



THE UNIVERSITY OF
SYDNEY



Department of
Primary Industries

Land ownership change in rural NSW

Hunter Transect Report

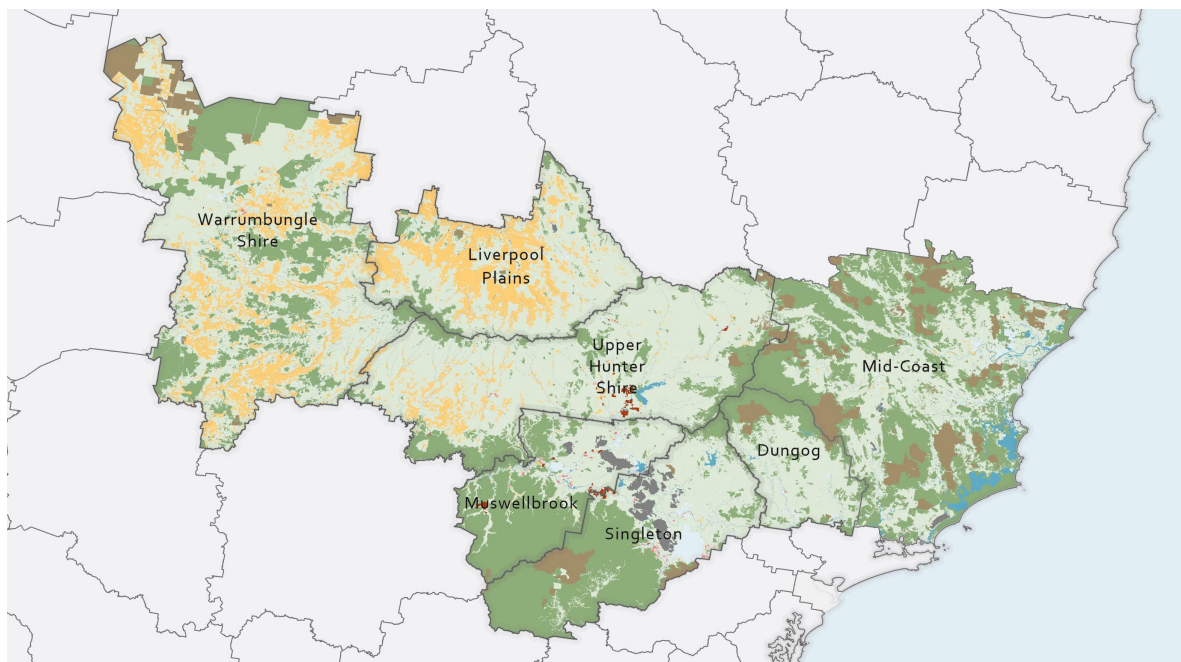
Bill Pritchard

Guillermo Umaña Restrepo

Cara Stone

Elen Welch

Lachlan Mitchell



Land Ownership Change in Rural NSW: Hunter transect Report

© University of Sydney & NSW Department of Primary Industries

February, 2022

This report has been commissioned as an output from the Australian Research Council's Linkage Project "The impacts of land ownership change on rural social and economic change" (LP170101125)

Contact for further information:

Professor Bill Pritchard, School of Geosciences, University of Sydney NSW 2006.

bill.pritchard@sydney.edu.au

How to cite this report:

Pritchard, B., Umaña Restrepo, G., Stone, C., Welch, E., Mitchell, L. (2022) Land Ownership Change in Rural NSW: Hunter transect Report, University of Sydney & NSW Department of Primary Industries. <https://rural-land-science.sydney.edu.au/>

ISBN 978-1-74210-518-5

Table of Contents

Acknowledgements and overview	1
Summary of findings.....	3
1. Introduction.....	8
2. Rural land ownership trends in the Hunter transect.....	11
3. Demographic trends as drivers of rural land ownership change in the transect.....	24
4. Agricultural restructuring and rural land ownership change in the Hunter transect	33
5. Land-use planning trends affecting land ownership patterns	44
6. Bibliography.....	52
Appendix A: Methodology.....	53
Appendix B: LGA data	55
Appendix C: Focus group indicative questions.....	69
Contact	70

List of Tables

Table 1 - Transect Overview: area and number of parcels in our sample by LGA, 2004-20	8
Table 2 - Proportion of agricultural and non-agricultural land in the Hunter transect.....	8
Table 3 - Median Rate of Change Summary by LGA compared to All NSW (total sample).....	15
Table 4 - Ownership trends for top 50 landowners by LGA	20
Table 5 - Ownership trends for top 15 landowners by LGA	21
Table 6 - Farmlands Sales by Municipality (adapted from Rural Bank, 2021).....	22
Table 7 - Demographic overview (data based on ABS 2021)	24
Table 8 - Changes in rural population by LGA	26
Table 9 - Change in population size 2006-2020	27
Table 10 - 10-year age group growth pattern (2011-16) (%)	28
Table 11 - Migration into rural parts of the transect	30
Table 12 - Proportion of agricultural land-uses in the Hunter transect	33
Table 13 - Top 10 largest employing industries across the Hunter transect (2006-16)	39
Table 14 - SIEMP proportions in agricultural industries (INDP3) for Hunter transect (2016).	41
Table 15 - Percentage change in the transect's agricultural industries (2006-16).....	42
Table 16 - List of LEP specific objectives for RU1 Primary production zone.	45
Table 17 - Number of parcels in the transect, 2004-20.....	47
Table 18 - Lot sizes in the Hunter transect.....	49
Table 19 - MidCoast Land Use Overview.....	55
Table 20 - Profile of top 15 largest private landholders in MidCoast	56
Table 21 - Dungog Land-use Overview.....	57
Table 22 - Profile of top 15 largest private landholders in Dungog	58
Table 23 - Singleton Land-Use Overview.....	59
Table 24 - Profile of top 15 largest private landholders in Singleton.....	60
Table 25 - Upper Hunter land-use table.....	62
Table 26 - Profile of top 15 largest private landholders in Upper Hunter.....	62
Table 27 - Muswellbrook Land-use Overview	63
Table 28 - Profile of top 15 largest private landholders in Muswellbrook.....	64
Table 29 - Liverpool Plains Land Use Overview.....	65
Table 30 - Profile of top 15 largest private landholders in Liverpool Plains.....	66

Table 31 - Warrumbungle Land Use Overview.....	67
Table 32 - Profile of top 15 largest private landholders in Warrumbungle	68

List of Figures

Figure 1 - Research Project Transects	2
Figure 2 - Hunter transect	10
Figure 3 - Rate of substantive rural land ownership change, transect and NSW.....	11
Figure 4 - Agricultural land churn rate in the Hunter transect and Rural NSW	13
Figure 5 - Rate of agricultural and non-agricultural land ownership change in the Hunter ...	14
Figure 6 - Rate of substantive rural land ownership change in MidCoast LGA.....	18
Figure 7 - Rate of substantive rural land ownership change in Dungog LGA.....	18
Figure 8 - Rate of substantive rural land ownership change in Singleton LGA	18
Figure 9 - Rate of substantive rural land ownership change in Muswellbrook LGA	18
Figure 10 - Rate of substantive rural land ownership change in Upper Hunter LGA.....	19
Figure 11 - Rate of substantive rural land ownership change in Liverpool Plains.....	19
Figure 12 - Rate of substantive rural land ownership change in Warrumbungle LGA.....	19
Figure 13 - Percentage occupied by top 50 landowners (2004-19) (East to West).....	20
Figure 14 - Percentage occupied by top 15 landowners (2004-19) (East to West).....	21
Figure 15 - Summary of findings, rate of change and land concentration in the Hunter	23
Figure 16 - Population growth by LGA in the transect, 2011-16.....	25
Figure 17 - Proportion of population who moved to select SUAs (2011-16)	31
Figure 18 - Proportion of population moving from rural SA2s to SUAs (2011-16).....	31
Figure 19 - Proportion of population moving from select SUAs to transect (2011-16)	31
Figure 20 - Proportion of population moving to rural SA2s from SUAs (2011-16).....	31
Figure 21 - Hunter transect Land-use Map	34
Figure 22 - NSW Commodity Price Comparison (Rural Bank, 2021)	36
Figure 23 - Largest employing industries across the Hunter transect	39
Figure 24 - Hunter transect Zoning Map	44
Figure 25 - Minimum lot size map, categorised by size	48
Figure 26 - Minimum Lot Size Ratio Map	49
Figure 27 - Incidence of change on agricultural and non-agricultural rural land in MidCoast	55
Figure 28 - MidCoast Land Use Map	55
Figure 29 - Largest 50 Landholders in MidCoast	56
Figure 30 - Incidence of change on agricultural and non-agricultural rural land in Dungog...	57
Figure 31 - Dungog Land-use map.....	57
Figure 32 - Largest 50 landholders in Dungog.....	58
Figure 33 - Incidence of change on agricultural and non-agricultural rural land in Singleton	59
Figure 34 - Singleton Land-Use Map	59
Figure 35 - Largest 50 landholders in Singleton	60
Figure 36 - Incidence of change agricultural and non-agricultural land in Upper Hunter	61
Figure 37 - Upper Hunter land-use map.....	61
Figure 38 - Top 50 Landholders in Upper Hunter.....	62
Figure 39 - Incidence of change agricultural and non-agricultural land in Muswellbrook	63
Figure 40 - Muswellbrook Land-use map	63
Figure 41 - Largest 50 Landholders in Muswellbrook	64
Figure 42 - Incidence of change agricultural and non-agricultural land in Liverpool Plains ...	65
Figure 43 - Liverpool Plains Land Use Map.....	65
Figure 44 - Largest 50 landholders in Liverpool Plains	66
Figure 45 - Incidence of change agricultural and non-agricultural land in Warrumbungle	67
Figure 46 - Warrumbungle land-use map	67
Figure 47 - Largest 50 landholders in Warrumbungle.....	68

Acknowledgements and overview

The Hunter transect report is an output from the Australian Research Council Linkage Project 'The impacts of land ownership change on rural social and economic change' (LP170101125) undertaken by the University of Sydney in partnership with the NSW Department of Primary Industries. Research reported here has the approval of the University of Sydney Human Research Ethics Committee (Protocols 2018/020 and 2019/749).

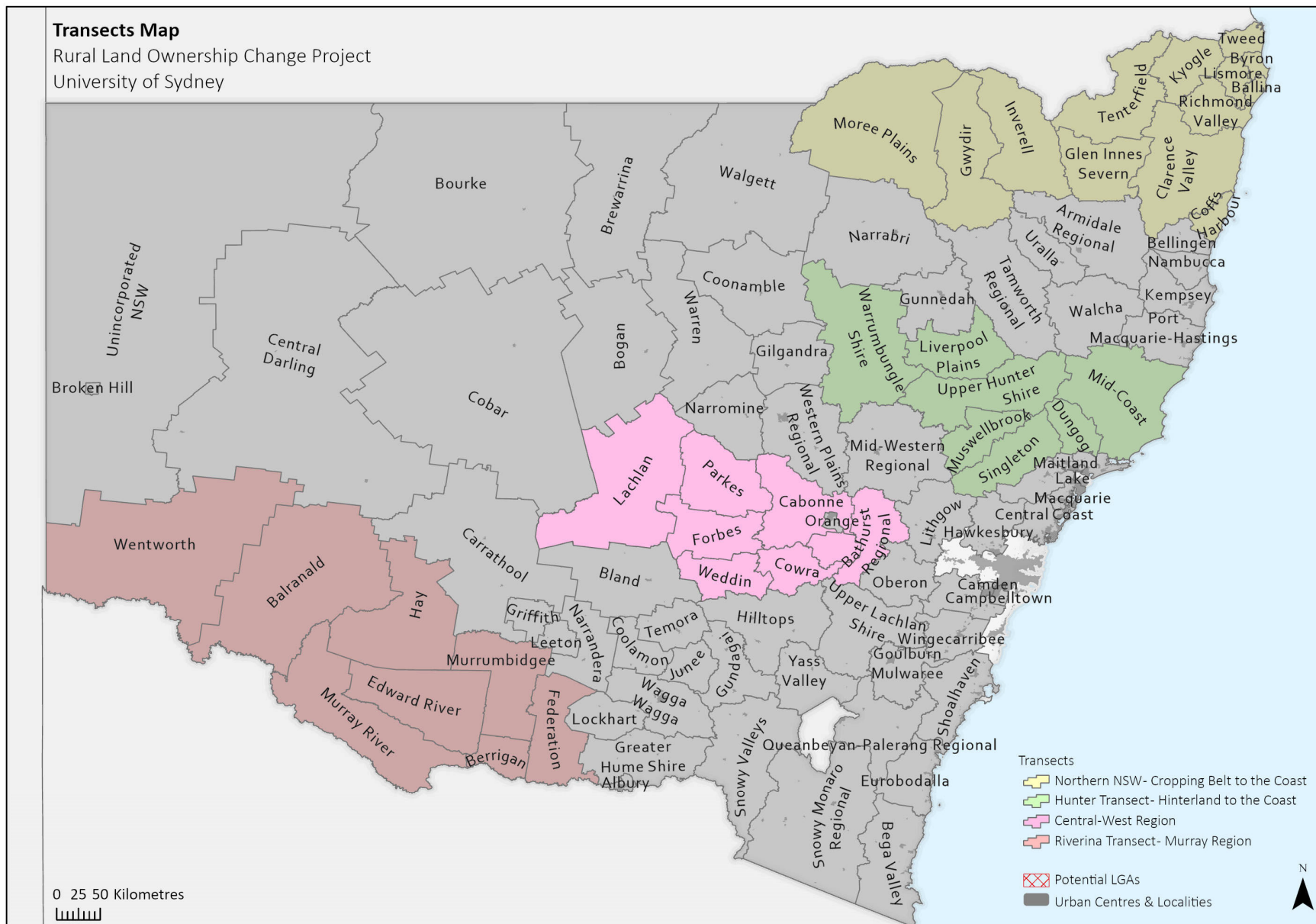
This report is one of four transect reports covering different regions of NSW. The aim of the broader project is to identify and explain key trends in the spatial and temporal patterns of changes in the ownership of land in rural NSW. The core component for achieving this objective is the construction of a unique, research-ready, spatially informed database that records and maps every land transaction in rural NSW over the 16-year period from January 2004 to January 2020. Details of the methodology for generating this dataset are provided in Appendix A of this report.

Preparation of this report has had oversight from the project's Steering Committee in the NSW Department of Primary Industries. We wish to thank members of the Steering Committee, and specifically the project liaisons, Tamara Prentice and Mary Kovac. We also thank and acknowledge Dr Robyn Hean in the NSW Department of Primary Industries, who was our liaison officer in the initiation stages of the project. For more information, please consult the webpage for this research project: <https://rural-land-science.sydney.edu.au/>.

Acknowledgement of Traditional Custodians of Country

We would like to acknowledge all Aboriginal and Torres Strait Islander Traditional Custodians of Country and recognise their continuing connection to land, sea, culture, and community. We pay our respect to Elders, past and present. In particular, we acknowledge and pay respect to all the Traditional Custodians of Country in NSW upon which this research is conducted. As we share our own knowledge, teaching, learning, and research practices within the context of this research project, we also pay our respect to the knowledge embedded forever within the Aboriginal Custodianship of Country.

Figure 1 - Research Project Transects



Summary of findings

The Hunter transect is a diverse area. So much so, that it is difficult to conceptualise it as a unity. It is a region in flux, with pockets of rapidly increasing land values and conversion of traditional agricultural land into rural residential and tourism uses. It also has significant pockets of highly productive agricultural land, with corporate actors playing a key role and areas of established family farming. Yet in some areas of the transect there has been a constant state of ownership change in recent years, as newcomers buy into the region, either to expand their assets or start anew. With major transformations occurring in other sectors, such as biobanking, renewable energy, and changes to the mining sector, the Hunter transect sheds light on the diverse sets of processes that are influencing patterns of land ownership in rural NSW.

The Hunter transect's location is pivotal to explaining this diversity. As a transect encompassing 31,137km² of rural land across seven LGAs – Warrumbungle Shire, Liverpool Plains, Upper Hunter Shire, Dungog, Muswellbrook, Singleton, and MidCoast – it is at a crossroad between high amenity coastal areas to the east, highly productive agricultural land to the north and west, and important peri-urban areas to the south. The economic interests of the Hunter transect are connected strongly to the urban economies of Newcastle and Sydney, and this proximity is the source of much of the opportunities that buyers into the region see in it.

Beef, wine, coal, and thoroughbred horses are some of the key primary industries that come to mind when thinking about the Hunter transect. However, our research has shown that these are only part of the story. As the population of the transect continues to change (growing steadily in some areas and decreasing in others), new economies are created and with them, new pressures on the use of land.

The aim of this report is to provide stakeholders in the public, private, and community sectors with key insights into patterns of rural land ownership in the Hunter transect based on analysis of land titles data from January 2004 to January 2020, supplemented by a series of focus group discussions and interviews with regional decision-makers throughout 2021.

A transect approach was adopted to examine the gradient of social, economic, and environmental patterns influencing rural land ownership change patterns across an east-west stretch from the Hunter hinterland to the coast. Throughout this report, our findings are summarised in text box “Key Insights”. The following discussion synthesises these “Key Insights” to build an overall picture of rural land ownership change in the transect region.

Key messages from this study

1. For most of the study period (2004-15), the rate at which rural land changed ownership in the Hunter transect followed the overall NSW trendline. However, since 2015, the Hunter has experienced significant peaks in the volume of land changing hands, associated with large and high-profile land sales, including large livestock and cropping farms and mining-land changing hands.
2. Patterns of land ownership change within the Hunter transect differ greatly between LGAs in the east, centre, and the west of the transect. Dungog and MidCoast are experiencing steady population growth, with both older people and younger families seeking rural land for residential and lifestyle purposes. Meanwhile, in Muswellbrook, Singleton and Upper Hunter, land transactions are mostly associated with large agribusiness holdings, such as equine farms, grazing estates and land associated with

mining leases. Further west in Liverpool Plains and Warrumbungle, land ownership changes are mostly related to existing farm expansions and farm successions.

3. Concentration of land in Singleton, Muswellbrook, Upper Hunter, and Liverpool Plains is high, driven by large agri-corporate and mining companies acquiring extensive areas of land over the years. In contrast, Dungog and MidCoast have very low rates of land concentration with many transactions being small and medium rural lifestyle holdings.
4. Zoning and planning controls reflect key geographical distinctions across the transect. The east is comprised of high amenity / lower agricultural production areas; the transect's central area is dominated by high amenity / extractive industry areas in the west, highly productive agricultural areas in Liverpool Plains and traditional small-scale grazing farms in Warrumbungle LGA are dominant.

Our analysis paints a picture of a region going through significant change. Key findings and insights are presented in 21 *Insights* located throughout the report. These are also summarised in the remainder of this section to assist readers in building an overall picture of substantive rural land ownership change in the transect region. A discussion and expansion of these is provided in each report section.

Summary of transect-wide insights

Insight 1. The Hunter transect's rate of substantive rural land ownership change was the same as the state-wide rate of change (4.3%) over the 16-year period between Jan 2004 and Jan 2020. Despite its average rate of change, the region has seen higher and more volatile rates of change since 2015, with annual peaks significantly above the state-wide median. The reason for increased volatility in recent years has been an increase in large and high-profile land sales linked to primary industries, including significant livestock and cropping farms and mining-related sales. Notwithstanding, the rate of change in the transect does not go below 3% of the total area of rural land, which indicates constant demand for rural land, as a result of agricultural expansion, farm successions, conversion of land to rural residential purposes and financial diversification, among others.

Insight 2. A significant part of the increasing rates of ownership change since 2015 is comprised of *agricultural* land ownership change, particularly large-scale pastoral sales. However, this is only part of the story. Recent years have also seen an increase in medium and small-scale holdings across the transect, particularly in the west (Warrumbungle and Liverpool Plains), driven by agri-corporate land aggregation and farming family transactions including farm succession sales, and east of the transect (MidCoast and Dungog), driven by demand for agricultural lifestyle blocks.

Insight 3. The Hunter transect experienced a significant increase in the rate of rural landownership change in 2019, the last year of the study period and a year of significant drought (see Figure 4). This trend is contrary to the state rate which flattened in 2018-19. The increase is driven by a significant jump in large acquisitions of agricultural land and large mining-related transactions. In the east of the transect, an increase in small-scale sales (many which are related to conversion of agricultural land to rural residential land) also contributed to this increase.

Insight 4. Despite median rates of change in the Hunter oscillating around the NSW state-average, year-on-year volatility varies greatly between the transect's LGAs. The LGAs in the east and west of the Hunter transect have relatively stable annual rates, while LGAs in the centre of the transect (Singleton, Muswellbrook, and Upper Hunter) are subject to significant

peaks and troughs. This significant volatility is connected to trends in the mining sector, with large tracts of land changing hands some years and no large transactions in other years. Liverpool Plains and Warrumbungle tend to be tightly held areas with relative stable churn rates.

Insight 5. The Hunter transect can be conceived in terms of the following geographical zones:

1. MidCoast and Dungog LGAs have rates of change that reflect the NSW median, with a constant churn rate interrupted by some year-on-year fluctuation. However, large-scale peaks and troughs are minimal, compared to other LGAs in the transect.
2. Singleton and Muswellbrook have lower median rates of change compared to NSW as a whole, indicating these areas are tightly held. However, significant peaks exist as very large-scale transactions associated with mining and grazing take place from time to time.
3. Upper Hunter has the highest median rate of change in the transect, as well as the highest volatility with significant peaks and troughs associated with large-scale transactions.
4. Liverpool Plains and Warrumbungle have average and relatively stable rates of change, indicating that there is a constant rate of rural land changing hands in this area, without major disruptors. There shows a clear regional change between Upper Hunter and Liverpool Plains and Warrumbungle.

Insights into land aggregation, family farms and corporatisation

Insight 6. Concentration of land in the Hunter transect is relatively high, compared to other transects. However, this concentration is not even across the transect. Land concentration is driven by the transect's central LGAs of Singleton, Muswellbrook, Upper Hunter, and Liverpool Plains, where large agri-corporate and mining companies have extensive areas of land. In the east and west of the transect (MidCoast, Dungog and Warrumbungle), land concentration is low and relatively stable.

Insight 7. The proportion of land owned by corporations in the Hunter transect is higher than that of rural NSW generally. Corporate land concentration is growing particularly in Muswellbrook, Upper Hunter and so some extent Liverpool Plains and Singleton. Dungog and Warrumbungle have low levels of corporate land aggregation, with many of the large transactions in these LGAs being done by individuals rather than companies.

Insight 8. In 2020 the median price per hectare in the Hunter transect (\$7,413/ha) was significantly higher than that of NSW (\$5,855). Higher land costs on average are strongly related to the increased corporatisation of large holdings and the steady churn rate of small and medium sized properties. Higher land costs are also a key incentive for older farmers of multigenerational owners to sell out.

Insights into demographic drivers of land ownership change

Insight 9. There is a demographic east-west gradient within the Hunter transect, with higher population growth in the east (MidCoast and Dungog) and lower in the west. This gradient is reflective of differences in land prices and rural land fragmentation patterns between LGAs in the east and west of the transect.

Insight 10. The high rates of population growth in Dungog and MidCoast LGAs are related to patterns of rural land-use change from traditional agriculture to lifestyle, tourism, conservation, and small-scale lifestyle farming. While most of the growth in Dungog occurred in rural areas, most of the growth in MidCoast occurred in urban and peri-urban areas. In

contrast, the rural population of Liverpool Plains and Warrumbungle declined between 2006 and 2020.

Insight 11. The Hunter transect's proportion of people over 60 increased between 2011-16, while the proportion of children, teenagers and 30–49-year-olds decreased. However, Dungog stands out as bucking this trend, with an increase in the proportion of young families, indicative of rural in-migration.

Insight 12. Migration patterns into and out of the Hunter transect are significantly age-influenced. People under 50 show higher rates of mobility within and in/out of the transect than those over 50. Out-migration is higher for younger cohorts, with the greatest proportion of those leaving the transect to significant urban areas being aged 20-24 across the transect. In-migration is significant for both young and old cohorts, with most prevalence for 25-34- and 60–69-year-olds.

Agricultural land-uses and restructuring insights

Insight 13. The Hunter transect has a diverse and profitable agricultural sector centred mainly around animal production. Most agricultural land is dedicated to cattle grazing for beef, although equine uses are significant in Upper Hunter, Muswellbrook, and Singleton. Milk production is also significant in some areas as well as chickens. Cropping and horticulture are not as significant in the Hunter transect, except in Liverpool Plains, which benefits from rich black soils and extensive ground water resources. Viticulture, of course, remains a key industry, generating significant income from agritourism as well.

Insight 14. Our findings suggest that the Hunter is a transect undergoing significant transitions into high value land uses. Rural land in the east and centre of the transect has significantly increased in value in recent years suggesting increased demand and limited supply. Large corporate and government actors play a significant role in rural restructuring as land is invested and subsequently divested years later.

Insight 15. Agriculture as a proportion of total employment is slowly increasing. This reverses a trend between 2006 to 2011, when it lost ground because of growth in mining, in particular.

Insight 16. Despite increasing employment in agriculture in the Hunter transect between 2011 and 2016, the following types of agricultural industries saw an overall decrease in the percentage of people employed: 'Sheep, Beef Cattle and Grain Farming', 'Mushroom and Vegetable Growing', 'Fruit and Tree Nut Growing', 'Other Crop Growing', and 'Dairy Cattle Farming'. Others saw a decrease in the percentage of owner managers of incorporated enterprises, including: 'Other Livestock Farming', 'Aquaculture', 'Forestry Support Services', and 'Agriculture and Fishing Support Services', indicating that processes of corporatisation have been strongest in these industries.

Insight 17. Findings from our data and focus group discussions confirm that in the short and medium term, drought does not lead to more or less ownership change. Owners tend to find other ways to cope with the stresses generated by drought and selling land remains a last resort.

Land-use planning insights

Insight 18. Zoning and planning controls reflect key geographical distinctions across the transect. The east is comprised of high amenity / lower agricultural production areas; in the transect's central area, high amenity / extractive industry areas dominate; in the west, highly productive agricultural areas in Liverpool Plains and traditional small-scale grazing farms in Warrumbungle LGA are dominant.

Insight 19. Minimum Lot Size (MLS) rules vary greatly from east to west. The 'right' size of a lot is contentious topic in the east of the transect, especially closer to urban centres and high-amenity coastal areas. Despite this, consolidation (merging parcels) played a larger role than sub-division (breaking up existing parcels) across the transect, leading to a net reduction in the number of rural parcels between 2004-20.

Insight 20. The ratio of MLS rules to lot sizes varies along the transect, with highest on-paper potential for subdivision and dwellings in Warrumbungle and lowest in the agricultural areas of Liverpool Plains and Upper Hunter Shire. Singleton, Muswellbrook, Dungog and MidCoast have a mix of pockets of more and less subdividable areas. It is important, however, to note that on paper potential for subdivision or a dwelling based solely on MLS roles does not necessarily mean the property can have a dwelling or can be subdivided. Other key matters for consideration, such as slope, vegetation, bushfire risk and service access help define this at a parcel-level.

Insight 21. Rural tourism and growing demand for rural residential uses are key factors influencing planning in the Hunter transect. These are most common east of Great Dividing Range.

1. Introduction

This report presents research findings on the dynamics of rural land ownership change in the NSW Hunter transect. It is one of four transect reports into regions of NSW. Transects provide a basis for comparative assessment of the different drivers of rural land ownership change across the state.

The Hunter transect is defined as the Local Government Areas (LGAs) of Warrumbungle Shire, Liverpool Plains, Upper Hunter Shire, Dungog, Muswellbrook, Singleton, and MidCoast. Ownership histories are considered for 31,137km² of rural land in the seven LGAs and the total transect area.

Table 1 - Transect Overview: area and number of parcels in our sample by LGA, 2004-20

LGA	Sample Area (km ²)	Percentage of region area	No. of Land Parcels ¹
MidCoast	6,058	19.46%	22,332
Dungog	1,396	4.48%	4,841
Singleton	2,501	8.03%	7,669
Upper Hunter Shire	6,011	19.31%	10,535
Muswellbrook	1,536	4.93%	4,524
Liverpool Plains	4,141	13.30%	5,995
Warrumbungle Shire	9,496	30.50%	8,804
Grand Total	31,137	100.00%	64,700

Note: LGAs are presented in order from east to west.

The Hunter transect includes more non-agricultural land-uses than other transects explored as part of this research project. Approximately 76% of the transect sample land is used for agriculture, while 23% includes non-agricultural uses such as mining, residential, and tourism uses.

Table 2 - Proportion of agricultural and non-agricultural land in the Hunter transect

Sample	Percentage of total
Agricultural	76.74%
Non-agricultural	23.26%
Total	100.00%

1.1 Measuring substantive change

Substantive land ownership change in the Hunter transect was analysed for the 16-year period between 01/01/2004 and 01/01/2020. This was done by measuring the annual proportion at which rural land changes hands (this is referred to as the substantive ‘churn rate’) but excluding instances in which the previous owner and new owner in a land-title registration are more than 70% similar. A fuzzy logic methodology was used for this purpose. Details of our data and methodology are provided in **Appendix A**.

Since our methodology relies on land title registrations, a transaction is defined as an instance in which the name of the owner on title changes in a given year. However, a name change on title not always represents a transaction. For example, an ‘on-paper’ name change occurs when a spelling error is corrected, when one of several owners is removed or added to the land title, or when a company updates its name (for example to add or remove Ltd.). This is why applying a substantive change threshold (<70% similarity) is beneficial. This approach allows us to exclude ‘on-paper’ land-registration name changes, not associated with

¹ This is the number of parcels in the LGA’s sample on 1 January 2020.

conventional land sales/transfers, and allows us to present an accurate representation of substantive churn rates in the transect or LGA. The threshold of 70% was chosen as it was found that it is the point in which most on-paper name changes cease to be name corrections and amendments, and start being conventional transactions. As such, the formula for the substantive churn rate is as follows:

$$\text{Substantive churn rate} = (\text{Land area in the sample that changed hands in a particular year excluding on-paper names changes with over a 70\% similarity}) / (\text{Total sample area}) \times 100$$

This methodology also allowed us to identify the largest landowners in each LGA of the region and the change in area of land owned by the largest landowners at the start and end of the 16-year period. Because of privacy provisions we cannot name individual landowners, however, we can use this information to establish whether an acquirer of land is a new entrant to the LGA, or an aggregator (a landowner already in the LGA increasing the size of their holding).

