Minimum Lot Sizes

How to use the framework

The following framework provides two options that may be used to identify or determine minimum lot sizes. They provide a realistic snapshot of what could be regarded as a commercial farm size for a locality.

The first option (A) depends on the current activities in an area and provides a macro approach, while the second option (B) builds on this through a detailed economic approach. It is recognised that this framework is not a science as agriculture itself is open to many variables, including climate and market returns. It does, however, provide a way to arrive at a representative number that considers the economic realities of a typical commercial farm in an area based on the best available knowledge at the time of assessment.

Option A (steps 1 and 2) can assist local and State government to determine an acceptable minimum lot size without detailed analysis. This is the recommended approach to determining a minimum allotment size for an entire LGA.

Alternatively, by 'drilling down' through a more detailed economic analysis, (Option B, Steps 1 through 7) and compiling data for subdistricts, local government will be able to determine minimum allotment sizes appropriate for the promotion of sustainable agriculture in that locality. This will enable councils, with the assistance of agricultural specialists, to establish appropriate minimum allotment sizes where landuse strategies identify distinct precincts within which certain types of agriculture are proposed to be undertaken. For example, these include dryland enterprises specifically associated with particular soil or landscape features or more intensive irrigated agriculture.

Councils are encouraged and it is strongly recommended that in using the framework to determine a minimum allotment size, agricultural professionals, including the local Agricultural Environmental Officer (DPI), are consulted.

Where the framework Option B is taken, there is allowance for up to a 20% variation from the agreed minimum determined (using Option A) for the area. This takes into account the assumptions made in relation to this process which include:

- the full costs of establishment can be met;
- equity of the costs associated with loan repayments can be met;
- the level of income used is adequate (based on ABARE estimations); and
- the full costs of production can be met, for example, environmental impacts can be managed on the holding.

Option A: Basic assessment

Step 1: Identify the key agricultural industries and enterprises in the LGA

What are the main agricultural industries in the LGA? These may include the type and mix of crops, the grazing enterprises, and horticultural or vegetable crops.

What is the LGA well-known for? Most LGAs have economic development reports that provide a detailed account of agriculture in the area, and which can be used to contribute to this procedure.

Has agriculture in the LGA changed over time and if so what has happened? It is important to look at the changes in crops or livestock over time and the number and size of holdings that make up the enterprises. While holding size may be fairly stable, factors such as drought and seasonal variability, or fluctuating commodity prices, will affect economic returns, and should all be considered. In some areas changes in enterprises may occur due to technological change, or new market opportunities.

It is important to identify any major shifts and trends in enterprises as a result of technological, market or environmental influences.

Industry organisations, government agencies such as the Australian Bureau of Statistics (ABS) and ABARE and the farm service sector may be able to provide information on key enterprises and trends across the LGA. Once the major agricultural enterprises have been identified across the LGA, the process of undertaking some case studies can begin.

Step 2: Identify the characteristics of farms in the LGA

What are the land use characteristics of the major existing agricultural enterprises in the area? The mix of crops and livestock enterprises across the LGA may vary according to factors such as locality, topography, soil type and climate.

Are there distinctly different patterns of agriculture in different areas across the LGA? Different areas may need to be considered for special provisions where the potential for conflict may arise, ie intensive agriculture.

In cropping areas, several crop options may need to be investigated, while grazing enterprises may operate both sheep and cattle enterprises, for example.

Assessment of holding size and pattern. The size of existing commercial holdings may be a useful indication of a realistic holding size in the area. It is important to recognise that some farmers are constantly adjusting their holding size and enterprise selection in response to economic conditions, so this may be a factor in determining the base size of a holding considered to be reflective of commercial farms in an area. An estimate of a realistic holding size can be determined at this point.

Care should be taken in looking at holdings. Many farmers lease or share farm production on other land held in different ownership. Hence land ownership is not always indicative of an area that would be considered to be a commercial farm. The farming community is often the best source of information in relation to what area is required for a commercial farm.

