Agricultural Land Classification Study – Taree Shire

Report on Methodology to accompany Agricultural Land Classification Map for Taree Shire

NSW Agriculture

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Agricultural Land Classification Study – Taree Shire

NOTE TO MAP USERS

The Taree Shire Agricultural Land Classification map was produced for use at a scale of 1:100,000 it must not be used at a more detailed scale (for example 1:50 000).

The map should be interpreted in conjunction with the information contained within this report and Chapter 9 of the Rural Lands Evaluation Manual (Department of Planning, 1988).

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METHODOLOGY REPORT

1. INTRODUCTION

The agricultural land evaluation methodology used by NSW Agriculture was developed to assist the State's various planning authorities deliver on the objectives of the Environmental Planning and Assessment (EP&A) Act 1979: specifically, section 5 (a) i "to encourage the proper management, development and conservation of natural and man-made resources including agricultural land … for the purpose of promoting the social and economic welfare of the community and a better environment".

Agricultural land evaluation is a tool designed to assist state and local government authorities formulate policies for the sustainable management of agricultural land. These policies mainly relate to strategic planning such as regional and local environment planning instruments, regional economic development and natural resource management.

The Rural Land Evaluation Manual (RLEM) (NSW Department of Planning, 1988) describes a procedure for classifying rural lands in terms of their suitability for agricultural enterprises. This methodology is based on evaluating land resources and matching their limitations with the requirements (biophysical, economic and social) of agricultural enterprises. The agricultural land evaluation methodology uses uniform and consistent standards to evaluate rural lands in New South Wales. This allows comparison of rural lands across the state.

The Taree Agricultural Land Classification Report applies to the Taree Local Government Area. The report assists in interpretation of the Taree Agricultural Land Classification Map prepared by NSW Agriculture in September 2000.

The agricultural land classification map provides:-

(a) generalised interpretation of agricultural land suitability based on landform, soil, vegetation, climatic, economic and social characteristics, and
(b) ranking of rural lands in terms of suitability for agricultural enterprises, within sustainable agricultural systems.

The agricultural land classification map represents a point in time.

The agricultural land classification map indicates the potential suitability of rural lands for a particular intensity of agricultural use. NSW Agriculture, through these maps, is not making specific land management recommendations as other considerations may prevail making the land unsuitable for agricultural development (for example, nature conservation).

In all cases, the ALC map should be used within the limitations of map performance. “The reliability of the agricultural land classification maps is dependent on a nominal error in the placement of boundaries of ± 1.5mm (on the map scale) at that scale at which the density of observations is 1 per 2 cm^2 on the map” (Riddler, 1987). The readability and performance characteristics will be drastically lowered by enlargement of the map. The Taree ALC map is produced at a scale of 1:100 000. At this scale, features of less than 40 hectares are not reliably represented on the map. Therefore, the ALC map scale should not be enlarged, even when available in a digital form. Other issues of mapping scale are discussed in Section 3.4.

The evaluation process may not identify all agricultural classes within a given area. For example, no class 1 land has been identified in Taree Shire, while class 2 land has only been identified in limited areas. Differences between class 3 and class 4 agricultural lands are based on delineation of soil characteristics and landscape limitations. Also, different areas of the same class have a similar degree of limitation, but not necessarily the same type of limitations. For example, one significant limitation may be a high soil erosion hazard. This would place rural lands into class 4. However, several minor limitations may include slope, stoniness, soil depth and distance to markets/handling facilities and result in a land class of 4. Areas of class 5 land have severe limitations for agricultural production and are associated with steep timbered areas and areas of saline water inundation or extreme acid sulphate soils.

The agricultural land classification map shows classes 2 and 3 (prime agricultural land) constituting 5.9 percent of the Taree Shire, while predominate land classes are Classes 4 and 5, together being 70.5 percent. The percentage distribution of agricultural land classes in the Taree Shire is shown in Table 1.

Table 1 The area and percentage break up for the agricultural land classification classes for Taree Shire.

