5 Box gum grassy woodland State and Transition Model

In its natural, pre-European state, the box gum grassy woodland ecological community thrived in soils with low phosphorus and low nitrate levels. The community was most likely lightly grazed by soft footed native marsupials and soil disturbance was low.

The introduction of hard-hooved grazing animals led to greater soil disturbance and higher grazing pressure, which was significantly worsened by the introduction of rabbits and pigs. Sheep and cattle added nutrients to the soil and over time these changes created an environment that was more suited to introduced plant species that gradually displaced the original community.

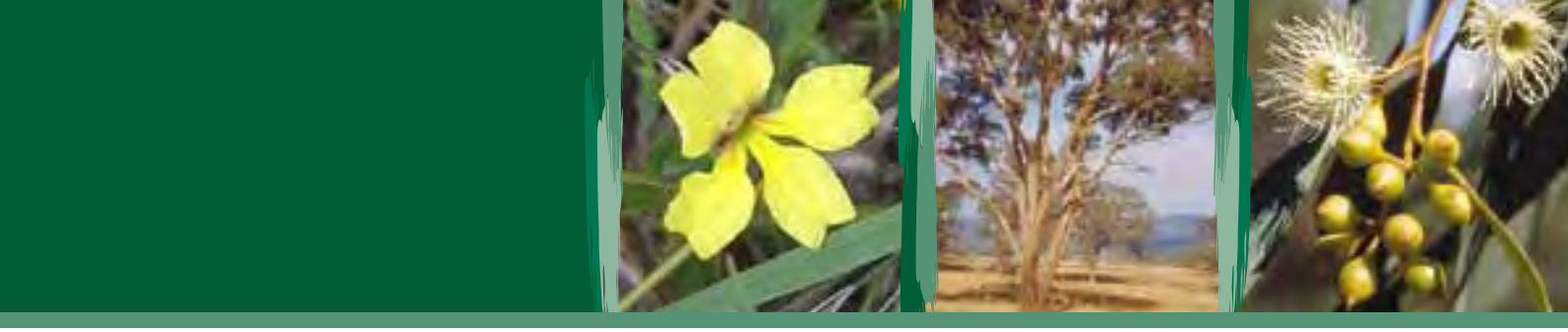
The introduction of fertiliser to improve pastures changed the nutrient levels in the soil. Associated increases in stocking rates and related grazing pressure further favoured some plant species over others. The subsequent introduction of cultivation and the introduction of exotic pasture species, such as phalaris, further changed the soil conditions and ecosystem in which the box gum grassy woodland community exists.

Over the long time period in which these management changes took place, there was a gradual "transition" of the vegetation from its original native state to an altered "state" that changed the overall condition of the natural ecosystem.

With the aim of restoring the box gum grassy woodland ecological community, the Australian Government wishes to assist farmers to reverse the processes that led to its degradation in the first instance thereby improving its condition and where feasible its extent, over time.

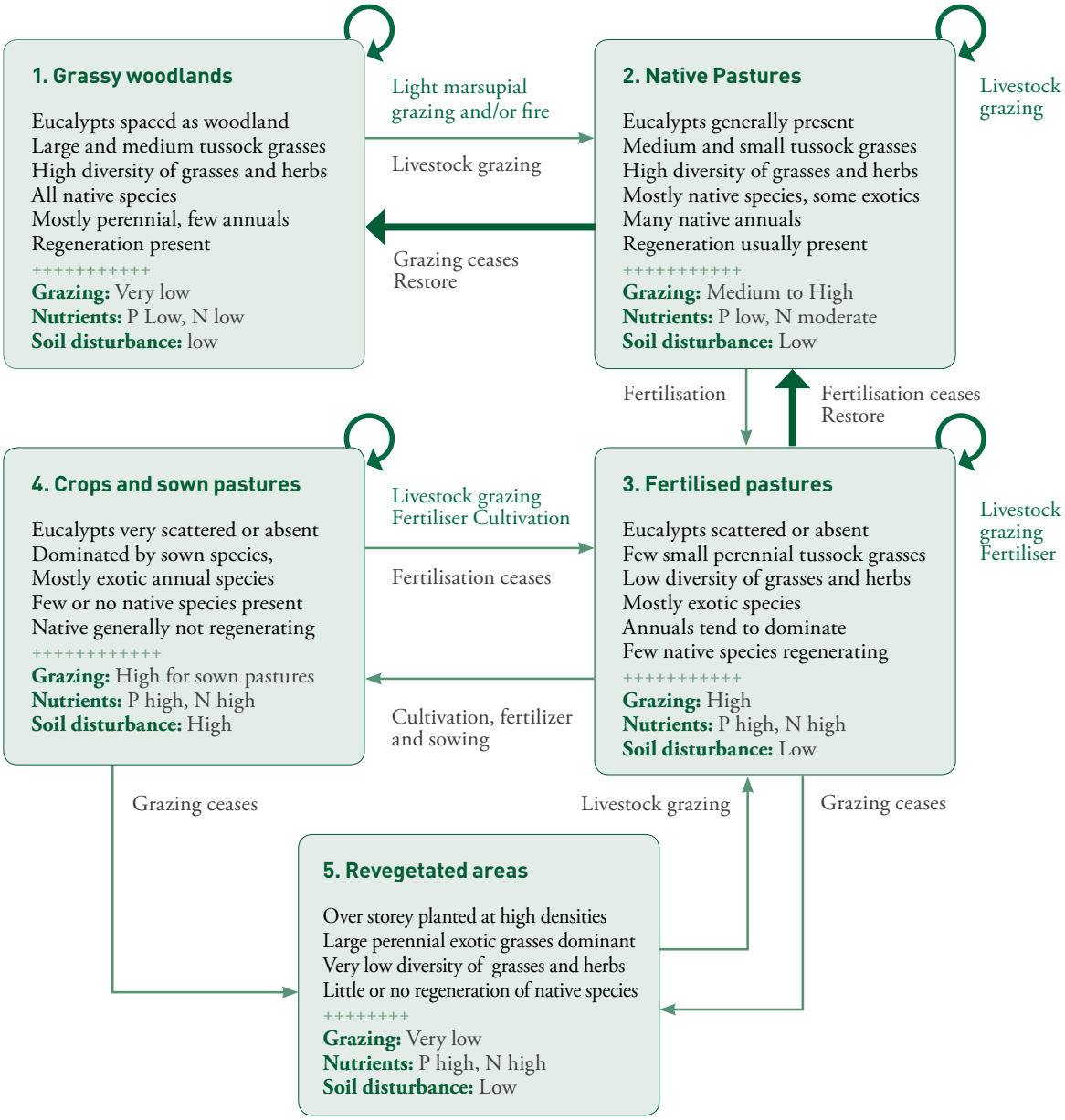
What is the box gum grassy woodland State and Transition Model?