Year-on-year rates of land ownership change reflect the combined effect of multitude forces exerting influence over how and when land parcels transfer from one owner to another. These forces include the state of the agricultural economy, demand for rural land for amenity and lifestyle reasons, the effects of drought, changes to planning regimes, and actions by government such as the acquisition or protection of land for conservation purposes. Because these forces operate at different strengths and are responsive to different time periods, nuanced consideration of data from several angles assists the identification of relevant insights.

Examining trends in these data over time and space generates insights into rural land ownership that have not been possible to present in any previous analysis. Large-scale land titles data has been a mostly untapped resource for researchers and policymakers. Their development has been driven mainly by desires to facilitate the extraction of point-in-time single records for 'over-the-counter' enquiries about land titles, rather than for the extraction of state-wide records over a multi-year period.

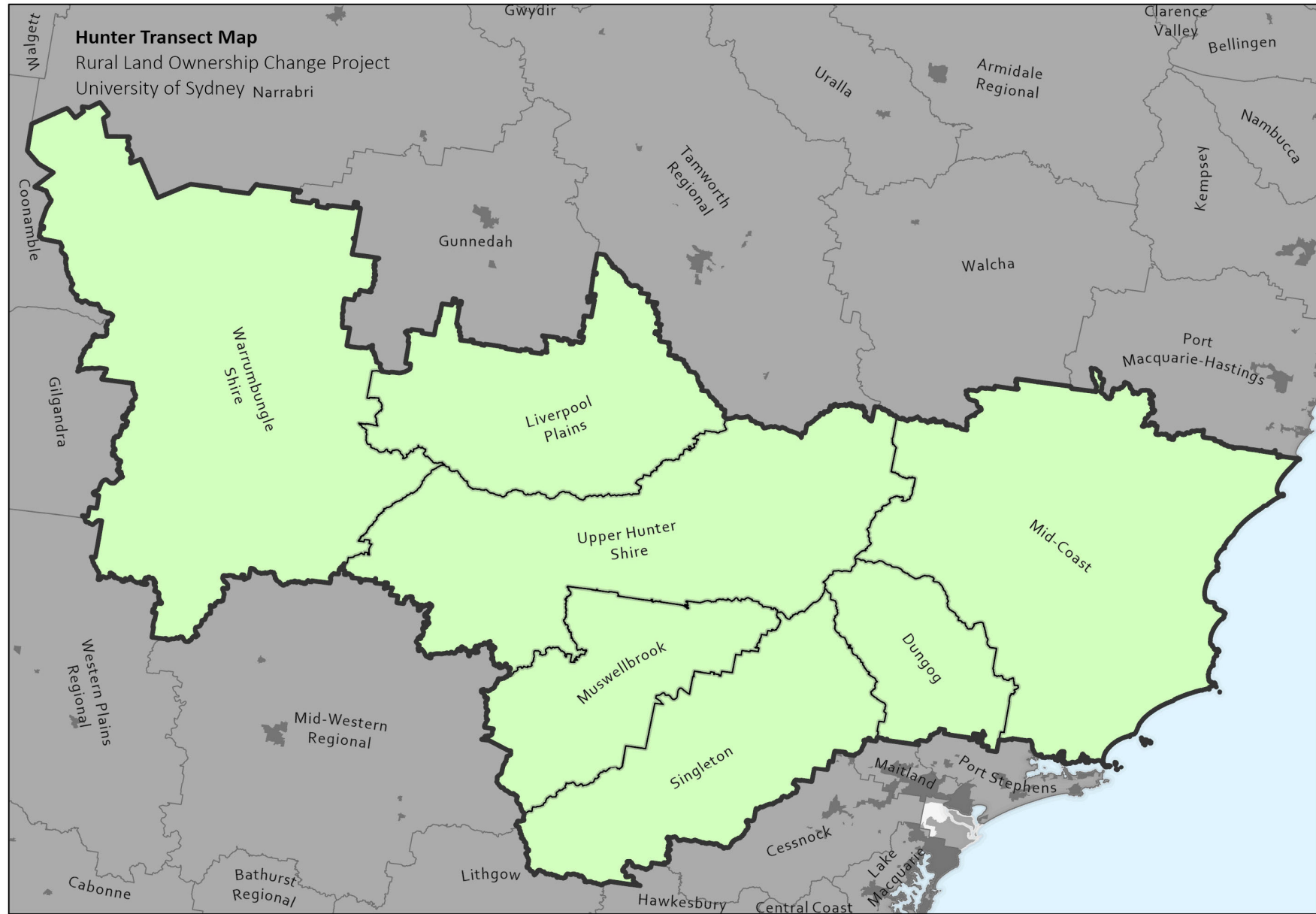
Applying these data to longitudinal regional analysis is a major innovation of this project. Once data was generated, we presented these to regional stakeholders in a series of in-depth interviews and focus groups with stakeholders in MidCoast LGA, Dungog LGA, Upper Hunter LGA, Liverpool Plains LGA, and Warrumbungle LGA during January and November 2021. Feedback from these meetings is incorporated into this report. Stakeholders in Singleton and Muswellbrook LGAs did not participate in the study, despite offers by the research team. As such, no stakeholder interview data from these two LGAs was used in this report.

1.2 Report sections

The next section of the report introduces key findings on rural land ownership in the transect. Then, three sections address how the use of our land titles database sheds light on four pressing issues at the forefront of agricultural policy in the Hunter transect:

- What demographic trends, including population growth driven by amenity and lifestyle migration, impact on patterns of rural land ownership (Section 3),
- How agricultural restructuring translates into greater consolidation or fragmentation of rural land, including a discussion of how drought cycles influence rates of substantive rural land ownership change (Section 4),
- How planning instruments shape patterns of rural land ownership (Section 5).

Figure 2 - Hunter transect



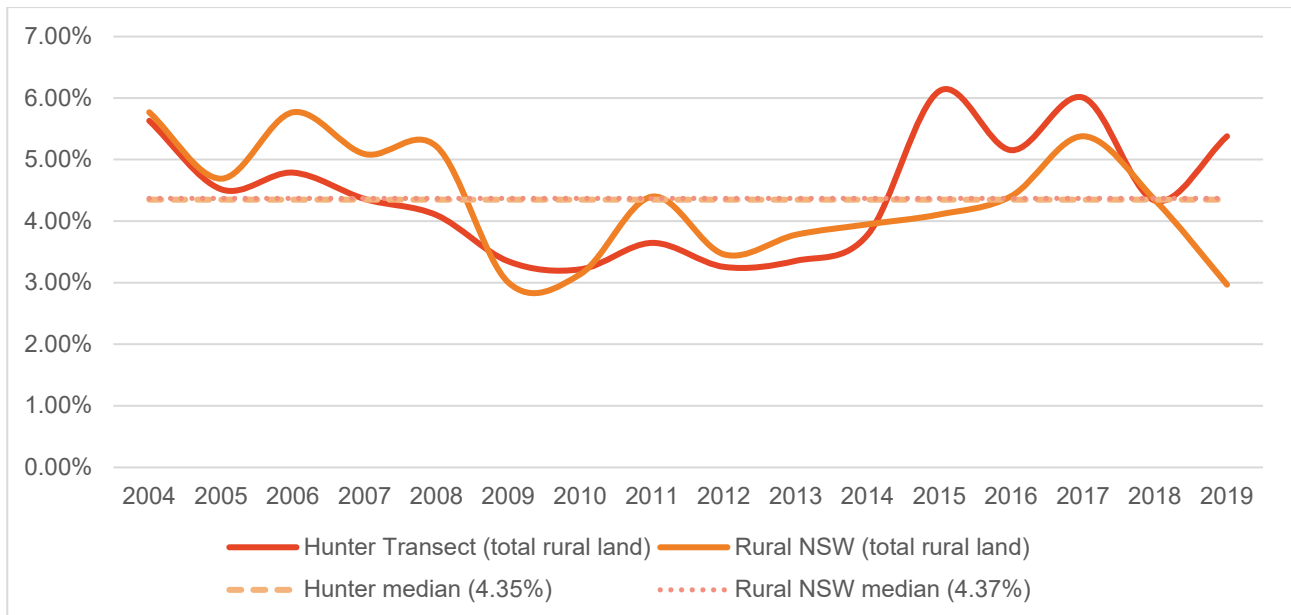
2. Rural land ownership trends in the Hunter transect

The Hunter transect is a significantly diverse area of NSW. The west-east line connecting Warrumbungle Shire to the MidCoast includes large areas of cropping and grazing farms, established mining regions, significant pockets of agritourism, winegrowing and equestrian land, and a growing demand for rural and peri-urban residential land, all within a 350km radius. This diversity explains why the seven LGAs that make up the transect are part of different planning regions. Most are located in the Hunter Region (Dungog, MidCoast, Muswellbrook, Singleton, and Upper Hunter) but Liverpool Plains is part of the New England North West Region and Warrumbungle is part of the Central West and Orana Region. These two LGAs have been included in this study as an extension of the Hunter, providing depth of comparison with the other LGAs that form part of the transect.

2.1 The transect in context

Insight 1. The Hunter transect’s rate of substantive rural land ownership change was the same as the state-wide rate of change (4.3%) over the 16-year period between Jan 2004 and Jan 2020. Despite its average rate of change, the region has seen higher and more volatile rates of change since 2015, with annual peaks significantly above the state-wide median. The reason for increased volatility in recent years has been an increase in large and high-profile land sales linked to primary industries, including large livestock and cropping farms and mining-related sales. Notwithstanding, the rate of change in the transect does not go below 3% of the total area of rural land, which indicates constant demand for rural land, as a result of agricultural expansion, farm successions, conversion of land to rural residential purposes and financial diversification, among others.

Figure 3 - Rate of substantive rural land ownership change, transect and NSW²



² This is measured as a percentage of total area. In this and all subsequent analysis presented in this report, the rate of land ownership change is calculated as ‘substantive change.’ This means that transactions in which former and subsequent owners have a similarity score of over 70% are not counted as being a change of ownership. For more information, see Appendix A.

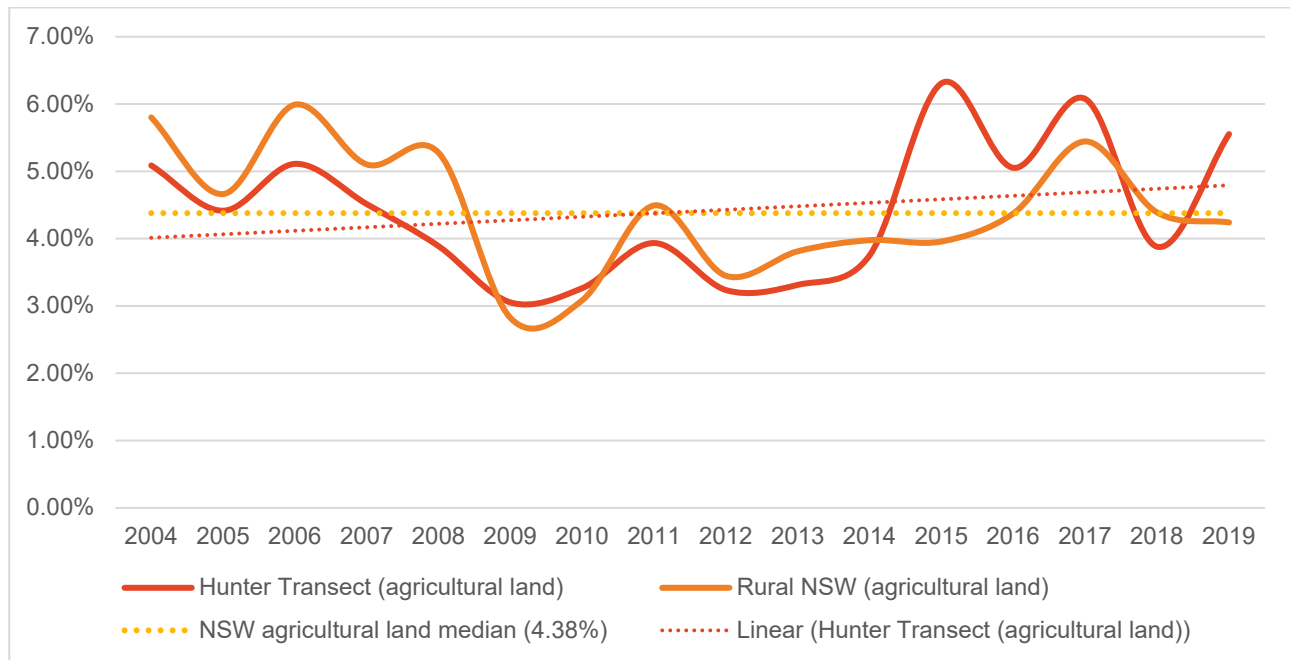
As shown in Figure 3, the Hunter transect's median rate of change is 4.35%, which is virtually the same as the media rate of change of 4.37% for rural NSW. This finding paints a picture of a region undergoing significant changes in recent years, influenced by its proximity to major economic and agricultural export centres, including the Port of Newcastle and Sydney.

Insight 2. A significant part of the increasing rates of ownership change since 2015 is comprised of agricultural land ownership change, particularly large-scale pastoral sales. However, this is only part of the story. Recent years have also seen an increase in medium and small-scale holdings across the transect, particularly in the west (Warrumbungle and Liverpool Plains), driven by agri-corporate land aggregation and farming family transactions including farm succession sales, and east of the transect (MidCoast and Dungog), driven by demand for agricultural lifestyle blocks.

The upward linear trend shown in Figure 4 indicates an increase in the volume of agricultural land changing hands in the transect throughout the study period. The impact of large-scale pastoral transactions (company-to-company) on the trend is significant. However, an increase in medium and small-scale farm transactions has also contributed to an upward trend. Due to data privacy commitments, it is not possible to outline the exact details of these transactions. However, the following is a list of some of the key large-and-medium-scale agricultural transactions across the transect since 2015 (note these do not include mining-related transactions which are significant drivers of change, especially in Muswellbrook and Singleton):

- 2015 – consolidation of large cattle holding in MidCoast LGA by large Australian agribusiness with exports mainly directed to China.
- 2016 – purchase of very large pastoral holding by Chinese owned farming operation from established Australian pastoral company in MidCoast LGA. Consolidation of large cattle holding by large Australian agribusiness with exports mainly directed to China in Upper Hunter LGA. Several medium-scale pastoral and cropping holdings also changed hands this year in Warrumbungle Shire and Liverpool Plains (both company-to-company and individual-to-individual).
- 2017 – large purchase of pastoral land by Chinese company from local pastoral company in Warrumbungle Shire. Several medium-scale transactions of cattle, sheep, and cropping farm holdings in Liverpool Plains and Upper Hunter (most of these were individual-to-company and individual-to-individual transactions).
- 2018 – large purchase of grazing land in MidCoast by an investment company. Several medium-scale transactions of cattle, sheep, and cropping farm holdings in Liverpool Plains and Warrumbungle.
- 2019 – several individual-to-company sales of grazing and cropping land across the transect this year, leading to rates of ownership change being significantly higher in the transect in 2019 compared to the state median.

Figure 4 - Agricultural land churn rate in the Hunter transect and Rural NSW

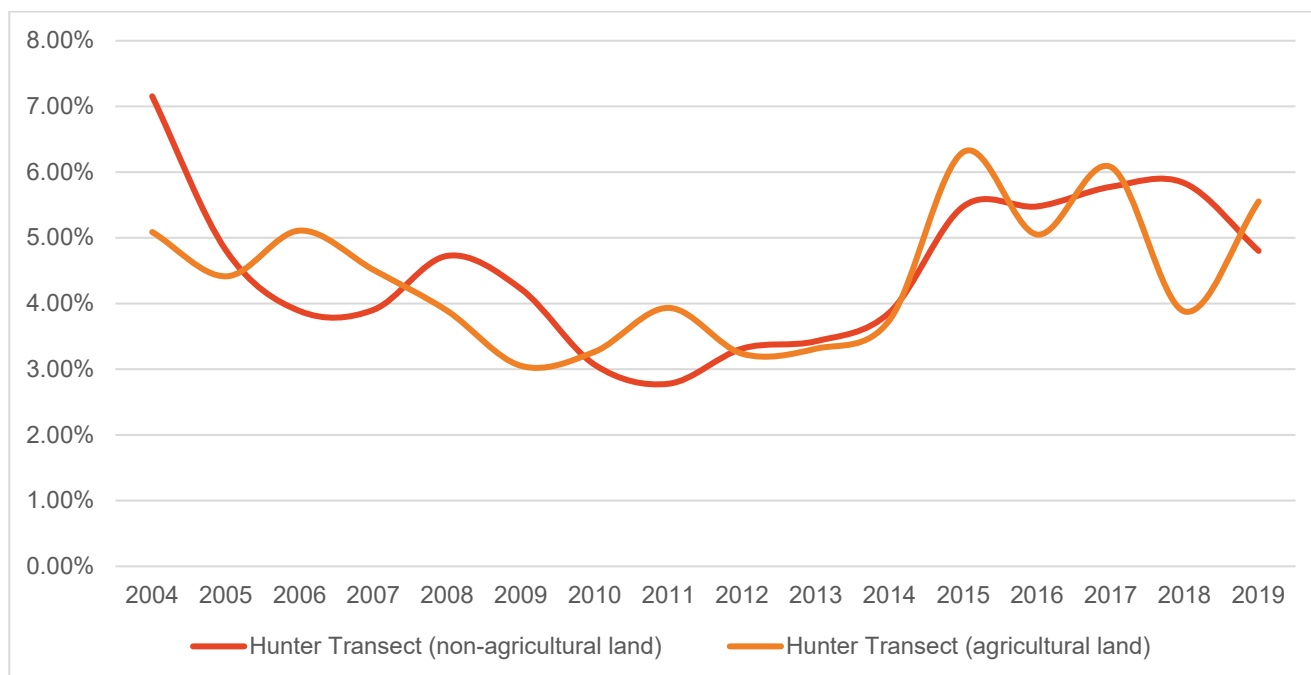


Insight 3. The Hunter transect experienced a significant increase in the rate of rural landownership change in 2019, the last year of the study period and a year of significant drought (see Figure 4). This trend is contrary to the state rate which flattened in 2018-19. The increase is driven by a significant jump in large acquisitions of agricultural land and large mining-related transactions. In the east of the transect, an increase in small-scale sales (many which are related to conversation of agricultural land to rural residential land) also contributed to this increase.

As shown in Figure 4, in 2019 the volume of rural land changing hands in the Hunter transect was significantly higher than the state-wide trend. This year, which is the last of the study period, the rate of agricultural land changing hands sharply increased from a dip in 2018, in comparison with non-agricultural land which took a small dip. Considering the 2018-19 period was one of significant drought across the entire state, this sharp increase in agricultural land ownership change is an indication that non-climatic drivers are playing a significant role in land markets, including low interest rates, increasing commodity prices, and the outlook of domestic and international food and fibre markets.

All in all, this sharp increase in 2019, the year before COVID-19 took over as a major disruptor, sparks a series of questions about rates of rural land ownership change in 2020, 2021, and beyond. At the time of writing this report, the COVID-19 pandemic was met with the drought breaking across NSW in 2020 and changing into large rainfall events in 2021, interest rates at record lows, and commodity prices at record highs. The mix of these major drivers would have had significant effects on the rates of rural landownership change in the Hunter transect. Future research should explore these trends in more detail.

Figure 5 - Rate of agricultural and non-agricultural land ownership change in the Hunter



2.2 Rates of ownership change by LGA

Insight 4. Despite median rates of change in the Hunter oscillating around the NSW state-average, year-on-year volatility varies greatly between LGAs. The LGAs in the east and west of the Hunter transect have relatively stable annual rates, while LGAs in the centre of the transect (Singleton, Muswellbrook, and Upper Hunter) are subject to significant peaks and troughs. This significant volatility is connected to trends in the mining sector, with large tracts of land changing hands some years and no large transactions in other years. Liverpool Plains and Warrumbungle tend to be tightly held areas with relative stable churn rates.

Annual rates of substantive rural land ownership change reflect the combined effect of multitude forces exerting influence over how and when land parcels transfer from one owner to another. These forces include the state of the agricultural economy, demand for rural land for amenity and lifestyle reasons, the effects of drought, changes to planning regimes, and actions by government such as the acquisition or protection of land for conservation purposes. Because these forces operate at different strengths and are responsive to different time periods, there need to be a nuanced consideration of data from several angles to assists the identification of relevant insights.

To compare LGAs within the transect, year-on-year rates of rural land ownership for each LGA through the following angles:

- the rate of change in relation to the transect average,
- year-on-year variability,
- whether volatility increased over time during the study period.

Taken together, these three ways of looking at the data on land ownership change provide a geographical framework for understanding the transect region in terms of four distinct sub-areas.

Table 3 - Median Rate of Change Summary by LGA compared to All NSW (total sample)³

LGA	Median rate of change	Distance from NSW median	Highest annual rate of change	Lowest annual rate of change	Distance between highest and lowest rate of change	Standard deviation
MidCoast	4.37%	0.00%	8.18%	2.59%	5.59%	1.63%
Dungog	4.49%	0.12%	6.92%	2.08%	4.84%	1.60%
Singleton	3.41%	-0.96%	6.93%	1.42%	5.52%	1.70%
Muswellbrook	3.69%	-0.68%	10.57%	2.13%	8.43%	2.43%
Upper Hunter Shire	4.74%	0.37%	9.66%	1.48%	8.18%	2.00%
Liverpool Plains	4.20%	-0.17%	6.74%	2.06%	4.69%	1.38%
Warrumbungle Shire	4.37%	0.00%	6.24%	3.21%	3.03%	0.84%
All NSW (sample)	4.37%	-	5.77%	2.97%	2.80%	0.93%

As shown in Table 3, median annual rates of substantive rural land ownership change among three of the seven transect LGAs were lower than those the state as a whole.

Reading this table in conjunction with data in **Appendix B** and insights from our key stakeholder meetings allows a fourfold classification of sub-areas across the transect to be proposed. LGAs in Table 3 are ordered from east-west, consistent with other tables and figures in this report. The LGAs are colour-coded according to the four regions identified in this report to assist with the analysis of processes and trends affecting land ownership change patterns. An analysis of each of the four regions is presented below.

Insight 5. The Hunter transect can be conceived in terms of the following geographical zones:

1. MidCoast and Dungog LGAs have rates of change that reflect the NSW median, with a constant churn rate interrupted by some year-on-year fluctuation. However, large-scale peaks and troughs are minimal, compared to other LGAs in the transect.
2. Singleton and Muswellbrook have lower median rates of change compared to NSW as a whole, indicating these areas are tightly held. However, significant peaks exist as very large-scale transactions associated with mining and grazing take place from time to time.
3. Upper Hunter has the highest median rate of change in the transect, as well as the highest volatility with significant peaks and troughs associated with large-scale transactions.
4. There is a clear regional change between Upper Hunter and Liverpool Plains and Warrumbungle. These two LGAs have average and relatively stable rates of change, indicating that there is a constant rate of rural land changing hands in this area, without major disruptors.

MidCoast

MidCoast is the most urbanised LGA in the transect. According to stakeholders it can be conceptualised as being made out of two regions. Its coastal areas are high amenity, residential and rural residential, while its western areas are still highly productive agricultural land, with medium and large cattle stations, horticultural production, and some intensive agricultural uses. The western part of the LGA is less significantly impacted by conversion of agriculture to lifestyle farming and rural residential uses, compared to the eastern part of

³ Ordered from east to west. In this and all subsequent analysis, the rate of land ownership change is calculated as the area of land with a change in owner from one year to the next, divided by the total area of land covered in our study. For more information, see Appendix A.

the LGA. According to stakeholders in the LGA, there are several multi-generational farms in the western area of the LGA. One family is particularly established and owns a large breeding establishment.

The difference between the two parts of the LGA are reflected in differences in churn rates. To the east of the LGA, there are more small-scale transactions, while to the west and north of the LGA there are less but larger transactions. A particular large-scale farm to the north of the LGA changed hands twice in the study period leading to two major spikes in the agricultural area changing hands in this LGA. Some corporate to private transactions around Gloucester (including land owned previously by a coal mine being transferred to individuals) have also contributed to the increase in transactions in some of the study period years. However, both the data and insights from stakeholders confirm that family-to-family farm transactions are still the most common mode of ownership change in the western parts of the LGA, including 'across-the-fence' sales (private transactions between willing neighbours) often associated with retirement. Despite this, large-scale aggregation is minimal in the LGA, with many buyers coming from outside the LGA.

Dungog

Dungog has been experiencing a change from traditional agriculture to rural lifestyle uses for decades, which is reflected in the increasing ownership fragmentation, high land prices, and almost no annual churn peaks, as it very difficult for large buyers to consolidate land in this LGA. As reported by stakeholders, lifestyle change is a key driver in Dungog, especially because of the proximity to major centres (3 hours from Sydney).

Many land buyers in Dungog in the past 15 years seem to be buying land for lifestyle agriculture, many with significant financial capacity to invest in the land. A strong narrative from stakeholders was that farmers with large holdings west of the Great Dividing Range were cashing in from high property prices and downsizing to rural lifestyle farming in and around Dungog. The area has limited irrigation but drought has not been as strong here as it has been in western parts of the transect, meaning it has been an attractive location for lifestyle farms and alternative uses of land, such as carbon farming.

Singleton

Singleton has low average rates of annual rural land churn but some significant peaks in later years. It has significantly higher land values compared to the other LGAs in the transect, partly related to the significant amount of land dedicated to extractive industries, as well as its proximity to significant urban areas (i.e. Newcastle and Sydney) which make it an attractive location for rural residential uses.

Muswellbrook

Muswellbrook has lower median rates of change compared to NSW as a whole. However, significant peaks exist as very large-scale transactions associated with mining and grazing take place from time to time. Like Singleton, its churn rates are related to the significant amount of land dedicated to extractive industries, as well as its proximity to significant urban areas (i.e. Newcastle and Sydney).

Upper Hunter

Upper Hunter has the highest median rate of change in the transect, as well as the highest volatility with significant peaks and troughs associated with large-scale transactions. It is a high-amenity area, with a mix of horse farming, grazing and some mining and rural residential activities. Its location at the cross-roads between the higher-amenity part of the transect and more traditional agricultural areas to the west make it a very interesting melting-pot of activity, reflected in its high churn patterns and significant peaks.

Liverpool Plains

Liverpool Plains a tightly held area with a high rate of family and multigenerational farming but also home to large corporate farming. This mix results in average and relatively stable rates of change, indicating that there is a constant rate of rural land changing hands in this area, without major disruptors. According to stakeholders it is rare for big farms to come up for sale in Liverpool Plains, but the data shows that there is a

constant rate of medium-size transactions, including across-the-fence deals leading to piecemeal aggregation by existing family owners.

Warrumbungle

Warrumbungle has the lowest land prices of the transect, connected to lower quality soil and its location at the westernmost extreme of the transect. According to stakeholders the area is generally tightly held. The data confirms that land concentration and corporation is relatively lower than other areas and the prevalence of multigenerational farming is high. Since the land is tightly held there is a low and stable churn rate, as with Liverpool Plains. Many family farming operations are supplemented with non-farm income.

