

Appendix 5: Economic Assessment

Rural Land Use Assessment for Upper Hutt

PREPARED FOR UPPER HUTT CITY COUNCIL
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1 Rural Land Use in Upper Hutt

1.1 Summary

The Upper Hutt district accounts for only a very small proportion of overall agricultural land in New Zealand and contains no class 1 soils, only a small block of the more valuable and versatile class 2 soils while the valley floor areas are generally class 3 soils. The key rural land uses in the district are forestry and sheep and beef. Economic trends in land use in the Upper Hutt district are likely to largely match those observed in the rest of the country. These include a relatively buoyant agricultural and forestry sector due to good commodity prices relative to historic price trends. There is some evidence of rural land aggregation, increased forest harvesting and an emphasis on cattle over sheep in the district. The latter is likely to have resulted from better beef prices for a longer period compared to sheep meat prices.

How these economic trends will play out over future planning periods is unknown. However, should current prices persist, and be overlaid by increased Government policy action designed to mitigate climate change, it could be expected that there may be a greater focus on afforestation on the more accessible blocks with poorer soil fertility. Pastoral farming is in a comparatively upbeat state too. Should that persist, it is likely to continue to compete effectively against forestry as a land use, as farmers continue to pursue their traditional livestock focused farming activities underpinned by supportive prices. Dairying is a minor land use activity in the Upper Hutt district and some statistics show it has been declining over the last decade. It is likely to come under increasing pressures and face greater costs given environmental concerns about the quality of freshwater resources and greater urbanisation in the district.

The Upper Hutt's rural land, and that of the Greater Wellington Region, make a useful, but marginal, contribution to New Zealand's overall agricultural and forestry production. Given its generally less valuable soils and proximity to, and strong commuter links with, Wellington city, it could be viewed as an area in which further urban development could be accommodated. This, of course, would depend on the extent to which regional demand in the greater Wellington area might be addressed in other areas. However, the district might provide good expansion options as part of a wider strategy that coordinates future urban growth in the Wellington region.

1.2 Introduction

This report focuses on primary production activities and examines the current state and trends in rural land use in the Upper Hutt City district.

The Statistics New Zealand Agricultural Production Census is an important source of data discussed in this report. This census data provides indications of broad trends but when the numbers of farming enterprises surveyed is low,

there is likely to be some lack of accuracy as some imputation of data is needed¹. So, it may not always match information held by UHCC. However, the survey does enjoy good response rates with 85.5 percent of eligible businesses responding to the survey in 2017. The businesses that responded represented 88.3 percent of the total estimated value of agricultural activities in New Zealand.

Farming/forestry enterprises included in the survey are drawn from businesses registered as agricultural based on their registration for goods and services tax (GST) with Inland Revenue. The compulsory registration level for GST is \$60,000, so there is a partial and unquantifiable coverage of businesses below this level. This will mean that smaller life style blocks are unlikely to be included. This data therefore will be of most use in investigating Upper Hutt area's larger agricultural enterprises.

This report has augmented the data in the Statistics New Zealand Agricultural Production Censuses with data from other sources. These include Statistics New Zealand Infoshare data, the Beef + Lamb New Zealand Economic Service, Ministry for Primary Industries historic forestry price series, Forestry Owners Association and resource and discharge consents and sales data for Upper Hutt's rural neighbourhoods.

The consultation document on a NPS for Highly Productive Land has been very recently released. We have not had the opportunity to consider the consultation document and its implications.

1.3 Current Land Use in the Upper Hutt Rural District

The Upper Hutt district has a small territory compared to other local authorities in New Zealand. It's total land area of 54,115 hectares² makes up 0.2 percent of New Zealand's total land area - a very small proportion. It forms part of the Greater Wellington Regional Council area which covers 804,900 hectares and makes up just under 3 percent of the country's total land area. This is still a minor proportion. The Upper Hutt district has no class 1 soil, only contains a small amount of class 2 soil in the Gillespie's block and valley floor areas are generally class 3. Most of the area's agricultural and forestry production is therefore not based on higher value soils.

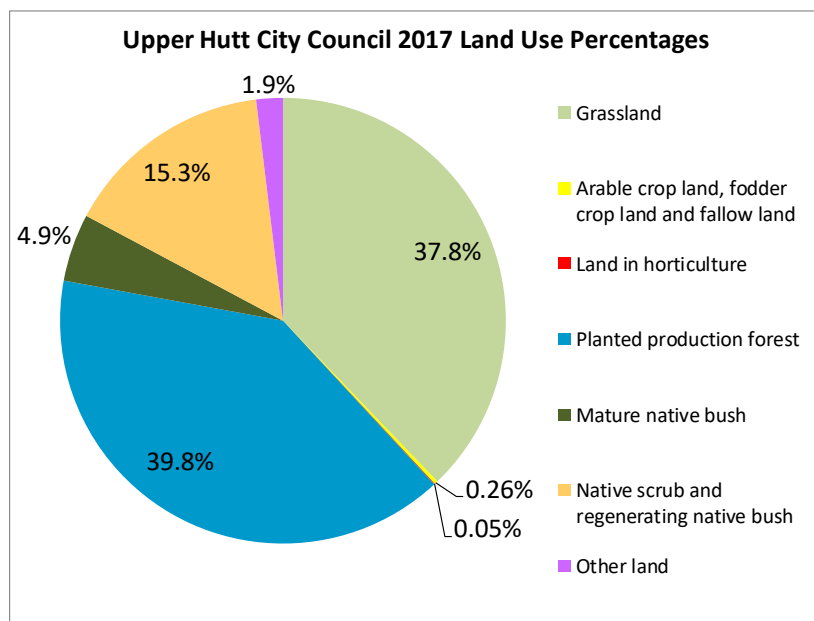
¹ Stats NZ imputes values for farmers and foresters who do not return a completed questionnaire. This involves replacing missing items with values based on other information available using random 'hot deck' imputation.

Using this method, Stats NZ replaces missing values for a non-respondent with values from a respondent with similar characteristics e.g. regional council area, ANZSIC06 group, and production data from previous years. For more information see http://datainfoplus.stats.govt.nz/Item/nz.govt.stats/6362a469-f374-412e-ac25-d76fd0962003?_ga=2.152506617.1354743630.1564879674-482333991.1553466485&_gac=1.259535096.1563782181.Ci0KCCQjwvdXpBRCoARIsAMJSKqIsbMarZYI2ImStuUFAHBeCL62wxqUjFdFoi59qQr_RbriiRQ6hldUaAmxrEALw_wcB#/nz.govt.stats/Oda803f1-7e28-448d-8360-28c03a92a9a1/#

² See http://www.localcouncils.govt.nz/lqip.nsf/wpg_URL/Profiles-Councils-Upper-Hutt-City-Council-Main?OpenDocument

Upper Hutt’s rural land makes up 96 percent of the district’s total land resources.

Figure 1 : Productive land in Upper Hutt in 2017



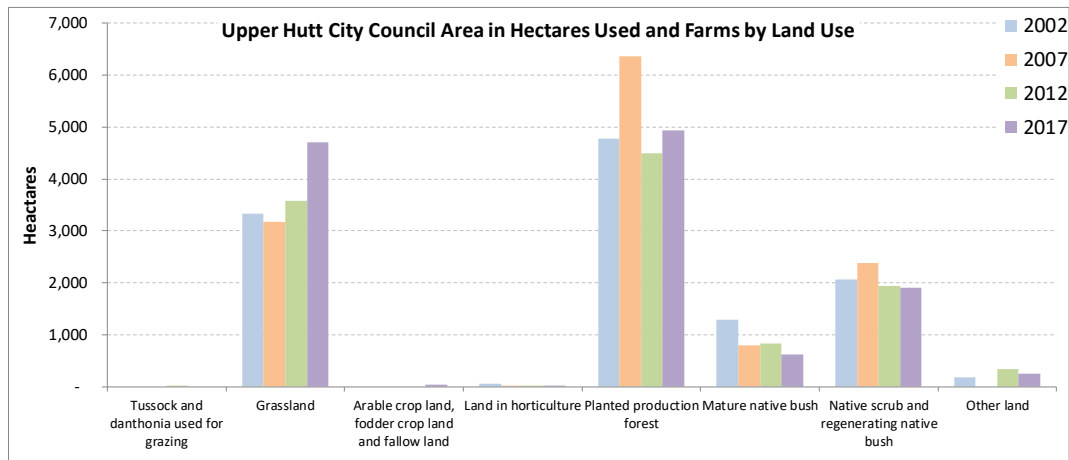
Source : Sapere analysis of Stats NZ 2017 Agriculture Production Census results

As is evident in Figure 1, 78 percent of the productive land in the Upper Hutt district is devoted to grassland or planted production forest. Another significant block, 20 percent, is in mature native bush or native scrub and regenerating native bush. Other land, and arable crop land, fodder crop land and fallow land accounts for the balance of 2 percent.

