Land capability analysis using the MLF method

The most limiting factor (MLF) method as used in this study identifies biophysical factors critical to production or the protection of the environment. The biophysical factors are assessed in relation to the level at which they become limiting to plant/animal growth or protection of the environment. The approach ultimately assigns a capability rating based upon the most limiting factor.

The MLF methodology for the identification of land capability is based on the method for determining land capability developed by the United States Department of Agriculture (Hopkins 1977). The land capability approach has been extensively used in Victoria during the past 30 years to facilitate land use planning at the local government level.

The MLF is a 'rules combination' method. This approach deals with the interdependence of landscape factors (or *factor interdependence*) (Hopkins 1977). The combination of landscape attributes (soil, vegetation, slope, drainage etc.) that occur in the landscape unit is considered, and different units are given the same capability rating if they have similar landscape attribute levels. The values derived for units are based upon expert knowledge of the key factors (attributes) and the level at which they become critical. *All factors are considered to have equal weight with respect to their impact upon growth or the environment*. The simplicity of the approach allows the technique to be applied via a GIS platform or manually.

Components, factors and critical values.

The land capability ratings for the various enterprises has been determined based upon three ecosystem components:

1. *Climate* Is the species in question suited to the rainfall, temperature and frost susceptibility within the land?
2. *Landscape* Will growing the species result in unacceptable water erosion on the land? Will the natural landscape features of the land result in drainage problems, or impede machinery operations?
3. *Soil* Are the inherent soil conditions suitable for growing the species?

The climate, land and soil components each have various elements or factors; and for each factor, critical values are identified and used to rate the capability for different types of agribusiness. The factors are rated for their limitation to plant/animal growth, or potential for environmental degradation, according to a three class rating system (Table1). The most limiting factor determines the class.

Table 1 Class definitions used for the MLF land capability methodology.

Class	Description	Definition
1	*High*	High probability of the climate, land and soil being capable for commercial production with respect to plant/animal production and protection of the natural resource base. High levels of production possible with standard management practices. Low levels of production and high levels of land degradation are possible if the land is poorly managed.
2	*Moderate*	Moderate probability of the climate, land and soil being capable for commercial production with respect to plant/animal production and protection of the natural resource base. High levels of production possible with very high levels of management, providing the limitations are manageable. Very low levels of production and high levels of land degradation are possible if the land is poorly managed.
3	*Low*	Low probability of the climate, land and soil being capable for commercial production with respect to plant/animal production and protection of the natural resource base. Moderate levels of production may be possible with the highest level of management, providing the limitations are manageable. Very low levels of production and extreme levels of land degradation are possible if the land is poorly managed.

The rationale for assigning critical values to each of the factors is based on: (a) plant/animal production, and (b) protection of the natural resource base, with the aim of identifying economically and environmentally capable land use and management options.