Figure 6 - Rate of substantive rural land ownership change in MidCoast LGA

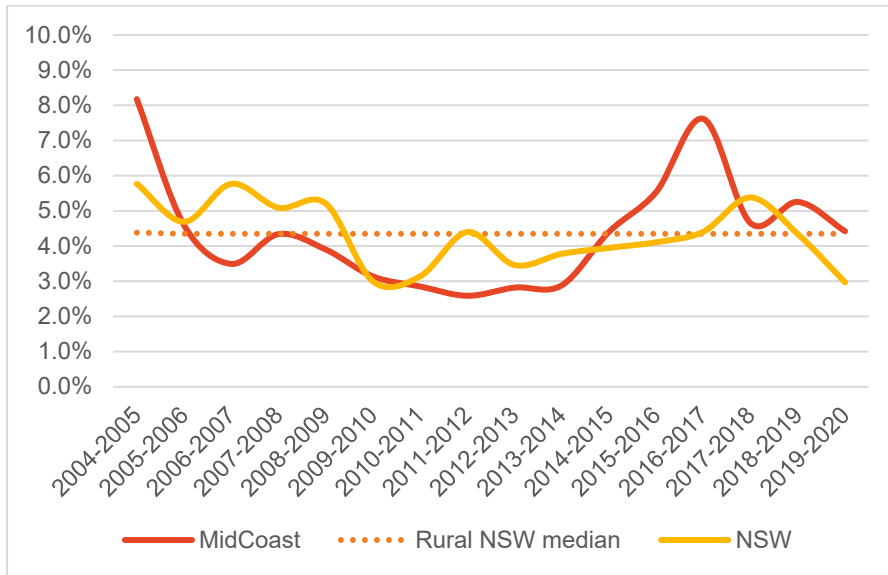


Figure 8 - Rate of substantive rural land ownership change in Singleton LGA

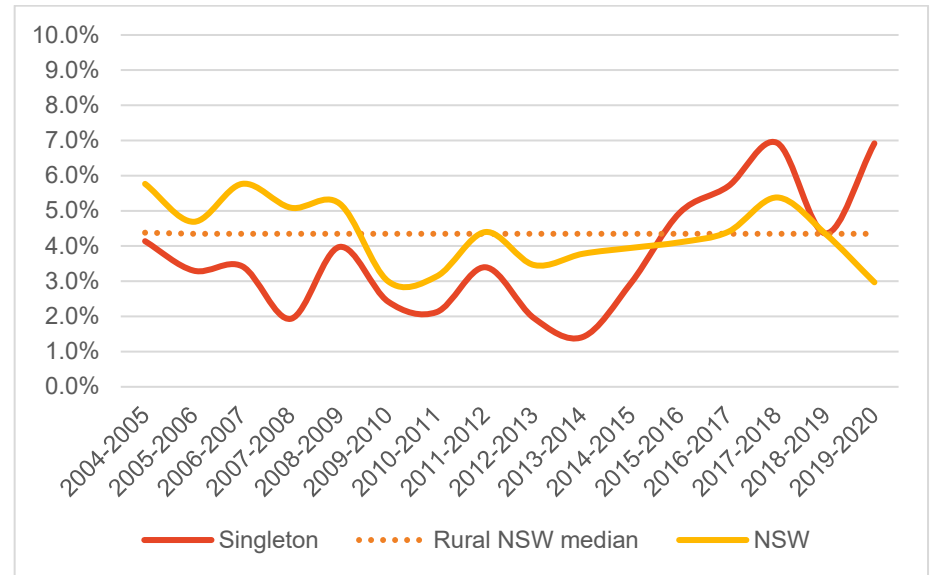


Figure 7 - Rate of substantive rural land ownership change in Dungog LGA

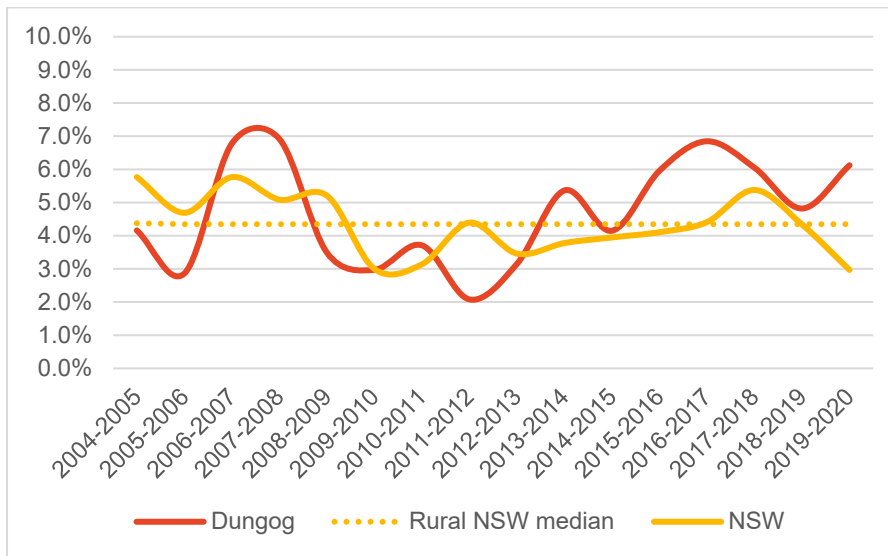


Figure 9 - Rate of substantive rural land ownership change in Muswellbrook LGA

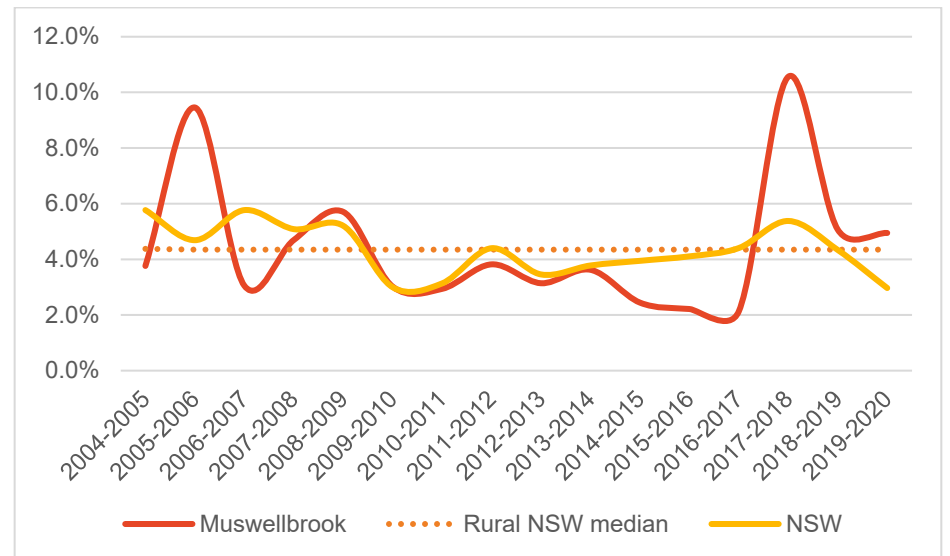


Figure 10 - Rate of substantive rural land ownership change in Upper Hunter LGA

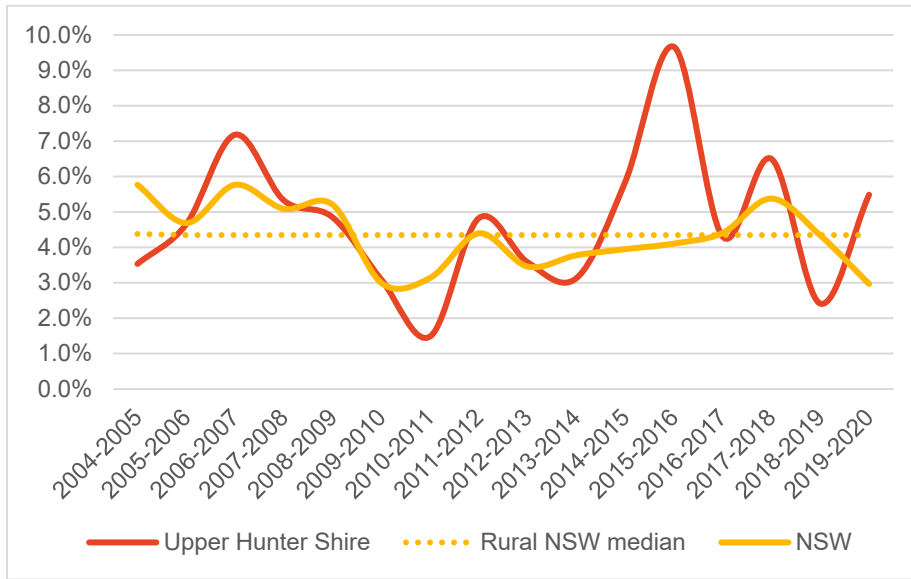


Figure 12 - Rate of substantive rural land ownership change in Warrumbungle LGA

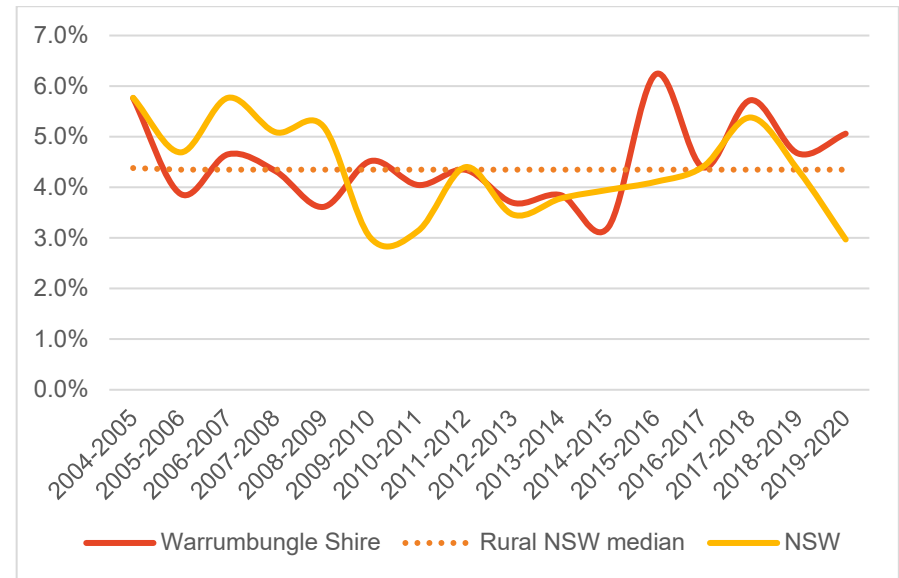
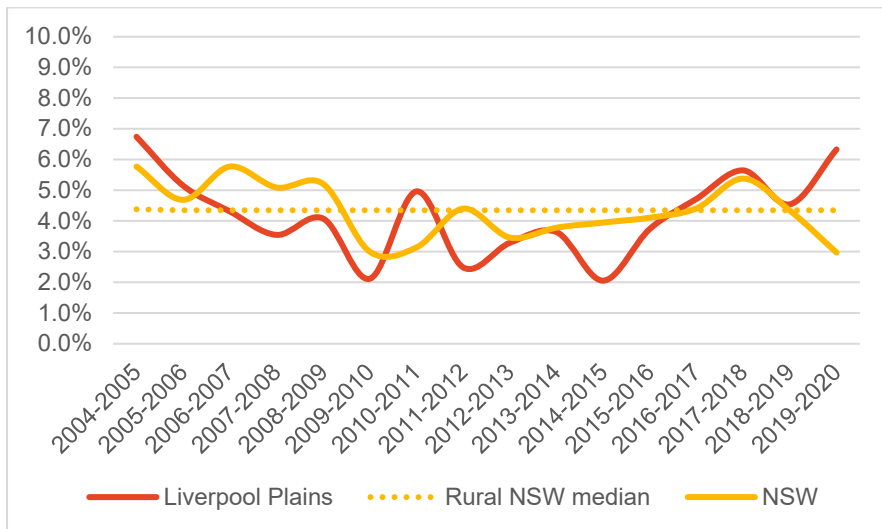


Figure 11 - Rate of substantive rural land ownership change in Liverpool Plains



2.2 Trends in land concentration and aggregation

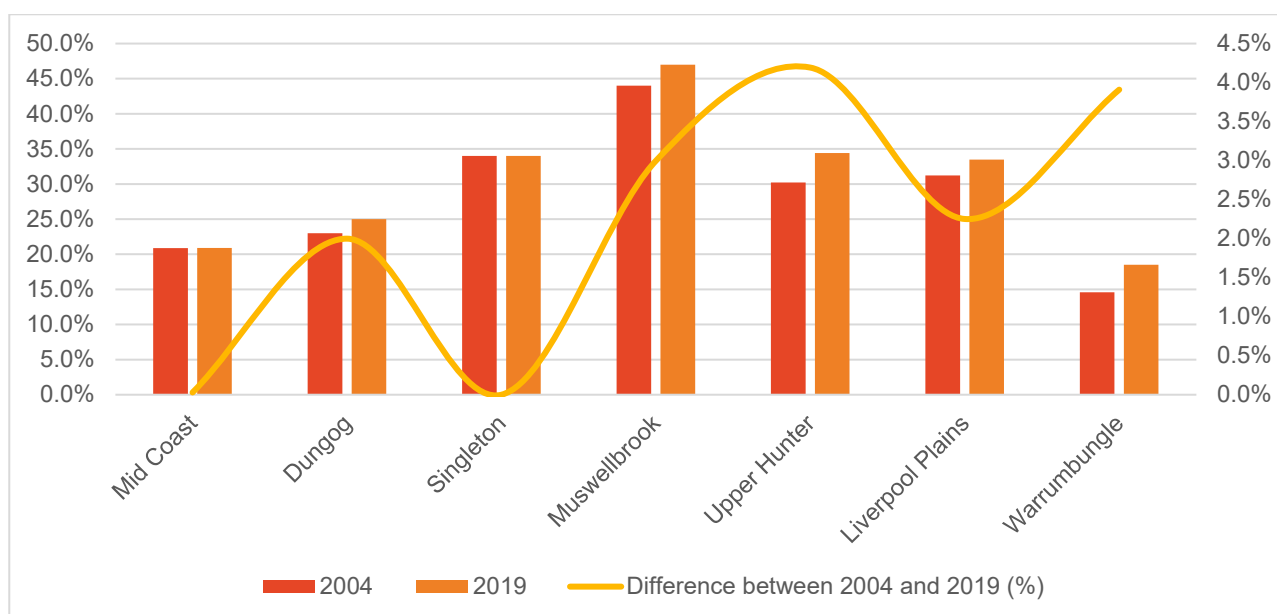
Insight 6. Concentration of land in the Hunter transect is relatively high, compared to other transects. However, this concentration is not even across the transect. Land concentration is driven by the transect’s central LGAs of Singleton, Muswellbrook, Upper Hunter, and Liverpool Plains, where large agri-corporate and mining companies have extensive areas of land. In the east and west of the transect (MidCoast, Dungog and Warrumbungle), land concentration is low and relatively stable.

Concentration of land in the Hunter transect is relatively high, compared to other areas of NSW, with the top 50 landowners in four of the seven LGAs together owning 33.75% of the rural land area in 2019. In contrast, the median land concentration for top 50 landowners in the Central West transect was 23% in 2019, 10% lower than the Hunter.

Table 4 - Ownership trends for top 50 landowners by LGA

LGA	2004	2019	Difference between 2004 and 2019 (%)	Number of corporate landowners in top 50		Difference
				2004	2019	
MidCoast	20.9%	20.9%	0.0%	22	24	2
Dungog	23.0%	25.0%	2.0%	13	16	3
Singleton	34.0%	34.0%	0.0%	29	31	2
Upper Hunter	30.2%	34.4%	4.2%	26	32	6
Muswellbrook	44.0%	47.0%	3.0%	34	31	-3
Liverpool Plains	31.2%	33.5%	2.3%	25	22	-3
Warrumbungle	14.6%	18.5%	3.9%	13	13	0
Median	30.70%	33.75%	2.65%	26	27	1

Figure 13 - Percentage occupied by top 50 landowners (2004-19) (East to West)



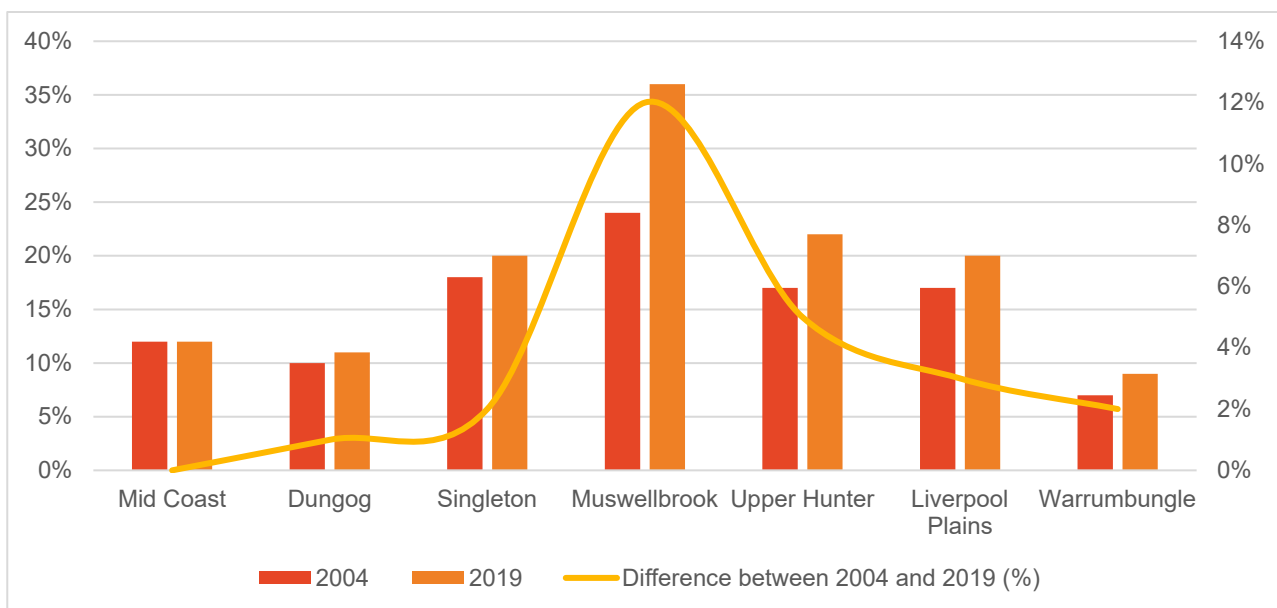
Insight 7. The proportion of land owned by corporations in the Hunter transect is higher than that of rural NSW generally. Corporate land concentration is growing particularly in Muswellbrook, Upper Hunter and so some extent Liverpool Plains and Singleton. Dungog and Warrumbungle have low levels of corporate land aggregation, with many of the large transactions in these LGAs being done by individuals rather than companies.

High concentration of land in the Hunter transect is accompanied by high levels of corporate ownership among the largest landholders. Corporate entities comprised 89% of the top 15 landholders in each of the transect’s LGAs in 2019, up from 77% in 2004. Apart from Dungog and Warrumbungle, where only a third of the largest landowners are corporates, the largest landowners in the Hunter LGAs are mostly corporate owners.

Table 5 - Ownership trends for top 15 landowners by LGA

LGA	% Of study area occupied by top 15 landowners		Difference	Number of corporate landowners in group of top 15 landowners		Difference	% Of study area occupied by top 15 landowners that is corporate owned		Difference
	2004	2019		2004	2019		2004	2019	
MidCoast	12%	12%	0	11	11	0	82%	85%	+3%
Dungog	10%	11%	+1%	4	6	+2	30%	42%	+12%
Singleton	18%	20%	+2%	10	12	+2	76%	87%	+11%
Upper Hunter	17%	22%	+5%	12	13	+1	88%	91%	+1%
Muswellbrook	24%	36%	+12%	14	13	-1	95%	94%	-1%
Liverpool Plains	17%	20%	+3%	13	10	-3	77%	94%	+17%
Warrumbungle	7%	9%	+2%	6	8	+2	49%	58%	+9%
Median	17%	20%	3%	11	11	2	77%	89%	10%

Figure 14 - Percentage occupied by top 15 landowners (2004-19) (East to West)



Insight 8. In 2020 the median price per hectare in the Hunter transect (\$8,971/ha) was significantly higher than that of NSW (\$5,855). Higher land costs on average are strongly related to the increased corporatisation of large holdings and the steady churn rate of small and medium sized properties. Higher land costs are also a key incentive for older farmers of multigenerational owners to sell out.

In 2020 the median price per hectare in the Hunter transect was \$8,971/ha, which is significantly above the NSW median of \$5,855. This high median price per hectare is mainly driven by the high cost of land in Singleton, Dungog, Muswellbrook, and MidCoast, relative to the other LGAs in the transect. In Singleton, in particular, the price of land is more than double that of the median for NSW and it has increased by over 20% in the five years to 2020.

According to the Rural Bank (2021) report, there were several high value transactions recorded for Dungog and MidCoast in the 2019-20 period. This aligns with the findings in our data and stakeholder observations, which suggest that conversion of agricultural land into large-lot rural residential uses, despite zoning objectives, is driving land prices up in these areas. This is not to deny that large agricultural transactions in these areas continue to occur from time to time, as has been the case with land around Cooplacurripa Station. However, the driver of high amenity land in the eastern portion of the Hunter transect is clearly reflected in the median land prices.

Table 6 - Farmlands Sales by Municipality (adapted from Rural Bank 2021)

LGA	2020 Median \$/ha	5yr CAGR	LGA	2020 Median \$/ha	5yr CAGR
MidCoast	\$8,971	4.6%	Upper Hunter	\$3,927	8.8%
Dungog	\$10,701	6.1%	Liverpool Plains	\$5,504	8.0%
Singleton	\$13,413	20.3%	Warrumbungle	\$2,138	6.1%
Muswellbrook	\$10,620	7.8%	NSW	\$5,855	12.2%

CAGR: Compound Annual Growth Rate

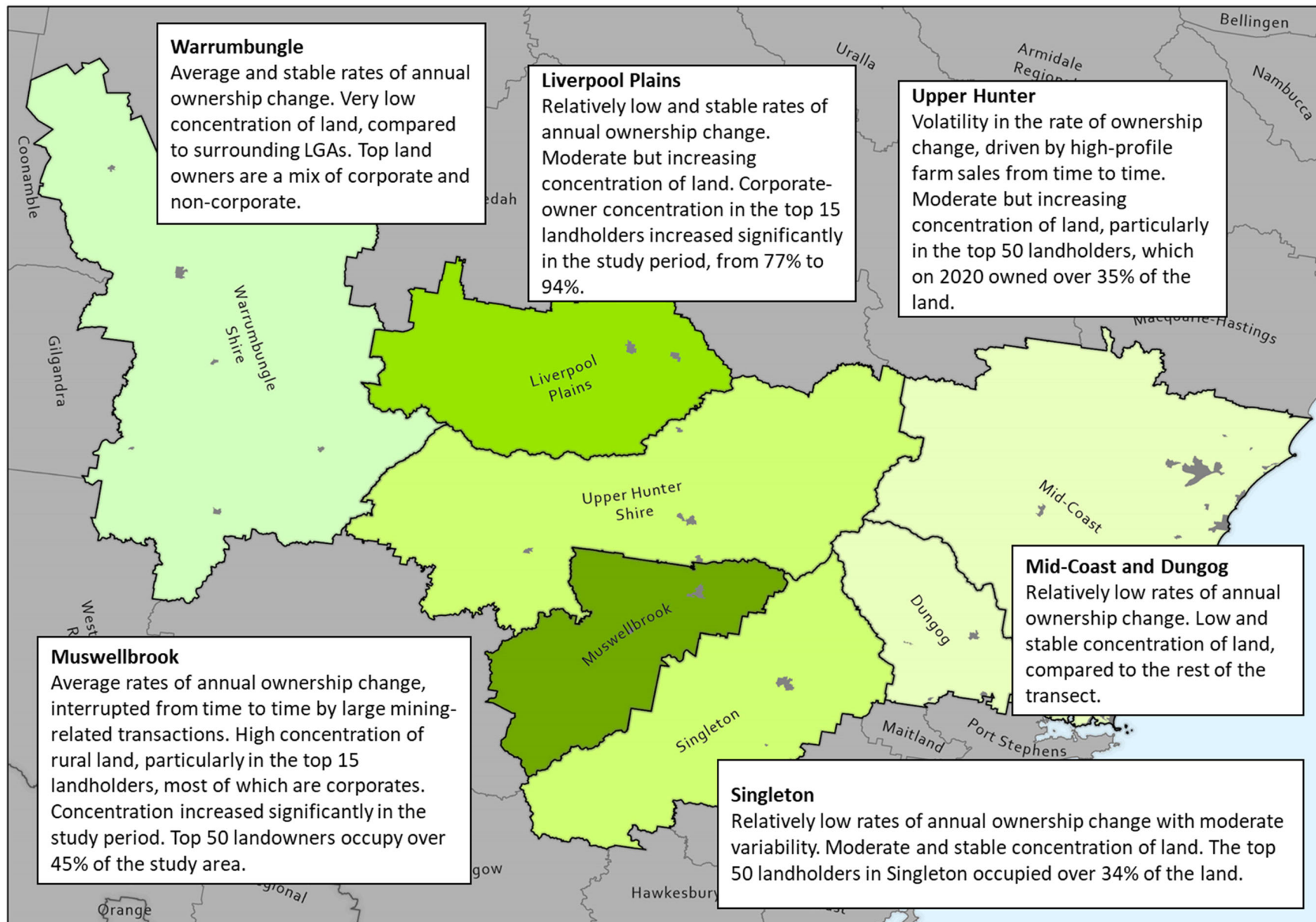
The high and increasing value of land in the Hunter region is also linked to the corporatisation of larger holdings, and conversion of smaller (often unviable) farms into other uses, such as lifestyle residential uses and tourism. According to stakeholders in Dungog, the growing cost of land means that many older owners of farms, unable to expand their holdings, are selling out to and moving into town or to coastal areas, creating space for urban newcomers with the financial ability to purchase land at increasing prices in Dungog.

On the other hand, in Liverpool Plains and other areas of the transect with larger farm holdings, many family farms are becoming family offices, with land registered under company names, and operated according to a variety of business models. This allows many of these businesses to take loans at better rates and manage their tax obligations more flexibly. The acquisition of land parcels for these purposes, however, can bid up prices thus raising the barriers for entry for new non-corporate entrants.

Themes for future research: The 2020-2022 period has been one of great change in the way land changes ownership in NSW. The COVID-19 pandemic, combined with the end of the most intense period of drought in recent years, record low interest rates, record high commodity prices and an intense La Niña, have significantly affected some of the trends of previous years. As such, it is important to consider annual churn rates beyond the period explored in this report. Future research should dive into these themes in more detail.

As more data is collected through the land-titles registration method presented in this report and other outcomes of our project, we hope that more light will be shed on these important trends affecting the ownership and management of land in rural NSW.

Figure 15 - Summary of findings, rate of change and land concentration in the Hunter



3. Demographic trends as drivers of rural land ownership change in the transect

Insight 9. There is a demographic east-west gradient within the Hunter transect, with higher population growth in the east (MidCoast and Dungog) and lower in the west. This gradient is reflective of differences in land prices and rural land fragmentation patterns between LGAs in the east and west of the transect.

The Hunter transect follows a similar east-west demographic pattern as other transects across NSW (see, e.g. Central West Report in this series). Coastal LGAs and LGAs closer to major centres like Newcastle and Sydney have experienced a population boom in recent years, while LGAs in the west of the same transect have experienced population stagnation or decline. In the Hunter transect there is a clear transition in population density, size, and growth between the LGAs near the coast (MidCoast LGA and Dungog Shire in particular), and those in the hinterland (such as Warrumbungle) as shown on Table 7.

These findings closely align to the conceptualisation of the transect as a gradient discussed in the previous section, with Dungog and MidCoast following similar patterns, followed by Upper Hunter, Muswellbrook, and Singleton, and completely different patterns in Liverpool Plains and Warrumbungle.

Table 7 - Demographic overview (data based on ABS 2021)

LGA	Total population (2020)	Population change (2006-20)	Population density (persons/km ²) (incl UCLs)	Percentage of residents living in rural areas of LGA (non-UCL) (2016)
MidCoast	94,395	14.13%	9.39	25.3%
Dungog	9,664	19.90%	4.30	58.9%
Singleton	23,380	6.58%	4.78	41.5%
Upper Hunter	14,167	9.20%	1.75	38.3%
Muswellbrook	16,355	7.34%	4.80	27.2%
Liverpool Plains	7,853	4.19%	1.55	43.7%
Warrumbungle	9,209	-6.11%	0.74	42.5%
Total	175,023	10.59%	-	-

Population clusters

With a total population of 94,395 people and a density of 9.39p/km², MidCoast LGA is the most populous and densely populated LGA in the transect. Singleton follows MidCoast in total population, with 23,280 people and its population density is 4.78, which is similar to the population density of Upper Hunter, Muswellbrook, and Dungog.

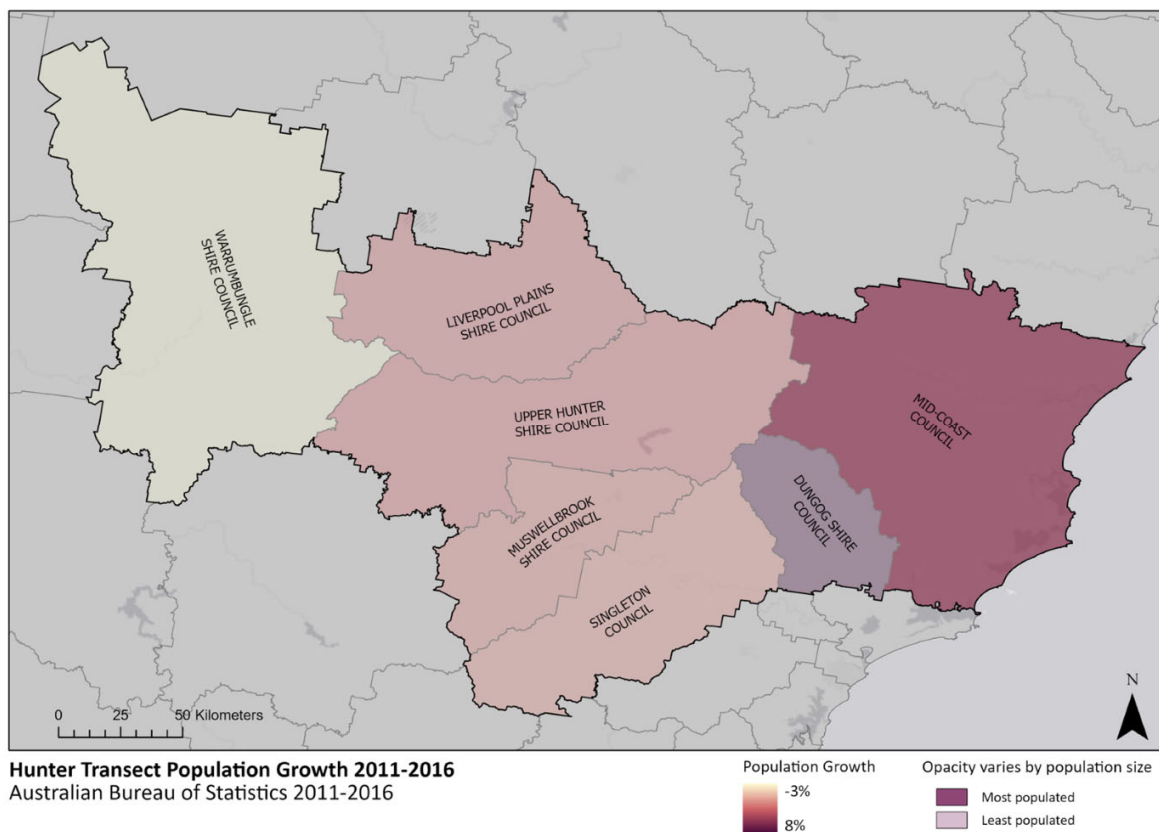
There is a clear contrast in terms of population densities between these LGAs and those to the west of the transect. The population density in Liverpool Plains is 1.55 people per km² and Warrumbungle is 0.74, significantly lower than those in MidCoast and Dungog.

Population growth

Population growth in the transect is clearly highest in Dungog and MidCoast LGAs. At almost 20% growth between 2006 and 2020, Dungog is an outlier in its patterns of growth. With most of its population living in rural areas of the LGA, its patterns of change are reflective of a rapidly restructuring rural landscape, with higher incidence of rural residential uses and lifestyle farming. In contrast, most of the population growth in MidCoast LGA comes from growth in towns and villages, meaning its patterns of population change are concentrated in the already established urban centres near the coast and their (rezoned) peri-urban areas, rather than growth being experienced directly on rural land.

The rate of population growth in the LGAs in the middle of the transect are fairly similar to those of other transects, oscillating between 4.19% for Liverpool Plains and 9.20% for Upper Hunter. In contrast, Warrumbungle LGA is the only one in the Hunter transect which experienced population decline in the study period, with 6.11% fewer people in 2020 compared to 2006.

Figure 16 - Population growth by LGA in the transect, 2011-16



Insight 10. The high rates of population growth in Dungog and MidCoast LGAs are related to patterns of rural land-use change from traditional agriculture to lifestyle, tourism, conservation, and small-scale lifestyle farming. While most of the growth in Dungog occurred in rural areas, most of the growth in MidCoast occurred in urban and peri-urban areas. In contrast, the rural population of Liverpool Plains and Warrumbungle declined between 2006 and 2020.