DPI is also developing a suite of farm models systems across the state that reflects different farming systems and has been developed to examine enterprise change. The farm models systems also examine sizes of the farms in their analysis which can be useful for this work (Davies & Mullen, 2004).

Local government cadastral and rates information may be used to provide a précis of holding(s) held by one owner, which may give an indication of holding size.

Note: Local government cadastral information is useful to establish lots and portions held by individual owners and therefore provides *an indication* of the holding sizes in an LGA. However, it is imperative that holding size and ownership information is lawfully collected, stored and used in accordance with the *Privacy and Personal Information Protection Act* 1998.

Option B: Using economic analysis to determine basic commercial farm size

The following steps build on the previous section and using economic analysis, provide an additional way of considering the many facets of farming practice that will help local government plan for commercial farming.

Whilst recognising that each commercial farm operation is unique, this analysis uses a general approach that considers a typical farm in an area that is commercial in its operation. A number of assumptions are made throughout this procedure, and although not complex, the process will benefit from the assistance of an agricultural farm management consultant, agricultural economist or farm business specialist. It is important that Council staff involved in planning for sustainable agriculture gain a good understanding of the factors affecting agricultural production and viability across the local government area.

Steps 1 and 2 from Option A are used, then the following:

Step 3: Determine the existing production levels of key enterprises on farms

Useful guides on production levels, such as crop yields and livestock performance, can be sourced from:

- Australian Bureau of Statistics (ABS);
- Australian Bureau of Agricultural and Resource Economics

(ABARE);
- Department of Primary Industries (DPI);
- Rural Lands Protection Boards (RLPBs); and
- industry sources.

It is essential to account for the variability in production across the area resulting from seasonal fluctuations and due to agronomic conditions such as soil type and topography.

Information on the LGA's biophysical characteristics, if available, is useful for determining variation in production. For example, soil maps may indicate the different types of soils across an area, and their suitability to different enterprises.

For the purposes of determining the size for a sustainable farming operation, it is suggested that a conservative estimate of production be used, to account for the considerable variation in skills and levels of farmers and farm managers and operators.

In the case of livestock enterprises, a key index is the carrying (stocking) capacity of the land, often recorded as DSEs (dry sheep equivalents) per hectare. The carrying capacity will vary according to many factors including the soils, climate, level of pasture improvement and season, for example. Understanding seasonal variation is critical and the impact of drought and markets is especially important for grazing enterprises. Statistical information is available to determine district averages, but information from local and expert sources is recommended, such as RLPBs, stock agents, farm service firms, and industry experts, should provide some typical ranges.

It is critical to note that although an LGA may have variability in the quality of agricultural land in terms of soil type, landform and other attributes that lowers its agricultural capability; it is accordingly often seen as unsuited to agriculture. However, it may be suited to specific forms of agriculture or require a larger area and/or different management techniques to be sustainable as a commercial farm. Such land is also not automatically suitable for subdivision for lifestyle purposes as it may be sensitive to erosion, effluent disposal, and have servicing, access, biodiversity and bushfire issues.

Agricultural suitability mapping that was produced by the previous Department of NSW Agriculture (now Department of Primary Industries), considered specific agricultural limitations that encompassed biophysical, market and climate parameters at the time of mapping. It is a guide to local government to indicate the potential land suitability across an LGA at the time and helped define areas of prime crop and pasture land as Class 1, 2 or 3. These maps have and continue to be improperly used in the assessment of individual properties in some LGAs, contrary to their intended use and the State Government Policy for Sustainable Agriculture (1999). Lands classed as 4 or 5 still have potential for agriculture but again this has been regarded as reason to its allocation

to other landuses rather than recognising that it has value to a number of agricultural uses such as low density grazing and/or forestry.

