

# C A S E S T U D Y

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### Model forests - predicting where wood will grow

Reproduced from *Bush Telegraph* magazine, published by Forests NSW.

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A crystal ball would be handy for any company wanting to see where it might be in a few years time, but Forests NSW has taken a step closer to making this notion a reality by harnessing sophisticated computer modelling.

It is using a computerised planning tool to emulate future forest growth dynamics and management options.

Canadian software, Woodstock and Spatial Woodstock, is being used by Forests NSW resources officers to assist in native forest planning and operation scheduling.

The models calculate how much timber is available, and where and when harvesting operations should be scheduled. The software also enables the standing volume of timber and the condition of the forest to be ascertained at any point in time.

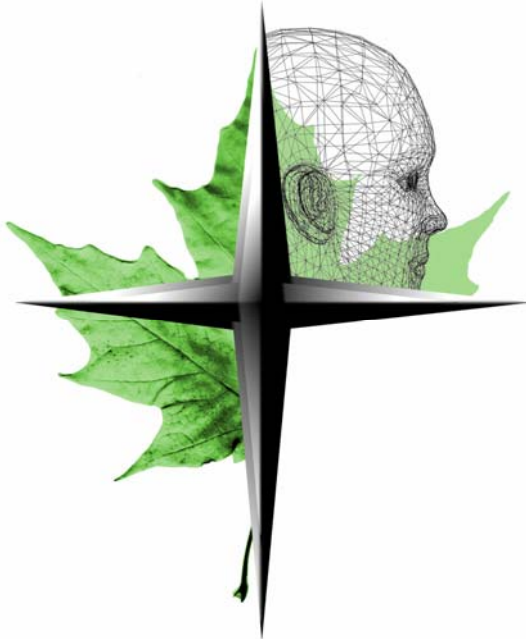
"This software has proven itself with softwood harvest computer modelling, but that is for even-aged forest with a single species and fairly consistent forest performances and silviculture," said Forests NSW resources analyst, John Turland.

"We have taken that knowledge and applied it to mixed species native forest with highly variable stand conditions and site productivity. This is using cutting-edge technology and so far providing good results.

"We are providing detailed predictions of where Forests NSW wood supply will be in a few years, to say 40 years, with broader predictions up to 200 years in the future," John said.

"The modelling is conducted at two levels using Woodstock.

"Strategic level modelling provides a forecast of the long-term wood supply capacity in terms of broad product types, species and location. Tactical level modelling looks at details on which precise compartments of forest will be harvested up to 20-40 years into the future.



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***“This is using cutting-edge technology and so far providing good results.”***

"Spatial Woodstock enables results of modelling such as operation schedules and the status of the forest condition over time to be instantaneously represented on maps. The real value this product provides is being able to model spatial constraints on the ground such as restricting harvesting of adjacent forest areas or clustering operations to reflect tactical level planning issues. With this functionality, operation schedules and wood supply forecasts better reflect the realities of management planning."

John said that modelling the future volume helps identify periods of changes in the predicted log volume, species and quality mix which is critical to forest managers.

These long-term predictions of changes in the product expectation help the timber industry to develop business plans for new equipment and help with ascertaining forward sales and marketing agreements.

"The program works similar to a chain of events," John said.

"We input area information, forest types, site productivity, stand quality and a range silvicultural possibilities for each forest block. We identify operational and management restrictions such as the minimum timber production level which must be sustained and the best rotation ages.

"It then determines the most appropriate silviculture for each forest block, how much timber is cut, where and when areas should be cut.

"Examples of wood supply issues which the sophisticated program helps with is the removal of wood supply spikes (over-supply) such as those from large-scale areas of regrowth forest following wildfires.

"Woodstock will select among a range of thinning options ranging from early thinning to on-time thinning or late thinning to smooth out the volume of timber and level of harvesting operations."

The initial stages of implementation have focused on south east NSW forests in transition from multi-aged forests of diverse quality timber to a more even-age regrowth forest.

John said the project results are due to a multidisciplinary team effort, with staff from technical services and regional management and planning coming together to develop and validate the model.

"Forests NSW will not stop there. The same package will be adapted to predict what can be done in uneven-aged mixed species forest where more selective logging is currently practiced," John said.

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