Examining the urban versus rural aspects of population change in each LGA, Liverpool Plains and Warrumbungle experienced rural population decline, by 2.3% and 4.4% respectively (Table 8). Since the

total population of Liverpool Plains increased, it is possible to conclude that the population growth in Liverpool Plains is strictly confined to existing UCLs, while people moved out the LGA's rural areas.

Median land prices for 2020 demonstrate that land is highly valued in the east of the transect, perhaps largely driven by the conversion of agricultural to rural residential land. The significant population increases in the east of the transect may similarly be a by-product of such conversion.

Table 8 - Changes in rural population by LGA

LGA	Total population in rural areas of the LGA (non-UCL) (2016)	Population change in rural areas of the LGA (non-UCL) (2006-16)
MidCoast	22,878	-0.1%
Dungog	5,283	14.3%
Singleton	9,540	15.6%
Upper Hunter	5,401	11.0%
Muswellbrook	4,368	15.5%
Liverpool Plains	3,360	-2.3%
Warrumbungle	3,983	-4.4%
Total	54,813	5.9%

Year-on-year population change patterns

The population change rate for each of the transect LGAs remained relatively stable across the study period, however there are a few nuances of this trend that are worth noting:

- Between 2006-11, Liverpool Plains and Warrumbungle Shire's populations decreased. After 2011 Warrumbungle's population continued to decrease while in Liverpool Plains, population grew slightly.
- The rate of growth in Upper Hunter, Muswellbrook, and Singleton is relatively low but becomes lower after 2011 and even lower after 2016, hinting at possible trends towards stagnation (which would need to be confirmed with the latest census data and changes associated with the COVID-19 pandemic).
- In contrast, the year-on-year growth in MidCoast and Dungog accelerated through the study period, with higher rates of growth in the period post 2016.

Table 9 - Change in population size 2006-2020

LGA	Population in 2006	Population in 2011	Population in 2016	Population 2020	Av. annual change 2006-11	Av. annual change 2011-16	Av. annual change 2016-20
MidCoast*⁴	82,706	85,581	90,302	94,395	0.76%	1.04%	0.91%
• UCLs	59,811	63,861	67,424	---	1.35%	1.12%	---
• Rest of LGA	22,895	21,990	22,878	---	-0.79%	0.81%	---
Dungog	8,060	8,317	8,976	9,664	0.64%	1.58%	1.53%
• UCLs	3,530	3,680	3,693	---	0.85%	0.07%	---
• Rest of LGA	4,530	4,637	5,283	---	0.47%	2.79%	---
Singleton	21,937	22,695	22,990	23,380	0.69%	0.26%	0.34%
• UCLs	13,887	14,222	13,450	---	0.48%	-1.09%	---
• Rest of LGA	8,050	8,473	9,540	---	1.05%	2.52%	---
Upper Hunter Shire	12,974	13,751	14,112	14,167	1.20%	0.53%	0.08%
• UCLs	8,166	8,730	8,711	---	1.38%	-0.04%	---
• Rest of LGA	4,808	5,021	5,401	---	0.89%	1.51%	---
Muswellbrook	15,236	15,793	16,086	16,355	0.73%	0.37%	0.33%
• UCLs	11,607	12,450	11,718	---	1.45%	-1.18%	---
• Rest of LGA	3,629	3,343	4,368	---	-1.58%	6.13%	---
Liverpool Plains	7,537	7,479	7,689	7,853	-0.15%	0.56%	0.43%
• UCLs	4,099	4,250	4,329	---	0.74%	0.37%	---
• Rest of LGA	3,438	3,229	3,360	---	-1.22%	0.81%	---
Warrumbungle Shire	9,808	9,589	9,380	9,209	-0.45%	-0.44%	-0.36%
• UCLs	5,650	5,693	5,397	---	0.15%	-1.04%	---
• Rest of LGA	4,158	3,896	3,983	---	-1.26%	0.45%	---
TOTAL	158,258	163,475	169,535	175,023	0.66%	0.74%	0.65%

Note: 2006, 2011 and 2016 data was sourced from ABS Population Census Data (ABS, 2021). Data for 2020 from ABS (2021). Urban Centres & Localities data derived from 2006, 2011 and 2016 censuses.

⁴ MidCoast formed in 2016 from the Gloucester, Great Lakes, and Greater Taree LGAs.

Insight 11. The Hunter transect’s proportion of people over 60 increased between 2011-16, while the proportion of children, teenagers and 30–49-year-olds decreased. However, Dungog stands out as bucking this trend, with an increase in the proportion of young families, indicative of rural in-migration.

The median age of the transect increased from 41 to 43 years between 2011-16, compared to the national median age which increased from 37 to 38 (ABS 2016a). A quarter of the transect’s population is over 65, concentrated in the MidCoast and Warrumbungle Shire LGAs. The LGA experiencing the fastest ageing of its population is Warrumbungle. The LGAs of Singleton, Upper Hunter Shire, Muswellbrook, and Liverpool Plains show similar, yet less pronounced, ageing population patterns. In all these LGAs, young people and families are making a progressively lesser proportion of their populations.

In contrast, Dungog was the only LGA in the transect to show an increase in the number of small children (0-9 years), accompanied by a similar increase in the proportion of those aged 20-39, which indicates an increase in the proportion of young families in the area. This is an interesting pattern, which differentiates Dungog from MidCoast where the proportion of young families seems to be decreasing. Overall, however, it is clear that the transect as a whole is moving towards an ageing population profile, in line with other transects across the state.

Table 10 - 10-year age group growth pattern (2011-16) (%)

	MidCoast	Dungog	Singleton	Upper Hunter	Muswellbrook	Liverpool Plains	Warrumbungle	Transect
0-9 years	-3.04	10.23	-0.63	-3.64	0.20	0.00	-13.41	-2.13
10-19 years	-8.14	-2.42	-7.56	4.10	-5.32	-3.81	-15.15	-6.69
20-29 years	10.08	8.73	-2.37	-7.07	-5.77	5.50	4.90	3.06
30-39 years	-4.88	11.23	-4.68	-2.59	0.00	2.25	-14.44	-3.40
40-49 years	-4.83	-6.15	-3.61	4.44	-5.41	-4.73	-11.11	-4.38
50-59 years	4.13	8.01	8.97	1.82	9.63	-1.24	0.86	4.81
60-69 years	15.43	19.39	16.62	10.30	13.75	9.04	9.87	14.62
70-79 years	24.50	22.29	26.45	17.47	27.78	16.34	15.24	23.25
80-89 years	11.80	18.55	10.69	19.39	22.19	18.81	14.22	13.41
90-99 years	27.57	-8.62	31.11	-12.93	21.43	-25.00	25.84	20.41
100+ years	283.33	-100	[NaN]	80.00	[NaN]	0.00	[NaN]	123.53

Insight 12. Migration patterns into and out of the Hunter transect are significantly age-influenced. People under 50 show higher rates of mobility within and in/out of the transect than those over 50. Out-migration is higher for younger cohorts, with the greatest proportion of those leaving the transect to significant urban areas being aged 20-24 across the transect. In-migration is significant for both young and old cohorts, with most prevalence for 25–34- and 60–69-year-olds.

There is a clear trend of age-influenced migration in and out of the Hunter transect. Out-migration weighs towards younger cohorts, with the greatest proportion of those leaving the transect to select SUAs being aged 20–24. The majority of these young people are leaving to Newcastle-Maitland, followed by Sydney. Migration to the Central Coast is more prevalent among older cohorts. Out-migration does spike for those older than 90, likely due to hospital and care requirements.

In-migration is significant for both young and old cohorts, with considerable proportions of 25–34- and 60–69-year-olds moving into the transect. It is more common for this older cohort to migrate from Sydney. These trends have accelerated the ageing of the transect's population. In 2016, 36.20% of the transect's population did not live there five years earlier, demonstrating a high rate of mobility. However, this mobility is not homogenous across the transect. Mobility within and out of the transect is more prominent among younger age groups. While 44.45% of people aged under 50 in rural parts of the Hunter transect were not living in the same SA2 five years earlier, the figure for people over 50 was 27.53%. This includes younger people moving within the transect and in and out of the transect.

In terms of inward migration, the patterns of change are relatively homogenous across LGAs, with areas in the east experiencing slightly higher rates of in-migration. Warrumbungle Shire exhibited the least in-migration in the transect (31.82%). Dungog, Liverpool Plains, rural Muswellbrook, and rural Upper Hunter Shire exhibited similar, moderate rates of in-migration (33-36%). Rural Singleton was a slight outlier to the east-west trend, experiencing a high incidence (39%) of in-migration between 2011-16. Presumably this was on account of the strong labour market drivers of employment in extractive industries.

Rural parts of the MidCoast experienced a high inflow of new residents with 36.70% of its 2016 population not living in the LGA five years earlier. According to stakeholders, part of this migration includes families moving into the MidCoast from western NSW after selling land to larger corporate actors and moving closer to the coast to preserve a rural lifestyle while being closer to amenities and non-farming jobs. These families generally look for properties around 100 hectares, which are not commercially productive in the MidCoast but suitable for lifestyle agriculture.

An interesting spatial difference in in-migration relates to differences in age groups. Movement into the transect of people over 50 is higher in the east and lower in the west, with people (over 50) commonly moving from Sydney into the transect (15.82%). This is more than double that for people under 50 (7.46%). In-migration from Sydney was highest for rural parts of the MidCoast, especially for people over 50 (10-27%), perhaps influenced by retirees and sea changers.

In terms of outward migration, 5.40% of the transect's rural population left to Central Coast, Newcastle-Maitland, and Sydney SUAs between 2011-16. According to stakeholders, the Upper Hunter has seen a few family properties being sold off because of succession planning circumstances (for example when a family is unable to split a property up so they sell it instead). Many of these involve people moving out of the area or into urban centres. However, and despite steady rates of migration out of rural areas into urban centres, in 2016, 8.39% of the rural population of the Hunter had migrated into the transect from SUAs, indicating that the net balance of migration is tipped towards in-migration from these areas, rather than out-migration into these areas. Of those moving into the rural Hunter transect from Central Coast SUA, rural MidCoast experienced the greatest inflow (5.01%). Similarly, of those moving out of the transect's rural areas to the Central Coast, the greatest proportion came from rural MidCoast (4.53%). Dungog was the most attractive part of the transect to those migrating from Newcastle-Maitland (32.99%), while half of people leaving Dungog moved to Newcastle-Maitland. Liverpool Plains had the greatest proportion of out-migration (10.64%) to Sydney, marginally greater than out-migration from rural MidCoast (10.54%).

Table 11 - Migration into rural parts of the transect

SA2	Total population						Persons over 50					
	Usual residence 2016 (persons)	Same SA2 five years earlier (persons)	Not in same SA2 five years earlier (persons)	Not in the same SA2 in 2011 (proportion)	Moved from Sydney (2011 - 2016) (persons)	Moved from Sydney (2011 - 2016) (proportion)	Usual residence 2016 (persons)	Same SA2 five years earlier (persons)	Not in same SA2 five years earlier (persons)	Not in the same SA2 in 2011 (proportion)	Moved from Sydney (2011 - 2016) (persons)	Moved from Sydney (2011 - 2016) (proportion)
Dungog	8,976	5,998	2,978	33.18	182	6.11	3947	3074	873	22.12	98	11.23
Quirindi	7,684	5,106	2,578	33.55	158	6.13	3410	2634	776	22.76	58	7.47
Taree Region	12,444	7,621	4,823	38.76	687	14.24	6944	4784	2160	31.11	381	17.64
Wingham	5,374	3,463	1,911	35.56	143	7.48	2517	1855	662	26.30	72	10.88
Old Bar–Manning Point–Red Head	10,531	6,158	4,373	41.53	737	16.85	5447	3561	1886	34.62	393	20.84
Forster-Tuncurry Region	6,085	3,706	2,379	39.10	450	18.92	3194	2168	1026	32.12	263	25.63
Buladelah–Stroud	4,725	3,171	1,554	32.89	100	6.44	2331	1745	586	25.14	58	9.90
Tea Gardens–Hawks Nest	5,038	3,074	1,964	38.98	399	20.32	3429	2233	1196	34.88	328	27.42
Gloucester	5,033	3,519	1,514	30.08	151	9.97	2663	2064	599	22.49	86	14.36
Muswellbrook Region	4,013	2,577	1,436	35.78	69	4.81	1426	1102	324	22.72	23	7.10
Singleton Region	4,922	3,002	1,920	39.01	88	4.58	1908	1410	498	26.10	40	8.03
Scone Region	8,288	5,288	3,000	36.20	144	4.80	3298	2546	752	22.80	58	7.71
Coonabarabran	7,950	5,420	2,530	31.82	186	7.35	3900	3007	893	22.90	77	8.62
TOTAL	91,065	58,103	32,962	36.20	3482	10.56	44408	32183	12225	27.53	1934	15.82

Note: To draw closer comparisons with our land titles data, the statistics in these tables have been tailored to focus on rural parts of the transect. They use SA2 regions at the 2016 Census (rather than LGAs) allowing the major population centers of the transect (Forster, Tuncurry, Taree, Muswellbrook town, Singleton town, and Scone town) to be excluded. For convenience, we call this population the 'rural Hunter transect'.

- 'Dungog' SA2 is the same as its LGA.
- 'Quirindi' SA2 = Liverpool Plains LGA.
- 'Taree Region', 'Wingham', 'Old Bar - Manning Point – Red Head', 'Forster-Tuncurry Region', 'Buladelah – Stroud', 'Tea Gardens – Hawks Nest', and 'Gloucester' SA2s = MidCoast LGA excluding Forster, Tuncurry, and Taree (in addition, a small portion of 'Williamstown – Medowie – Karuah' SA2 which does not completely fit within the border of MidCoast LGA).
- 'Muswellbrook Region' SA2 = Muswellbrook LGA excluding Muswellbrook town.
- 'Singleton Region' SA2 = Singleton LGA minus Singleton town (in addition, parts of 'Wollangambe – Wollemi' and 'Branxton – Greta – Pokolbin' SA2s which do not completely fit within the border of Singleton LGA).
- 'Scone Region' SA2 = Upper Hunter Shire LGA excluding Scone town (in addition, a small portion of 'Mudgee Region – West' which does not completely fit within the border of Upper Hunter Shire LGA).
- 'Coonabarabran' SA2 = Warrumbungle Shire LGA (excluding a small portion of 'Mudgee Region – West' which does not completely fit within the border of Warrumbungle Shire LGA).

Figure 17 - Proportion of population who moved to select SUAs (2011-16)

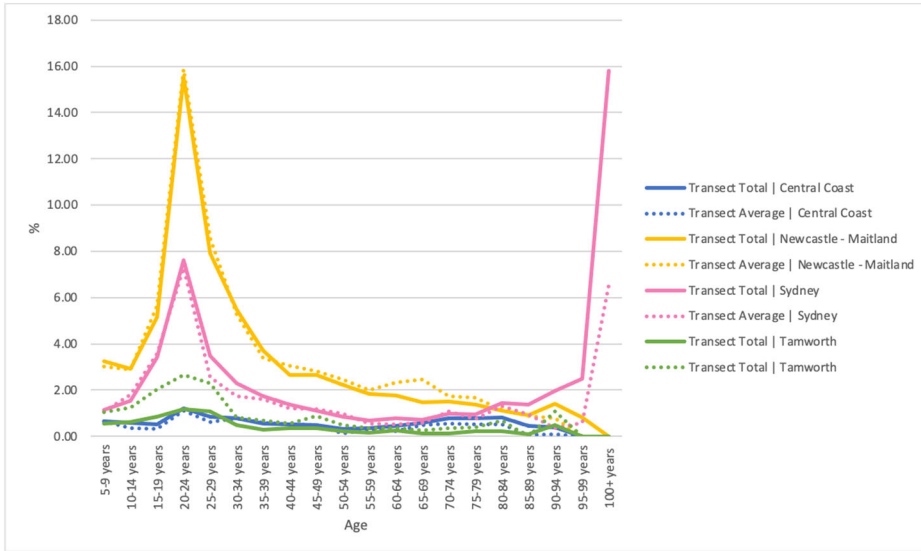


Figure 19 - Proportion of population moving from select SUAs to transect (2011-16)

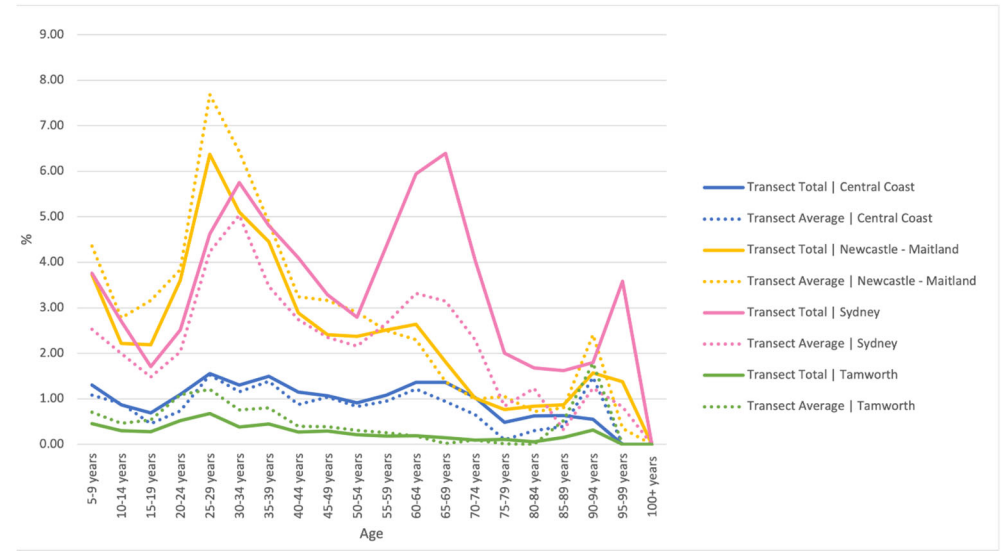


Figure 18 - Proportion of population moving from rural SA2s to SUAs (2011-16)

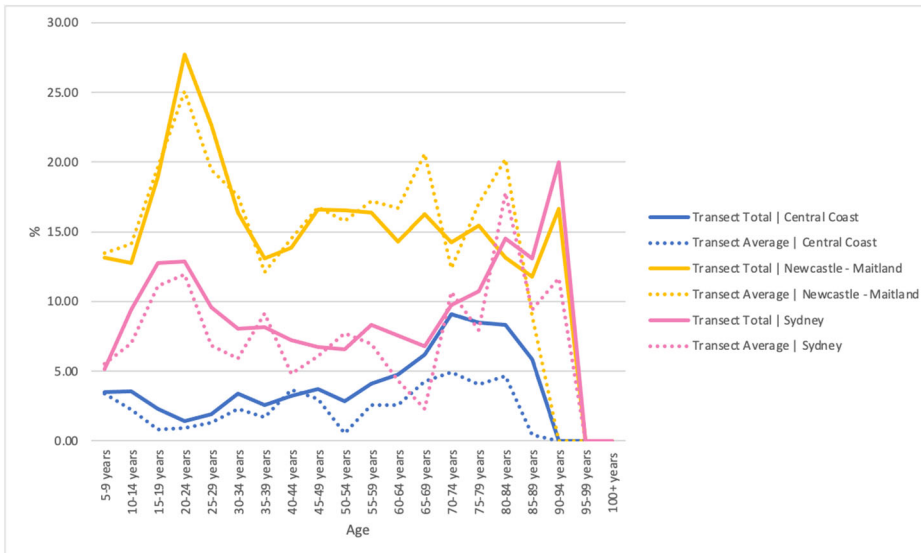
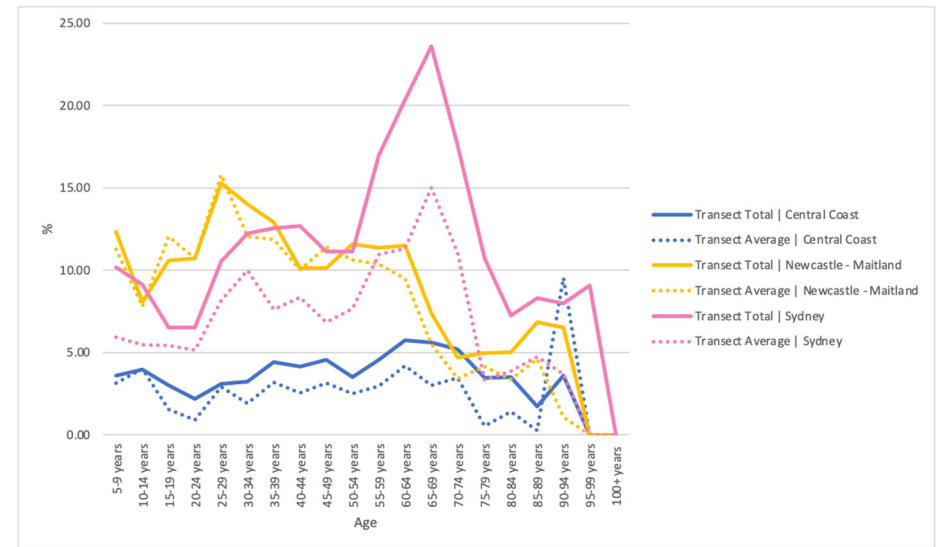


Figure 20 - Proportion of population moving to rural SA2s from SUAs (2011-16)



4. Agricultural restructuring and rural land ownership change in the Hunter transect

4.1 Agricultural land-use profile of the transect

Insight 13. The Hunter transect has a diverse and profitable agricultural sector centred mainly around animal production. Most of the agricultural land is dedicated to cattle grazing for beef, although equine uses are significant in Upper Hunter, Muswellbrook, and Singleton. Milk production is also significant in some areas as well as chickens. Cropping and horticulture are not as significant in the Hunter transect, except in Liverpool Plains, which benefits from rich black soils and extensive ground water resources. Viticulture, of course, remains a key industry, generating significant income from agritourism as well.

The location of the Hunter transect is a key asset to its successful agricultural sector. Its proximity to major ports in Sydney and Newcastle as well as the short distance to major population centres means that animal production (including intensive animal uses, which require fast supply chains) can thrive. The majority of the transect's agricultural land is dedicated to grazing, with beef being a significant contributor to the regional economy. Despite the relatively small proportion of cropping and horticultural land compared to other transects across the state, the Hunter transect is incredibly diverse. Equine uses and viticulture generate significant income in Upper Hunter, Muswellbrook, and Singleton, both from production and tourism.

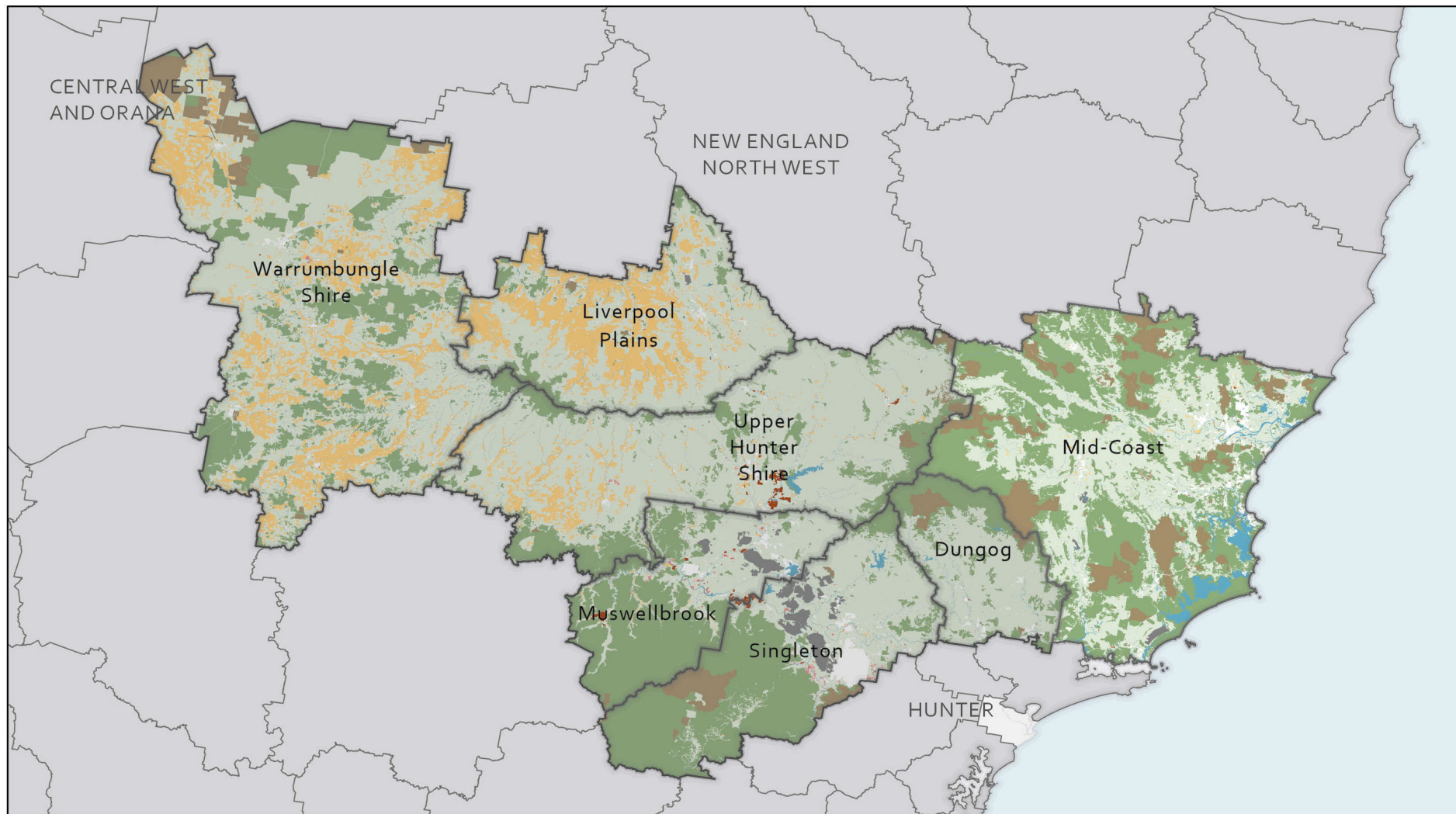
The transect's cropping hotspot is Liverpool Plains, which has some of the most productive land in NSW due to its rich black soils underlain by extensive ground water resources (DPE, 2017). This part of the transect is more closely related to LGAs to its north in terms of production patterns. As such, it is part of the New England & Northwest planning region, rather than the Hunter region. Despite this, there is a strong connection between the processes of rural change happening in this area and the Upper Hunter LGA. Mining and exploration remain a key income generator for the region as well as a key source of land-use tensions. Renewable energy projects and agritourism are also changing the rural landscape of the region, as well as rural residential pressures as the coastal population grows.

Table 12 - Proportion of agricultural land-uses in the Hunter transect⁵

Agricultural Land-use	Total Area (ha)	Proportion of the transect	Details
Cropping	397,100	17.00%	Includes irrigated cropping, including cereals, cotton, and pulses. Includes land under rotation, which at other times may be pasture.
Grazing	1,927,098	82.48%	Includes grazing on native and modified pastures.
Horticulture	4,136	0.18%	Includes perennial and seasonal horticulture (both irrigated and non-irrigated).
Intensive animal production	8,197	0.35%	Includes feedlots for cattle or sheep, dairy sheds and yards, poultry farms, pig farms, horse studs, saleyards, and some forms of aquaculture.
Total	2,336,532	100.00%	-

⁵ Calculated based on the NSW Land use 2017 v1.2 dataset, publicly available for download on the NSW Government SEED website, <https://datasets.seed.nsw.gov.au/dataset/nsw-landuse-2017-v1p2-f0ed>

Figure 21 - Hunter transect Land-use Map



Hunter Transect Study Area
NSW Land Use (ALUM)

- | | | |
|--------------|-----------------------------|--------------------------------|
| Cropping | Intensive Animal Production | Water |
| Grazing | Plantations & Forestry | Mining |
| Horticulture | Conservation | Local Government Area Boundary |

4.2 Agricultural change in the Hunter transect imprinted on patterns of land ownership

Insight 14. Our findings suggest that the Hunter is a transect undergoing significant transitions into high value land uses. Rural land in the east and centre of the transect has significantly increased in value in recent years suggesting increased demand and limited supply. Large corporate and government actors play a significant role in rural restructuring as land is invested and subsequently divested years later.

Sales related to mining and water companies

Mining is a key driver of agricultural change and there are several examples of farm restructuring due to mining processes (purchases of large tracts of land which are then resold to individuals). However, it is not just mining companies investing on rural land to subsequently divest it back to individual ownership. There are examples of water companies undertaking similar processes in the Hunter region.

An example provided by a stakeholder is of a water company which purchased a large tract of land in one of the Hunter LGAs from several multigenerational farming families, to then re-sell to different individuals years later, ultimately becoming a catalyst of long-term ownership change in the region. A mining venture in another LGA induced a similar type of change after not proceeding with the mining operation in 2009. The area was re-sold to individuals, but the original families had already left the area. Mining companies during the study period also bought and sold land for biodiversity offsets. Some of these areas are leased for agriculture, some are not. A stakeholder explained that in 2011, a large area of land used for a biodiversity offset was acquired by a mining company, but some of it is still leased out for farming. Examples such as these ones show that large actors can have a significant effect on the social fabric of an area and become significant catalysts of agricultural land ownership change.

Key agricultural industries

As outlined above, the Hunter transect has a diverse and profitable agricultural sector centred mainly around animal production. Most of the agricultural land is dedicated to cattle grazing for beef. However, it is important to point out that there are several other key industries entering and expanding in the area. One of these is the poultry industry. Stakeholders in Liverpool Plains indicated the opportunities for growth that exist in terms of abattoirs, which can benefit from the production of grain in the area and can service key centres west and east of the LGA. There is evidence of companies buying land in the area to build chicken sheds and service Tamworth for example.

In Upper Hunter LGA, equine land dominates the sale of valuable land holdings. This has had the effect that land value in some parts of the Upper Hunter is too high for grazing. According to one stakeholder, horse farms can reach a land value of \$25,000 per hectare. Unlike other forms of agriculture, these estates require significant investment on the presentation of the land (as they are not just productive farms but also perform key social and tourism functions). Irrigation availability, flat land and undulating hills and location are key factors that buyers are looking for in horse farms.