Step 4: Determine appropriate gross margins for the key enterprises

Gross margin budgets are a simple cost and return analysis of a farm activity, at a given time. The gross margin is calculated by deducting input and production costs from gross income based on an estimated yield or production level and the prevailing market prices. Gross margin budgets are a useful way of comparing farm enterprise activities, and can also be used to provide an indication of the productivity of farming land when appropriate yield or production levels and realistic commodity prices are used.

It is important to note that a gross margin budget does not contain costs of general farm overheads that are incurred regardless of choice of enterprise, and typically they do not make an allowance for the farmer's labour. This must be accounted for separately (see below).

The Department of Primary Industries provide annually typical gross margin budgets for the major broad scale agricultural enterprises in NSW. The most recent versions are available on the Department's web site: http://www.dpi.nsw.gov.au/reader/dpi.

A gross margin budget is only a snapshot of enterprise performance and when being used for estimating longer term economic performance, it is important that an average yield or production level is chosen which reflects seasonal variation under average management. Similarly, prices should be those which are realistic for the market, not based on short term peaks.

Using the key enterprises identified in Option A, Step 1, the gross margin budgets should be adjusted to the productivity levels identified in Option A, Step 2. Local expertise from agricultural advisers, economists or farm management consultants can help to refine such gross margins to the local situation.

In order to derive a "whole" farm gross margin, the farm can be proportionally allocated to provide the area of each enterprise. The enterprise gross margins can then be multiplied by the enterprise areas and totalled to provide a whole farm summary. For example, in a given year a mixed farming operation with rotational cropping may have 50% of the farm under crops, and 25% under grazing and 25% fallow (as part of a three in five year rotation). The cropping area may consist of 40% wheat, 40% sorghum and 20% canola. On a 1000 ha property, this would mean annually, 250 ha grazed, 250 in fallow (with some grazing value), 200 ha in wheat, 200 in sorghum and 100 ha in canola. A purely livestock property may need to allocate proportions to various cattle and sheep enterprises and perhaps fodder production.

In practice it is also important to identify areas of the property

which are not contributing directly to or being used for agricultural production, but are typical components of the property, such as roads, water bodies, rocky ridges, buffer areas and conservation areas such as riparian zones, shelter belts, wildlife corridors and densely timbered areas. Farm gross margins should reflect sustainable land use, that is, enterprises and production levels that are within the capability of the land and its natural resources.

An alternative approach is to base the total farm production on the type of farm, where total farm production needs to be proportionally allocated to each enterprise gross margin. For example, a typical cropping enterprise may gain its income from an area consisting of 40% wheat, 40% sorghum and 20% canola across a range of land types. Likewise, a grazing property may contain different grazing areas and types as well as enterprises eg sheep and cattle.

Step 5: Determine a target income level for a commercial farming unit

A reasonable estimate of the level of net income needed to indicate economic sustainability is required. The following is suggested as a starting point.

The Australian Bureau of Agricultural and Resource Economics (ABARE) publishes each year a report on its long running survey of major broad scale agricultural industries or specialist industry reports in partnership with industry groups. A selection of farms is surveyed across the major agricultural zones, to provide an indication of the economic performance of those industries. Results are typically reported according to industry, state or zone (pastoral, wheat-sheep, or high rainfall). Comprehensive cost and income data is collected to determine a range of farm economic performance parameters. In particular, farm cash income is adjusted for asset and stock changes and family labour costs to estimate farm business profit, which is further adjusted according to debt levels to provide farm business profit at full equity. This profit when divided by farm capital and assets gives a rate of return on capital for the farm (ABARE 2003, 2004). The ABARE reports typically cover a 3 year period so that the recent level of performance of various industries can be gauged.