Agricultural Land Class	Area (ha)	% Shire
Class 2	1,375	0.4
Class 3	20,360	5.5
Class 4	106,215	28.5
Class 5	156,710	42.0
Urban	1,460	0.4
Water	3,745	1.0
State Forest	43,130	11.6
National Park	39,490	10.6
Total	**372,850**	**100.00**

2. AN OVERVIEW OF EVALUATION OF RURAL LAND

2.1 BACKGROUND

The agricultural land classification process uses standard principles and concepts as set out for land evaluation/suitability surveys. These principles have been formulated by the Food and Agricultural Organisation (FAO, 1983) and Dent and Young (1981), as adapted by the RLEM.

Agricultural land evaluation involves three successive stages.

Stage 1

The first stage involves identification, classification and evaluation of land resources with similar biophysical attributes. The major attributes include landform, slope, drainage patterns, soil morphological factors, grassland species, vegetation communities and land use practices.

Stage 2

The second stage evaluates the qualities and limitations of land resources, for use by agricultural enterprises within sustainable agricultural systems.

During this evaluation process the requirements of agricultural enterprises are assessed against the biophysical, economic and social limitations of the land. These relationships establish the predicted performance of agricultural enterprises within each land unit. These predictions are based on conservative estimates in an attempt to ensure the future sustainability of the resource base.

Stage 3

The final stage evaluates the potential for modifying biophysical, economic and social limitations. These evaluations are based on:

(a) the application of modern technology to overcome technical limitations and,
(b) the use of management procedures to achieve optimum productivity from agricultural enterprises.

2.2 Description of classes

The agricultural land evaluation methodology classifies rural land into five classes according to its suitability for a wide range of agricultural enterprises. A plain english description of the classes are provided in the Rural Lands Evaluation Manual (RLEM) (NSW, Department of Planning, 1988) and are set out below, table 2. Please refer to Appendix 1 for a general description of the major attributes, benefits and constraints of agricultural land classes.

Table 2 General description of the agricultural land classes

Class 1	Arable land suitable for intensive cropping where constraints to sustained high levels of agricultural production are minor or absent.
Class 2	Arable land suitable for regular, but not continuous, cropping. It has a moderate to high suitability for agriculture but soil or environmental constraints reduce the overall level of production and may limit cropping to a rotation with sown pastures.
Class 3	Grazing land or land well suited to pasture improvement. It may be cultivated or cropped in rotation with sown pasture. The overall production level is moderate because of soil or environmental constraints.
Class 4	Land suitable for grazing but not for cultivation. Agriculture is based on native pastures or improved pastures established using minimum tillage techniques. Production may be seasonally high but the overall production level is moderate because of soil or major environmental constraints.
Class 5	Land generally unsuitable for agriculture or at best suitable for occasional light grazing or supporting activities related to agriculture (for example, shelter for livestock, and forestry). Agricultural production is low as a result of severe biophysical, social and economic constraints, which preclude land improvements.

An additional class may occasionally be used where lands have some special features, allowing special crops to be grown (e.g. bananas and other tropical horticultural tree crops).

Specialist Use Land which, because of a combination of soil, climate and other features, is well suited to intensive production of a crop or a narrow range of crops whose special requirements limit their successful culture to such land. This class may include some lands formerly described as unique.

2.3 Assumptions used during the evaluation process

The following assumptions, established in the RLEM have been used when evaluating rural lands in the Greater Taree City Council area:-

- appropriately high management level and technology is used;
- land with constraints that have been modified or removed have been assessed on its present status e.g. irrigation areas, flood mitigation areas, cleared land;
- land with constraints that could be economically removed have been assessed as if they have been removed, e.g. low chemical fertility, presence of stones.
- legislative constraints which limit areas or restrict production have been ignored if change is considered likely;
- economic inputs based on realistic farm management have been assumed;

- land suitable for intensive uses such as cropping is also suited to less intensive uses such as grazing, forestry, recreation, etc;
- assessment reflects long term capacity for sustained agricultural productivity; and
- assessment may need to be reviewed if technological advancements permanently change the productivity of the land.

2.4 The role of current land use

The agricultural land evaluation process aims to classify biophysical, social and economic attributes of an area, rather than the current land use. Existing land use is not always a good indicator of appropriate land use or suitability for specific enterprises because the effects of using land beyond its physical capability may not always be apparent during the evaluation survey. The use of land beyond its physical capability will result in degradation of the land resource, for example soil structural decline, soil erosion, soil acidity.