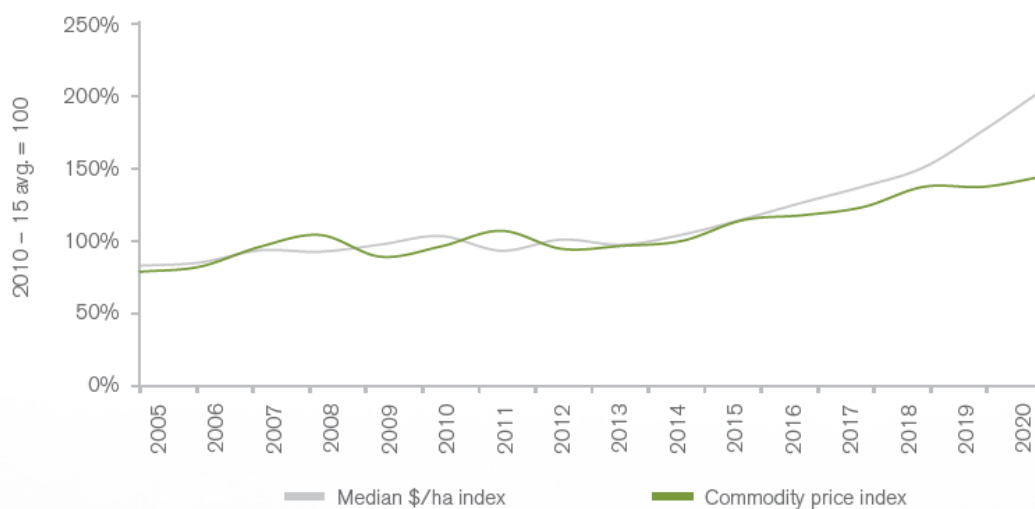
In MidCoast LGA, cattle and breeding remain key agricultural commodities, although recently, intensive uses such as hydroponics and tomatoes have been increasing. The council is considering land use planning options to support these growing intensive industries. However, many existing farms across the LGA are not profitable and so are being converted into non-agricultural uses or lifestyle farming. For many owners, rural land holdings are seen as superannuation, future retirement funds or subdivision capital. Many of these owners rely on off farm employment.

A vital development in the agricultural land market is a trend towards the decoupling of agricultural land market conditions and agricultural commodity prices. As shown in Figure 22, sourced from the Rural Bank

(2021: 27), NSW has seen a historically ‘strong correlation between commodity price and farmland values in NSW.’ Since around 2015, however, this correlation has been diverging. Median agricultural commodity prices have continued to grow, but rural property prices have escalated much more rapidly.

According to the Reserve Bank of Australia data (RBA, 2022), the index of commodity prices (rural component; SDR) grew by 1.5% between January 2015 and January 2020.⁶ Meanwhile, data from the Rural Bank shows that the median \$ / ha of the Hunter transect LGAs grew on average 9.24% in the same period.⁷ These data highlight the increasingly divergent trends between commodity price index increases and land price increases, which are not just evident in the Hunter transect but in other transects across NSW. We identify three trends associated with this process relevant to the Hunter transect: the effect of large investors, lifestyle farming, and the role of emerging industries such as carbon farming.

Figure 22 - NSW Commodity Price Comparison (Rural Bank, 2021)⁸



Large investors

The entry of new agricultural investors seems to have had an effect in driving up rural land prices. Some of these are foreign owned, while others are financial vehicles connected to domestic corporate interests. There is no definitive data that points to the precise role of these actors in market trends, but anecdotally this was raised by many stakeholders, with examples provided. These entities typically employ professional on-farm management and generate commercial advantages through economies of scale.

Identifying the extent of this trend through land titles data alone is difficult because not all land held in the name of corporations is large-scale (many are family companies) and in some other cases, corporate-run businesses operate on land registered in the names of individuals (sometimes a director of the company, sometimes another party, which the company leases from). Nevertheless, a corporate name on title does give an indication that the property is linked to an agricultural business, an investor or financial institution, which tells us a lot about the use of land.

In the Hunter transect corporate ownership (both locally owned and large agri-businesses) is most prevalent in the centre of the transect (Upper Hunter, Muswellbrook, and to some extent Singleton and Liverpool Plains). According to stakeholders in these areas, there are many Sydney-owned properties with local managers. We heard from a few stakeholders in different focus groups that some investors from outside the region do not generally know the area, do not understand about water management and know little about

⁶ Index for Jan 2015 = 99.8. Index for Jan 2020 = 101.4. Index based on 2019/20=100.

⁷ Average calculated from the 5yr Compound Annual Growth Rate in median %/ha for all the LGAs in the Hunter transect, as published by the Rural Bank (2020).

⁸ Graph published by the Rural Bank (2021).

planning regulations. For many, the employment of local managers is a necessity to ensure the viability and sustainability of businesses. As expressed by a stakeholder describing one property: 'A large corporate owner has a pretty gun local managing the farm. He'd die on his sword.'

We also heard about the role of businesses linked to foreign-owned corporations in the region. Although the presence of large export-focused businesses is not as prevalent in the Hunter as it is in certain areas of Northern NSW, there are notable examples of very large grazing farms being bought and sold by companies linked to large Chinese exporters. As pointed out by a stakeholder, the extent of this trend is difficult to fully gauge, as the purchase of smaller farms and the complexities of multi-level corporate structures is not straightforwardly reflected in parcel ownership data: '*Big players in real estate here were entertaining Chinese investors in the past, whether that is going to continue is a question mark. The way around it for some is buying small parcels*' (Focus Group participant).

Lifestyle farming

A second key driver is the trend is lifestyle farming, reported by stakeholders in the east of the transect, notably in MidCoast and Dungog. In many ways this is the reverse of agricultural corporatisation, as it involves new landowners acquiring properties that are smaller than what would typically be required for economic viability. New owners operate these farms as part of a wider set of lifestyle logics premised on their ability to access other income streams such as investments, drawing down savings, or engaging in non-farm employment. These operations can be larger than traditional rural acreages and hobby farms, but smaller than standalone livestock or cropping properties. The potential to gain tax benefits from farming and credit these across a wider range of income-generating activities provides an institutional incentive for this type of arrangement.

Emerging industry: carbon farming and biodiversity offsetting

The rise of income-generating non-agricultural land-based activities, such as carbon farming and biodiversity offsetting provide examples of emerging industries associated with changes in land ownership and providing a further mechanism to drive a decoupling between rural land prices and agricultural commodity prices. Carbon farming can take many forms, sometimes consistent with ongoing agricultural production, and sometimes displacing agriculture altogether. Either way, carbon farming participants generate income unrelated to wider agricultural commodity price conditions. Many participants in this market are traditional farmers, but many are also new owners of rural land looking for different ways to utilise the land.

Participants engage in this sector for a range of motivations, from purely profit-based to environmental-driven. The price per tonne of sequestered carbon has increased over recent years, drawing in more participants to this industry. Within the Hunter transect, this trend is particularly noticeable in Dungog, due to an alignment of lifestyle farming, amenity acquisitions and extensive tree-cover. Many properties in Dungog have become lifestyle farms or large acreage rural residential properties over recent years. Stakeholders in focus groups indicated that these activities have reduced the extent of traditional farming in the LGA, with rural land-uses now much more diversified.

Many new owners have the financial means to venture into new and innovative land management techniques, including venturing into carbon farming operations. In Dungog, many people are undertaking projects to improve the carrying capacity of land (e.g. increase the number of cows a property can hold without the property being larger). According to a stakeholder 'many of these are happy to spend money on carbon projects and do something on global warming.'

Carbon farming is compatible with grazing operations and with environmental conservation efforts, making it an interesting example of an emerging industry associated with multifunctional rural transitions, creating diverse rural settings in which the value of land increases as a result of demand for uses other than large-scale farming. As this industry becomes increasingly more profitable, interest in using land for carbon farming grows, putting a pressure on land availability and, as a result, putting upward pressure on land prices.

Biodiversity offsetting is another emerging area which is changing the dynamics of land ownership. In NSW, under the *Biodiversity Conservation Act 2016*, landholders can establish Biodiversity Stewardship Agreements to create offset sites on their land to generate biodiversity credits. These can then be used to offset the impacts of development elsewhere through the purchase and/or retirement of biodiversity credits or payment to the Biodiversity Conservation Fund. In many areas of the transect, land used to generate biodiversity credits is generating income for landowners. Stakeholders in Dungog, in particular, pointed out at the increasing experience of people buying into this LGA with a conservation mindset, with projects such as carbon farming and storage and biodiversity offsetting.

4.3 Transitions in agricultural employment

Insight 15. In the Hunter transect, agriculture is the third single largest employer, after mining and health and social assistance. Agriculture as a proportion of total employment has been slowly increasing since 2011, reversing a trend between 2006 to 2011, when it lost ground because of growth in mining, in particular.

Agriculture is the region's third largest single employing industry in the Hunter, comprising 9% of the total workforce as of 2016 (Figure 23). Agriculture's placement dropped from second in 2006 (Table 13), overtaken by mining and 'Health Care and Social Assistance' industries. Growth in mining is largely attributed to Muswellbrook and Singleton LGAs, which experienced a 50% increase in employment across the transect between 2006-11. However, growth in the mining sector has significantly slowed over the last census period, increasing only by 11.23% between 2011-16.

The incentive to leave farming for mining has existed in the Hunter transect for several years. According to one focus group participant, the pay difference and stability provided by mining jobs in Muswellbrook and Singleton generated a big employment shift between 2006 and 2011: 'If you are a farmer, you will always have an incentive to leave the property and work for the mines running a tractor for 200,000 dollars...an incredible financial opportunity.' (Focus Group participant). However, since 2011, with the slowing of growth in the mining sector, agriculture as a proportion of total employment is slowly increasing across the transect. In Dungog, Liverpool Plains, Upper Hunter Shire, and Warrumbungle Shire agriculture is still the dominant employment industry.

Health Care and Social Assistance is the largest employing industry in the MidCoast LGA, reflecting the large retiree and coastal population, however agriculture remains a large source of employment in the western portion of this LGA. Despite this, agriculture's growth in employment has only marginally increased (3.98%) between 2011-16 relative to other top industries (as shown in Figure 23). This is strongly related to population growth in urban areas of the transect, particularly in MidCoast, where employment in retail trade, manufacturing, health and social assistance and other industries has significantly increased.

Figure 23 - Largest employing industries across the Hunter transect⁹

Largest Employing Industries (2016 Census)

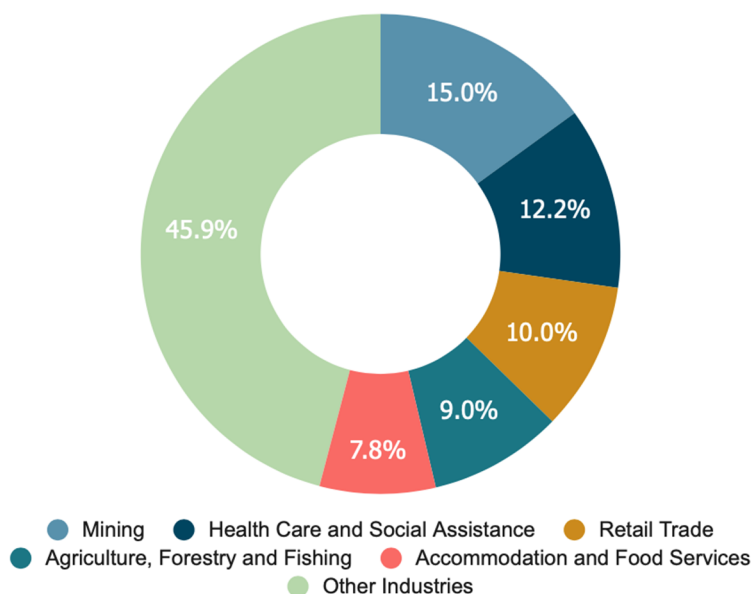


Table 13 - Top 10 largest employing industries across the Hunter transect (2006-16)

Top 10	2006	2011	2016
1	Retail Trade	Mining	Mining
2	Agriculture, Forestry and Fishing	Health Care and Social Assistance	Health Care and Social Assistance
3	Health Care and Social Assistance	Retail Trade	Retail Trade
4	Mining	Agriculture, Forestry and Fishing	Agriculture, Forestry and Fishing
5	Manufacturing	Accommodation and Food Services	Accommodation and Food Services
6	Accommodation and Food Services	Education and Training	Education and Training
7	Education and Training	Manufacturing	Construction
8	Construction	Construction	Public Administration and Safety
9	Public Administration and Safety	Public Administration and Safety	Manufacturing
10	Other Services	Other Services	Other Services

Insight 16. Despite increasing employment in agriculture in the Hunter transect between 2011 and 2016, the following types of agricultural industries saw an overall decrease in the percentage of people employed: ‘Sheep, Beef Cattle and Grain Farming’, ‘Mushroom and Vegetable Growing’, ‘Fruit and Tree Nut Growing’, ‘Other Crop Growing’, and ‘Dairy Cattle Farming’. Others saw a decrease in the percentage of owner managers of incorporated enterprises, including: ‘Other Livestock Farming’, ‘Aquaculture’, ‘Forestry Support Services’, and ‘Agriculture and Fishing Support Services’, indicating that processes of corporatisation have been strongest in these industries.

⁹ Modified from source: ABS 2016b

The Status in Employment (SIEMP) data from the Census was used to identify the percentage change in the number of people employed in different agricultural industries along the transect between 2006 and 2016. The following categories of employment were used for this purpose (with definitions from the ABS (2011, 2016)):

- **Owner managers of incorporated enterprises** - a person who works in his/her own incorporated enterprises, that is, a business entity which is registered as a separate legal entity to its members or owners (also known as a limited liability company).
- **Owner managers of unincorporated enterprises** - a person who operates his/her own unincorporated economic enterprise, that is, a business entity in which the owner and the business are legally inseparable, so that the owner is liable for any business debts that are incurred. It includes those engaged independently in a profession or trade.
- **Contributing family workers** - a person who works without pay, in an economic enterprise operated by a relative.
- **Employee not owning business** - employees who do not own businesses (excluding owner managers of incorporated enterprises and contributing family workers).

As evident in Table 15, most agricultural industries experienced an increase in employment between 2011-16. In the previous five-year period (2006-11), employment significantly dipped for most agricultural industries. 'Sheep, Beef Cattle and Grain Farming' was the transect's largest employing agricultural industry at INDP3 level over the study period, despite seeing a percentage decrease in employment across all SIEMP categories. Meanwhile, 'Agriculture, Forestry and Fishing, not further defined' and 'Agriculture, not further defined' grew by 57.14% and 122.03% between 2011-16, respectively. The number of contributing family workers in the 'Agriculture, not further defined' category grew by almost six-fold.

Agricultural industries with a decrease in employment

Alongside 'Sheep, Beef Cattle and Grain Farming', the following industries experienced an overall decrease in the number of people employed between 2011-16:

- Mushroom and Vegetable Growing
- Fruit and Tree Nut Growing
- Other Crop Growing
- Dairy Cattle Farming

The reduction in these industries is largely associated with a reduction of owner managers and/or family workers. Most of these industries saw a decrease in the number of employees not owning a business, but to a lesser extent than owner managers and family workers. As demonstrated in Table 14, in all of the above industries bar 'Sheep, Beef Cattle and Grain Farming' and 'Other Crop Growing', most workers were employees not owning a business. There is likely some level of corporatisation across the 'Mushroom and Vegetable Growing', 'Fruit and Tree Nut Growing', and 'Dairy Cattle Farming' industries in the transect as most workers are employees with no family association to the owner.

Agricultural industries with more than 50% employees not owning a business

The below industries have considerable demand for agricultural wage-labour, as indicated in the data for 'employee not owning business' category:

- Mushroom and Vegetable Growing
- Poultry Farming
- Other Livestock Farming
- Aquaculture
- Forestry and Logging
- Forestry Support Services
- Agriculture and Fishing Support Services

Of these, 'Mushroom and Vegetable Growing', 'Other Livestock Farming', 'Aquaculture', 'Forestry Support Services', and 'Agriculture and Fishing Support Services' saw a decrease in the 'owner managers of incorporated enterprises' category between 2011-16. 'Aquaculture' saw a 75% decrease in the number of family workers. The decline in owner managers in industries with an employee-dominated workforce is an indication of corporatisation and scale economies.

Table 14 - SIEMP proportions in agricultural industries (INDP3) for Hunter transect (2016)

Proportion (%) of workers in Hunter Agriculture INDP3 by SIEMP categories				
Agriculture INDP3	Employee not owning business (%)	Owner managers of incorporated enterprises (%)	Owner managers of unincorporated enterprises (%)	Contributing family workers (%)
<i>Agriculture, Forestry and Fishing, nfd¹⁰</i>	49.09	21.82	38.18	12.73
<i>Agriculture, nfd</i>	43.51	12.72	25.19	20.87
<i>Nursery and Floriculture Production</i>	48.04	8.82	30.39	20.59
<i>Mushroom and Vegetable Growing</i>	65.82	0.00	22.78	7.59
<i>Fruit and Tree Nut Growing</i>	44.55	5.45	10.91	25.45
<i>Sheep, Beef Cattle and Grain Farming</i>	27.25	7.21	36.13	29.17
<i>Other Crop Growing</i>	32.69	7.69	38.46	13.46
<i>Dairy Cattle Farming</i>	46.56	6.68	34.35	12.02
<i>Poultry Farming</i>	61.08	9.85	22.66	5.91
<i>Other Livestock Farming</i>	83.15	3.18	7.87	5.52
<i>Aquaculture</i>	60.44	16.48	20.88	3.30
<i>Forestry and Logging</i>	61.22	20.41	18.37	10.20
<i>Fishing</i>	17.31	5.77	76.92	0.00
<i>Forestry Support Services</i>	66.67	0.00	33.33	0.00
<i>Agriculture and Fishing Support Services</i>	50.55	11.54	32.97	4.40

¹⁰ nfd = not further defined

Table 15 - Percentage change in the transect's agricultural industries (2006-16)

Percentage Change (%) in status of agricultural employment categories in Hunter Agriculture INDP3										
Agriculture INDP3	Employee not owning business (%)		Owner managers of incorporated enterprises (%)		Owner managers of unincorporated enterprises (%)		Contributing family workers (%)		Total (%)	
	2006-11	2011-16	2006-11	2011-16	2006-11	2011-16	2006-11	2011-16	2006-11	2011-16
<i>Agriculture, Forestry and Fishing, nfd¹¹</i>	-21.05	80.00	[NaN]	140.00	30.00	61.54	-100.00	[NaN]	12.90	57.14
<i>Agriculture, nfd</i>	-12.86	180.33	127.27	100.00	100.00	20.73	-55.56	583.33	20.41	122.03
<i>Nursery and Floriculture Production</i>	-8.70	133.33	-50.00	125.00	-32.26	47.62	83.33	90.91	-11.76	70.00
<i>Mushroom and Vegetable Growing</i>	-12.50	-7.14	133.33	-100.00	-48.15	28.57	-23.53	-53.85	-21.30	-7.06
<i>Fruit and Tree Nut Growing</i>	-57.26	-7.55	-20.00	-50.00	-51.52	-25.00	-35.71	3.70	-45.97	-3.51
<i>Sheep, Beef Cattle and Grain Farming</i>	-10.95	-6.56	-6.61	-13.75	-17.50	-14.00	-9.23	-2.10	-12.78	-8.50
<i>Other Crop Growing</i>	0.00	-19.05	-30.00	-42.86	-35.90	-20.00	33.33	-41.67	-20.24	-22.39
<i>Dairy Cattle Farming</i>	6.60	16.19	-22.22	0.00	-16.31	-35.02	-13.56	23.53	-7.68	-9.19
<i>Poultry Farming</i>	-7.04	87.88	-47.83	66.67	-3.03	43.75	100.00	50.00	-10.95	66.39
<i>Other Livestock Farming</i>	0.93	10.46	6.06	-34.29	0.00	-3.39	-30.91	5.26	-1.89	7.26
<i>Aquaculture</i>	-19.70	3.77	0.00	-6.25	-51.61	26.67	-20.00	-75.00	-34.56	2.25
<i>Forestry and Logging</i>	-60.94	20.00	-57.14	233.33	42.86	-10.00	-50.00	66.67	-55.81	28.95
<i>Fishing</i>	37.50	-18.18	[NaN]	[NaN]	82.35	29.03	-100.00	[NaN]	48.15	30.00
<i>Forestry Support Services</i>	-47.37	120.00	[NaN]	-100.00	-100.00	[NaN]	-100.00	[NaN]	-42.11	200.00
<i>Agriculture and Fishing Support Services</i>	-14.29	53.33	50.00	-22.22	-2.33	42.86	-56.25	14.29	-3.57	34.81

¹¹ nfd = not further defined

4.4 Drought in the Hunter transect

Insight 17. Findings from our data and focus group discussions confirm that in the short and medium term, drought does not lead to more or less ownership change. Owners tend to find other ways to cope with the stresses generated by drought and selling land remains a last resort.

Analysis by the research team of the correlation between landownership change and drought patterns shows that at the state-wide level, droughts have little if no effect on regional patterns of ownership change in the short-term. Over the long term (10+ years), however, the longer the time in drought, the less land seems to change hands.

When these state-wide findings were put to stakeholders along the Hunter transect, most responded that this was not a surprise, and confirmed their expectations. In Warrumbungle Shire, for example, stakeholders indicated that drought years may not have led to significant changes in land ownership as there is a significant number of small-scale long-term landowners with no debt, who are able to adjust to drought periods without the need of assistance from loans. A constant message is that farmers tend to hang on and dig in during drought. Some benefit from government drought assistance measures and hand-outs, some might seek work outside the farm or have alternative sources of income already. Some, however, would not seek help. According to a stakeholder in Liverpool Plains, although the 2019 drought was the most intense ever experienced by residents of the LGA, many resisted to seek help and although many crops were maintained through access to irrigation, prices for water skyrocketed. Hay and other drought management supplies also went up in price making tougher especially for smaller holdings. For cattle producers, feedlots became an importance response, and many of these have become permanent after 2019, with an increase in development applications being lodged for permanent feedlots, which did not require consent as temporary structures during the drought.

According to stakeholders along the transect, properties were still selling during the 2019 drought and property prices remained relatively stable showing that annual variants in climate may not be enough of a catalyst to generate regional processes of land ownership change. This may mean that drought strategies such as off-farm employment, de-stocking or moving stock around, and adjustments in farm equipment are effective coping mechanisms. Many also indicate that small and medium-scale grazing farms provide a level of flexibility that cropping farms do not, as managing stock levels can become a primary strategy to adjust to drought. For many, selling may not a consideration unless the prospect is already on the cards regardless of the drought.

Destocking as a strategy to manage drought can be expensive in the long run. According to some stakeholders, it may be easy to destock, but re-stocking is expensive, which leads to many farms remaining underutilised after drought. This is an important consideration, especially in areas where there is pressure for rural land to be converted into non-agricultural uses, such as rural housing. In many areas of the Hunter transect, higher altitudes and relatively cooler climates have also meant that droughts have not been as strong as in other areas further north and west. In Dungog, for example, stakeholders indicate that natural water availability in the LGA mean that irrigation is not required. Although grazing is more common in most the transect than cropping, some water-intensive animal industries, such as dairy farming have also been moving away in certain areas. However, dairy farming it is still a key part of the transect's economy.

Finally, a common theme in the Hunter, as in other transects across NSW, is that rainfall prompts sales, rather than drought precluding them. In the words of one focus group participant: "You want to try to sell when it looks green." This is an important observation, as it shifts the view away from drought, and onto 'good years.'. In the Upper Hunter, for example, stakeholders reported on the importance of green pasture on the value of horse farms. A similar experience exists for grazing farms and cropping farms. Areas linked to water licences may have different propensity to change of ownership, compared to those with no licenses, for example. Further research is necessary to correlate rainfall patterns (rather than drought patterns) to patterns of agricultural land sales.

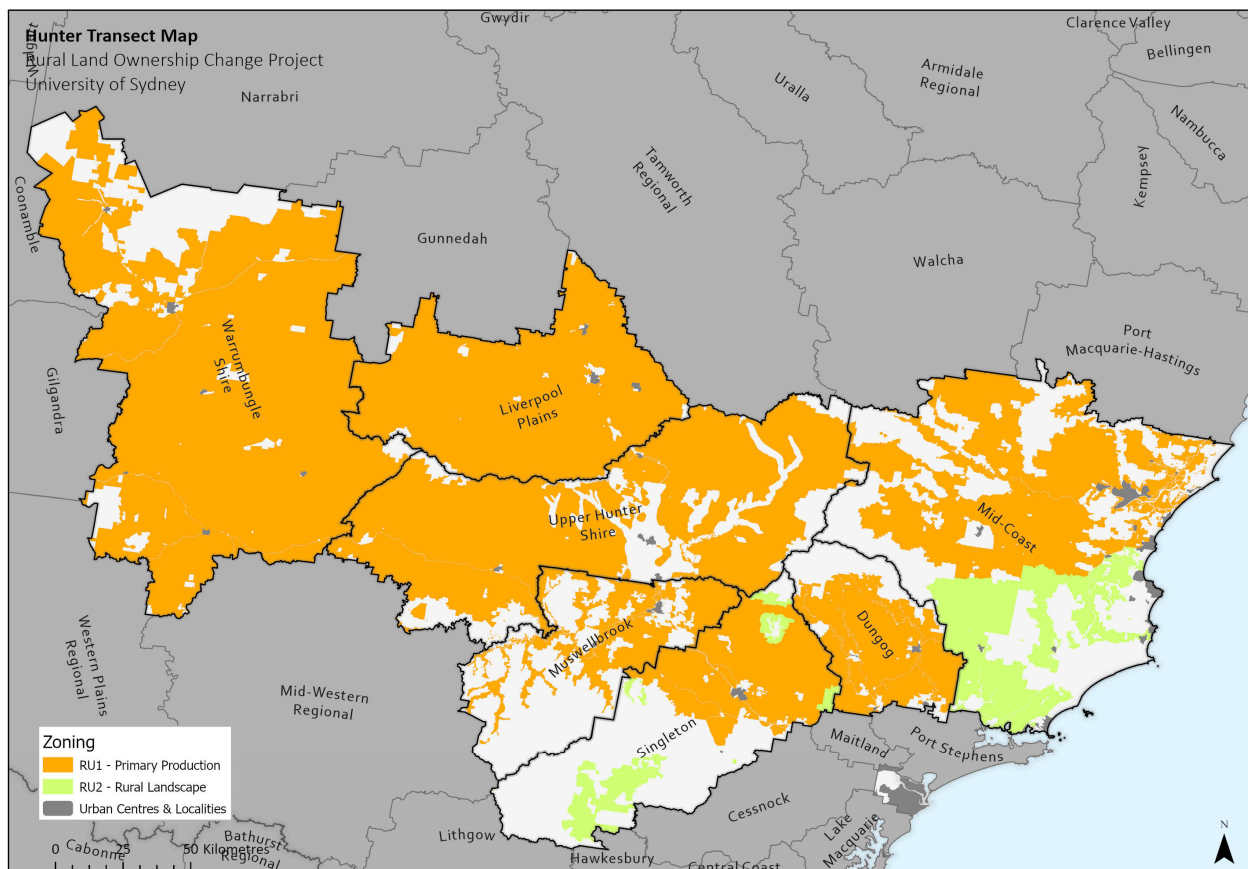
5. Land-use planning trends affecting land ownership patterns

5.1 Zoning and land-use permissibility

Insight 18. Zoning and planning controls reflect key geographical distinctions across the transect. The east is comprised of high amenity / lower agricultural production areas; in the transect’s central area, high amenity / extractive industry areas dominate; in the west, highly productive agricultural areas in Liverpool Plains and traditional small-scale grazing farms in Warrumbungle LGA are dominant.

The transect’s diversity of rural land types is reflected in its zoning. While other transects across the state have a consistent RU1 Primary Production zone throughout (extensive agriculture is permitted without consent in RU1 zone of all LGAs, as per the standard instrument) the Hunter’s geography means that many pockets of RU1 land are surrounded by national park zoning, forestry zoning and other special uses. Similarly, the transect has a relatively large proportion of land zoned as RU2 Rural Landscape, especially in MidCoast LGA but also in parts of Singleton. These zones were established by the Great Lakes Local Environmental Plan 2014 and Singleton Local Environmental Plan 2013.

Figure 24 - Hunter transect Zoning Map



The NSW standard LEP includes a list of standard objectives for all RU1 Primary Production zones:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.

However, councils can and often do add additional objectives to reflect the local character of the zone, as outlined in Table 16. As this table shows, the councils on the east of the transect (MidCoast and Dungog) have included several additional objectives to the standard ones for the zone, mostly in relation to provide for rural tourism that is compatible with primary production and to minimise the fragmentation of rural land. Meanwhile, the LGAs with significant extractive industries (Upper Hunter and Muswellbrook) have added significant objectives in relation to the protection of agricultural land from other uses, the protection of soil quality, water resources and specifically on the need to minimise the impact of extractive industries on primary production. To the west of the transect, Warrumbungle and Liverpool Plains do not have any additional objectives to the standard RU1 ones, reflecting their more traditional agricultural character, which aligns with the standard objectives of the RU1 Primary production zone.

Table 16 - List of LEP specific objectives for RU1 Primary production zone.

Local Environmental Plan (LEP)	LEP specific objectives for the RU1 zone (additional to those in prescribed by the standard instrument LEP)
<p>MidCoast: <i>Greater Taree Local Environmental Plan 2010</i></p>	<ul style="list-style-type: none"> • To permit small scale rural tourism uses associated with primary production and environmental conservation with minimal impact on primary production and the scenic amenity of the area. • To maintain the rural landscape character of the land. • To protect and enhance the native flora, fauna and biodiversity links. • To secure a future for agriculture in the area by minimising the fragmentation of rural land and loss of potential agricultural productivity.
<p><i>Gloucester Local Environmental Plan 2010</i></p>	<ul style="list-style-type: none"> • To encourage eco-tourism enterprises that minimise any adverse effect on primary industry production and the scenic amenity of the area.
<p><i>Great Lakes Local Environmental Plan 2014</i></p>	<ul style="list-style-type: none"> • <i>No RU1 zone</i> <p>Additional RU2 objectives</p> <ul style="list-style-type: none"> • To provide for rural tourism in association with the primary industry capability of the land which is based on the rural attributes of the land. • To secure a future for agriculture in the area by minimising the fragmentation of rural land and loss of potential agricultural productivity.
<p>Dungog: <i>Dungog Local Environmental Plan 2014</i></p>	<ul style="list-style-type: none"> • To provide for recreational and tourist activities that are compatible with the agricultural, environmental and conservation value of the land. • To promote the rural amenity and scenic landscape values of the area and prevent the silhouetting of unsympathetic development on ridgelines.
<p>Singleton: <i>Singleton Local Environmental Plan 2013</i></p>	<ul style="list-style-type: none"> • None.
<p>Muswellbrook:</p>	<ul style="list-style-type: none"> • To protect the agricultural potential of rural land not identified for alternative land use, and to minimise the cost to the community of providing, extending and maintaining public amenities and services. • To maintain the rural landscape character of the land in the long term.

