Sarawak will have a sustainably managed and high-yielding forest resource that provides a permanent and managed supply of wood for the pulp and paper, plywood and sawn-timber industries.

The project will improve access to the rural areas and bring with it employment and business opportunities. Local people who have chosen to participate in agricultural plantation schemes have become prosperous while still maintaining their traditional way of life.

Large areas of rainforest will be protected as a permanent home for the many rare plants and animals of Sarawak. Tourists will come to visit these areas and experience the wonders of the forest and traditional longhouse village living.

The masked tree frog, *Rhacophorus angulirostris*, is found in Malaysia's forests. Sergey Korotkov

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More information:
www.csiro.au/science/SarawakPlantedForest.html

The *Discover* article is at http://discovermagazine.com/2007/dec

The *Nature* editorial is at www.nature.com/nature/journal/v446/n7136/full/446583b.html (subscription required)