2.5 Land not evaluated for agriculture

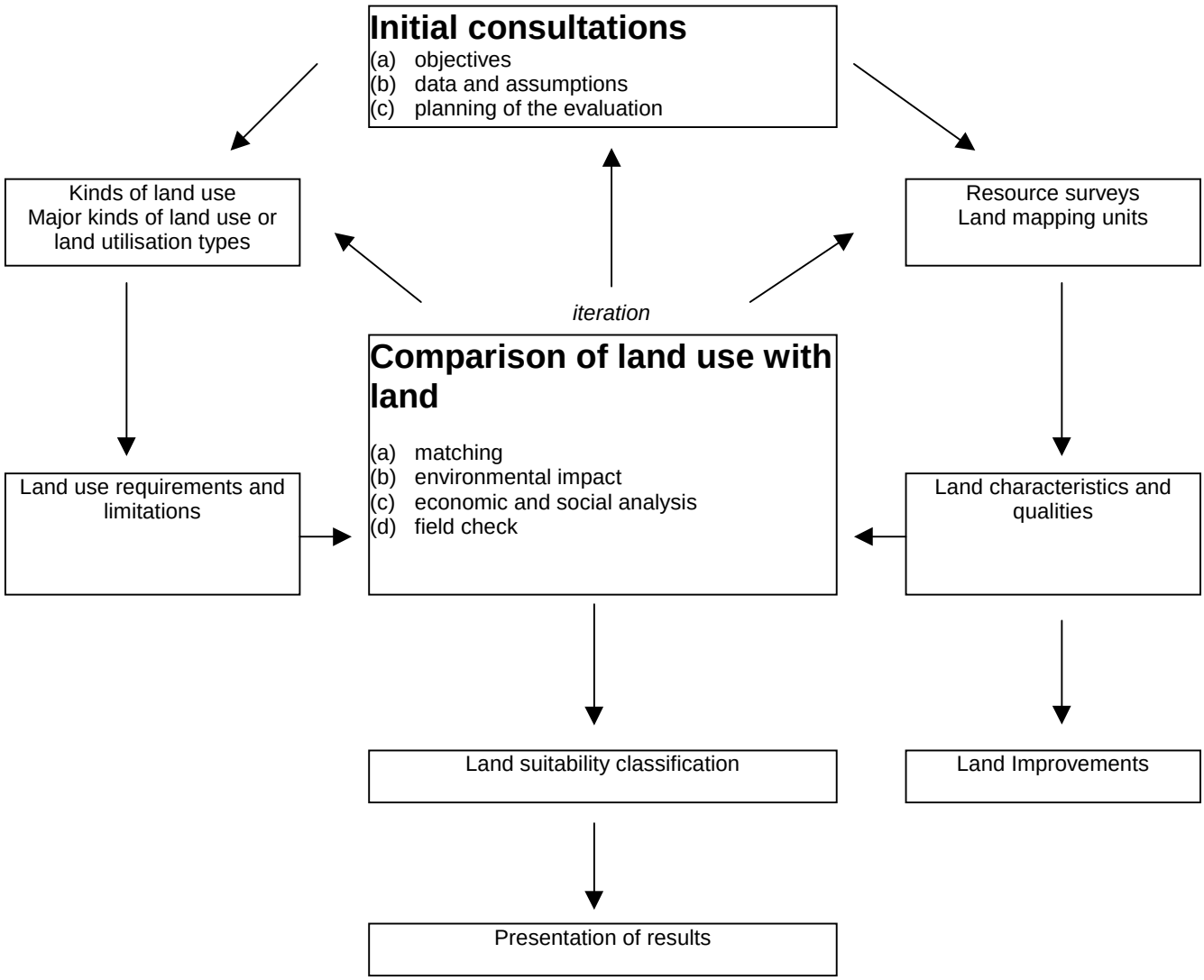
Certain rural lands have been excluded from the rural land evaluation process due to their tenure or land use. In Taree Shire, these areas include state forests, national parks, nature reserves, and areas zoned urban or village.

3. AGRICULTURAL LAND EVALUATION METHODOLOGY

3.1 The land evaluation process

This section describes the method employed to classify rural lands in Taree Shire. The process of agricultural land classification is shown in Figure 1. This diagram has been adapted from Dent and Young, (1981).