<p><i>Muswellbrook Local Environmental Plan 2009</i></p>	<ul style="list-style-type: none"> • To ensure that development for the purpose of extractive industries, underground mines (other than surface works associated with underground mines) or open cut mines (other than open cut mines from the surface of the flood plain), will not— <ul style="list-style-type: none"> ○ (a) destroy or impair the agricultural production potential of the land or, in the case of underground mining, unreasonably restrict or otherwise affect any other development on the surface, or ○ (b) detrimentally affect in any way the quantity, flow and quality of water in either subterranean or surface water systems, or ○ (c) visually intrude into its surroundings, except by way of suitable screening. • To protect or conserve (or both)— <ul style="list-style-type: none"> ○ (a) soil stability by controlling development in accordance with land capability, and ○ (b) trees and other vegetation, and ○ (c) water resources, water quality and wetland areas, and their catchments and buffer areas, and ○ (d) valuable deposits of minerals and extractive materials by restricting development that would compromise the efficient extraction of those deposits.
<p>Upper Hunter: <i>Upper Hunter Local Environmental Plan 2013</i></p>	<ul style="list-style-type: none"> • To protect the agricultural value of rural land. • To maintain the rural landscape character of the land in the long term. • To ensure that development does not unreasonably increase demand for public services or public facilities. • To ensure that development for the purposes of extractive industries, underground mines (other than surface works associated with underground mines) or open cut mines (other than open cut mines from the surface of the flood plain) will not— <ul style="list-style-type: none"> ○ (a) destroy or impair the agricultural production potential of the land or, in the case of underground mining, unreasonably restrict or otherwise affect any other development on the surface, or ○ (b) detrimentally affect the quantity, flow and quality of water in either subterranean or surface water systems, or ○ (c) visually intrude into its surroundings, except by way of suitable screening.
<p>Liverpool Plains: <i>Liverpool Plains Local Environmental Plan 2011</i></p>	<ul style="list-style-type: none"> • None
<p>Warrumbungle: <i>Warrumbungle Local Environmental Plan 2013</i></p>	<ul style="list-style-type: none"> • None

5.2 Minimum lot sizes

Insight 19. Minimum Lot Size (MLS) rules vary greatly from east to west. The ‘right’ size of a lot is contentious topic in the east of the transect, especially closer to urban centres and high-amenity coastal areas. Despite this, consolidation (merging parcels) played a larger role than sub-division (breaking up existing parcels) across the transect, leading to a net reduction in the number of rural parcels between 2004-20.

Minimum lot size (MLS) rules are a contentious topic across the transect. Many of the stakeholders we spoke to as part of the focus group expressed disagreement either with the status quo, or with particular philosophies for change advocated by other stakeholders. What is common among most stakeholders is the feeling that blanket MLS rules are inadequate in responding to changing agricultural practices and land-uses. Some believe that MLS rules should be further relaxed, some believe they should be scrapped, and the system should rely more on case-by-case merit assessments. For example, a stakeholder in Dugong expressed the view that the LGA has become a lifestyle area, but strict MLS rules remain wedded to presumptions about

standard agriculture, and this is an obstacle to appropriate development in the council area. This stakeholder believed that smaller (more relaxed set of rules would not impede in protecting the rural ‘beauty of the area.’ On the other hand, there is also a strong view that the current rules provide an important mechanism for preventing rural land fragmentation, which together with flexible LEP clauses, allow for a balanced approach to the management of subdivision applications and dwelling approvals.

What is clear is that the same MLS restrictions often blanket areas of land with very different agricultural prospects, measured by soil quality, pasture availability, etc. In Warrumbungle, for example, a stakeholder indicated that a 200-hectare farm would not be viable as the type of soil and pasture require much larger properties for viability. This is in contrast to Liverpool Plains, for which soil type provides a lot more flexibility regarding the type of enterprise and property size. An oft-heard view among focus group participants was that MLS rules are not highly attuned to these differences and can act to the frustration (in different circumstances) both to landowners wishing to subdivide their parcels, and those wishing to preserve agricultural landscapes.

Overall, there is evidence that MLS rules provided a significant barrier to rural subdivision in the transect. At the start of the study period, the area covered by the seven transect LGAs contained 64,700 unique land parcels (noting the exclusions described in **Appendix A**). At the endpoint of the study, in January 2020, this area was covered by 64,062 unique parcels, indicating a small net consolidation in the number of parcels of 1%. This indicates that any increases in the number of parcels caused by subdivisions were more than offset by the merging of parcels by landowners. It also shows that the overwhelming number of ownership changes occurred within the confines of pre-existing parcel boundaries. Most LGAs had a net reduction in the number of individual parcels or a very small net increase (Dungog). Singleton and Muswellbrook are the exceptions, with an increase in parcel numbers related to residential subdivisions close to urban centres.

Table 17 - Number of parcels in the transect, 2004-20

LGA	Number of parcels	Number of parcels	Percentage change
	(Jan 2004)	(Jan 2020)	(2004-2020)
MidCoast	22,332	22,135	-0.89%
Dungog	4,841	4,855	0.29%
Singleton	7,669	7,924	3.22%
Upper Hunter Shire	10,535	10,128	-4.02%
Muswellbrook	4,524	4,581	1.24%
Liverpool Plains	5,995	5,725	-4.72%
Warrumbungle Shire	8,804	8,714	-1.03%
Hunter transect (total)	64,700	64,062	-1.00%

Note: LGAs are presented in order from east to west.

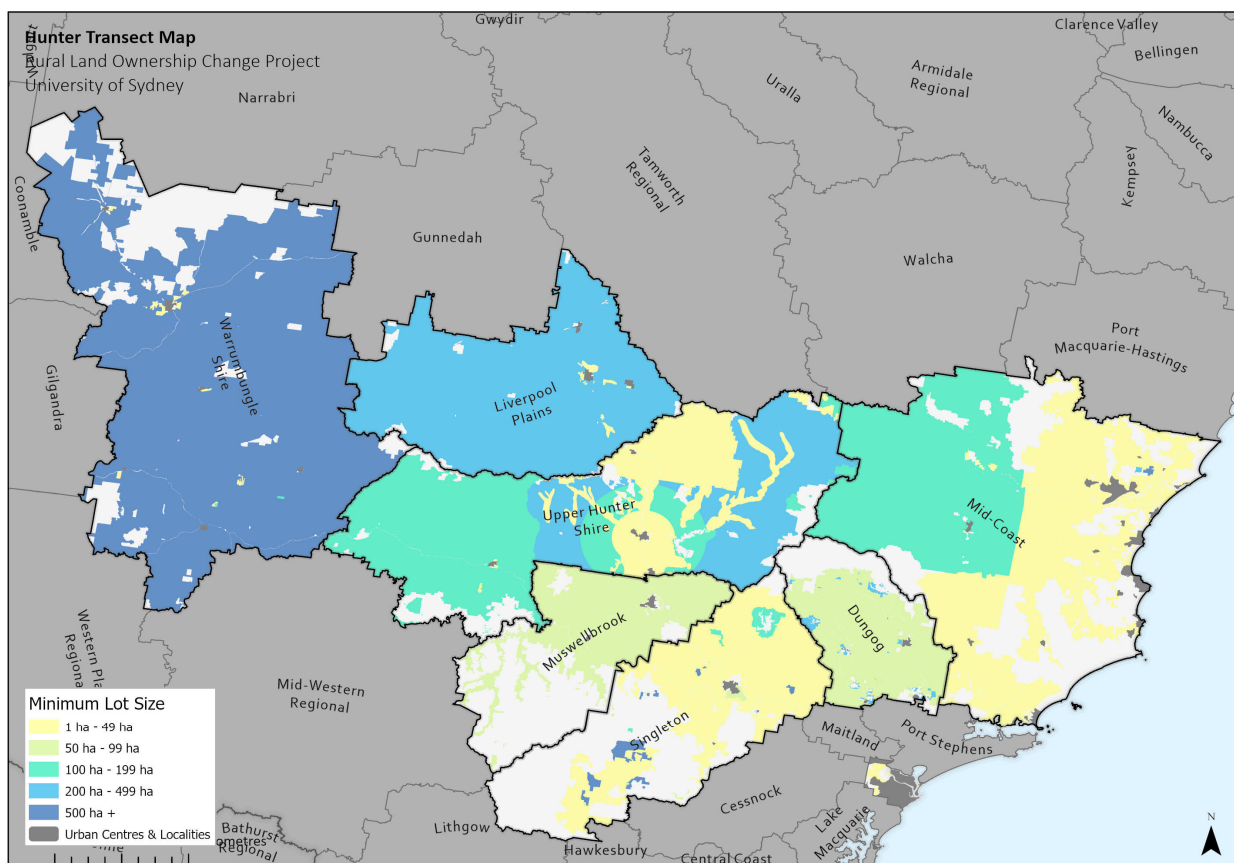
Not surprisingly, areas at the east of the transect have smaller MLS’s on average than those on the transect’s west (Figure 25). The smaller MLS’s in MidCoast, Singleton and (to a lesser extent) Dungog LGAs places limits on the number of parcels that are potentially subdividable. This is the case even though it is these LGAs, because of amenity values or urban growth, which have highest pressures for subdivision. In the more traditionally agriculturally dominant LGAs in the western portion of the transect, many parcels are still not large enough to provide opportunities for subdivision. According to some focus group participants, this impacts negatively on succession-planning. Since the abolition of concessional lot provisions, more than a decade ago, it has not been possible for farm families to carve out house blocks that enable family members to reside on their properties. This led to the situation where, according to focus group participants many retiring farmers of multigenerational farm families to sell and move out the region. These sales are profitable,

especially in high amenity areas. Some stakeholders in these areas, believe that more flexibility in MLS rules would allow for better social outcomes, arguing that any MLS rule would be arbitrary and would not allow landowners to make best economic use of their land. There is a clear tension here between opportunity/profitability and protection.

In these contexts, MidCoast Council is currently undertaking a review of the three LEPs that apply to its LGA, with the objective of combining them into one single LEP. Part of this includes reviewing minimum lot sizes. A review process like this one generates many opinions about the 'right' type of minimum lot size, with some people indicating that a standard 40 ha rule across the LGA is appropriate. Some, on the other hand, believe that more nuanced MLS rules that consider the particular local context of each area, are more appropriate. If a smaller MLS rule is adopted, building entitlements for smaller rural lots would be created allowing many to develop new housing or subdivide. However, some stakeholders believe that 40ha lots are not relevant to lifestyle properties or profitable farms, a middle ground which may lead to poor planning outcomes.

The diversity of MLS's in Upper Hunter LGA is noteworthy. According to stakeholders, there are historical reasons for this diversity, which also means some of the differences are contentious and contextual (and would be difficult to standardise across the LGA). Finally in the western end of the transect, Warrumbungle has the largest MLS, which relates to the need for larger farms for viability considering the type of soil and topography.

Figure 25 - Minimum lot size map, categorised by size



5.3 Dwelling entitlements and subdivision

Insight 20. The ratio of MLS rules to lot sizes varies along the transect, with highest on-paper potential for subdivision and dwellings in Warrumbungle and lowest in the agricultural areas of Liverpool Plains and Upper Hunter Shire. Singleton, Muswellbrook, Dungog and MidCoast have a mix of pockets of more and less subdividable areas. It is important, however, to note that on paper potential for subdivision or a dwelling based solely on MLS roles does not necessarily mean the property can have a dwelling or can be subdivided. Other key matters for consideration, such as slope, vegetation, bushfire risk and service access help define this at a parcel-level.

As show in Table 18, lot sizes vary significantly across the transect, with LGAs in the west having larger average parcel sizes than the east. However, this does not necessarily reflect subdivision or dwelling potential, as other matters are necessary to establish this. However, a ratio of minimum lot size rules to lot sizes can be established to determine patterns of lot size across the transect, as show on Figure 26.

Table 18 - Lot sizes in the Hunter transect

LGA	Average parcel size (Jan 2020)	Largest parcel (Jan 2020)	Difference in the No. of parcels 2004-20
MidCoast	27.13 ha	41,538 ha	-197
Dungog	28.83 ha	17,115 ha	14
Singleton	32.61 ha	131,759 ha	255
Upper Hunter Shire	57.06 ha	53,111 ha	-407
Muswellbrook	33.94 ha	18,710 ha	57
Liverpool Plains	69.07 ha	54,242 ha	-270
Warrumbungle Shire	107.86 ha	28,585 ha	-90
Hunter transect (total)	48.12 ha	13,176 ha	-638

Figure 26 - Minimum Lot Size Ratio Map

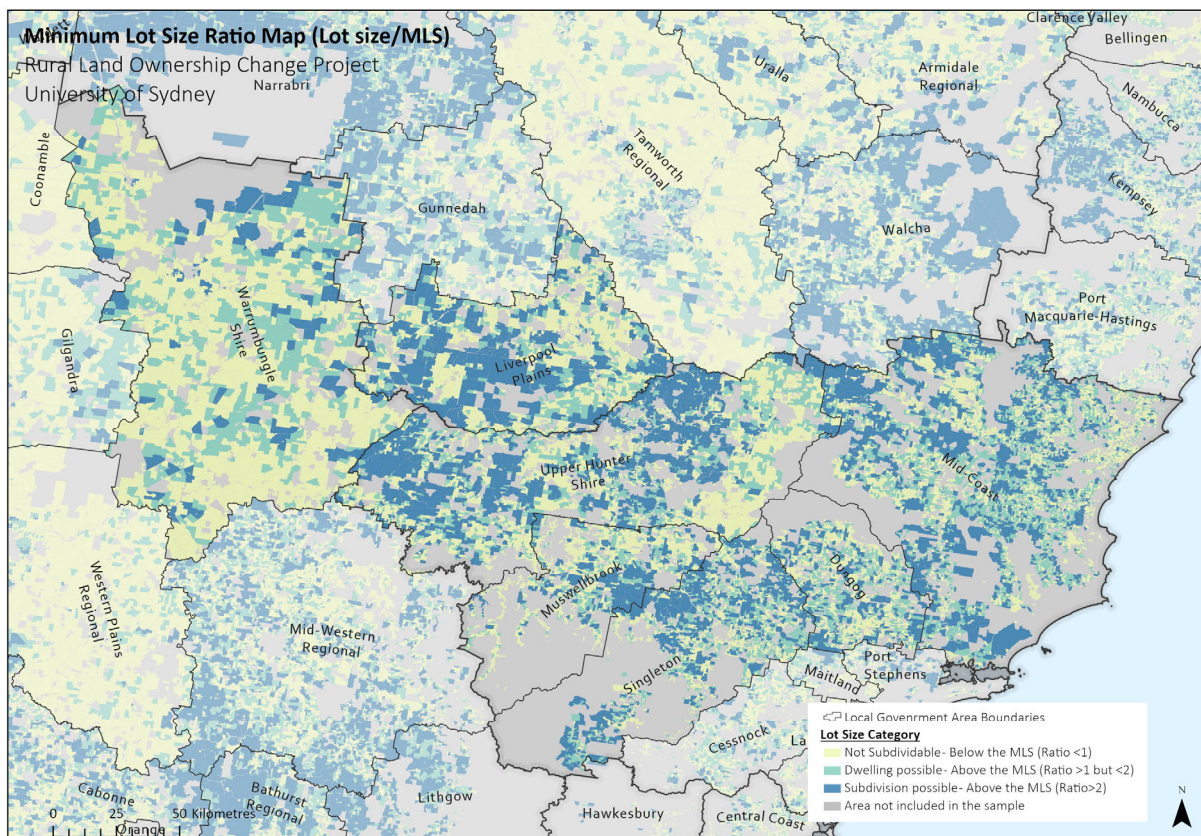


Figure 26 shows that the minimum lot size rules in Warrumbungle are the most restrictive ones in the transect, as most of the existing parcels of land are below the size required to allow a new dwelling or subdivision. This is in contrast to areas in Liverpool Plains and Upper Hunter, which on paper, are subdividable and/or can have a new dwelling as they are above the minimum lot size requirements. A similar pattern occurs to the east of the transect with many pockets of subdivisible areas. However, as pointed out by stakeholders in the region, this does not necessarily mean all parcels that meet the minimum lot size requirements can have a dwelling or be subdivided. Other key matters for consideration, such as slope, vegetation, bushfire risk and service access help define this at a parcel-level.

Flexible minimum lot size clauses

According to stakeholders, flexible clauses in the LEP and variations to standards in SEPPs have been extensively used by property owners in this area, also generating several court cases. One stakeholder in this area reported that cl 4.2 of the standard LEP is problematic in areas of significant transition such as the Hunter (particularly in peri-urban settings). Sometimes, subdivisions as a result of this clause are followed by changes to the agricultural business which render the land unusable and with a covenant stating that a dwelling cannot be erected on the land, making re-amalgamation the only possible options for the land.

Stakeholders in Warrumbungle explained that council receives a lot of queries about dwelling entitlements. Due to the very large MLS threshold in the LGA and planning controls related to bushfire protection, among others, it is difficult for rural property owners to obtain dwelling entitlements in the LGA. Despite this, the experience reported here is that flexible clauses are not often used. Council introduced a 5-year sunset clause on historic dwelling entitlements which ended in 2020. These historic dwelling entitlements resulted in many pockets of small holdings. However, these areas are generally far from amenities, making them less attractive than areas closer to the coast.

5.4 Land use conflicts

Insight 21. Rural tourism and growing demand for rural residential uses are key factors influencing planning in the Hunter transect. These are most common east of Great Dividing Range.

A common theme outlined by stakeholders across the transect is the importance of tourism for the region. Tourism is both a significant and rapidly growing source of income in the transect but also a generator of land-use change and in many instances land-use conflict. In MidCoast many stakeholders pointed to the growth of short-term rental accommodation and associated tourist facilities as areas of interest in terms of regulation. In Dungog, some have concerns of a growing demand for lifestyle farms and holiday houses putting pressure on the LGA and having the potential to change the character of the area. In Upper Hunter, stakeholders point out that parts of the area are increasingly becoming peri urban extensions of the Greater Newcastle area. The issue of dwelling entitlements is key here, with many wanting to sell or subdivide, but being deterred from doing so because of planning controls.

As in other transects, the concept of 'shouse' (shed-house) came up in conversation several times. It is known that restrictive dwelling entitlement rules have led to some people converting farm sheds into houses without council approval. This issue is related to some of the rural residential pressures in the transect, which are not specific to the transect, but a common issue across many parts of NSW. Some stakeholders called for the need of more mid-size lots with dwelling entitlements, particularly in high amenity areas, which are no longer strictly used for primary production.

Further west in Liverpool Plains, the council has been working with the Small Business Commissioner to incentivise agritourism in the LGA, with some steps made in providing opportunities for farmers to diversify their income. In Liverpool Plains as well as Warrumbungle, the pressures of tourism and demand for dwellings are less and councils report that land use conflict complaints are minimum. Warrumbungle Council is also working to expand agritourism in the LGA, with some small progress being made. In Liverpool Plains it was reported that historical dwelling entitlements (existing holding) rules were repealed with a 5-year sunset

clause ending in 2016. There were a few applications for dwelling in 2016 but less than a third have been completed.

The different experiences reported by stakeholders show that there is a sharp difference in drivers of land ownership change in relation to planning rules between the east and the west of the transect. In high amenity, coastal and peri-urban areas the growing demand for hobby farm and lifestyle houses is putting pressure on planning controls and creating tension with existing farming operations. In contrast, western parts of the transect are not experiencing these pressures. In fact councils are aiming to increase agritourism and plan for more housing as ways to incentivise economic diversification.

Finally, there are other sources of land use conflict reported by stakeholders. Energy generation projects, including solar and wind farms and coal-seam gas exploration are important areas to explore. They are not the focus of this report and so are not explored in detail here.

Themes for future research: Many of the socio-economic themes presented in this report have been communicated to us by stakeholder who kindly shared their views about our data and shared their own experiences with the topic. This paper has attempted to consolidate these views and to create connections to the findings from our database.

Many of the anecdotal findings from focus groups have assisted to confirm our findings and to provide local context to the quantitative analysis from our database. These findings present interesting opportunities for further research and future conversations with stakeholders. As more data is collected through the land-titles registration method presented in this report and other outcomes of our project, we hope that more light will be shed on these important trends affecting the ownership and management of land in rural NSW.

6. Bibliography

- Australian Bureau of Statistics (2011a) Table Builder, Place of Usual Residence (online resource), accessed 9 January 2021.
- Australian Bureau of Statistics (2011b) Table Builder, Place of Work (online resource), accessed 9 January 2021.
- Australian Bureau of Statistics (2016a) Table Builder, Place of Usual Residence (online resource), accessed 9 January 2021.
- Australian Bureau of Statistics (2016b) Table Builder, Place of Work (online resource), accessed 9 January 2021.
- Australian Bureau of Statistics (2017) 3101.0 - Australian Demographic Statistics, Dec 2016, <https://www.abs.gov.au/ausstats/abs@.nsf/7d12b0f6763c78caca257061001cc588/40269d5a7e7bd7a1ca2581470023db40!OpenDocument>.
- Australian Bureau of Statistics (2021) Regional Population 2019-20 – Estimates by Local Government Area. <https://www.abs.gov.au/statistics/people/population/regional-population/latest-release>.
- Australian Government (2021) About my region – Central West New South Wales, Department of Agriculture, Water and the Environment Website, accessed 26 July 2021, <https://www.agriculture.gov.au/abares/research-topics/aboutmyregion/nsw-central#regional-overview>.
- Australian Bureau of Statistics (ABS) (2021), Census <<https://www.abs.gov.au/census>>
- NSW Department of Planning and Environment (2016), Hunter Regional Plan 2036.
- NSW Department of Planning and Environment (2017), New England North West Regional Plan 2036.
- Pritchard, B., Welch E., Umana Restrepo, G. (2021) Rural Land Ownership Change in NSW, 2004-20, University of Sydney & NSW Department of Primary Industries.
- Pritchard, B., Umaña Restrepo, G., Welch, E., Mitchell, L., Stone, C. (2021) Land Ownership Change in Rural NSW: Central West Transect Report, University of Sydney & NSW Department of Primary Industries. <https://rural-land-science.sydney.edu.au/>
- Reserve Bank of Australia (RBA) (2022) Index of Commodity Prices, accessed 31 January 2022, <https://www.rba.gov.au/statistics/frequency/commodity-prices/2021/icp-1221.html>
- Rural Bank (2020) Australian Farmland Values – New South Wales 2020.
- Rural Bank (2021) Australian Farmland Values – New South Wales 2021.
- Sippel, S. R., Larder, N., & Lawrence, G. (2017) Grounding the financialization of farmland: perspectives on financial actors as new land owners in rural Australia. *Agriculture and Human Values*, 34(2), 251-265, <https://doi.org/10.1007/s10460-016-9707-2>.

Appendix A: Methodology

The findings in this report are based on spatial analysis and a series of interviews and focus groups undertaken in the region by the research team.

The spatial database

Spatial analysis was undertaken by creating a spatial database that contains land parcel ownership information on an annual basis each year from 2004 to 2020. Land titles and cadastral data was provided to the research team through an agreement with NSW Land Registry Services (LRS). We augmented these data with linked datasets on land-use sourced from the NSW Department of Planning, Industry and Environment (DPIE) and drought data provided by the Department of Primary Industries (DPI). The spatial database covers 91% of rural NSW (639, 975 km²). Full details of the state-wide scope of the spatial database are available in Pritchard et al. (2021). Each parcel of land in the study area includes the following information for each year of the study period:

- **Land parcel details:** including area (sqm), Cadastre ID (CADID), LGA and region where it is located
- **Ownership information:** including owner category, names of owners
- **Seller information:** including seller category and names of sellers (for parcels changing hands in the relevant year)
- **Subdivision and amalgamation data:** whether the parcel was subdivided or combined with other parcels in the calendar year
- **Land use information:** the total area of the different land uses that apply to the parcel of land and the proportion of the lot that is dedicated to agriculture, developed by the overlay of Australian Land Use & Management (ALUM) onto our land parcel spatial dataset.
- **Other information:** whether the lot changed hands in the calendar year and the proportion of similarity between the owners and the seller.

The database excludes Urban Centres and Localities (UCLs), Metropolitan LGAs, national parks and parcels under 200sqm. This is because residential and industrial land in urban centres and rural towns follow different ownership change patterns and respond to different pressures. The same can be said of environmental protection areas. In rural areas parcels of land under 200sqm are too small to be viable farming land, and are likely to be road easements, drainage land or land dedicated to other infrastructure or services. These exclusions ensure that 'data noise' created by these specific land-uses was excluded from the analysis.

Furthermore, land titling has inherent legal and administrative complexities, including business registration rules, co-ownership of land between private owners and public agencies, land covenants and name changes. Consequently, the creation of a research-ready database required the development of sophisticated methodologies to facilitate the extraction, cleaning and interpretation of the data. Hence, this project's research-ready database is an innovative source of evidence on the NSW landownership change patterns over the past two decades.

Identifying substantive change

Since the data used for this report relies on land-titles registration names, there are inevitable formatting inconsistencies in the data associated with name changes which are not a result of a transaction. These are not as simple to identify and clean due to the scale of the dataset, and the possibility remains for certain administrative inconsistencies being picked up as 'ownership changes.'

For example, the correction of a spelling error for the same parcel of land across datasets could be classified as an 'event' because it involves a change in the owners' record name (e.g. a land parcel held by 'Jonathon Smith' one year and 'Johnathon Smith' the next may refer either to a spelling correction for the same person, or an actual transfer of ownership between two people with remarkably similar names).

The same issue occurs when the owner has the same name but a different surname across multiple years, which may represent a name change (for example due to a marriage) or it may represent a sale between two different people who share a given name. Some of these may be naming and spelling corrections, however the possibility remains that these are legitimate transactions between individuals with similar names or transactions between family members. In other situations, a parcel of land may be owned by (say) five individual owners, and one of these is removed from the title and an additional owner added. Classifying examples like these as transactions requires making a judgment of the extent under which a name is similar enough to be classified as being the same owner. The research team sought to clean the data as far as possible, but the possibility remains for certain data anomalies being picked up as transactions.

The method used by the research team to minimise the false identification of these formatting inconsistencies as changes in ownership was based on identifying the extent of similarities between the seller and owner fields in the database. The *Fuzzy Lookup* add-in for Microsoft Excel was used to determine the similarity between 'strings of text' in the owner and seller fields of the database. This tool provides a similarity score based on the percentage of the text string which matches. The following thresholds were defined based on the percentage similarity between the owner and seller fields for each parcel of land on each year:

- **0-20% similarity:** this level of similarity is considered a definite ownership change with little or null possibility for typographical or formatting errors to be present.
- **20-70% similarity:** this level of similarity is considered to be an ownership change; however, it includes instances in which there are partial ownership changes, including:
 - One or multiple owners being replaced in a multi-owner arrangement
 - Potential family transactions, where the owner and seller share a surname
 - Name changes (for example due to marriage)
 - Typographical and formatting errors are also possible, including different spellings for the same surname or given name, and different use of acronyms and special characters.
- **70-100% similarity:** when the similarity is above 70% it is considered not to be a legitimate ownership change, but a typographical or formatting issue associated with the same owner.

For the purposes of the analysis presented in this report, only substantial changes (where similarity between owner and seller is below 70%) are considered to be a 'change of ownership' as they indicate a significant change to the name on the land title.

In-depth interviews and focus groups

Once data was prepared, a series of interviews and focus groups were scheduled with stakeholders in the region to elicit local perspectives on patterns of rural land ownership change. Stakeholders included local and state government staff, real estate agents, landholders and primary producers. Adding this research component to our analysis of the spatial database allowed a nuanced and locally grounded understanding of the factors shaping patterns of ownership change in the Hunter transect.

In-depth interviews and focus groups were undertaken in January 2021 and November 2021. Each focus group session was 1.5 hours long and was attended by 3-5 stakeholders. A total of 21 stakeholders participated in the focus groups. Stakeholders included business and farm representatives, council and state government officers and real estate agents operating in MidCoast LGA, Dungog LGA, Upper Hunter LGA, Liverpool Plains LGA and Warrumbungle LGA. Each session included a presentation by the research team on the quantitative findings followed by an in-depth discussion about issues and factors surrounding patterns of ownership change. The discussion was guided by questions prepared by the research team and submitted to the participants in advance. Indicative focus group questions are included in **Appendix C**. In some cases, stakeholders were not available to participate in focus groups, and so individual, in-depth interviews were arranged.

