**Model description**

This is a state-and-transition model modified from Perry et al. 2015. Key changes:

* Addition of a ‘rank grass’ state – cells in the state will slowly transition to mānuka shrubland or degraded shrubland (i.e. weedy shruband) at a rate determined by the local neighbourhood.
* Succession can proceed through shrubland and young forest with or without kauri. This depends on the landscape position, with cells on ridges more likely to have kauri than those in gullys.
* States with kauri (3 and 4) can suffer from PTA – this can cause various state transitions, including retrogression, which is a function of the time the cell has had the disease. PTA spreads slowly between cells with kauri (states 3, 4, 5) with some latent period; there is also a risk of a random cell (in an appropriate state) getting the disease (representing long-distance movement).
* Fire is also influenced by inter-annual climate variability, with El Niño conditions having elevated ignition risks and flammability and La Niña the opposite. We will generate a synthetic ENSO time series based on historical data.

Question

1. I have not included myrtle rust as it seems likely to change the composition rather than the trajectory of succession. Ok?
2. Should cells be able to turn into rank grass after fire? Under what conditions?

Perry GLW, Wilmshurst JM, Ogden J, Enright NJ 2015. Exotic mammals and invasive plants alter fire-related thresholds in southern temperate forested landscapes. Ecosystems 18: 1290–1305.