A farm 'business' should generate an acceptable return on invested capital and assets, but what is an appropriate rate of return for agriculture varies according to different expectations. The ABARE reports show the range of economic performance of farms in the survey. As a starting point, it is suggested that the 'break even point' is a suitable baseline from which to consider an acceptable rate of return. The break even point occurs when farm business profit is zero, that is, when income covers production costs, family labour and overheads. This point can be gleaned from the ABARE data by deducting farm business profit (at full equity) from farm cash income. The ABARE data can thus provide a picture of the average farm income

	2000/01 (e)	2001/02 (p)	2002/03 (s)
Farm Cash Income ($)	124,183	186,710	-17,600
Farm Business Profit (at 100% equity) ($)	69,619	148,180	-82,200
Rate of Return (%)	4.0	7.4	-4.1
Break Even Income ($)	54,564	38,530	64,600
Average Equity (%)	79.6	81.0	n.a.

Table 1: NSW Wheat and other crops
Source: ABARE (2003)

(e) Final estimate
(p) Preliminary estimate
(s) Provisional estimate

needed before a return on capital is generated.

The ABARE information also illustrates the variability of farm cash income, further reinforcing the need to use such information carefully in its use.

Table 1 shows ABARE data for the years 2000/01 to 2002/03 for broad acre cropping in NSW. The third year is preliminary data only. The break even income ranges between $38,000 and $65,000 (preliminary) at 100% equity. For the purposes of the example below, $60,000 has been selected as a starting point for a target income on a cropping enterprise.

Table 2 shows the equivalent data for the beef industry. The break even point ranged between $44,000 and $66,000. These are the target incomes that would need to be reached before a profit is generated, assuming full equity and when overhead costs have been considered.

Step 6: Calculate the overhead costs

Gross margin budgets do not include many farm fixed costs or costs that are incurred regardless of which crop or enterprise is undertaken, or indeed whether there is any production such as during a drought. Examples are Council rates, electricity and phone costs, and farm maintenance such as fencing, water supply, and machinery repairs. Depreciation is another important item. These costs are typically referred to as overhead costs. Often family labour or income is regarded as an overhead cost, but in this exercise it is accounted

	2000/01 (e)	2001/02 (p)	2002/03 (s)
Farm Cash Income ($)	39,513	44,470	8,800
Farm Business Profit (at 100% equity) ($)	- 6,300	530	- 57,100
Rate of Return (%)	0.6	0	-4.3
Break Even Income ($)	45,813	43,940	65,900
Average Equity (%)	97	98	n.a.

Table 2: NSW Beef Industry
Source: ABARE (2003)

(e) Final estimate
(p) Preliminary estimate
(s) Provisional estimate

for by the target income.) However, any additional farm labour such as permanent staff should be included either in gross margin or overhead costs.

It is not easy to find published information on overhead costs because they are so variable. Discussion with industry experts and farmers is probably the best guide. DPI experts (L. Davies, pers. comm.) suggest that overhead costs can be significant relative to those costs included in gross margin budgets, often approaching 50% of total farm costs. Overheads for cropping enterprises are often higher than for livestock enterprises because of the greater investment in machinery and corresponding maintenance and depreciation costs. For the purpose of determining a commercial farming size, it is suggested that a conservative figure of 40% be used, unless more accurate local data is available. The gross margin budgets discussed above include a summary of variable costs on a hectare or DSE basis. The overhead costs can be estimated as a percentage of these, and can be totalled for the farm as per Step 7 below.

Overhead costs may vary from district to district because of a range of local factors. Where available, the expertise of a local agricultural economist, farm business accountant or farm management advisor should be sought.

Step 7: Calculate the area needed to generate the break even level of income

This step involves the selection of a farm with a typical mix of enterprises for a locality or selecting a particular case study farm, as discussed in Step 2. By dividing the farm area proportionally into the various enterprises and selecting suitable gross margin budgets for these enterprises as per Step 4, the gross margin for the whole property can be determined by multiplying the area of each enterprise by the relevant gross margin budget on a per hectare basis.