Appendix B: LGA data

1. MidCoast

Figure 27 - Incidence of change on agricultural and non-agricultural rural land in MidCoast

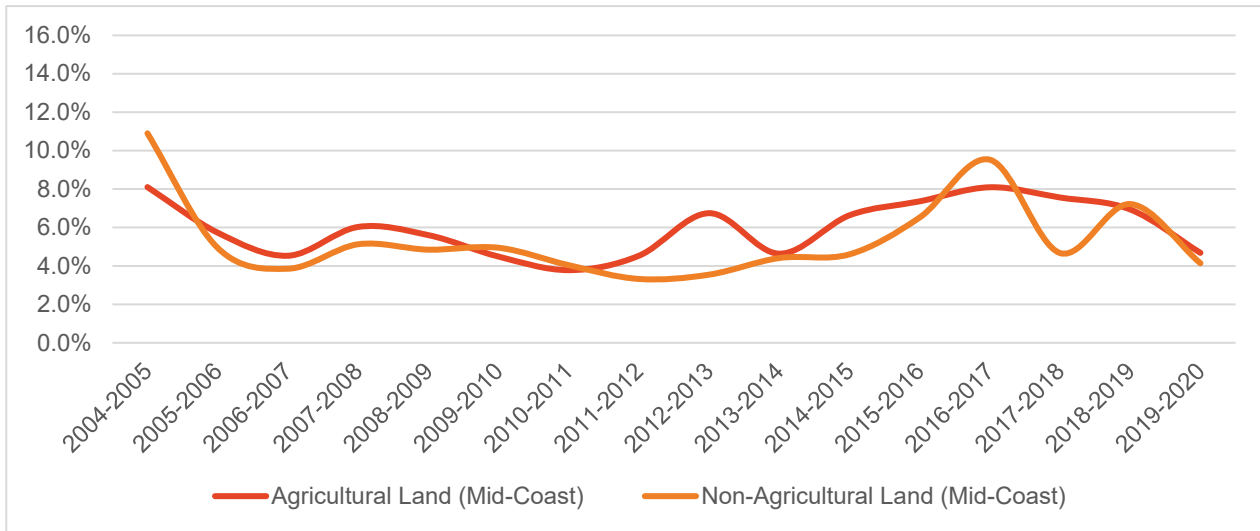
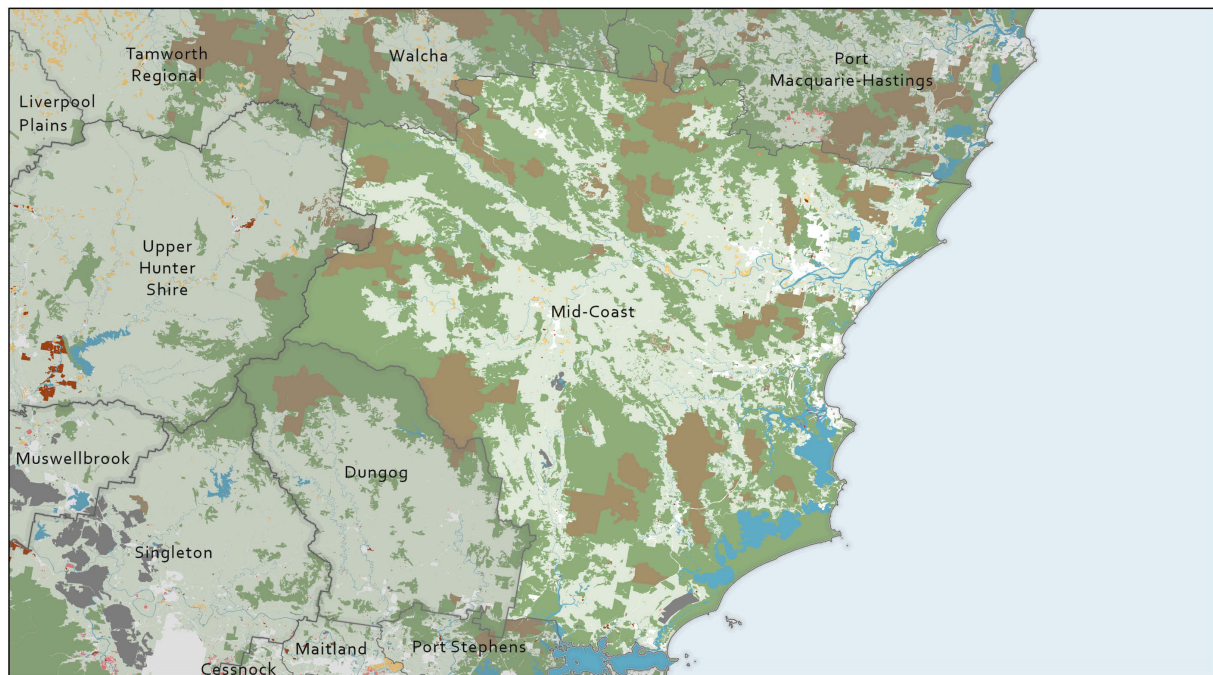


Figure 28 - MidCoast Land Use Map



Mid-Coast LGA

ALUM



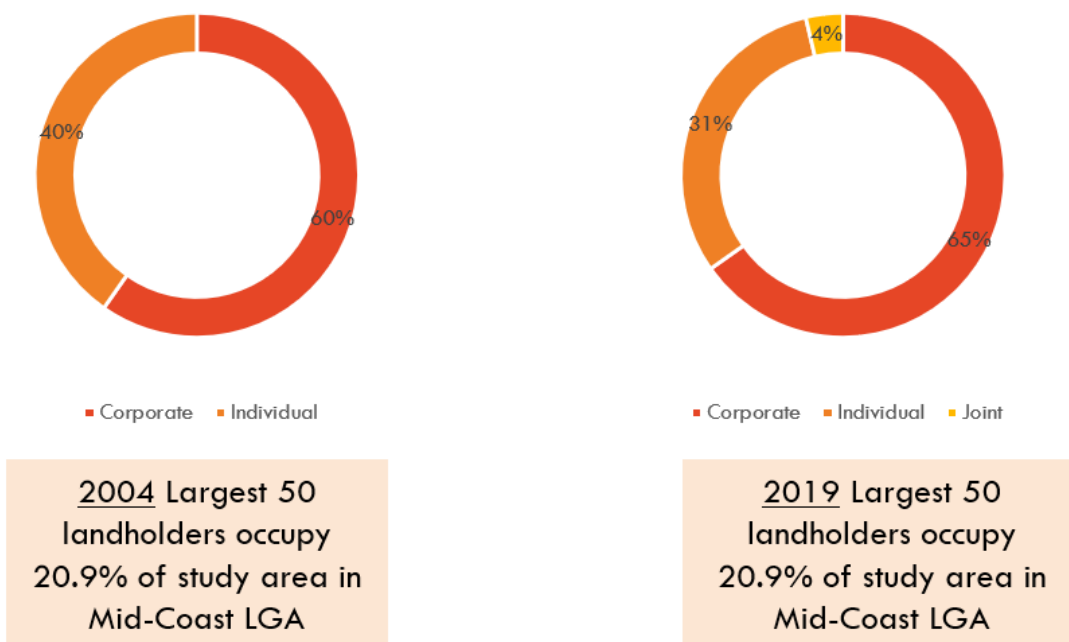
Table 19 - MidCoast Land Use Overview

Primary Agricultural Activity	% of Total Agricultural Land (Area)	% of Area Irrigated
Grazing	99.33%	0.18%
Cropping	0.58%	2%
Horticulture	0.09%	8.56%

Figure 29 - Largest 50 Landholders in MidCoast

Area % held by 2004 Largest 50 Landholders

Area % held by 2019 Largest 50 Landholders



Current (2019) Individual: 3
Corporate: 11
Joint: 1
Largest 15 landholders occupy 12% of the Mid-Coast LGA study area. By area, 85% of this is corporate owned.

Baseline (2004) Individual: 4
Corporate: 11
Largest 15 landholders occupy 11.7% of study area within Dungog. By area, 82% of this is corporate owned.

Table 20 - Profile of top 15 largest private landholders in MidCoast

2019 Rank	2019 Area (ha)	Type of owner	2004 Rank	2004 Area (ha)	Change in holding %
1	20264	Corporate			NEW
2	6271	Corporate	4	4739	24.43%
3	6168	Corporate			NEW
4	5291	Corporate	2	5291	0.00%
5	4100	Corporate			NEW
6	3374	Corporate			NEW
7	3252	Joint	5	4041	-24.26%
8	3236	Corporate			NEW
9	2739	Corporate			NEW
10	2581	Corporate			NEW
11	2476	Corporate			NEW
12	2426	Corporate	13	2425	0.05%
13	2355	Individual	14	2355	0.00%
14	2239	Individual			NEW
15	2118	Individual			NEW

2. Dungog

Figure 30 - Incidence of change on agricultural and non-agricultural rural land in Dungog

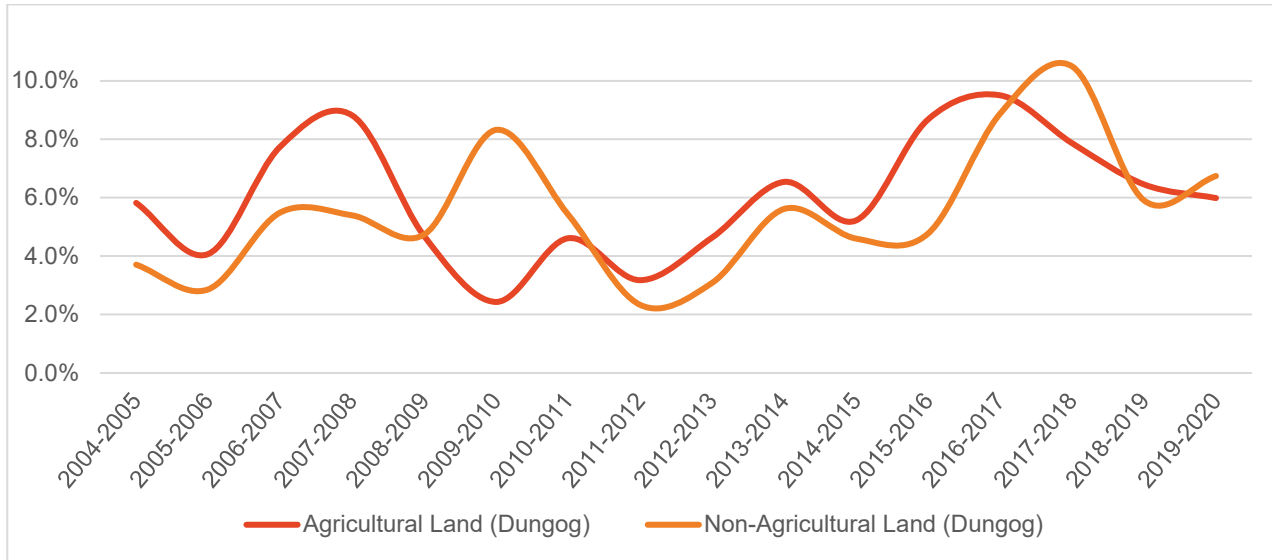


Figure 31 - Dungog Land-use map

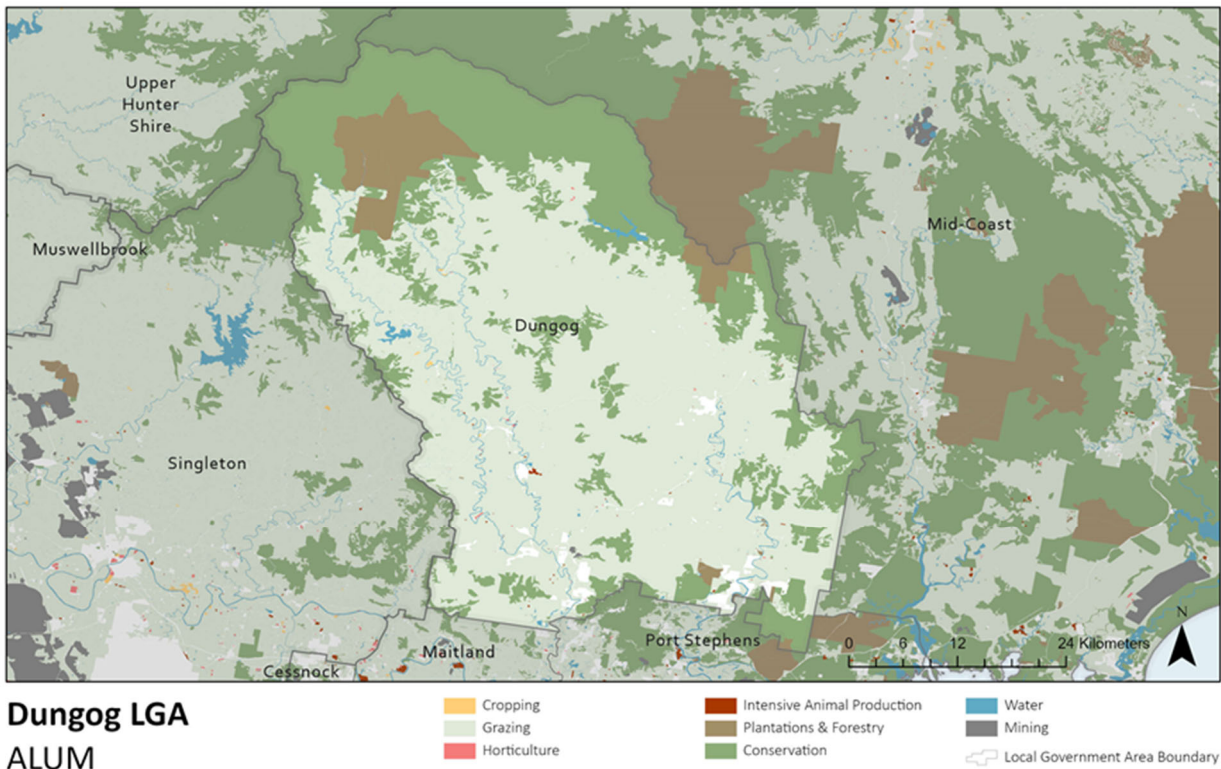
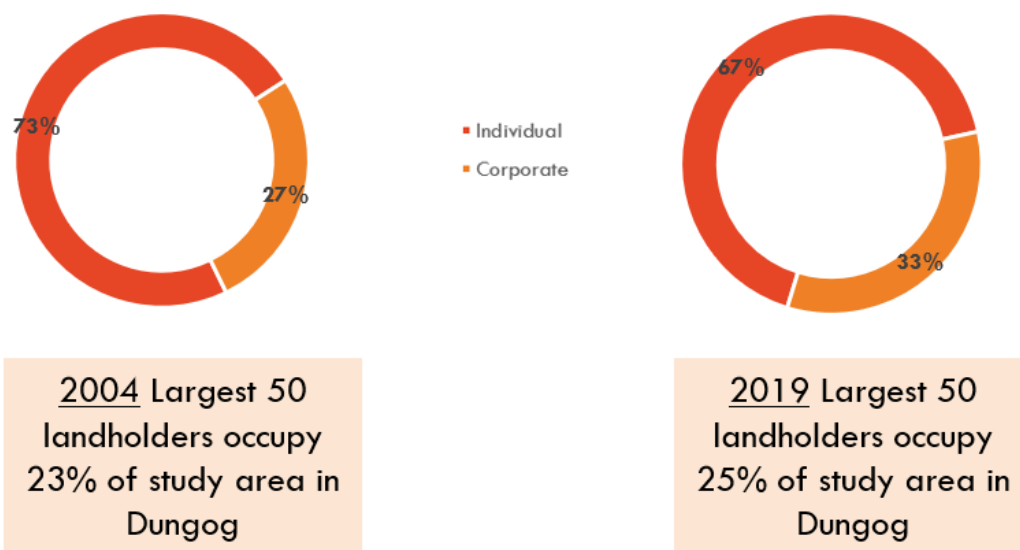


Table 21 - Dungog Land-use Overview

Primary Agricultural Activity	% of Total Agricultural Land (Area)	% of Area Irrigated
Grazing	99.9%	0.47%
Cropping	0.05%	0%
Horticulture	0.05%	0.00%

Figure 32 - Largest 50 landholders in Dungog

Area % held by 2004 Largest 50 Landholders Area % held by 2019 Largest 50 Landholders



Current (2019) Individual: 9 Largest 15 landholders occupy 11% of study area within Dungog. By area, Corporate: 6 42% of this is corporate owned and 58% is individually owned.

Baseline (2004) Individual: 11 Largest 15 landholders occupy 10% of study area within Dungog. By area, Corporate: 4 30% of this is corporate owned and 70% is individually owned.

Table 22 - Profile of top 15 largest private landholders in Dungog

2019 Rank	2019 Area (ha)	Type of owner	2004 Rank	2004 Area (ha)	Change in holding %
1	1841	Individual/s	#1	1841	0%
2	1635	Company	#2	1635	0%
3	1214	Individual/s	-	0	NEW
4	1195	Company	-	0	NEW
5	1088	Company	-	0	NEW
6	1028	Company	-	0	NEW
7	982	Individual/s	-	0	NEW
8	976	Individual/s	-	0	NEW
9	888	Individual/s	-	0	NEW
10	879	Individual/s	#6	879	0%
11	860	Individual/s	#13	719	20%
12	846	Individual/s	-	0	NEW
13	841	Company	-	0	NEW
14	840	Company	-	0	NEW
15	808	Individual/s	#9	815	-1%

3. Singleton

Figure 33 - Incidence of change on agricultural and non-agricultural rural land in Singleton

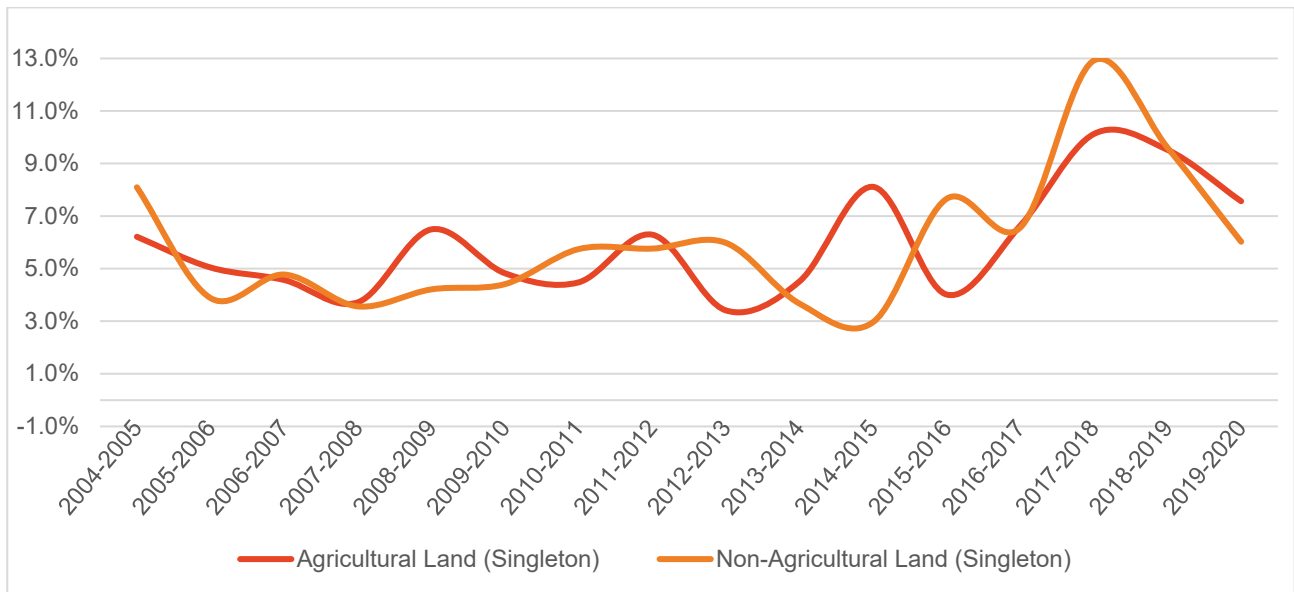


Figure 34 - Singleton Land-Use Map

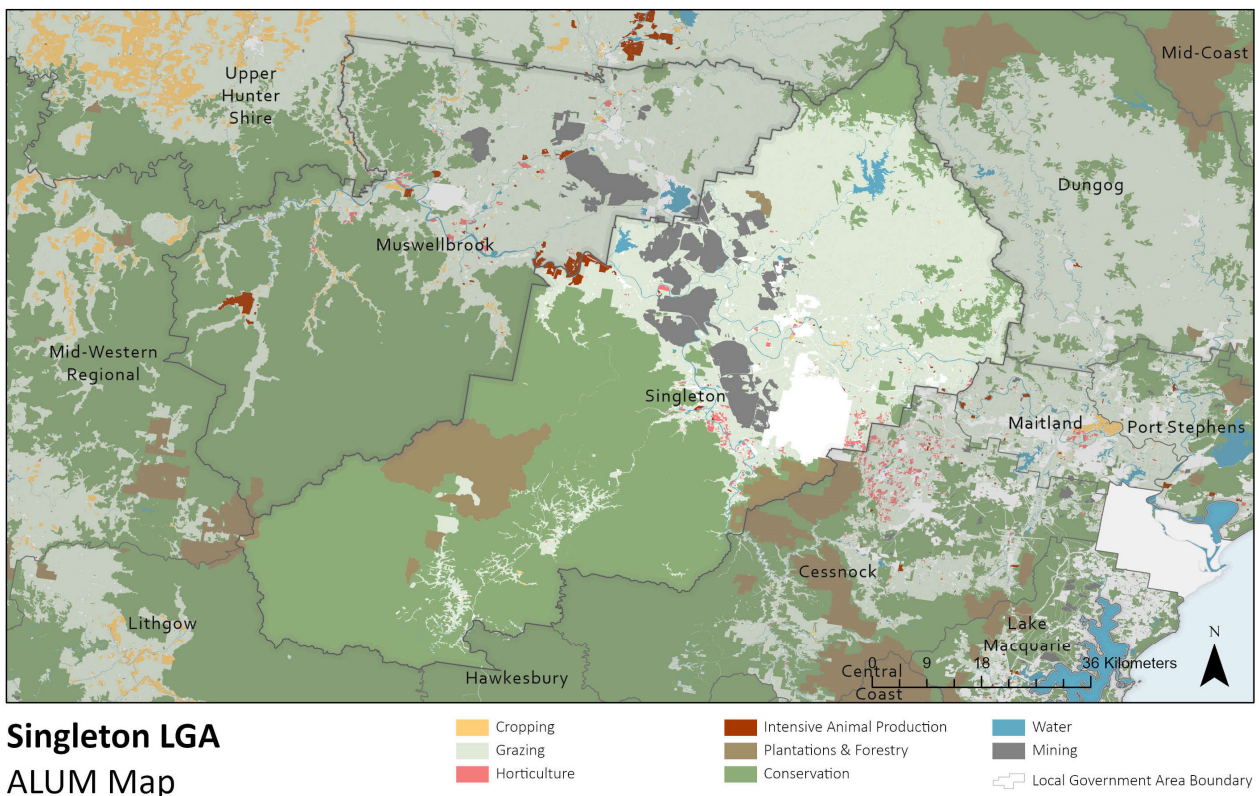
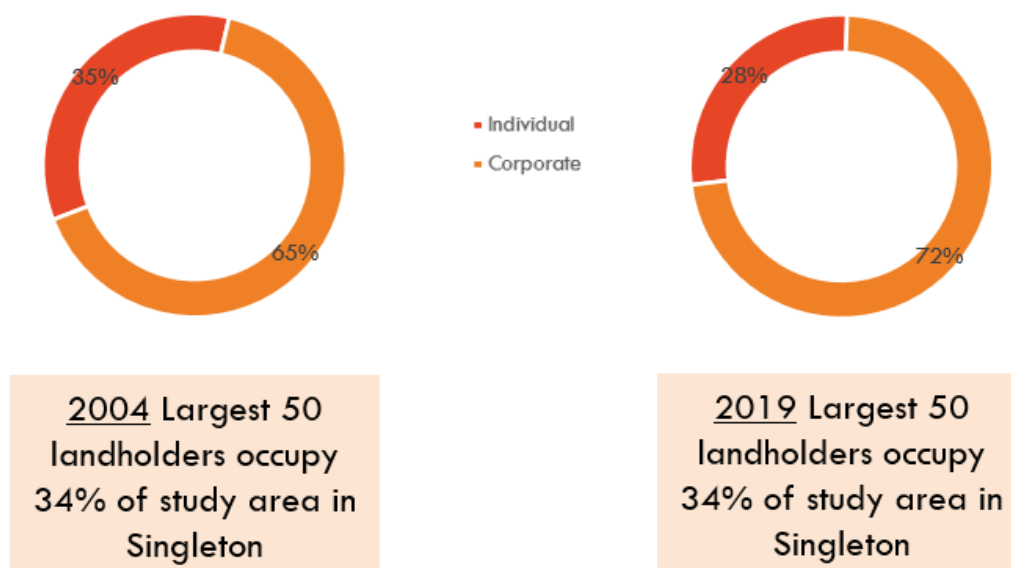


Table 23 - Singleton Land-Use Overview

Primary Agricultural Activity	% of Total Agricultural Land (Area)	% of Area Irrigated
Grazing	98.5%	3.2%
Cropping	0.2%	0%
Horticulture	1.3%	0.4%

Figure 35 - Largest 50 landholders in Singleton

Area % held by 2004 Largest 50 Landholders Area % held by 2019 Largest 50 Landholders



Current (2019) Individual: 3 Largest 15 landholders occupy 20% of study area within Singleton. By area, Corporate: 12 87% of this is corporate owned and 13% is individually owned.

Baseline (2004) Individual: 5 Largest 15 landholders occupy 18% of study area within Singleton. By area, Corporate: 10 76% of this is corporate owned and 24% is individually owned.

Table 24 - Profile of top 15 largest private landholders in Singleton

2019 Rank	2019 Area (ha)	Type of owner	2004 Rank	2004 Area (ha)	Change in holding %
1	10660	Company	#1	6482	64%
2	5613	Company	#5	3774	49%
3	3993	Company		0	NEW
4	3839	Company	#3	4561	-16%
5	3529	Company	#23	1445	144%
6	3310	Company		0	NEW
7	3009	Company		0	NEW
8	2576	Individual/s	#7	2576	0%
9	2271	Company	#19	1668	36%
10	2221	Individual/s	#14	1884	18%
11	2167	Company	#10	2084	4%
12	1978	Company		5633	-65%
13	1925	Company	#15	1872	3%
14	1907	Individual/s		0	NEW
15	1802	Company		0	NEW

4. Upper Hunter

Figure 36 - Incidence of change agricultural and non-agricultural land in Upper Hunter

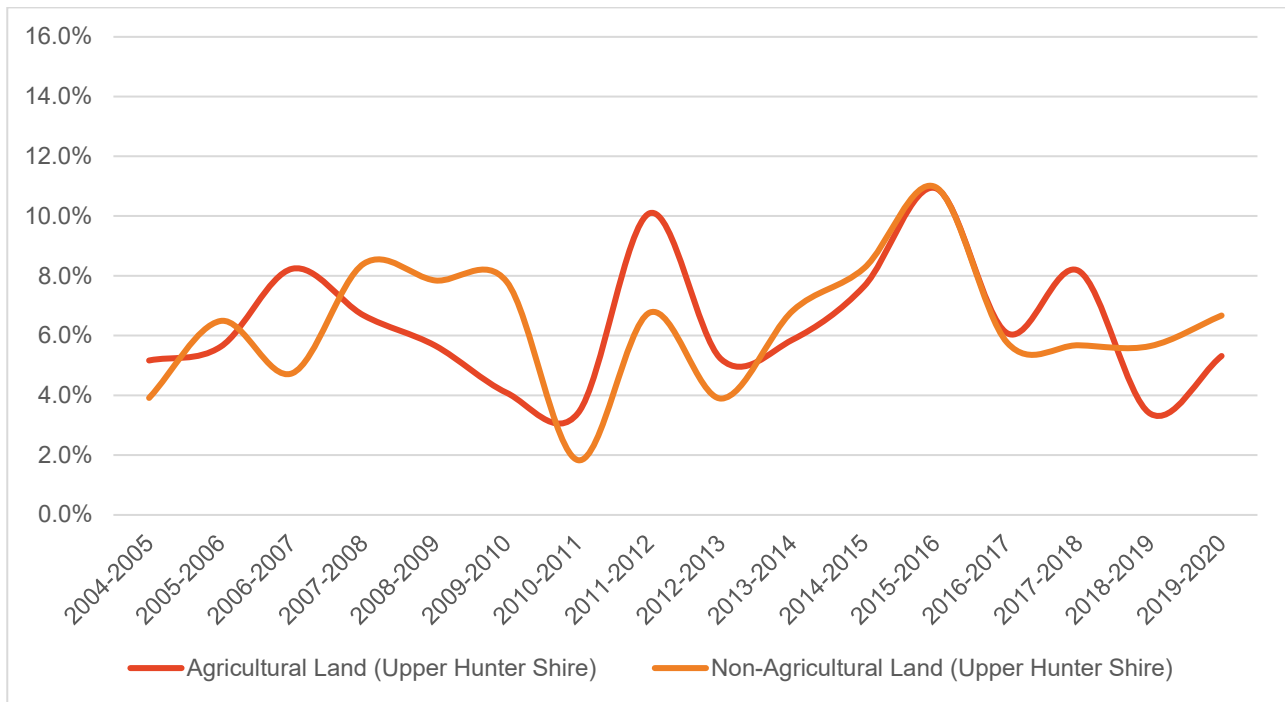
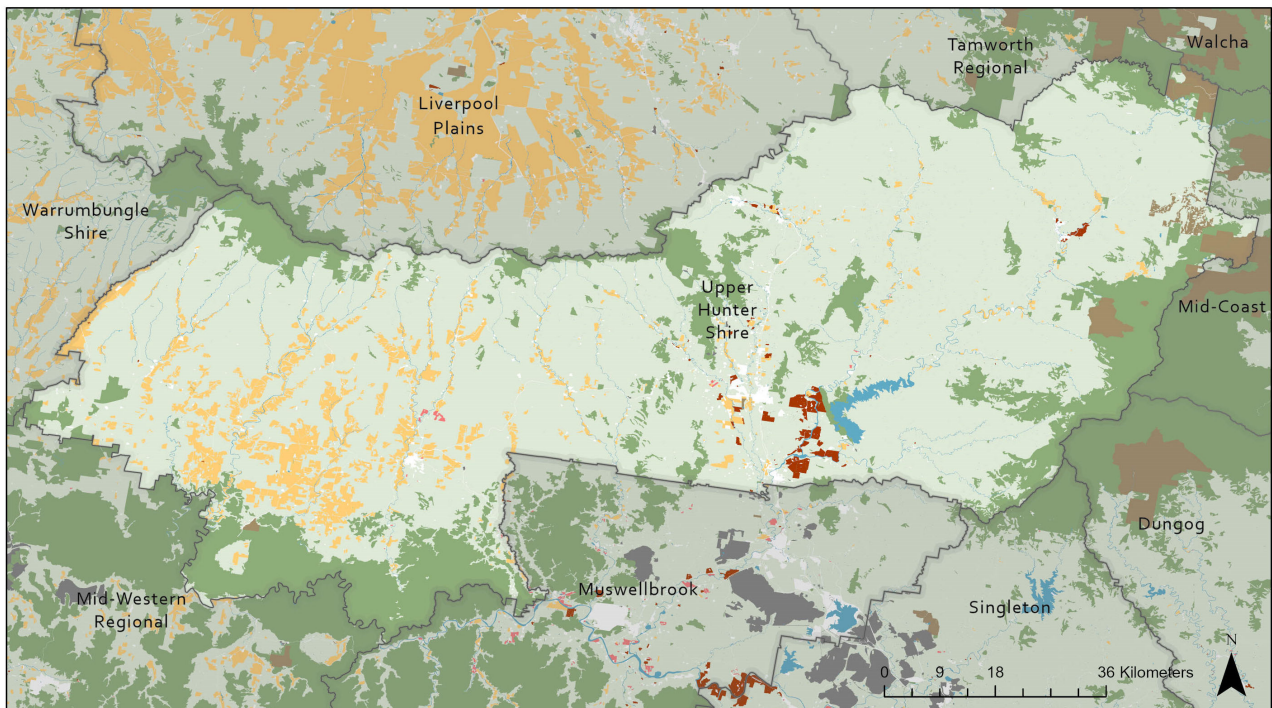


Figure 37 - Upper Hunter land-use map



Upper Hunter LGA
ALUM Map

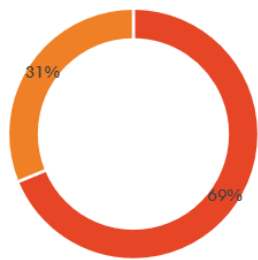
- Cropping
- Intensive Animal Production
- Water
- Grazing
- Plantations & Forestry
- Mining
- Horticulture
- Conservation
- Local Government Area Boundary

Table 25 - Upper Hunter land-use table

Primary Agricultural Activity	% of Total Agricultural Land (Area)	% of Area Irrigated
Grazing	92.16%	0.72%
Cropping	7.80%	1%
Horticulture	0.04%	34.90%

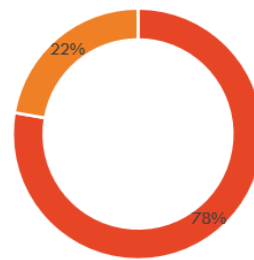
Figure 38 - Top 50 Landholders in Upper Hunter

Area % held by largest 50 landholders 2004 Area % held by largest 50 landholders 2019



■ Corporate ■ Individual

In 2004, the largest 50 landholders occupied 30.2% of study area in Upper Hunter



■ Corporate ■ Individual

In 2019, the largest 50 landholders occupied 34.4% of study area in Upper Hunter

Current (2019) Individual: 2
Corporate: 13

Largest 15 landholders occupy 21.7% of study area within Upper Hunter. By area, 91% of this is corporate owned.