1.4 Land use change

Figure 2 shows the change in land cover since 2002 using data from successive Agricultural Production Censuses. The main changes in land use appear to be an increase in Upper Hutt district’s hectares devoted to grassland and a reduction in planted production forest. These two trends could be the result of harvesting plantations due to attractive log prices, with some land returned to pasture. There also is a trend of decline in land in mature native bush, native scrub and regenerating native bush. In the case of native scrub and regenerating native bush, it is possible this may have resulted from a marginal amount of development of new grassland or forestry blocks. It is not clear why the amount of mature native bush is recorded as declining. Hectares devoted to planted production forest in 2017 include 465 hectares of harvested exotic forest awaiting replanting.

Figure 2 : Change in productive landcover in Upper Hutt 2002, 2007, 2012 and 2017.



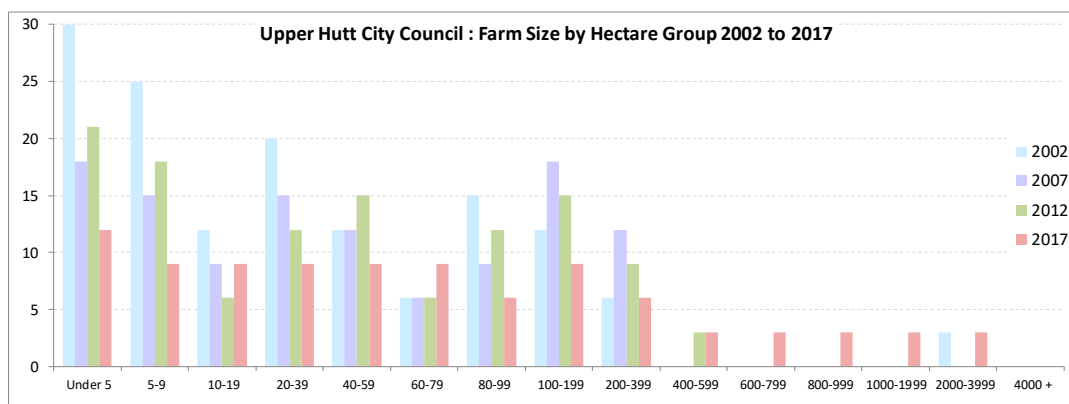
Source : Sapere analysis of Stats NZ 2002, 2007, 2012 & 2017 Agriculture Production Census results

Another notable trend, which is disguised in Figure 2 due to the scale of the larger land uses, is the fall in the amount of land used for horticulture. This has fallen from 48 hectares in 2002 to 6 hectares in 2017. Other smaller land uses vary between census results suggesting potential sampling challenges when there are low numbers of enterprises surveyed leading to less accuracy as discussed in the Introduction.

1.5 Farm Numbers and Sizes

Figure 3 sets out data on farm size in grouped ranges of hectares and is drawn from Agricultural Production Census results for 2002, 2007, 2012 and 2017. It shows decreasing numbers of farms in most of these hectare ranges. The exceptions are farms between 60 and 79 hectares and those in the larger bands of 600 to 799, 800 to 999 and 1000 to 1999 hectares. This may indicate a degree of aggregation of rural properties in the Upper Hutt district.

Figure 3 : Farm sizes (in hectares) in Upper Hutt over the last four censuses



Source : Sapere analysis of Stats NZ 2002, 2007, 2012 & 2017 Agriculture Production Census results

The QV Sales Data Set provides an alternative set of data for the Upper Hutt district. This data covers the period between January 2006 and December

2018 and recorded 1,951 sales³. It is possible to compare this data with the data in Figure 3 to see if similar trends are visible. The QV data shows 20 sales of blocks over 50 hectares. This was 1 percent of the total of 1,951 blocks sold. Twelve blocks sold which were over 100 hectares. The largest block sold was 209 hectares. Seventy three percent of QV sales covered areas of less than 5 hectares.

The potential aggregation of land which appears in Figure 3 may have resulted from the 20 sales over 50 hectares that appear in the QV data. This could explain the aggregation of land particularly in the land blocks between 80 and 400 hectares shown in Figure 3. However, the irregular appearance of the land blocks over 400 hectares in Figure 3 may be the result of survey sampling problems rather than land aggregation.

1.6 Farm Types and Numbers

The number and types of farms in the Upper Hutt district is set out in Figure 4. This shows the numbers of farms falling since 2002, with a significant fall of 18 enterprises between the 2012 and 2017 Agricultural Production Census results. The top five activities by farm numbers are:

1. Forestry 30 businesses
2. Specialised beef cattle farming 27 businesses
3. Specialised sheep farming 9 businesses
4. Sheep/beef cattle farming 9 businesses
5. Horse farming 6 businesses

There were 3 enterprises recorded for each of a range of other activities such as dairy cattle farming, poultry farming (eggs), other crop growing, floriculture production (under cover) and berry fruit growing.

The number of forestry enterprises have fallen by 29 percent between 2012 and 2017 which may be due to some degree of aggregation of rural land blocks that is apparent in Figure 3. Specialist sheep farms have also fallen by 40 percent from 15 in 2012 to 9 in 2017. Specialised cattle farming has increased by 29 percent from 21 to 27 over the same period. This may indicate farmers shifting from sheep to cattle. Dairy farms have reduced by 50 percent from 6 to 3 between the 2012 Agricultural Production Census and that conducted in 2017. The rarer farm types such as deer and pig farms show sharp variation over the 15 years. For example, 6 deer farms in 2012, none recorded in 2007, 3 in 2012 and none again in 2017. This may indicate changing emphasis in mixed farming operations leading farms to define themselves differently. The variation in farm numbers may also be the result of sampling challenges when dealing with small sample sets.

³ From QV Sales Data Set in file SalesData_Rural_Neighbourhoods_updated'.xlsx

Figure 4 : Farm type and number in Upper Hutt district

Upper Hutt City Farm Types 2002 -2017	2002	2007	2012	2017	% Change 2012 to 2017
Nursery production	6	6	3		
Floriculture production (under cover)	3			3	
Berry fruit growing		3		3	
Apple and pear growing			3		
Sheep farming (specialised)	9	15	15	9	-40%
Beef cattle farming (specialised)	40	33	21	27	29%
Sheep-beef cattle farming	3		9	9	0%
Other crops growing	3		3	3	0%
Dairy cattle farming	9	6	6	3	-50%
Poultry farming (eggs)	3			3	
Deer farming	6		3		
Horse farming	9	6	6	6	0%
Pig farming	3		3		
Other livestock farming	3	3			
Forestry	35	42	42	30	-29%
Other	3				
Total	135	114	114	96	

Source : Sapere analysis of Stats NZ 2002, 2007, 2012 & 2017 Agriculture Production Census results

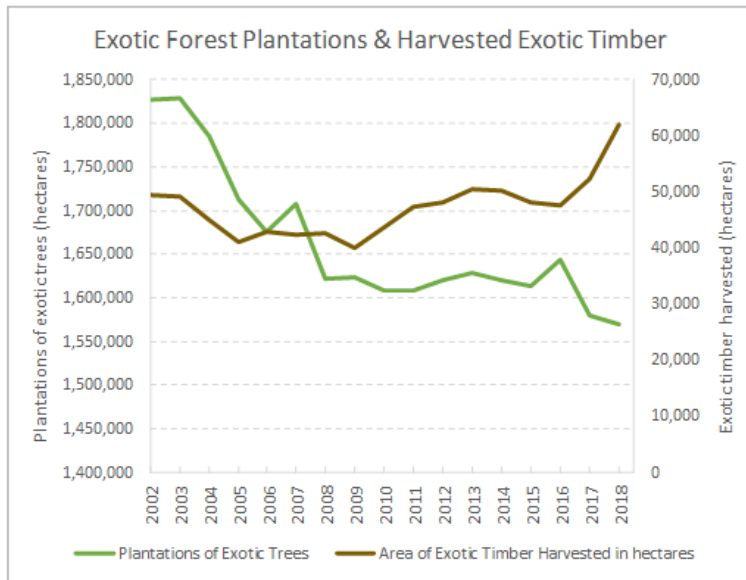
1.7 Key rural land uses in the Upper Hutt district

1.7.1 Forestry

The 2017 Agricultural Production Census noted that there were 129,251 cubic metres of exotic timber harvested in the Upper Hutt area from 204 hectares (634 cubic metres/hectare). Two hundred and four hectares makes up less than 5 percent of the 4,476 hectares of plantations of exotic trees intended for harvest documented in the Upper Hutt area in the census. In the same year 76 hectares were replanted in areas where exotic trees were previously clear felled, or salvage logged. The 2017 harvest of exotic timber was a large increase on the 2012 census when only 13,200 cubic metres of exotic timber were harvested from 26 hectares.