Figure 1 Schematic Representation of the process of agricultural land evaluation



The land evaluation process compares the major biophysical, social and economic attributes of rural land against the land use requirements of the agricultural systems likely to be employed in the region. It then assigns agricultural land suitability classes to land units according to the degree of limitation encountered. The fewer and less severe the limitations the more suitable the land for agriculture. The major attributes used in the classification process are shown in Table 2.

Table 3 Key attributes in determining agricultural land suitability classes

Physical attributes	Social and economic attributes
Landform	Skilled labour
Vegetation	Road Infrastructure
Soils	Distance to markets, handling facilities
Potential for land degradation	Access to capital
Slope	Knowledge
Current land use	Skills

3.2 Collection of background data and information

Information on the above attributes was gathered from a number sources. As much as possible publicly available data sources were used including topographic maps, soil and vegetation reports, satellite imagery and acid sulphate soil risk maps. These sources of data were examined to determine the location, extent and value of data for the agricultural land classification process.

The role and value of these data sources are discussed in the following subsections.

3.2.1 Topographic Maps

The topographic maps (1:25 000) covering Taree Shire were obtained from the Land Information Centre, Bathurst. These maps provide base-line information for landscape features, watercourses and cultural features such as roads, towns and railways.

3.2.2 Vegetation and Soil Survey

The distribution of vegetation communities and soils across the Shire were obtained from the Taree District, Technical Manual, Department of Land and Water Conservation, Sydney. The manual represents the soils and vegetation data at an approximate scale of 1:650 000. The general nature of the soil and vegetation descriptions in the Manual represent an absolute limitation to the accuracy of the agricultural land classification map.

3.2.3 Acid Sulphate Soils

The Acid Sulphate Soil Risk Maps (Nalyor, et al, 1995) provide information on the distribution of potential acid sulphate soils and possible environmental risks from disturbing potential acid sulphate soils. Details of agronomy limitations for potential acid sulphate soils were obtained from discussions with professional officers within NSW Agriculture.

3.2.4 Satellite Imagery

A Landsat Thematic Mapper (TM) multi-spectral satellite image recorded on the 18/8/1990 provided the base data for this project. Details on the location and characteristics of major landform features (landscapes, drainage patterns, soil types and vegetation communities) were provided from the visual interpretation of patterns, colour and textures on Landsat images.

The digital data was radiometrically and geometrically corrected to level 4 and, subsequently, georeferenced to 30 m accuracy. This allows ground features on the image to have a locational accuracy, corresponding to a map in the same projection and at the same scale (Australian Centre for Remote Sensing, 1989).

3.2.5 Slope Data

Slope is an important factor in determining rural land use. In many cases, an increase in slope will increase slope hazards, reduce management options and limit the choice of agricultural enterprises. Slope hazards include soil erosion, presence of rock outcrops and depth of soil.

Slope and aspect data were derived from 1:25 000 Topographic Maps, supplied by and the copyright of Land Information Centre, Bathurst.

3.2.6 Professional Officers

Discussions were also held with professional officers from NSW Agriculture and the Department of Land and Water Conservation. These Officers have detailed knowledge and experience in soil surveying, agronomy, horticulture and livestock farm management practices and provided valuable information on all aspect of agricultural enterprises.

Discussions covered the following key themes:-

- existing and potential role of agronomy and livestock practices in view of the present state of technology for each enterprise;
- inter-relationships, opportunities and limitations for relevant physical, social and economic attributes used by agricultural enterprises;
- evaluations of land resources, limitations and needs of agricultural enterprises and assignment of agricultural land classes. Particular attention was paid to the influence of soil erosion hazards, climatic factors (rainfall), current land use and management practices on agricultural enterprises.

3.2.7 Field Observations

Existing roads and tracks provided an excellent opportunity to systematically traverse the shire to observe agricultural lands, particularly adjacent major rivers and creeks. The following areas were visited during the field trip; Johns River, Lansdowne, Coopernook, Cundletown, Nabiac, Taree and Wingham.