The box gum grassy woodland State and Transition Model has been developed by expert ecologists to show how the ecological community changes from one State or condition to another in response to land-use change. The model is used in the Conservation Value Measure (see Chapter 7) and provides a practical scientific framework for deciding on the current State of a patch of Box Gum Grassy Woodland and what management changes are likely to be required to assist that patch to transition to an improved State. The model has five "States" as shown in Figure 3 over the page. Arrows that lead from a less-modified to a more-modified State (e.g. S1-S2) indicate the management inputs or disturbances that may cause a site to 'transition' to another 'state'. The thicker arrows represent the harder transitions. The circular arrows indicate management inputs or disturbances that will maintain a site within a particular State.



The model shows that grazing and nutrients have a significant role in moving the box gum grassy woodland ecological community from State 1 to State 3.

Figure 3: Box gum grassy woodland State and Transition Model



How does the box gum grassy woodland State and Transition Model affect me?

The Box Gum Grassy Woodland Project will target only those patches of woodland that currently exist as States 1, 2 and 3, as these have the best chance of being restored to a higher State over the fifteen year period for which stewardship payments are available.

If you wish to participate in the Project, you will be asked by a field officer to explain the management history and current uses of the patch you wish to conserve eg the fertiliser history of the patch, current stocking rates. This will help the field officer to decide which of the States in the model best describes your patch.

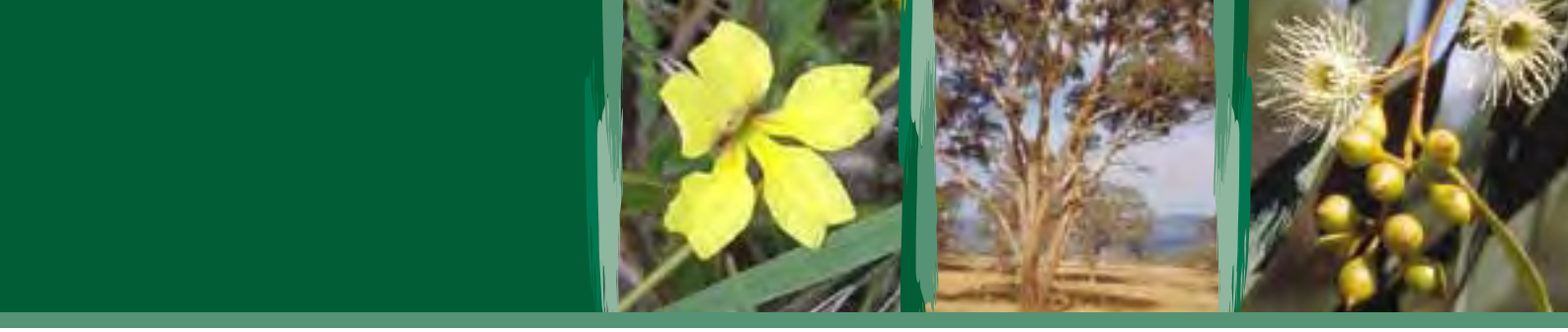
Figure 4: Possible transitions between States*.

FROM: / TO:	STATE 1. GRASSY WOODLAND	STATE 2. NATIVE PASTURE	STATE 3. FERTILISED PASTURE	STATE 4. CROPPED AND SOWN	STATE 5. REPLANTED SITES
GRASSY WOODLAND	High	Medium	Medium Low	Very Low	Very Low
NATIVE PASTURE		High	Medium	Very Low	Very Low
FERTILISED PASTURE					
CROPPED AND SOWN					
REPLANTED SITES					

*The general feasibility of desirable transitions from the States in each column to the State in the corresponding row. Hatched shading represents non desirable transitions; grey shading represents infeasible transitions for the program.

▲ **Likely appearance of a State 1 patch** (Photo: Phil Gibbons)

▲ **State 1 patch** (Photo: Reiner Rehwinkel)



▲ **Likely appearance of State 2 patch** (Photo: Ian Davidson)

▲ **Degraded State 2 patch** (Photo: Reiner Rehwinkel)

▲ **Likely appearance of a State 3 patch** (Photo: Ian Davidson)

▲ **Possible appearance of State 4 patch - pasture has been improved with ryegrass and phalaris** (Photo: Graham Hodge)