Similarly, the overhead costs for the property can be accounted for by determining a percentage of the total farm costs, and calculating them by comparison with gross margin costs. These overhead costs should then be deducted from the whole farm gross margin to estimate net farm income.

This income level can then be compared with that selected in Step 5 as being required for break even point, the benchmark above which a commercial operation can be considered profitable.

This net farm income is that which provides the farm operators with their income and living expenses (eg. for a farm family) and which is the starting point for generating a return on investment and assets.

It should be noted that the above procedure makes no allowance for interest and repayment of farm debt, as it assumes a full equity situation. In reality most farms will be below 100% equity and a higher level of farm income will need to be generated to cover this. The ABARE survey reports provide a snapshot of farm equity levels for various industries.

Case Study: Cropping/cattle enterprise in Northern NSW

For the purpose of illustrating the procedure, take a simplified case of a mixed farming enterprise in northern NSW using two alternative approaches.

Option A: Step 1

Agricultural enterprises in the sample LGA are typically mixed farming enterprises, in this example, growing wheat and cattle.

Option A: Step 2

An assessment of the Council's cadastre and holdings data, and after speaking to agronomists in the district, indicate that commercial farms in this area average 800+ha.

> After assessing the case study with Option A, the recommendation is made to establish the minimum lot size for a new farm at 800 ha.

Option B: Step 3

Looking at the area, a simplified farm operation is worked out. It is located in an area typified by heavier grey clays on the floodplains and lighter red soils on the adjacent slopes and hills. The heavier soils in the locality are mainly used for cropping while the lighter soils are more sustainable under grazing enterprises. Our case study farm consists of approximately 60% of heavy clay soils almost totally used for wheat cropping and 40% of lighter soils used for cattle grazing.

On this sample farm, the only cropping enterprise is dryland wheat production grown continuously using short fallow and minimum or zero tillage techniques. Around 55% of the farm is under wheat, ie. 440 ha. Around 35% of the farm (280 ha) is used for raising and fattening cattle, typically turned off at 15-20 months. The remaining 10% of the farm is non-productive area, including roads, house paddock, water areas, ridge top, and some dense timber.

Assume that typically in the locality, yields for this form of wheat growing average around 2.5 tonnes per hectare, taking into account seasonal effects.

For the cattle enterprise let's assume a stocking capacity of 3 DSE per hectare. There are some small areas of semi improved pasture which help with fattening.

Option B: Step 4

Use the DPI Farm Enterprise Budget for Dryland Wheat (Northern Zone – East, Winter 2004) (http://www.dpi.nsw.gov.au/reader/dpi), assuming average wheat yields of 2.5 t/ha and a wheat prices of $172/t (AH12 on farm).

The Gross Margin for wheat is $201.81 per hectare, say $200/ha.

Total variable costs in the budget are shown as $228.19 per hectare, say $230.

For cattle, the Farm Enterprise Budget for young cattle (15-20 months) indicates a Gross Margin of $26.68 per DSE. At a carrying capacity of 3 DSE/ha, this means a Gross Margin of $80.04 per hectare, say $80/ha.

The variable costs can be determined from the budget at $5.89 per DSE or $17.67 per hectare, say $18/ha. Note that this is for a self replacing herd.

Option B: Step 5

A target income is required that covers the livelihood of this family farm.

The ABARE data in Tables 1 and 2 suggests that break even incomes in recent years have been in the $40,000 to $60,000 range.

For this case study assume a target income level of $60,000 as the starting point for considering farm viability.

Option B: Step 6

As this is a mixed farm, the greater proportion of farm costs are associated with the cropping enterprise, as indicated by the variable costs in Step 4.

Assume that overhead costs are 40% of total farm costs.

Option B: Step 7

The net farm income for our simplified farm is itemised in the following Table 3.