The field inspections are primarily designed to assess the condition of biophysical features for each uniform area of land. This was achieved by assessing the value of

attributes and the degree of limitation, associated with land systems, soil series, agro-climatic zones and vegetation types. These observations were noted on topographic maps and/or recorded as text descriptions for each area. In Taree Shire, emphasis was placed on slope and soil types. Slope has had a major influence on the land classification as it is directly related to soil erosion hazard. Soils have also had a significant influence as they often dictate the range of agricultural enterprises available.

The next stage involves assessing the agricultural land classification assumptions and the relationships between land attributes and land use requirements. The important biophysical features were correlated with significant economic, social and environmental attributes to determine possible yields and levels of land improvements. During this stage only the impacts of major attributes were considered. The process was based on the experience, skill and knowledge of the assessor, rather than factual data.

3.3 Creating the map

The agricultural land classes observed during the field work phase, 18-19 May, 1998 were drawn onto topographic sheets in the field. These ALC Class boundaries were later extrapolated over the rest of the Shire in the office. This extrapolation process was assisted by the visual interpretation of landscape features displayed on colour, hard copy Landsat 5 Thematic Mapper (TM) imagery at a scale of 1:30 000. Both the observed and extrapolated agricultural land classes were then physically transferred onto colour, hard copy imagery. These Landsat false colour composite images became the base data for the ALC maps.

The agricultural land class boundaries on the coloured hard copy images were then digitised, using a stream digitising technique and PC Arc/Info software®. Editing and labelling of polygons was undertaken using Arc/Info while the final hard copy output was generated using ArcView®.

The ALC boundary positions were discussed with NSW Agriculture staff. Inspections were arranged to confirm the ALC classes. This process is essential as it maintains ALC class consistency within the Shire and also at the State level.

Maps were compiled in the office with emphasis on boundary reconciliation between the ALC classes and location of State Forests, National Parks and urban areas. The final stage involved preparation of the report.

3.4 Limitations of Taree Map Scale

Agricultural land classification maps should only be used within the limitations of map performance.

Map scale is the relationship between a unit of length on a map and the actual length it represents on the ground. This scale is usually expressed as a ratio. A scale of 1:100 000 means that one unit on a map corresponds to 100 000 units on the ground. For example, 1 cm on the map corresponds to 100 000 cm or 1 km on the ground. One square centimetre corresponds to one square kilometre; one square millimetre represents one hectare. The minimum area that can be legibly delineated on a map is usually 40 square millimetres (a circle of about 7 mm in diameter). At a mapping scale of 1:100 000 this represents an area on the ground of approximately 40 hectares. **The logical conclusion is that an area of less than 40 hectares will not be represented on a 1:100 000 map.**

In practice, classes represent mixtures of landform, geology, soil and climatic characteristics. Therefore, the classes will include small areas of land with different classes to the dominant class. These areas may occupy up to 40% of the class. The final agricultural land classification map show agricultural classes as discrete areas, however, they represent gradual changes in land resource, economic and social attributes.

In the field, there are few instances where sharp boundary lines divide classes. Boundary lines on the map represent the best-fit position or a half way point between the two classes. The accuracy for locating the class boundary lines is expressed as a confidence limit. For a 1:100 000 map this limit is ± 1.5 mm representing a confidence limit of ± 150 m in the field (Riddler, 1987).

As the boundary precision is a function of the level of detail recorded and observed in the field, the scale of agricultural land classification maps should not be enlarged. The Taree agricultural land classification map does not show any features less than 20 hectares. It is important to note that enlargement of the map beyond its original scale, for example to 1: 50 000, will create errors in interpretation, because small areas of different class lands will not be shown. It is particularly easy, and therefore tempting to enlarge digital maps, however this should not be done.

4 AGRICULTURAL LAND CLASSIFICATION

4.1 The evaluation of rural lands in Taree Shire

The evaluation of rural lands is essentially a matching process, where the quality of land resources is compared with the needs of agricultural enterprises and sustainable agricultural practices. The relationship between agricultural land classes and agricultural enterprises are summarised in Table 3.