This trend in the estimates for the Upper Hutt area is consistent with the national trends shown in Figure 5 below. Around New Zealand there has been a sharp increase in hectares harvested since 2015 and a fall in hectares planted in exotic plantations.

Figure 5 : New Zealand exotic forestry & harvesting (hectares)



Source : Stats NZ Infoshare, Group: Agriculture – AGR, Table: Variable by Total New Zealand (June Years)

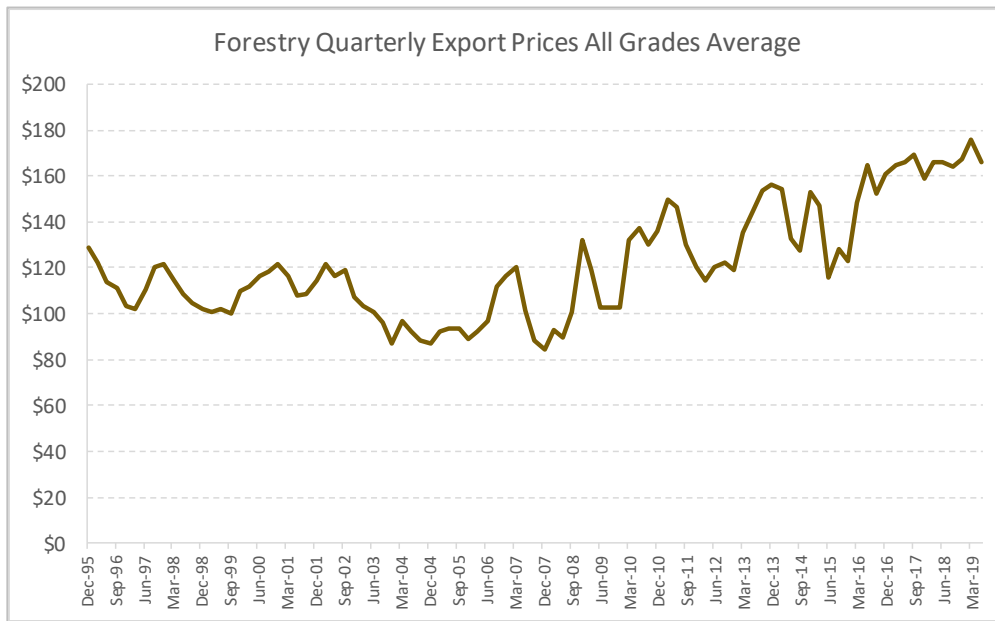
The increase in exotic plantation harvesting over recent years has been driven by the increasing proportion of plantation forests nearing the optimum harvest age and by improved returns from forestry as log prices have climbed relative to historic prices. While the long run trend has been upward, there was a sudden drop in export log prices in late June 2019. This is thought to have been the result of an oversupply in key markets such as China rather than being caused by weakening demand⁴.

In 2017, 60 percent of *pinus radiata* trees in New Zealand’s plantations were over 16 years old. Thirty five percent were between 21 and 30 years old⁵, so approaching or at harvest age. The improving returns, particularly on average over the last decade, are illustrated in Figure 6 below.

⁴ ANZ Research Agri Focus ‘Rising Tide’, August 2019, Page 13

⁵ Forestry Owners Association, Fact and Figures 2017/18, NZ Plantation Forestry Industry, Page 16.

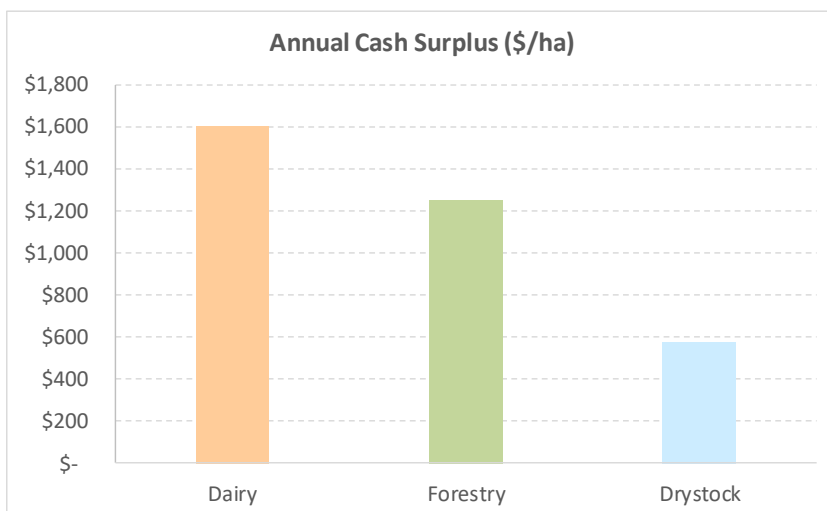
Figure 6 : Forestry Quarterly Export Prices Japanese Agricultural Standard (JAS) m³



Source : MPI, <https://www.teururakau.govt.nz/news-and-resources/open-data-and-forecasting/forestry/wood-product-markets/historic-indicative-new-zealand-radiata-pine-log-prices/> Average Quarterly Prices NZ\$ Free on Board, all grades average per quarter, December quarter 1996 to June quarter 2019. Note: Weighted averages were used from June 2017, so care is needed when comparing with previous quarters. JAS is a method of expressing the cubic meter equivalent of a load of wood. See <https://www.ribbonwood.co.nz/forestry-news-JAS-payments-for-logs-to-export.html> for more information.

The long run improvement in forestry prices over recent years has flowed through to attractive relative returns from forestry compared to other land uses, for example dry stock farming. An estimate of this effect on an average per hectare basis is shown in Figure 7 below.

Figure 7 : Relative returns by main land use activity : 10 year average 2005 to 2015



Source : Forestry Owners Association, Fact and Figures 2017/18, NZ Plantation Forestry Industry, Page 5

Figure 7 captures the average annual cash surplus per hectare over the 10 years between 2005 and 2015 of dairying, forestry and dry stock farming based

on East Coast hill country farms for the dry stock estimate⁶. While in the Upper Hutt district sheep and beef farming may perform better than East Coast hill country farms due to better rainfall, the returns to forestry as an alternative land use have evidently been attractive and remain so despite the recent dip in the price. This benefit is likely to be heightened in coming decades as New Zealand seeks to mitigate climate change through encouraging more forestry.

While that may encourage greater use of land for forestry, the underlying economics of forestry is very dependent on: scale, accessibility of the plantation and distance to market. While the Upper Hutt district's exotic forest plantations are small relative to those of other regions, they are of economic scale and are relatively close to market. For forests in the Upper Hutt area the main options are likely to be exporting via the Port of Wellington or selling to the closest major wood processing operations to the Upper Hutt area. This is Juken New Zealand Limited's Wairarapa Mill. It is capable of throughput of 25,000 to 49,999 m³ per annum. It can also produce Veneer/LVL/CLT and manufactured wood products. There is also the Kiwi Lumber Ltd mill in Masterton, which has a greater throughput of 50,000 - 99,999 m³ per annum.⁷

In the period between August 2006 and October 2018 there were 17 forest harvesting notices issued in the Upper Hutt district⁸. Consistent with national trends discussed above, 65 percent of these were issued since 2015. Six of these notices were for blocks in the Mangaroa Valley, with all but one of these applied for in 2017 or 2018. There were two harvesting notices over more significant blocks in the Moonshine Valley in 2015 and 2016 and three each from blocks in the Akatarawa and Whiteman's Valley areas since 2006.

