Climate change adaptation in the Midlands

Landscape restoration for increasing productivity and reducing the climate threat – prioritising where to focus in the Midlands

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Photo: Graham Green

In the previous article I focused on Chauncy Vale and Flat Rock Reserve in the Hills to the east of Bagdad and the important role that this protected forest and woodland plays in terms of nature conservation, education, recreation, and for drawing carbon dioxide from the atmosphere. I also spoke of the contribution the Chauncy family made to protecting this land and how this generous commitment created a nucleus for other reserves to be subsequently created.

In the Southern Midlands, where 92.5% of the land is in private ownership, the importance of land owners committing to protection of natural vegetation cannot be overstated, not only for the reasons mentioned above, but also so we can work towards protecting representative examples of the range of original vegetation communities throughout the Midlands.

Conservation covenants are a key mechanism by which private landholders can voluntarily protect natural values on their land. The area of private land protected in the Southern Midlands under covenants was increased by 11 300 hectares between 2002 and 2010, largely due to the availability of a range of Government incentive programs. All eligible land offered up for protection was rigorously assessed for its conservation value to ensure that incentive payments made to landowners was a worthy investment and resulted in effective and important contributions to species protection and or vegetation community reservation targets.

The beauty of conservation covenants is that they are a model of practical conservation that encourage active engagement with the land to maintain its values, inclusive of prescribed grazing rates or ecological burn intervals.

Despite the recent conservation gains through covenants, there is a need to continue the land preservation effort, inclusive of the way we manage agricultural production land. Climate heating, and associated extreme weather events and unpredictable seasonal patterns, is placing stress on water resources, soils, vegetation communities, plant and animal species. Agricultural land covers a significant proportion of the Southern Midlands and there are many things that farmers can do, and are already doing, to improve productivity with the co-benefit of increasing carbon storage on their farms, particularly in soils.

When natural systems are degraded, either directly or indirectly through freak natural events, stored carbon can be lost, particularly from the soil. Preservation of soil carbon as a goal in itself is particularly important. It is believed that 50-70% of the original carbon store has already been lost from the world's cultivated soils. Soil carbon consists of: living carbon - microbes, fungi, roots, earth worms etc; labile carbon - decomposing plant and animal matter; and fixed carbon – biologically stable substances such as humus.

Soil depleted of carbon becomes mere dirt. This 'dirt' then ironically requires ongoing external inputs at significant cost to prop up its productivity. Responsible stewardship of agricultural land, and restoration through regenerative agriculture, is critical so that further losses of soil carbon are halted and that the land is given the opportunity to recommence carbon absorption. Actively working to facilitate carbon absorption back into soils is viewed as one of the most important ways in which dangerous climate heating may be reduced. This can be done through already recognised and established regenerative farming techniques such as holistic grazing, pasture cropping, cell grazing and no-till cropping. Increasingly, farmers are incorporating more trees back into their farming systems to act as shelter belts, improve ecosystem services and to accumulate carbon. This is always a worthy contribution.

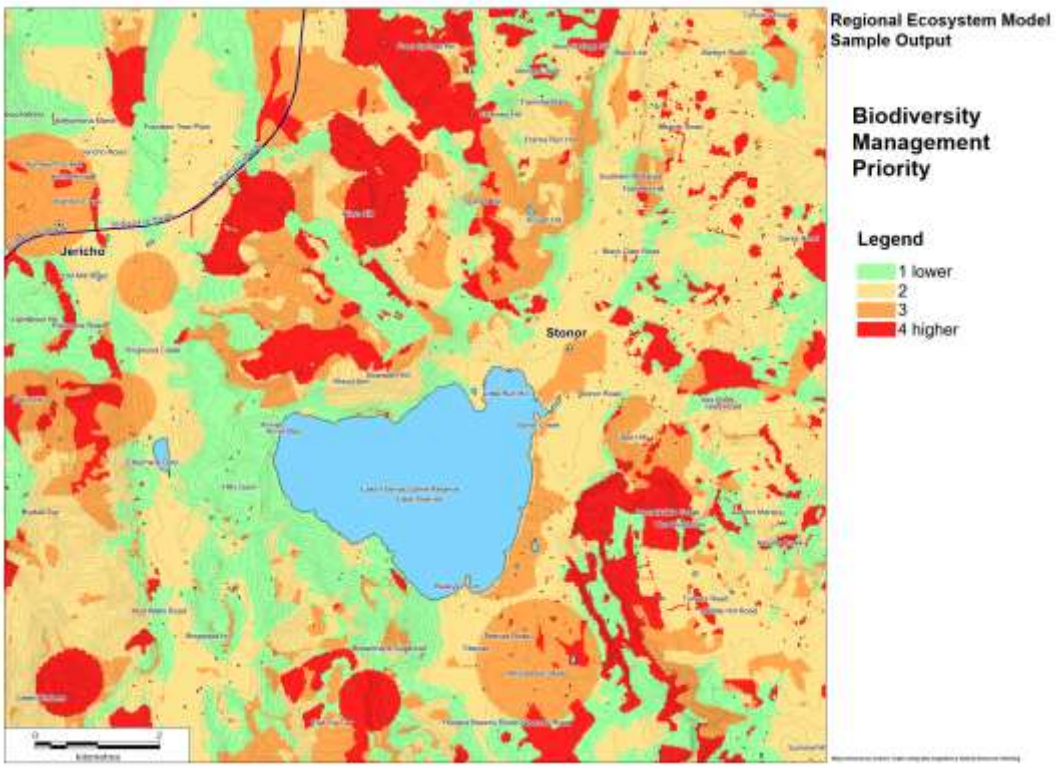
Agricultural systems that accumulate carbon gain soil fertility. Carefully managed grasslands accumulate and store carbon in the soil, even while being grazed by livestock or native animals. Protected or restored forests represent great stocks of carbon, continue to accumulate carbon, and serve as safe havens for our biodiversity. Staring us in the face are so many positive actions and