Table 4 Relationship between agricultural land classes and agricultural enterprises

SUITABILITY CLASSES		AGRICULTURAL ENTERPRISES									
CLASS	DESCRIPTION	HORTICULTURE				FIELD CROPS				GRAZING/PASTURE	
		Vegetables		Tree Crops		Summer Crops		Winter Crops		Improved	Unimproved
		Irrigated	Rainfed	Sensitive	Tolerant	Irrigated	Rainfed	Non-continuous	Irrigated	Rainfed	
2	Arable land with good suitability for agricultural uses such as intensive horticulture and cropping. Constraints to sustained levels of production are minor to moderate.	●	✰	●	★	✰	★	★	✰	★	★
3	Land suited to cropping in rotation with sown pastures but not continuous cropping nor intensive horticulture.	●	●	●	✰	●	✰	✰	●	✰	★
4	Land suited to grazing but not cultivation. Agriculture is based on native pastures established using minimum tillage techniques. Overall level of production is low but maybe seasonally high.	❍	●	❍	●	❍	❍	❍	❍	●	✰
5	Land not suited for agriculture or only rough grazing. Agricultural production, if any,is low	❍	❍	❍	❍	❍	❍	❍	❍	❍	●

★ Class having requirements in excess of those needed for sustained production from agricultural enterprises.
✰ Class having the minimum requirements for sustained production from agricultural enterprises.
● Class may be suited to agricultural enterprises depending on the nature of the limiting factors to production.
❍ Class not suited to agricultural enterprises because of limiting factors to cultivation and/or production.

Notes:
1 The ability to cultivate is a pre-requsite for cropping in this table. In Taree Shire the establishment of fodder crops on class 4 lands using minimum tillage techniques is not represented
2 Non continuous cropping reflects the need for a pasture phase in the cropping cycle.

Adapted from: RIDDLER, A.M.H. (1996) Agricultural Suitability Maps – Uses and Limitations, Medium Scale. Agfact AC. 9, third edition, NSW Agriculture.

5. REFERENCES AND FURTHER READING

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6. APPENDICES

6.1 Appendix 1 Land class description attributes, benefits and constraints to production

Class 1
Class 1 land is arable land suitable for intensive cropping where constraints to sustained high levels of agricultural production are minor or absent.

Class 1 lands have all, or nearly all, of the following characteristics:
- productivity is high to very high for a very wide range of field crops adapted to the area;
- access to local and export markets is satisfactory;
- local or regional infrastructure to support intensive forms of agriculture is present and a ready supply of suitable labour is available, if required;
- potential land use conflict with neighbours as a result of standard agricultural practices is low;
- slopes are level to very gently inclined;
- soils are deep;
- the land is capable of sustaining regular cultivation;
- the soil profile is well drained to moderately well drained;
- erosion hazard is low, simple soil conservation management practices are required to protect the soils from erosion;
- any soil physical and chemical constraints are capable of being economically overcome for a very wide range of field crops;
- recurrent extremes of climate does not seriously affect productivity;
- potential economic losses due to flooding are very low, in the long term.
- the level of economic constraint from factors such as weeds, site contamination, standing timber and feral animals is very low.

Class 2
Class 2 land is land suitable for regular, but not continuous cropping. It has a moderate to high suitability for agriculture but soil or environmental constraints reduce the overall level of production and may limit cropping to a rotation with sown pastures

Class 2 lands have all, or nearly all, of the following features:
- productivity is high to very high for a wide range of field crops adapted to the area;
- access to local and export markets is satisfactory;
- local or regional infrastructure to support intensive forms of agriculture is present and a ready supply of suitable labour is available, if required;
- potential land use conflict with neighbours as a result of standard agricultural practices is low;
- slopes are level to gently inclined;
- soils are deep to moderately deep;
- the land is capable of sustaining regular cultivation however conservation tillage practices may be required;
- the soil profile is either moderately well drained or rapidly drained;

- erosion hazard is low to moderate, soil conservation measures may need to be adopted to avoid erosion;
- recurrent extremes of climate are unlikely to affect productivity;
- any soil physical and chemical constraints are capable of being economically overcome for a wide range of field crops;
- potential economic losses due to flooding are low, in the long term; and
- the level of economic constraint from factors such as weeds, site contamination, standing timber and feral animals is low.

Class 3

Class 3 land is grazing land or land well suited to pasture improvement. It may be cultivated or cropped in rotation with sown pasture. The overall production level is moderate because of soil or environmental constraints.