Given all these factors, and assuming log prices remain at or close to their historically good levels, in the Upper Hutt district, like other parts of New Zealand, is likely to see more harvesting of exotic trees over the next decade as trees reach the economically optional age for harvest. Policies designed to mitigate climate change are also likely to encourage a reversal of the trend towards increasing grassland areas that was apparent over recent years (See Figure 2).

Four blocks of land were sold between January 2006 and December 2018 in the Upper Hutt area with a land use description of 'forestry,' in blocks greater than 80 hectares, according to the QV Sales Data Set⁹. Two of these blocks were circa 90 hectares and two were circa 180 hectares, and all were on Akatarawa Road. The prices per hectare of these blocks varied from circa \$1,600/hectare to \$4,100/hectare¹⁰. The two larger blocks were at the lower

⁶ The estimation was done by Scion in November 2015 and for the drystock figure used Beef & Lamb NZ data.

⁷ Forestry Owners Association, Fact and Figures 2017/18, NZ Plantation Forestry Industry, Page 37 and 38.

⁸ From UHCC Consenting Records file 'ResourceConsents_Rural_Neighbourhoods.xlsx'

⁹ From QV Sales Data Set file 'SalesData_Rural_Neighbourhoods_updated'.xlsx'

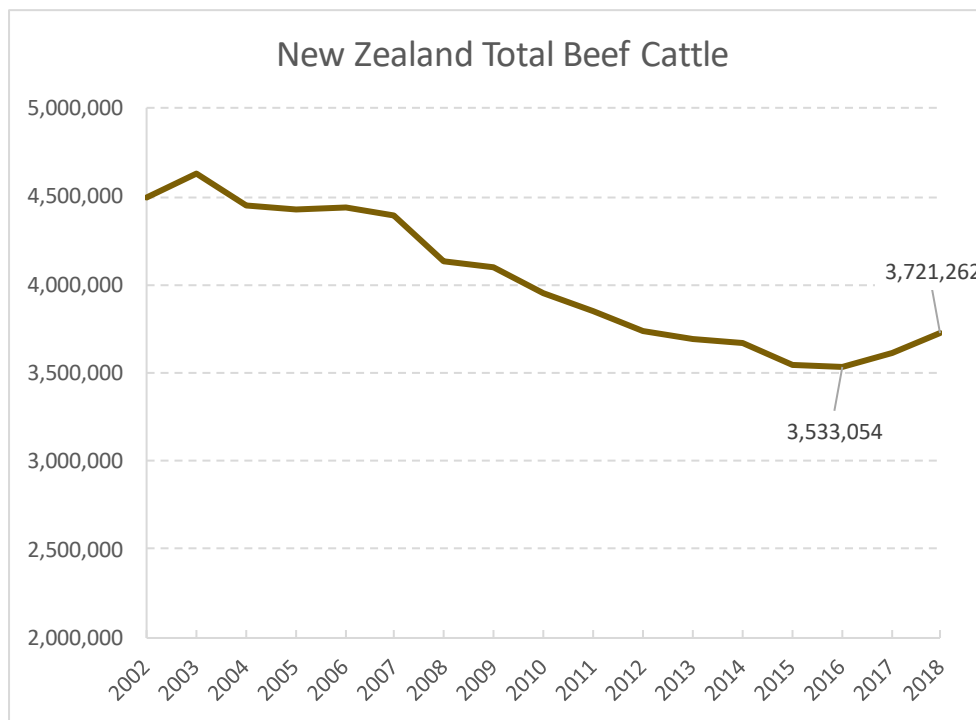
¹⁰ Net sales price to hectare land area.

end of this price range and were zoned Rural Hill and appeared to have more challenging access compared to the smaller blocks at the upper end of the price range. These were also zoned Rural Hill but were close to the road or adjacent to Rural Valley zoned land. There was only one other sale of a block of 21 hectares in the same 13 year period in the Whiteman’s Valley. This was at a much higher price per hectare which may have reflected alternative land use opportunities.

1.7.2 Beef cattle

The Upper Hutt area recorded a total of 3,337 beef cattle in the 2017 production census. This included 35 breeding bulls and 30 non breeding bulls, 731 steers and 1,833 cows and heifers. This was a major increase on the numbers recorded in the previous census in 2012. Then, there were a total of 1,944 beef cattle in the Upper Hutt area with 26 breeding bulls and 318 non breeding bulls, 596 steers and 646 cows and heifers. The increase in beef cattle numbers in the Upper Hutt area between the 2012 and 2017 census aligns with New Zealand wide trends as beef cattle numbers have increased to 3.7 million since 2015, as shown in Figure 8 below. However, evidently New Zealand beef cattle numbers are well down on those reached between 2002 and 2012.

Figure 8 : New Zealand Total Beef Cattle

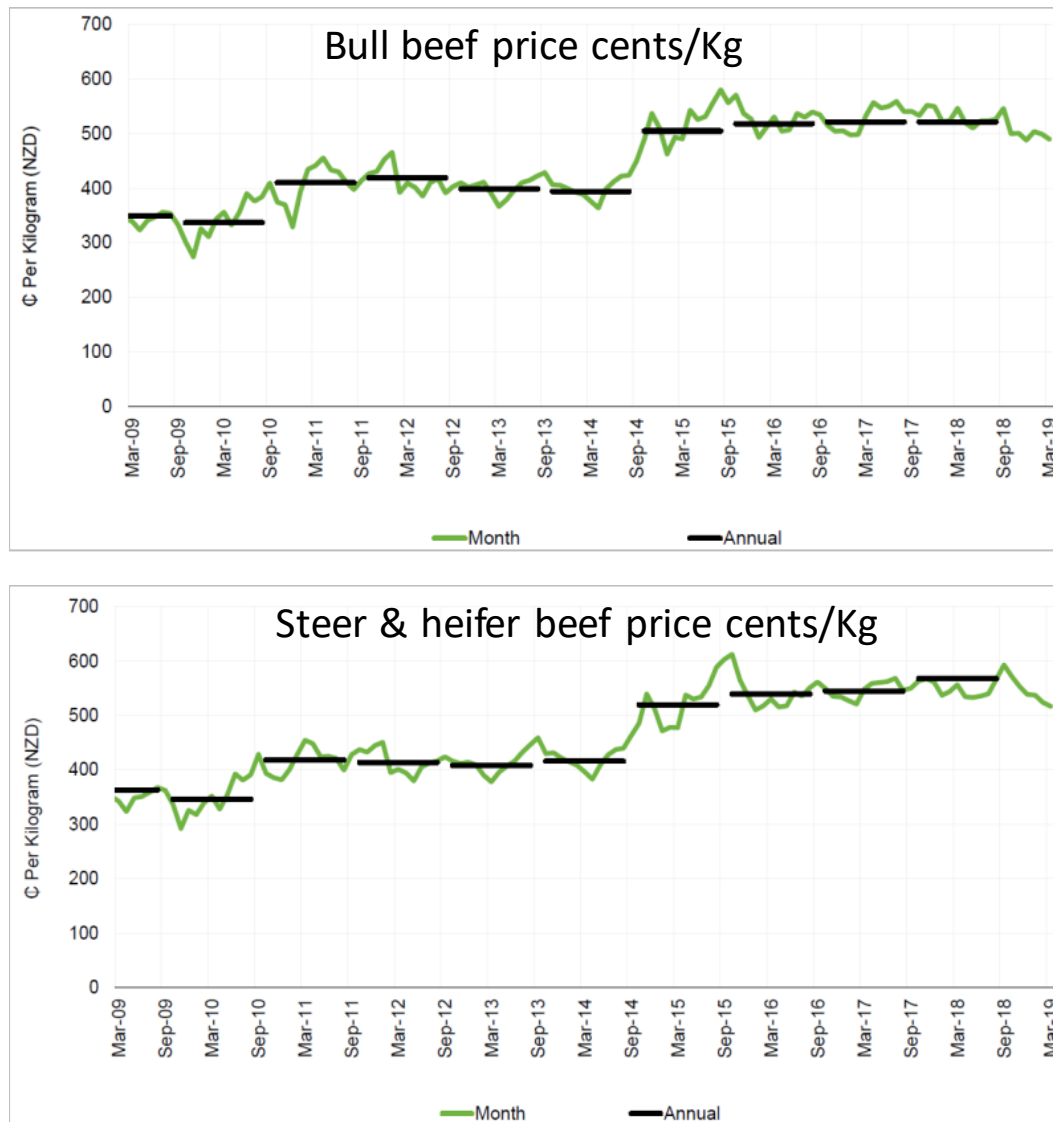


Source : Stats NZ Infoshare, Group: Agriculture – AGR, Table: Variable by Total New Zealand (June Years)

The 2012 and 2017 Agricultural Production Census data may have captured a shift in focus on Upper Hutt farms away from raising beef bulls, because there was a sharp fall in the estimates of non-breeding bulls from 318 in 2012 to 30 in 2017.