Baseline (2004) Individual: 3
Corporate: 12

Largest 15 landholders occupy 17% of study area within Upper Hunter. By area, 88% of this is corporate owned and 5% is individually owned.

Table 26 - Profile of top 15 largest private landholders in Upper Hunter

2019 Rank	2019 Area (ha)	Type of owner	2004 Rank	2004 Area (ha)	Change in holding %
1	32160	Corporate			NEW
2	19309	Corporate	1954	4	99.98%
3	14556	Corporate			NEW
4	6834	Corporate			NEW
5	6604	Corporate			NEW
6	6325	Corporate	17	3318	47.55%
7	6234	Individual	4	6211	0.37%
8	5465	Corporate	7	5308	2.88%
9	5395	Corporate	6	5399	-0.07%
10	5199	Corporate	14	3433	33.96%
11	5066	Individual			NEW
12	4033	Corporate			NEW
13	3562	Corporate	12	3562	0.00%
14	3521	Corporate	13	3521	0.00%
15	3285	Corporate			NEW

5. Muswellbrook

Figure 39 - Incidence of change agricultural and non-agricultural land in Muswellbrook

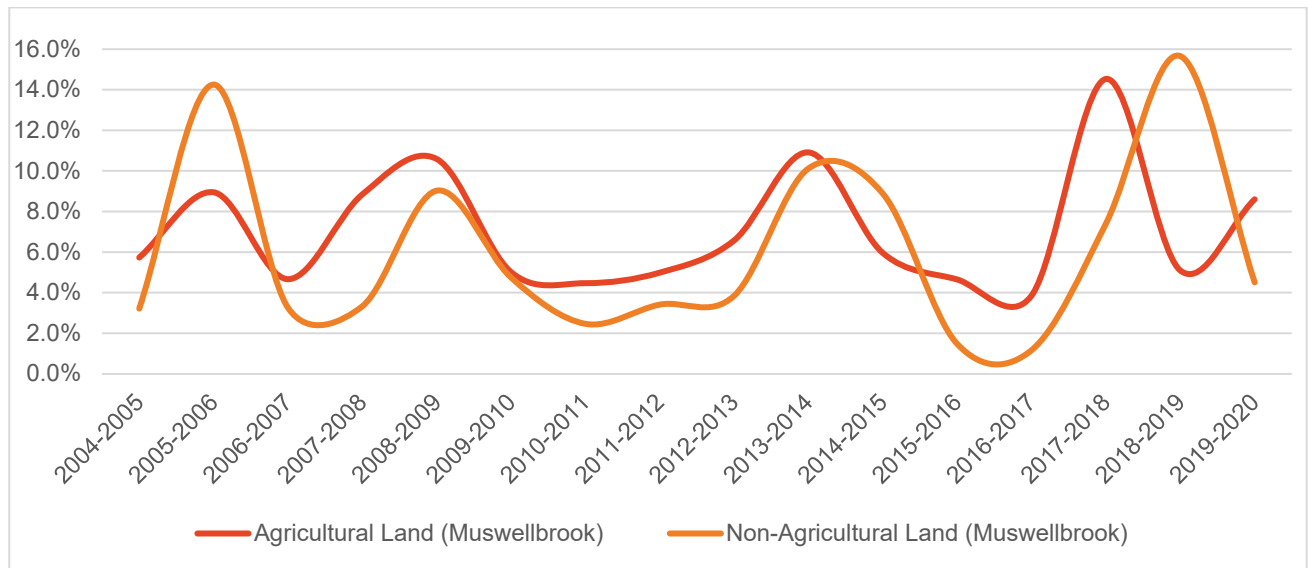
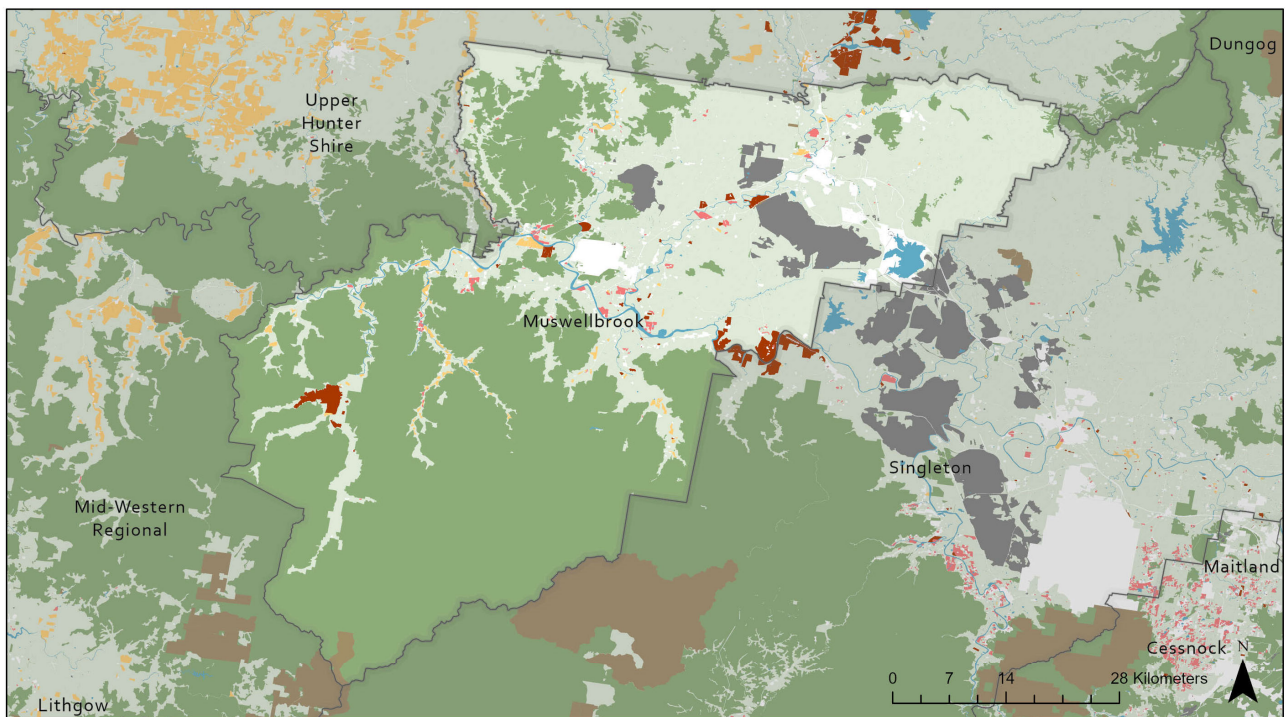


Figure 40 - Muswellbrook Land-use map



Muswellbrook LGA

ALUM Map



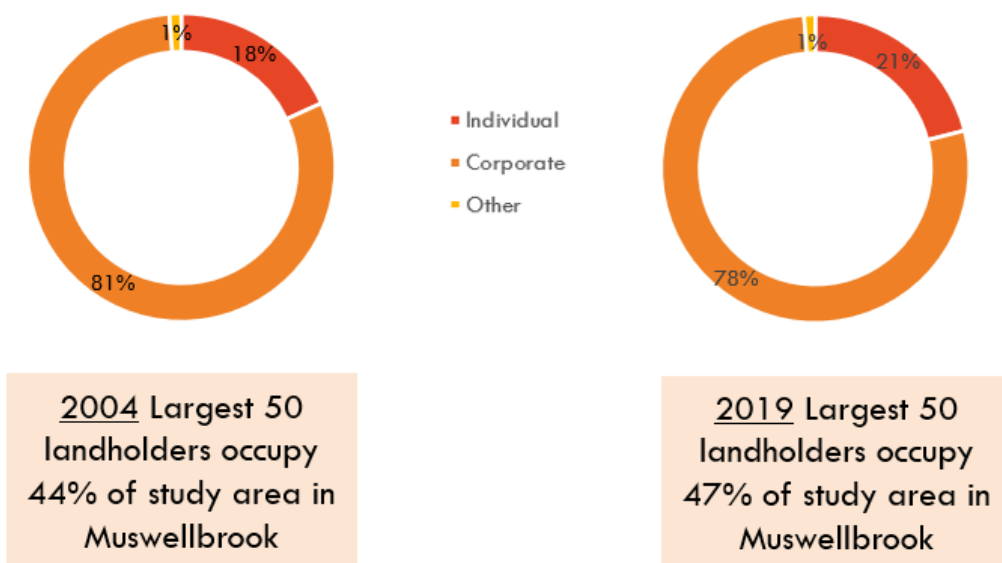
Table 27 - Muswellbrook Land-use Overview

Primary Agricultural Activity	% of Total Agricultural Land (Area)	% of Area Irrigated
Grazing	97.4%	6.2%
Cropping	1.5%	0%
Horticulture	1.2%	0.9%

Figure 41 - Largest 50 Landholders in Muswellbrook

Area % held by 2004 Largest 50 Landholders

Area % held by 2019 Largest 50 Landholders



Current (2019) Individual: 2 Largest 15 landholders occupy 36% of study area within Muswellbrook. By Corporate: 13 area, 94% of this is corporate owned and 6% is individually owned.

Baseline (2004) Individual: 1 Largest 15 landholders occupy 24% of study area within Muswellbrook. By Corporate: 14 area, 95% of this is corporate owned and 5% is individually owned.

Table 28 - Profile of top 15 largest private landholders in Muswellbrook

2019 Rank	2019 Area (ha)	Type of owner	2004 Rank	2004 Area (ha)	Change in holding %
1	9920	Company		0	NEW
2	9721	Company		0	NEW
3	4789	Company		0	NEW
4	4753	Company		0	NEW
5	4309	Company		0	NEW
6	3417	Company	#12	1812	89%
7	3004	Company		0	NEW
8	2214	Company	#17	1474	50%
9	2156	Company	#6	2323	-7%
10	1943	Company	#10	1943	0%
11	1922	Company		0	NEW
12	1888	Individual/s		0	NEW
13	1565	Individual/s		0	NEW
14	1519	Company		0	NEW
15	1513	Company		0	NEW

6. Liverpool Plains

Figure 42 - Incidence of change agricultural and non-agricultural land in Liverpool Plains

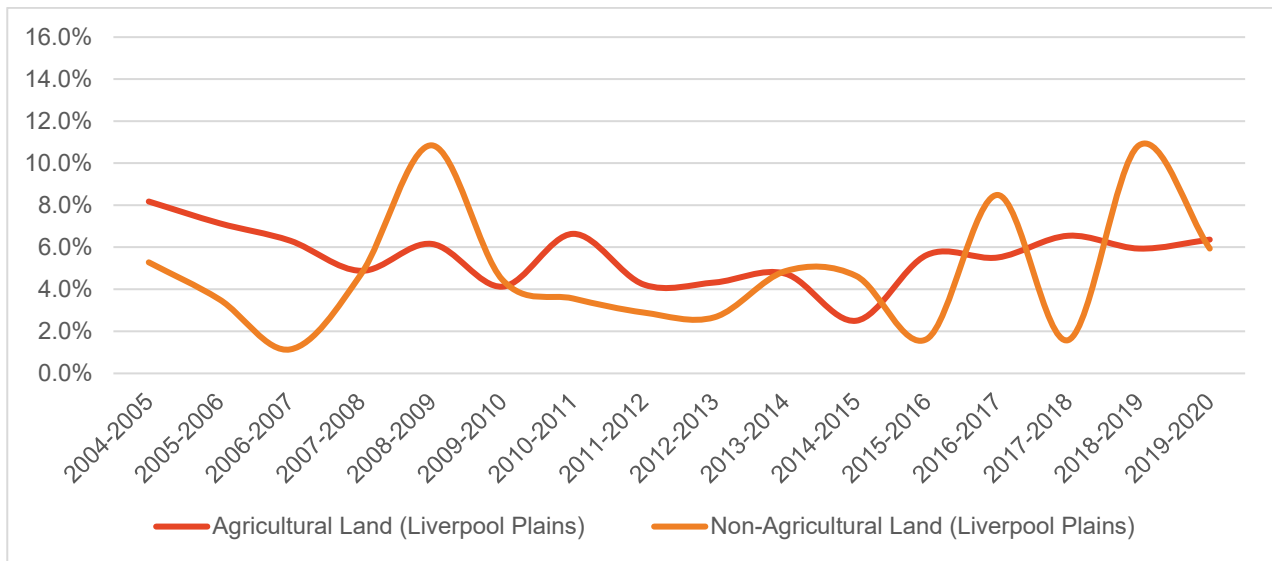


Figure 43 - Liverpool Plains Land Use Map

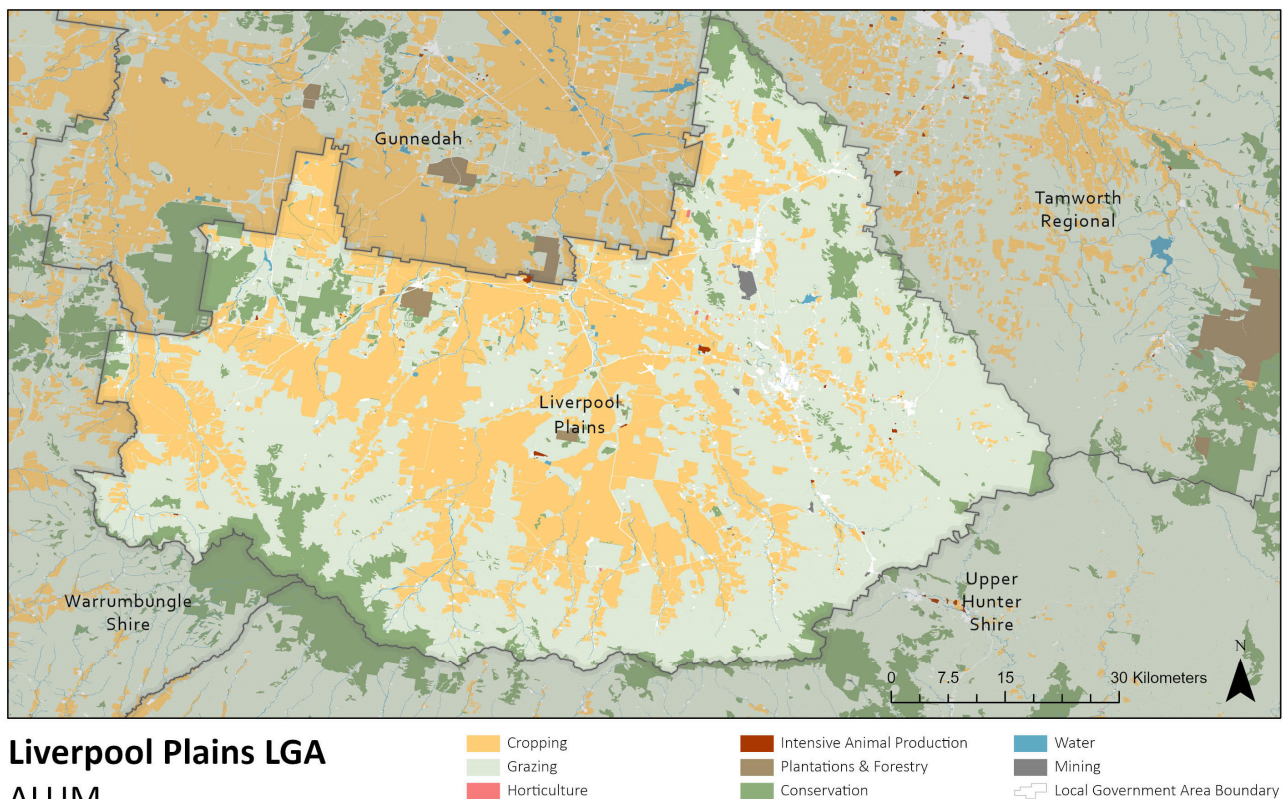
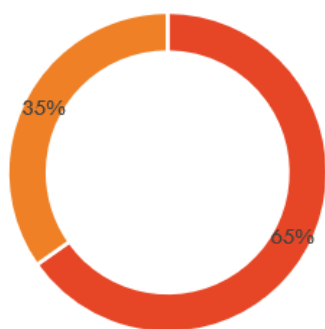


Table 29 - Liverpool Plains Land Use Overview

Primary Agricultural Activity	% of Total Agricultural Land (Area)	% of Area Irrigated
Grazing	64.13%	0.10%
Cropping	35.84%	19%
Horticulture	0.03%	0.00%

Figure 44 - Largest 50 landholders in Liverpool Plains

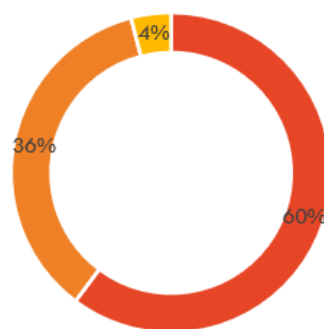
Area % held by 2004 Largest 50 Landholders



■ Corporate ■ Individual

2004 Largest 50 landholders occupy 31.2% of study area in Liverpool Plains

Area % held by 2019 Largest 50 Landholders



■ Corporate ■ Individual ■ Joint

2019 Largest 50 landholders occupy 33.5% of study area in Liverpool Plains

Current (2019)

Individual: 4
Corporate: 10
Joint: 1

Largest 15 landholders occupy 20% of study area within Liverpool Plains. By area, 94% of this is corporate owned.

Baseline (2004)

Individual: 2
Corporate: 13

Largest 15 landholders occupy 17% of study area within Liverpool Plains. By area, 77% of this was corporate owned.

Table 30 - Profile of top 15 largest private landholders in Liverpool Plains

2019 Rank	2019 Area (ha)	Type of owner	2004 Rank	2004 Area (ha)	Change in holding %
1	22471.9	Corporate	1	22498.59	-0.12%
2	6970.2	Individual			NEW
3	6532.6	Corporate			NEW
4	6053.7	Corporate	13	2798.087	53.78%
5	4975.5	Corporate	3	4273.1	14.12%
6	4748.7	Corporate			NEW
7	4550.8	Corporate	2	4550.822	0.00%
8	3935.4	Corporate	4	3935.423	0.00%
9	3297.2	Individual			NEW
10	3173.2	Corporate			NEW
11	3171.3	Individual	11	3171.335	0.00%
12	3082.9	Corporate	12	3083.036	-0.01%
13	2403.7	Joint			NEW
14	2201.5	Individual			NEW
15	2135.0	Corporate			NEW

7. Warrumbungle

Figure 45 - Incidence of change agricultural and non-agricultural land in Warrumbungle

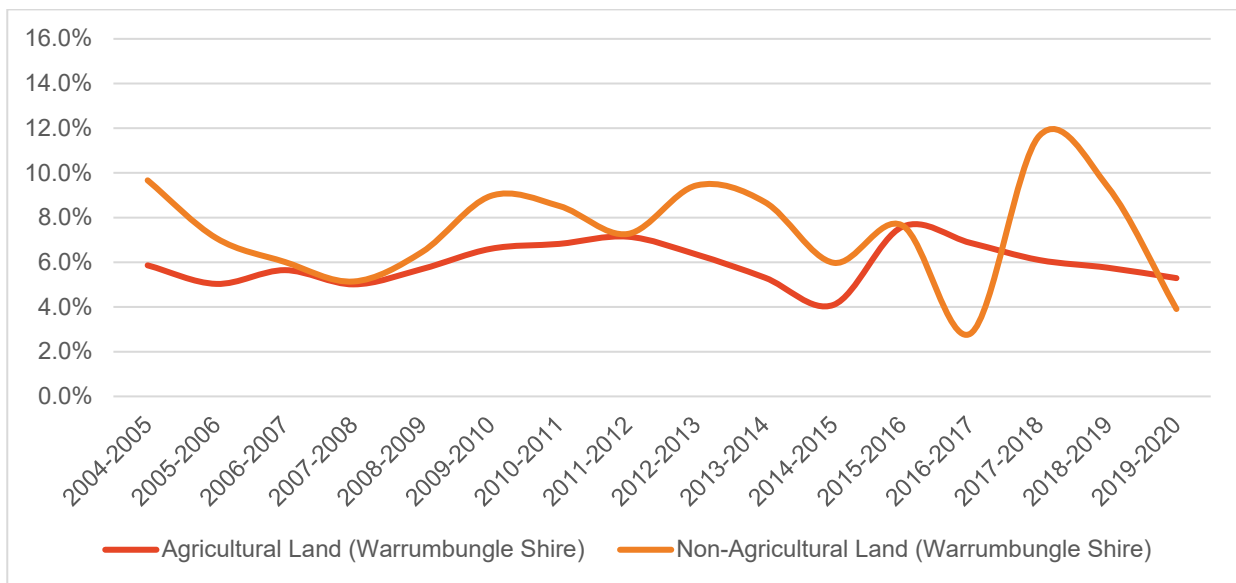
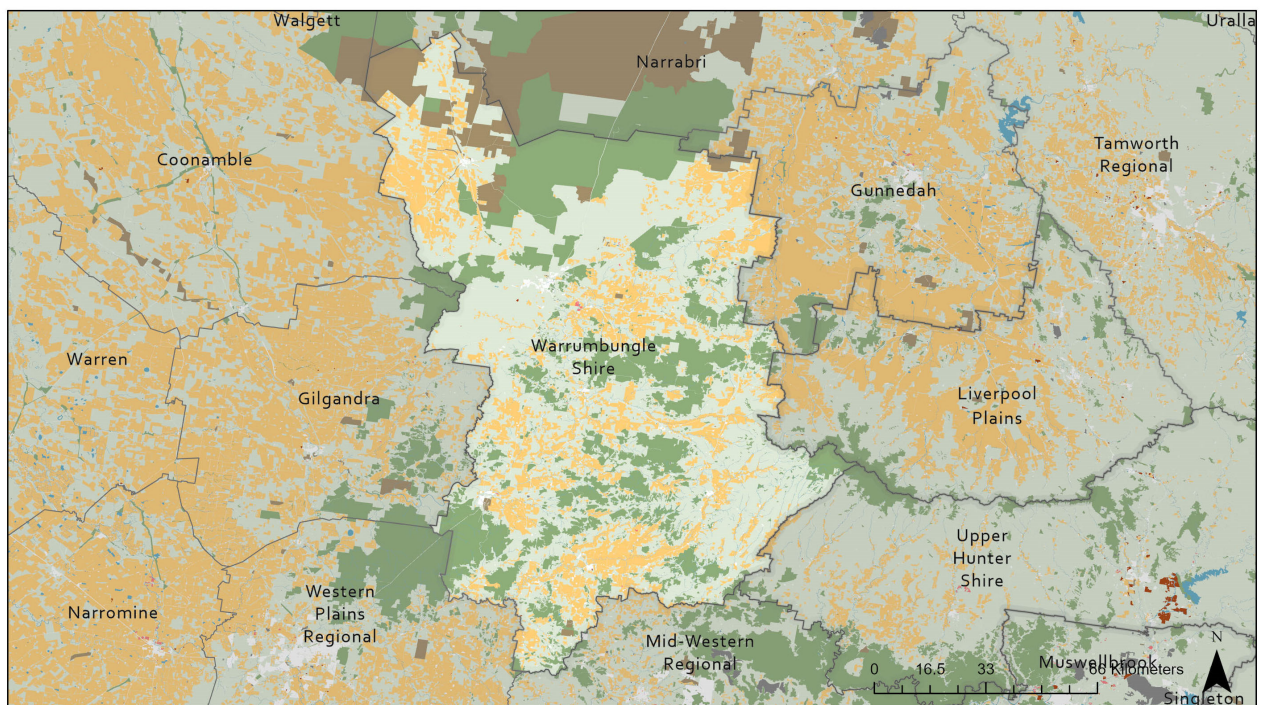


Figure 46 - Warrumbungle land-use map



Warrumbungle LGA

ALUM



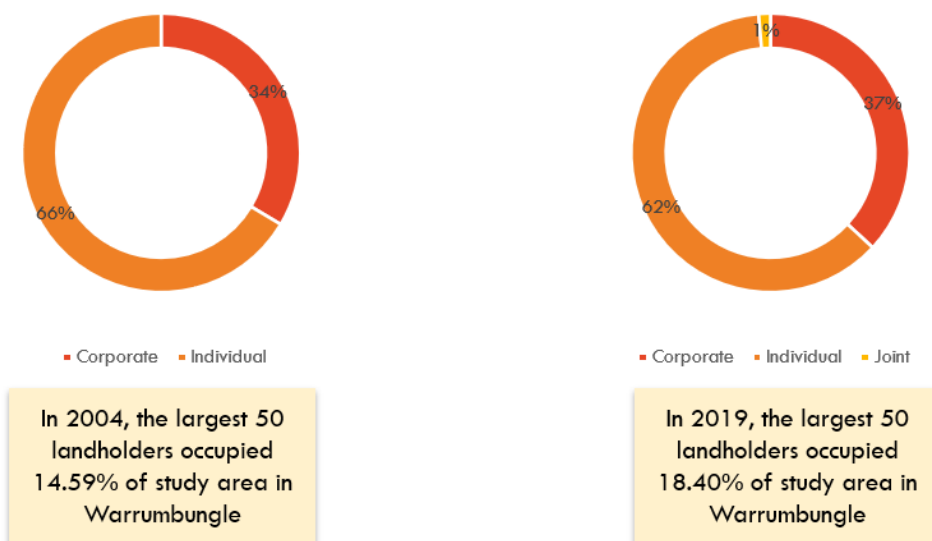
Table 31 - Warrumbungle Land Use Overview

Primary Agricultural Activity	% of Total Agricultural Land (Area)	% of Area Irrigated
Grazing	71.33%	0.00%
Cropping	28.63%	2%
Horticulture	0.05%	81.09%

Figure 47 - Largest 50 landholders in Warrumbungle

Area % held by largest 50 landholders 2004

Area % held by largest 50 landholders 2019



Current (2019)	Individual: 7 Corporate: 8	Largest 15 landholders occupy 9% of study area within Warrumbungle. By area, 58% of this is corporate owned.
Baseline (2004)	Individual: 9 Corporate: 6	Largest 15 landholders occupy 7% of study area within Warrumbungle. By area, 49% of this is corporate owned.

Table 32 - Profile of top 15 largest private landholders in Warrumbungle

2019 Rank	2019 Area (ha)	Type of owner	2004 Rank	2004 Area (ha)	Change in holding %
1	11650.5941	Corporate	1	11636.5592	0.12%
2	9682.41747	Individual			NEW
3	8755.89666	Corporate	2	7414.58679	15.32%
4	7743.15804	Corporate			NEW
5	5783.65043	Individual			NEW
6	5527.43212	Corporate	524	640.712409	88.41%
7	4909.14564	Corporate			NEW
8	4613.05296	Individual	95	1484.23003	67.83%
9	4571.27707	Individual	8	3397.25454	25.68%
10	4092.72608	Corporate			NEW
11	4045.89408	Corporate			NEW
12	3907.36557	Individual	6	3907.37	0.00%
13	3844.96018	Individual	7	3844.96	0.00%
14	3591.06292	Corporate			NEW
15	3590.61673	Individual	94	1489.33672	58.52%

Appendix C: Focus group indicative questions

The following is a list of the indicative questions submitted to stakeholders ahead of the focus group sessions.

- Who owns/is buying agricultural land in the LGA/region? How is land ownership relevant to different agricultural sectors/for the LGA/region?
- How does drought impact on rates of types of land ownership changes/sales? E.g., grazing, cropping, horticulture, irrigated/non irrigated land.
- In what ways is the composition of farm ownership changing in the LGA/region? E.g., Individuals/families, large companies, small companies, non-local/local.
- What is the profile of new entrants? Are existing owners increasing their holdings, landowners exiting/decreasing the scale of their holdings?
- Are different types of farms more likely to be bought/sold?
- How have planning and subdivision policy and instruments shaped drivers of rural land ownership change in NSW over time in the LGA/region?
- To what extent is fragmentation of agricultural land occurring in the LGA/region? What are the local drivers/pressures to fragment land?
- What has the impact of subdivision/new dwelling policies been on:
 - the conversion of farmland to non-farm uses
 - changes in average farm property size
 - construction of new dwellings for non-agricultural purpose.

Contact

Sydney University

School of Geosciences

Professor Bill Pritchard, School of Geosciences, University of Sydney NSW 2006.

bill.pritchard@sydney.edu.au

sydney.edu.au

rural-land-science.sydney.edu.au

CRICOS 00026A