So after deducting the overhead costs ($70, 827) from the total costs, after gross margin ($177, 067-

Enterprise	Dryland wheat	Cattle	Non-productive land	**Total**
Area (ha)	440	280	80	**800**
GM/ha ($)	200	80	0	
Total GM ($)	88,000	22,400	0	**110,400**
GM variable costs ($)	101,200	5,040		**106,240**
GM variable costs (% of total costs)				**60**
Total costs ($)				**177,067**
Overhead (% of total costs)				**40**
Overhead costs (%)				**70,827**
Net farm income ($)				**39,573**

Table 3: Eight hundred ha wheat and cattle farm in Northern NSW
Note: In Table 3, the overhead costs are 40% of total costs. Therefore the gross margin costs ($106,240) are 60% of total costs ie. total costs are $177,067. So 40% of 177,067 is $70,827.

Enterprise	Dryland wheat	Cattle	Non-productive land	**Total**
Area (ha)	550	350	100	**1000**
GM/ha ($)	200	80	0	
Total GM ($)	110,000	28,000	0	**138,000**
GM variable costs/ha ($)	230	18	0	
GM variable costs ($)	126,500	6,300	0	**132,800**
GM variable costs (% of total costs)				**60**
Total costs ($)				**221,333**
Overhead (% of total costs)				**40**
Overhead costs (%)				**88,533**
Net farm income ($)				**49,467**

Table 4

Enterprise	Dryland wheat	Cattle	Non-productive land	**Total**
Area (ha)	660	420	120	**1200**
GM/ha ($)	200	80	0	
Total GM ($)	132,000	33,600	0	**165,600**
GM variable costs/ha ($)	230	18	0	
GM variable costs ($)	151,800	7,560	0	**159,360**
GM variable costs (% of total costs)				**60**
Total costs ($)				**265,600**
Overhead (% of total costs)				**40**
Overhead costs (%)				**106,240**
Net farm income ($)				**59,360**

Table 5

$70,827=$106,240), the net farm income is only approaching $40,000 per annum, not quite the target income level of $60,000 sought.

In this simplified case, the operator may attempt to improve income levels by diversifying into more profitable crops or enterprises, increasing yield levels, or by **expanding the size of the farm**. Where more rotational cropping is introduced then crop areas need to account for the fact that land is periodically in fallow and may not produce a crop every year.

Comparing existing holding sizes as identified in Step 2 will also help to identify the current range of farm sizes in the local government area. If holding sizes are greater for these typical types of enterprises, it suggests the estimated farm size is conservative and perhaps should be larger to meet current trends and long term expectations for profitable agriculture.

The above example of an 800 ha property does not achieve the current target income. The exercise may be repeated by increasing farm size until the target income is reached. Tables 4 and 5 show the same method for farm sizes of 1000 and 1200 hectares respectively, with corresponding increases in areas for the enterprises. The target income is reached with a property size of 1200 hectares for this particular financial period.

Interpreting the Budget Information

The above example is based on recently published budgets for common broad scale enterprises in NSW. Because markets and prices vary, such budgets are only a snapshot and they should be reviewed regularly using the most reliable data. It is recommended that above and below average scenarios be tested to indicate the sensitivity of net farm incomes to prices and seasonal impacts on yield, particularly during droughts. For example, for the above case study in Option B, if the equivalent DPI Farm Enterprise Budget for dryland wheat for 2005 was used, a much different estimate would have resulted, since the decline in wheat price to $150/t pushed the gross margin down to $127/ha, while costs increased slightly. While this was offset marginally by improved results for beef cattle, the net farm income estimate declines to around $6,000. That is, a much larger farm area would have been required. In other words, the target income needs to be robust enough to buffer landholders against below average seasonal conditions or price troughs.

It is important that the percentage of the farm available for productive enterprises be realistically quantified. Parts of the farm not in production may include house and infrastructure areas, areas for conservation, tree plantings, ridges, dams and riparian areas. This can be around 30% of a holding, especially with landholder's efforts in conserving areas of remnant vegetation, or sacrificing land for salinity control or other landuses eg forestry.