The trend towards increasing beef cattle numbers, and Upper Hutt farms focusing on beef cattle, is likely to be driven by the improving returns for beef that has characterised recent decades, as shown in the two charts under Figure 9. Since 2015 the annual average prices in the M Grade have been above \$5/kilogramme for both bull beef and for steers and heifers.

Figure 9 : NZ M Grade (270 to 295kg) First chart: bull beef price & second chart: steer & heifer beef price

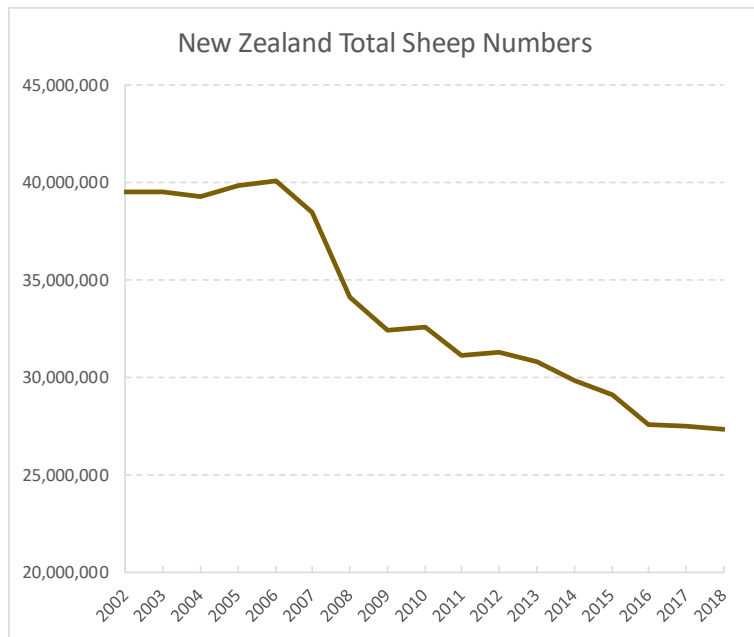


Source : Beef + Lamb New Zealand Economic Service.

1.7.3 Sheep

Unfortunately, the Agricultural Production Census results for 2017 for sheep populations in the Upper Hutt area were largely suppressed. This was due to high sample errors or imputation levels in the data. However, in 2012 there was more accurate data collected which estimated that the total sheep numbers were 11,565. This included 9,375 ewes and 128 rams. The number of specialist sheep farms in the Upper Hutt area fell between 2012 and 2017 as shown in Figure 4. This is consistent with the falling total number of sheep in New Zealand, as shown in Figure 10.

Figure 10 New Zealand total sheep numbers

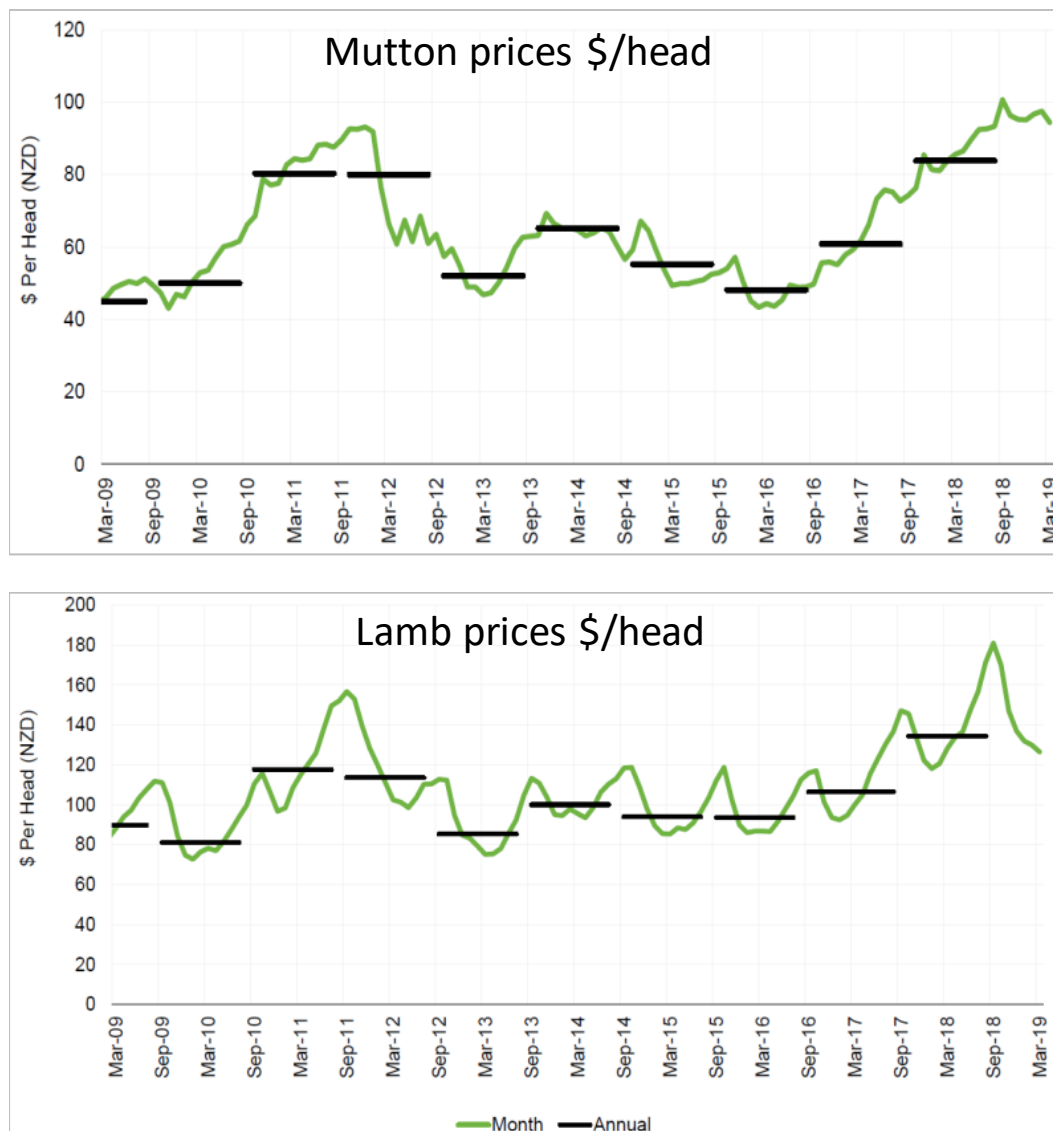


Source : Stats NZ Infoshare, Group: Agriculture – AGR, Table: Variable by Total New Zealand (June Years)

Sheep meat prices haven't shown the buoyancy of beef prices for as long, so the decline in sheep numbers has yet to turn the corner. As illustrated in Figure 11, prices for MX Grade mutton¹¹ and all grades of lamb were at a higher annual average in 2018 than at any time in the last decade. However, these prices have been a relatively recent phenomenon, so it will take time for farmers to respond and increase capital stock to increase mutton and lamb production. Their response will also depend on the specific circumstances of their farms and their perceptions about the relative value of changing the mix of stock on their farms.