Class 3 lands have generally moderate levels of social, economic or physical limitations, restricting the extent of arable agriculture. For example erosion hazard, soil structural breakdown or other factors including climate may limit the capacity for cultivation and soil conservation or drainage works may be required. However, a high to very high level of one particular characteristic may result in an area being classified as class 3 even where other limitations are absent.

Class 3 lands are characteristically lands with the following features:

- high levels of productivity for locally adapted pastures and moderate levels of productivity for crops well suited to the area;
- access to local and export markets is satisfactory;
- local and regional infrastructure to support extensive forms of agriculture is present and a ready supply of suitable labour is available;
- potential land use conflict with neighbours as a result of standard agricultural practices may restrict agricultural activities;
- slopes are level to moderately inclined;
- soils are moderately deep to shallow;
- the land has moderate to limited suitability for cultivation, cultivation is only sustainable in rotation with pastures;
- the soil profile is well drained to imperfectly drained;
- erosion hazard is low to high, intensive measures of soil conservation may be required to control erosion in the long term;
- soil physical and chemical properties may limit crop and pasture productivity;
- recurrent extremes of climate may affect productivity;
- potential economic losses due to flooding are moderate, in the long term; and
- the level of economic constraint from factors such as weeds, site contamination, standing timber and feral animals is moderate.

Class 4

Class 4 land is land suitable for grazing but not for cultivation. Agriculture is based on native pastures or improved pastures established using minimum tillage techniques. They generally have moderate to high levels of social, economic or physical limitations, restricting the agricultural productivity. The inability for the preparation of a cultivated seedbed on these lands typifies their limitations. It should be noted that a severe to extreme level of one particular characteristic may result in an area being classified as class 4 even where other limitations are absent.

Class 4 lands are characteristically lands with the following features:

- productivity levels for locally adapted pastures are low to moderate, however productivity for selected tree crops may be high;
- access to local and export markets may be restricted by location;
- local infrastructure to support extensive forms of agriculture is present however suitable labour resources may be limited;
- potential land use conflict with neighbours as a result of standard agricultural practices may restrict agricultural activities;
- slopes are level to steeply inclined;
- soils are mostly shallow;
- the land is unsuitable for cultivation, minimum tillage techniques can be used to establish perennial pastures;
- the soil profile is well drained to poorly drained;
- erosion hazard is low to very high, intensive measures of soil conservation may be required, however erosion may still be significant in the long term;
- soil physical and chemical properties limit crop and pasture growth, low productivity levels limit the economic amelioration of this constraint;
- recurrent extremes of climate are likely to affect productivity;
- potential economic losses due to flooding are high, in the long term; and
- the level of economic constraint from factors such as weeds, site contamination, standing timber and feral animals is high.

Class 5

Class 5 land is land generally unsuitable for agriculture or at best suitable for occasional light grazing or supporting activities related to agriculture (eg. shelter for livestock, forestry). Agricultural production is low as a result of severe biophysical, social and economic constraints, which preclude land improvement.

Class 5 lands suffer extreme limitations for agricultural production. These limitations may be one of or a combination of the following:

- productivity levels for all types of agricultural crops and pastures are very low;
- access to local and export markets may be very restricted by location;
- local infrastructure to support extensive forms of agriculture may be absent as may suitable labour resources;
- extremes of slope can be expected;
- the land is unsuitable for cultivation;
- the soil profile is very poorly drained;
- erosion hazard is extreme, economic control using conventional soil conservation measures is impractical;
- soil physical and chemical properties present an extreme limitation to the growth of agricultural plant species;
- recurrent extremes of climate may seriously affect productivity;
- potential economic losses due to flooding are high, in the long term; and
- the level of economic constraint from factors such as weeds, site contamination, standing timber and feral animals is very high to extreme.

6.2 Appendix 2 Agricultural land classification map

The attached map is a reduced version of the original and is at a scale of approximately 1:450,000. This map has been supplied to provide a general overview of the distribution of agricultural lands throughout the Shire. This map cannot be used to accurately determine the agricultural land classification of any particular site or locality.

Copies of the map, reproduced at 1:150,000 or the digital data that makes up this map (under certain licence conditions) can be obtained from:

Environmental Planning and Management Sub-Program
NSW Agriculture
Locked Bag 21
ORANGE NSW 2800

or from the Spatial information Officer (Systems) at this address.