The budget could be reworked to identify what scale of enterprise is required to generate incomes above the target level. However, estimating the value of the farm and assets and determining an acceptable rate of return is a challenging task and should be left to farm management specialists. Hence the approach used here is to provide a benchmark to indicate what scale of enterprise is needed to start defining an appropriate commercial farm size, and ultimately a minimum allotment size that is reflective of protecting land in holdings of an adequate size for agriculture.

In the above discussion and example, farm debt has not been considered. The ABARE survey reports provide a picture of average farm equity and the majority of farms are likely to have some indebtedness. So the net farm income will also have to be raised to cover the servicing of farm debt, in addition to generating a rate of return. Increasing the size of a farm is one way of dealing with this.

This approach is reflective of the way farms that conduct multi-enterprise or farming systems are structured (Davies & Mullen 2004). NSW DPI is developing whole farm models that are representative of a range of farming systems across the state for assessing enterprise change impacts. This information is also another potential source of providing a picture of a

representative farm in a region.

In the case of horticultural and agroforestry enterprises, estimates of target income may require more consideration since there is often a considerable lag time between tree establishment and full production, sometimes well over a decade. This delay in reaching a profit must be factored into the target income level. Furthermore, with tree crops, farmers have less flexibility to switch between enterprises, and so their operation must be based on a sustainable sized operation to withstand seasonal and market fluctuations. It is recommended that specialist economic advice be sought when planning sustainable holding sizes for horticulture and agroforestry.

Conclusion

The above procedure attempts to provide a reasonably simple method of understanding the economics associated with farm productivity and commercial returns, and the relationship with estimating a commercial holding size. From here a minimum allotment size can be determined with other considerations that may affect the long term needs of agricultural landuse in an area. It is important to consider the trends associated with increasing holding size and the opportunities associated with agriculture.

References

ABARE, 2003, *Australian Farm Surveys Report 2003*, November 2003. ABARE, Commonwealth of Australia, Canberra.

ABARE, 2004, *Australian Farm Survey Results*, ABARE, Commonwealth of Australia, Canberra.

Davies, L. and Mullen, J., 2004, 'Farming Systems in NSW: Representative farm models developed by NSW Department of Primary Industries', Proceedings of Conference Papers, Australian Farm Business Management Network Conference 2004, at http://www.afbmnetwork.orange.usyd.edu.au/conferences/2004 Proceedings/index.htm (after 1 December 2004).

Davies, L., 2004, *Recent beef production and management system trends in NSW*, NSW Department of Primary Industries. at http://www.agric.nsw.gov.au/reader/beefbudinfo/beef-bud-info-systems-trends.htm

Davies, L., Wilkins, J., Arnott, R. and Rayner, A., 1999, *Review of the store cattle industry in NSW 1998*, Animal Industries Report, No. 7. NSW Agriculture, 1999.

Hooper, S., Martin, P., Love, G., and Fisher, B.S. 2002, *Farm size and productivity: where are the trends taking us?* Australian Commodities, Vol. 9(3), September quarter 2002.

McDonald, W., and Orchard, P., 2004, *Using DSEs and carrying capacities to compare beef enterprises*, NSW Department of Primary Industries, http://www.agric.nsw.gov.au/reader/beefbudinfo/dse-carrying-capacity.htm

NSW Department of Agriculture, 1999, *Policy for Sustainable Agriculture in NSW*

NSW Department of Infrastructure, Planning and Natural Resources, 2003, *Section 117(2) Direction for the Protection of Agricultural Land (North Coast)*

NSW Department of Primary Industries, 2004, *Farm Enterprise Budgets for September 2003*, at http://www.agric.nsw.gov.au

NSW Department of Primary Industries - Agriculture, *Policy for the Protection of Agricultural Land*, 2004

NSW Department of Urban Affairs and Planning, 2000, *Rural Lands Policy*