¹¹ M and X grades are key weight classes for classifying sheep meat.

Figure 11 : First chart is of mutton prices MX Grade & second chart is lamb price average of all grades

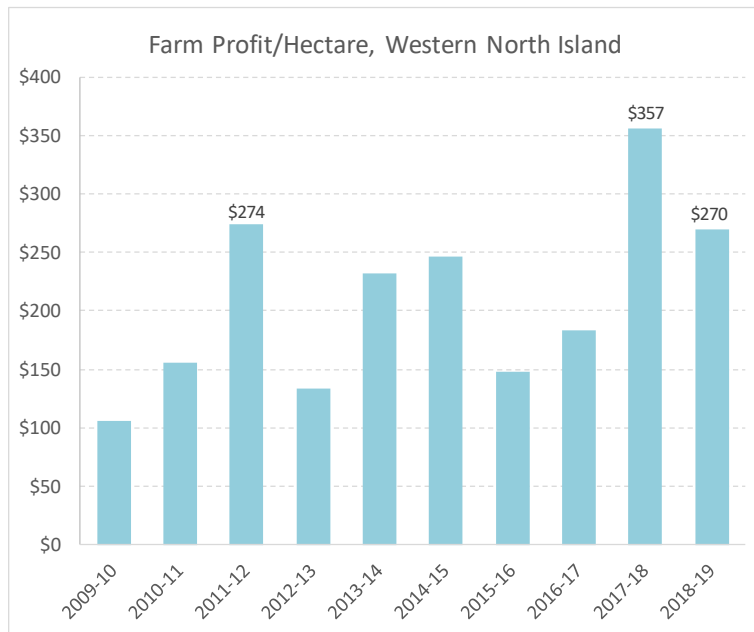


Source : Beef + Lamb New Zealand Economic Service.

Sheep & beef farm average profitability

The comparatively upbeat state of the pastoral sector is also illustrated by the results of Beef + Lamb New Zealand’s regular sheep and beef farm survey. The average profitability per hectare of surveyed sheep and beef farms of all land classes for the Western North Island is set out below in Figure 12. The Western North Island includes farms in the Upper Hutt district. It shows that the 2017/18 year was the best year in the last decade, reaching an average profitability of \$357 per hectare. The 2018/19 data is a forecast and expected to represent a fall in profitability to \$270 per hectare. But even that is close to the second-best year in the last decade, which was in 2011/12 at a profitability of \$274 per hectare.

Figure 12 : Sheep & Beef farm profitability time series



Source : Beef + Lamb New Zealand Economic Service, Sheep and Beef Farm Survey - \$ Per Hectare Analysis, Class 9 All Classes - Taranaki-Manawatu (includes Upper Hutt district) dated 12 September 2018 available at <https://beeflambnz.com/data-tools/sheep-beef-farm-survey>

Sheep and beef farm land sales statistics

The QV Sales Data Set shows that 608 hectares of land described as ‘store livestock’¹² or ‘vacant farm’ & ‘business’ changed hands in blocks of more than 40 hectares, between January 2006 and December 2018¹³. This was made up of only 5 sales and only one of these 5 was sold after 2010 (in Whiteman’s Valley). The prices per hectare of these blocks varied from circa \$3,000/hectare to \$25,000/hectare¹⁴. The lower end of this price range is low for operating sheep and beef farms, which are currently circa \$11,000 hectare for grazing farms¹⁵. The higher end of the price range probably reflects the zoning of the blocks as Rural Valley (blocks at the lower end of the range were zoned Rural Valley but may have included a significant proportion which was zoned Rural Hill). There were only 6 sales of smaller ‘store livestock’ blocks (between 5 hectares and 40 hectares) over the same 13 year period.

¹² Land used for future breeding or finishing of stock.

¹³ From file SalesData_Rural_Neighbourhoods_updated.xlsx

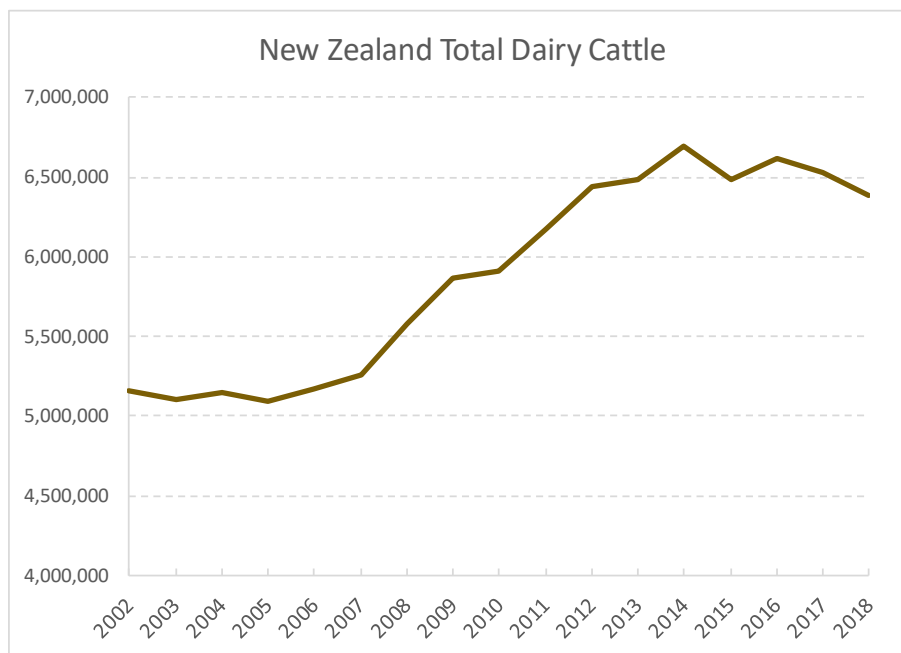
¹⁴ Net sales price to hectare land area.

¹⁵ See Real Estate Institute monthly report for June 2019 see <https://www.interest.co.nz/farm-sales>

1.7.4 Dairy

The 2017 Agricultural Production Census logged 1,037 dairy cattle in the Upper Hutt area and 442 calves born to dairy heifers and cows¹⁶. There were only 2 dairy bulls used for dairy breeding captured in this data. This represents a significant fall of over half in estimated total dairy cattle in the area, because in the 2012 census there were estimated to be 2,430 dairy cattle including 31 breeding bulls¹⁷. This level of decline is much greater than the decline in numbers of dairy cattle in New Zealand overall, as shown in Figure 13. Over the same period New Zealand's total dairy cattle population reduced by only 1.5 percent.

Figure 13 New Zealand Total Dairy Cattle



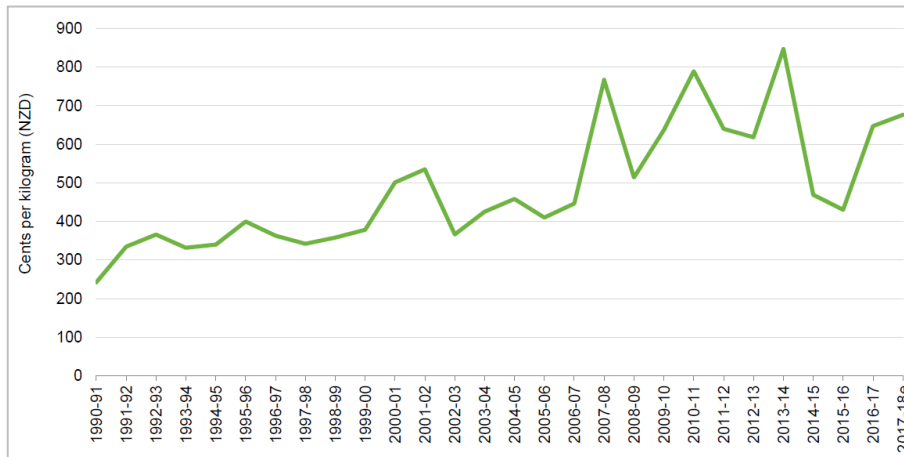
Source : Stats NZ Infoshare, Group: Agriculture – AGR, Table: Variable by Total New Zealand (June Years)

Figure 14 below demonstrates the volatility of the milk solid price over the last decade. This volatility may have discouraged some dairy farmers in the Upper Hutt area and caused the fall in dairy farms estimated in the Agricultural Production Census in Figure 4.