solutions that have multiple co-benefits that it seems to be madness not to take action.

In terms of how we prioritise where to focus our efforts to protect and restore our land, the Regional Ecosystem Model, developed by Natural Resource Planning, is a 'spatial tool' that provides an excellent way to do this. The Model can be applied to any area in Tasmania and provides guidance as to the relative conservation importance and hence the most effective places in which to invest in conservation work. The Model identifies relative 'Biodiversity Management Priority' at any chosen location. Biodiversity Management Priority is derived from the integration of the following data:

- Vegetation community;
- Old growth forest;
- Threatened and other priority species;
- Structural characteristics of eucalypt forests;
- Clearing Bias - the extent to which each land component has been cleared;
- Connectivity - the distances over which both native vegetation patches and cleared land are separated from native vegetation;
- Remnant Vegetation - the size of patches of native vegetation;
- Naturalness - within-site vegetation condition.

The Model enables objective decision making and utilises ground-truthed environmental data sets in a way that maximises potential for protection of priority environmental assets. This is an important consideration when funds available for investment may be limited and the most effective outcomes are desired.



A sample output from the Regional Ecosystem Model

Targeting old growth forest and woodland

The Southern Midlands has an estimated 210 km^2 coverage of old growth forest. The Model places significance on rating these areas for preservation because old growth forest provides multiple functions and benefits:

- multiple canopy and understorey layers provide habitat for a wide range of organisms;
- the usually deep litter layer means that old growth forests are producers of topsoil and are recognised as carbon sinks – storing up to 1900 tonnes of carbon per hectare (SE Australian eucalypt forest example);
- the standing biomass is an important store and accumulator of carbon;
- old-growth forests play an important role in water and air purification cycles;
- hollows in standing old-growth trees provide habitat for 42 vertebrate species in Tasmania and are particularly important for rare bird, for example the masked owl and swift parrot;
- hollow logs on the ground in old growth forests are habitat for many species including Tasmanian devils, quolls, wombats and echidna; and
- sheltered stands of old growth trees are preferential nesting locations for wedge-tailed eagles.

Landscape restoration climate change challenges

With a rapidly warming climate we are beginning to observe too many examples of natural systems changing or under pressure, whether this be through tree

dieback, loss of species, severe drought, severe wildfire or a combination of factors. We need to accept that the task of restoring ecosystems or maintaining the highest priority areas for conservation is unlikely to be easy. It may not be possible to protect against biological 'drift'. This is because ecosystems do not move as a unit in response to changing conditions. Individual species each move at their own rate and in their own directions in response to environmental change. This range of individual responses of species can lead disassembly of vegetation communities as we have come to know them. Species that survive may reassemble in unforeseen or unpredictable combinations, including with species that have moved from elsewhere.

Many researchers are concluding that ecological systems around the planet will not be able to tolerate temperature rise much beyond 1.5°C without undergoing significant transformation. A few paths to capping temperature increase at 1.5°C still exist. Ecosystem restoration and it's potential to halt carbon loss to the atmosphere and re-commence carbon accumulation is one of the most important of these pathways and one that comes with the associated benefits mentioned in this article.

Modeling to prioritise where work happens is a useful tool at our disposal but more important is any commitment with concrete outcomes that landholders make to protect and regenerate their land. It no longer makes sense to continue managing land in ways that deplete it of the very things that are required to maintain its health. It is common sense, and a great service to humanity, to turn a farm from one that produces greenhouse gas emissions into one that absorbs them. The positive alternatives are staring us in the face.

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