¹⁶ Calves born to dairy heifers and cows are not included in overall population of dairy cattle.

¹⁷ Further breakdown of the dairy cattle population is not available in the 2012 Agricultural Production Census results for Upper Hutt area due to it being suppressed or confidential to protect the confidentiality of individual respondents due to there being few dairy farmers to survey. See http://datainfoplus.stats.govt.nz/Item/nz.govt.stats/6362a469-f374-412e-ac25-d76fd0962003?&_qa=2.230577940.961428267.1560114253-482333991.1553466485&_qac=1.226368872.1557875626.CiOKCQiwzunmBRDsARIsAGrt4mtokcOqdqATGt4CduHcfJwIq3xIOzsZOyS8v7kfZcZmWMUzHxtizOcaAn5ZEALw_wcB#/nz.govt.stats/d5d735fe-71e3-4a54-a720-5f0426c26a3b/

Figure 14 : Milk Solid Price (nominal)



Source : Beef + Lamb Economic Service & Livestock Improvement Corporation

One dairy unit of 164 hectares was sold in Whiteman’s Valley in 2015 for circa \$24,000/hectare,¹⁸ at the depths of the downturn in the price for milk solids illustrated in Figure 14 above. There were only 2 other sales with land use descriptions recorded as dairy in the QV Sales Data Set and both were probably ex dairying land as they were both smaller than 4 hectares.¹⁹

1.7.5 Other

The 2017 Agricultural Production Census logged 358 hectares used for producing pasture or lucerne hay, silage and/or baleage. This was down on the 485 hectares recorded as producing these in 2012. There was little cultivation recorded in the Upper Hutt area with 35 hectares of reduced cultivation and no full cultivation and only small amounts of direct drilling used in 2017²⁰. There were 832 egg laying hens which laid 11,386 dozen eggs in the area. The census also estimated that the Upper Hutt district had 60 horses and 17 goats which was down from 105 horses and 29 goats in 2012. There is little horticulture in the Upper Hutt area but there were 2 hectares of blueberries and a hectare of flower bulb, corm, and tuber crops grown mainly for sale as bulbs, corms and tubers recorded in 2017. Irrigation is not widely used in the area. There were 110 hectares irrigated for grain/seed/arable crops with another hectare both irrigated by micro irrigation systems and other horticultural crops. Over decades to come climate change may cause some increase in use of irrigation if the predicted increase in the incidence of droughts materialises.

There is likely to be a lot more varied and richer set of commercial/life style activities in the Upper Hutt district than is captured in the Agricultural

¹⁸ Net sales price to hectare land area.

¹⁹ From file SalesData_Rural_Neighbourhoods_updated'.xls

²⁰ **Full cultivation** is mechanically breaking up the soil to create a seed bed. Full cultivation is substantial soil disturbance with full inversion, deep, or frequent tillage operations during the year (e.g. ploughing). **Reduced cultivation** is primary and/or secondary tillage with reduced soil disturbance (usually shallow tillage and without full soil inversion). **Direct drilling** is often using spray to suppress pre-existing plants and directly inserting seed into the ground without breaking up the soil.

Production Census. This is because, as discussed at the outset, the census surveys are targeted at businesses through GST registration records, so smaller life style blocks are unlikely to be included. In addition, where there are only a few activities taking place in the district, there will be much greater likelihood of these being missed in surveys or the surveys finding unrepresentative data because of small sample size of say, llama breeders. However, the censuses do provide some visibility of the variety of potentially commercially viable activities that can be pursued on smaller blocks of land, e.g. egg production, blueberries and flowers.

Life style sized enterprises can be a source of experimentation and innovation that is not always possible in larger, more established commercial operations. These vary across a gamut of possibilities for example, equestrian training for show jumping or dressage, horses trekking businesses, truffle growing, olive orchards, greenhouses, small tourism enterprises like paintball or disc golf, rare and heritage animal breeding, nut production, speciality gardens, café's and crafts. Many of these activities may be able to be accommodated on blocks of 4 hectares or less and some on 1 hectare or less. However, others will need flexibility to operate on larger areas to adequately cover the fixed costs of the activities in question.

The data available from Statistics New Zealand Agricultural Production Censuses cannot throw much light on the economic surpluses coming from the smaller life style sized blocks of land within the Upper Hutt district. This is because, as discussed earlier, the enterprises included are those registered for GST and compulsory registration is set at a turnover of \$60,000. Enterprises below this level are generally not included. This will exclude most land use activities on smaller blocks such as those of 4 hectares. In the future it may be possible survey life style block owners within the district to get more direct applicable information.

While measuring of the economic returns from land use on smaller blocks in the district isn't possible from available sources, it is possible to examine, at the average level, the opportunity cost of moving land out of its existing activity and into smaller life style type blocks. The returns per hectare of some life style block activities are likely to be significantly better than that achieved on the pastoral sheep and beef farming land that they have superseded, even with the current buoyant commodity prices. For example, Figure 7 shows that over the decade between 2005 and 2015 the annual cash surplus from dry stock farming averaged \$575 per hectare. Assuming this estimate provides a reasonable proxy from the annual cash surplus for sheep and beef enterprises in the district, the activities carried out on a 4 hectare life style block would have to return a cash surplus of \$2,300 per year to be a more economic land use²¹. Applying the same approach, if land previously used for forestry were subdivided into a 4 hectare block it would need to earn a cash surplus of

²¹ This is the annual cash surplus for dry stock farming shown in Figure 7 of circa \$575 per year x 4 hectares.

\$5,000 per year to provide a better return than remaining as a forestry block²². Of course, this analysis assumes that the averaged 2005 to 2015 results will be similar in the future. However, these benchmarks of annual cash surpluses will rise, and fall, driven by the underlying prices of the principle commodities produced by the forestry and sheep and beef land uses. That said, it is possible to envisage many other land use activities that could provide a greater annual cash surplus than existing uses even on smaller land areas.

1.7.6 Fertiliser use and effluent management

In 2017 there were 243 tonnes of superphosphate applied along with 287 tonnes lime (excluding dolomite). There was only one tonne of dolomite applied. This was down on the 2012 census figures, when there were 376 tonnes of superphosphate or potassic superphosphate and 429 tonnes of lime applied. The 2017 census recorded that effluent was sprayed on 44 hectares. This was likely carried out on the three dairy farms identified in the Upper Hutt area. The census also collected information about the main types of effluent management systems used on Upper Hutt farms. It documented three single storage ponds/tanks (no solid separation systems) and three sump storage systems (storage for at least 1-2 days prior to irrigation). There was one consent granted to discharge contaminants to land in 2018 from collected dairy shed effluent. This was the only such consent recorded in the period between August 2001 and March 2019 in the GWRC discharge consents file²³.

A report prepared for Greater Wellington Regional Council (GWRC) in 2018²⁴ by Aquanet on Whaitua Te Whanganui-a-Tara River and stream water quality and ecology noted that significant faecal contamination was generally limited to urban streams (See Appendix for map of Whaitua catchments). However, it pointed out that the Mangaroa River was one of two non-urban waterways in the region that were not suitable for primary contact recreation due to elevated levels of the pathogen indicator bacteria *E. coli*. It also explained that the main source of faecal contamination in urban streams was human wastewater, but in the Mangaroa River the primary source was stock (sheep and beef cattle).

The Aquanet report stated that benthic cyanobacteria also posed a significant health risk to recreational users in the Hutt River, but the causes for this were complex and not fully understood. Further work on this could have implications for Upper Hutt district rural land use.

The report suggested that improving the ecological and recreational state of urban streams in Whaitua Te Whanganui-a-Tara would require significant upgrades to the stormwater and wastewater infrastructure in the cities of

²² This is the annual cash surplus of forestry shown in Figure 7 of circa \$1,250 per year x 4 hectares.

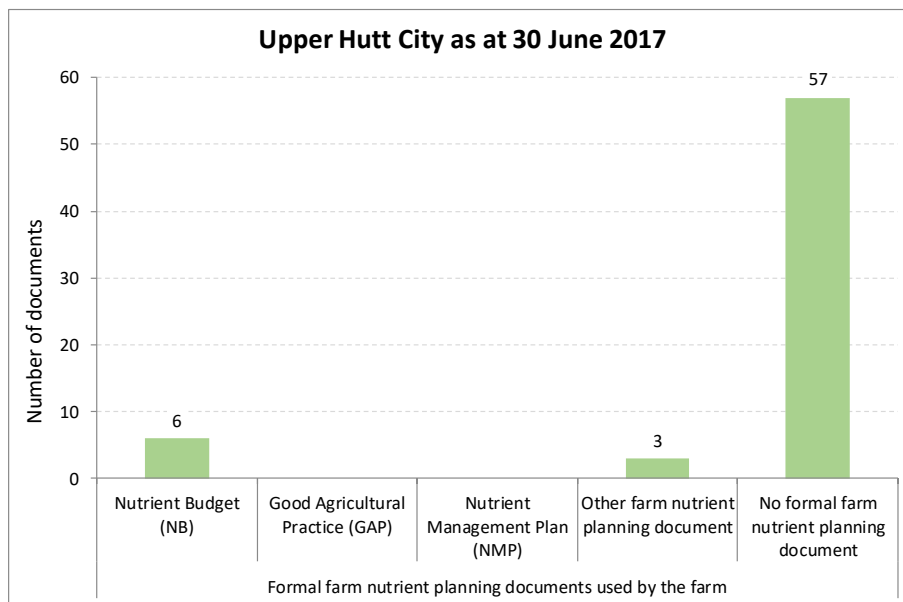
²³ See file Copy of GWRC Discharge consents.xlsx

²⁴ See Whaitua Te Whanganui-a-Tara River and stream water quality and ecology, 30th October 2018, Aquanet Consulting Ltd, Report Prepared for Greater Wellington Regional Council by Dr Michael Greer & Dr Olivier Ausseil, Page i & ii.

Wellington, Lower Hutt and Upper Hutt, and the adoption of water sensitive urban design in new developments. It concluded its summary by declaring that improving the state of agricultural catchments, specifically the Mangaroa River, would require a shift in land management practices. However, further information needed to be collected on nutrient sources, transport and dynamics to support future decision making.

The Agricultural Production Census also gathered information on formal farm nutrient planning documents used by farms. The results for the Upper Hutt area are shown in Figure 15.

Figure 15 : Nutrient plans in Upper Hutt area



Source : Statistics NZ, Agricultural Production Statistics: June 2017 (final), Table 8, Farm Practice Counts by Territorial Authority.

Figure 4 recorded 96 farms in the Upper Hutt area. Figure 15 shows that the majority of these do not have a formal nutrient planning document. Nine farms had some form of planning document for example a nutrient budget or other farm nutrient management planning document. These statistics suggest that there could be improvements in farming enterprises measuring and tracking their likely use and leaching of nutrients. Often there can be quite low cost or even profitable improvements made to fertiliser usage and nutrient management which nutrient management planning can uncover.

2 Conclusion

The Upper Hutt district accounts for only a very small proportion of overall agricultural land in New Zealand - 0.2 percent of New Zealand's total land area. It forms part of the Greater Wellington Regional Council area which covers 804,900 hectares and makes up just under 3 percent of the country's total land area. This is still a minor proportion. It has no class 1 soil, contains only a small block of the more valuable and versatile class 2 soils around the Hutt River at

Te Marua and the Gillespies block and has valley floor areas which are generally class 3. The key rural land uses in the district are forestry and sheep and beef, with 78 percent of the productive land in the Upper Hutt district devoted to grassland or planted production forest.

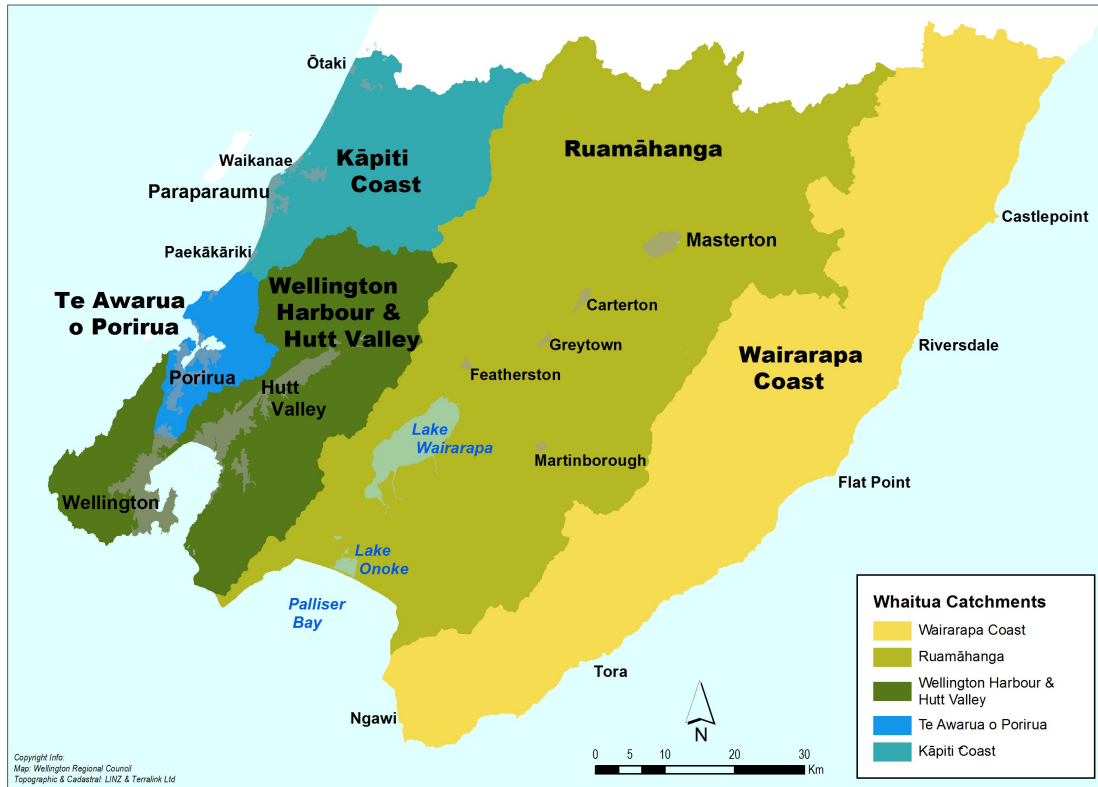
Economic trends in land use in the Upper Hutt district are likely to largely match those observed in the rest of the country. These include a relatively buoyant agricultural and forestry sector due to good commodity prices relative to historic price trends. There is some evidence of rural land aggregation, increased forest harvesting and an emphasis on cattle over sheep in the district. The latter is likely to have resulted from better beef prices for a longer period compared to sheep meat prices.

How these economic trends will play out over future planning periods is unknown. However, should current prices persist, and be overlaid by increased Government policy action designed to mitigate climate change, it could be expected that there may be a greater focus on afforestation on the more accessible blocks with poorer soil fertility. Pastoral farming is in a comparatively upbeat state too. Should that persist, it is likely to continue to compete effectively against forestry as a land use as farmers continue to pursue their traditional livestock focused farming activities underpinned by supportive prices. Dairying is a minor land use activity in the Upper Hutt district, and some statistics show it has been declining over the last decade. It is likely to come under increasing pressures and face greater costs given environmental concerns about the quality of freshwater resources and greater urbanisation in the district.

The Upper Hutt district's rural land makes a useful, but marginal, contribution to New Zealand's overall agricultural and forestry production. Given this, the generally less valuable soils of the district, and Upper Hutt area's proximity to and strong commuter links with Wellington city, it could be viewed as an area in which future urban development could well be accommodated. This, of course, would depend on the extent to which regional demand for increased urban development in the greater Wellington area might be addressed in other areas. However, the district might provide good expansion options, for example cluster developments which can spread development costs more effectively, as part of a wider strategy that coordinates areas for future urban growth in the Wellington region.

Appendix

This appendix shows that the Upper Hutt district lies within the Wellington Harbour and Hutt Valley catchment within the GWCC Whitua region. Figure 16 : GWRR Whitua Regions



Source : <http://www.gw.govt.nz/assets/Environment-Management/Whaitua/whaituamap3.JPG>